



**METSIMAHOLO LOCAL MUNICIPALITY
CONSTRUCTION FOR RE-COMMENCEMENT OF UPGRADING
OF ORANJEVILLE 4ML/DAY WASTEWATER
TREATMENT PLANT**

BID NO.: MLM 22/2024/25

CIDB GRADING: 8 CE/ME OR HIGHER

ISSUED BY:

Metsimaholo Local Municipality
Municipal Building
10 Fichardt Street
Sasolburg
4800



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

TENDER NUMBER: MLM 22/2024/25

**CONSTRUCTION FOR RE-COMMENCEMENT OF UPGRADING OF ORANJEVILLE
4ML/DAY WASTEWATER TREATMENT PLANT**

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 4 is issued at the tender stage as per the tender advertisement. The pricing data is available on request in Excel format**

At the contract stage Volume 4 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 4 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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METSIMAHOLO LOCAL MUNICIPALITY

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CONSTRUCTION FOR RE-COMMENCEMENT OF UPGRADING OF ORANJEVILLE 4ML/DAY WASTEWATER TREATMENT PLANT

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PART T1: TENDERING PROCEDURES

T.1.1 TENDER NOTICE AND INVITATION TO TENDER



TENDER NOTICE

BID NO: MLM 22/2024/25

METSIMAHOLO LOCAL MUNICIPALITY invites tenders for the **CONSTRUCTION FOR RE-COMMENCEMENT OF UPGRADING OF ORANJEVILLE 4ML/DAY WASTEWATER TREATMENT PLANT.**

Tenderers should have a CIDB Contractor grading designation of **8CE/ME** or higher.

Bid documents will be available during working hours upon payment of R400.00 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.

A compulsory clarification meeting will be held on 12 February 2025 at 12H00 finance building 2nd floor building municipal foyer

Finance Building, Metsimaholo Municipality.

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 **05 March 2025, 11H00**. Bid documents, clearly marked **BID MLM 22/2024/25; CONSTRUCTION FOR RE-COMMENCEMENT OF UPGRADING OF ORANJEVILLE 4ML/DAY WASTEWATER TREATMENT PLANT** 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 8455

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

Technical:

M.L. Mhindurwa

Tel No.+27 83 480 1305

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

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

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

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

F.2.13.9 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.
- d) *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	The Project Document issued by the Employer consists of the following: THE TENDER Part T1: Tendering procedures: T1.1 Tender notice and invitation to tender T1.2 Tender Data Part T2: Returnable documents T2.1 Returnable Schedules required for Tender Evaluation T2.2 Other Documents required for Tender Evaluation T2.3 Returnable Schedules that will be incorporated into the Contract THE CONTRACT Part C1: Agreements and contract data C1.1 Form of Offer and Acceptance C1.2 Agreement in terms of Occupation Health and Safety Act C1.3 Form of Guarantee C.1.4 Contract Data Part C2: Pricing data C2.1 Pricing instructions C2.2 Bills of quantities Part C3: Scope of work Part C4: Site information Drawings

Tender data contd.

Sub-clause	Data
F.1.3	The Tender Document is available upon payment of R400.00 or can be downloaded free of charge from the e tender website.
F.1.4	Name: Techi Consulting Engineers Address: Plot 8 Dann Rd, Kempton Park A/H, 1619 Contact person: Muchatyiwa Lawrence Mhindurwa Tel: +27 11 452 5114 Cell: +27 83 480 1305 E-mail: info@techi.co.za
	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 8 CE/ 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 8CE/ ME class of construction work, are eligible to have their tenders evaluated.
	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 8 CE/ 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 8 CE/ ME class of construction work, are eligible to have their tenders evaluated.

	1. every member of the joint venture is registered with the CIDB; 2. the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for an 8CE class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.
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Tender data contd.

Sub-clause	Data
F.1.4	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: 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 8CE/ ME class of construction work; and • 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. c) Compulsory Briefing Meeting will be held on 12 February 2025 at 12hr00 finance building 2nd floor foyer.
F.2.1	Eligibility

	Only those tenderers who satisfy the following eligibility criteria and who provide the required evidence in their tender submissions are eligible to submit tenders and have their tenders evaluated: 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 8 CE/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 8CE/ME class of construction work, are eligible to have their tenders evaluated. Joint ventures are eligible to submit tenders provided that: - 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 8 CE/ ME class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.
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Tender data contd.

Sub- clause	Data
F.2.1	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:

	c) 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 8CE/ ME class of construction work; and d) 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 e) the employer agrees to provide the financial, management or other support that is considered appropriate to enable the contractor to successfully execute that contract. f) Compulsory Briefing Meeting will be held on 12 February 2025 at 12hr00 finance building 2nd floor foyer.
F.2.10	a) The Valued Added Tax (VAT) rate shall be 15% or as otherwise provided for by legislation. b) The successful Tenderer shall be required to produce a VAT invoice that shall only be prepared once measurements and valuations for work done in terms of the contract offer have been agreed with the Employers agent and a certificate of payment issued. 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.
F.2.11	A Tender offer shall not be considered if alterations have been made to the forms of tender data or contract data (unless such alterations have been duly authenticated by the Tenderer) or if any particulars required therein have not been completed in all respects.

F.2.12	No alternative tender offers will be considered
F.2.13.1	The Tenderer may not make an offer for only part of the services as defined in the Scope of Work.

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: 11H00 on 05 March 2025 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	RETURNABLES	
No	Returnable	Notes
1	Form of Offer	Fully completed in handwriting and signed in black ink pen.
2	A copy of a CSD summary report OR CSD number.	• CSD full report or summary report OR CSD number. • Municipality may not make any award to a person whose tax matters are not compliant with SARS, please note that tax compliance will be verified before any award.
3	Proof of company registration documents with the Director's details must be attached.	• 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.
4	Fully completed and signed MBD forms	Fully Completed and signed in handwriting and in black ink pen.

5	Completed BOQ in black ink pen	Items not priced will be considered rated at R0.00 and cannot be re-priced after appointment
6	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)	• Submit Audited Financial Statements 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)
7	Joint Venture Agreement (Must indicate the lead partner, if the bidders grading is not the same the lead partner must have the higher grading)	• 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)
	NB! The following documents will not be accepted: for number 8, 9 and 10 Affidavits; Address confirmation letter; invoices from the body corporates or agents, rates and taxes of the lessor (without a lease agreement) and municipal tender / rates clearance letter.	
8	Latest Municipal rates and taxes account for the COMPANY AND DIRECTORS/TRUSTEES / MEMBERS/ SHAREHOLDERS.	• Submit strictly FEB 2025 OR MARCH 2025 municipal rates & taxes statement must be attached • The submitted account must not be in arrears for more than 3 months. • 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.
9	In the event of a tenant renting a lease agreement MUST be attached for the COMPANY AND DIRECTORS/TRUSTEES	The lease agreement must include the following: • 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.

	/MEMBERS/ SHAREHOLDERS.	- 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>	
10	Municipal rates and taxes for bidders who are from the rural areas for the COMPANY AND DIRECTORS/TRUSTEES /MEMBERS/SHAREHOLDERS.	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.
11	CIDB Grading	Copy of Company CIDB Grading designation 8 CE/ ME or Higher
12	Compulsory briefing	Proof of having attended compulsory briefing

Failure to comply with the above-mentioned terms and conditions will deem your bid to be disqualified.

Specific Goals (Locality) REFER TO: MBD 6.1	The following must be submitted for proof of locality: - Municipal account in the name of the bidder not older than 90 days or - A valid copy of lease agreement signed by both parties, where the bidder is the lessee, or - SARS tax pin document - An official letter from the bank or bank statement indicating the registered business address of the bidder - Bidders from 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
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Bidders must keep a copy of a completed Excel spreadsheet BOQ which may be required during the evaluation processes

Tender data contd.

Sub-clause	Data
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	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 70 points will automatically be disqualified. The 90/10 evaluation criteria will be used where Price will be allocated 90 points and Preference will be scored out of 10 points.
F.3.11.1	The procedure for evaluation of responsive Tender Offers will be Method 4: Financial Offer, Functionality, and Preferences. The responsive tender with the highest total points as defined below is the preferred tender
F.3.11.2	The financial offer will be scored in terms of Formula 2, Option 1 of Table F.1 of SANS 294:2004, which reads as follows: $Nfo = W1 \times A$ Where: Nfo = number of tender evaluation points awarded for the financial offer;

	W180 points for rand value above R50 000 000;	
F.3.11.3	(a) Functionality will include the following:	
	Functionality	Attainable points
	A. PROJECT EXPERIENCE AND PERFORMANCE	50
	B. CONSTRUCTION PLANT	20
	C. COMPANY KEY PERSONNEL	20
	D. FINANCIAL STABILITY	10
	Total	100
	Minimum Threshold	70

Criteria	Evaluation Indicators	Points Allocated	Weight
A. PROJECT EXPERIENCE AND PERFORMANCE			MAX. 50 POINTS
Company experience with regards to the construction of water/sewer treatment/ package plants	Required submission to claim points: 1. 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. 2. Project signed Appointment letter (letter must be within the past 20 years and the value of the project must be above R20 000 000.00) & corresponding Metsimaholo reference letter as a main contractor.	10 points per project	50
B. CONSTRUCTION PLANT			MAX. 20 POINTS
Vehicle Registration Certificates in a company or directors name/ Signed letter from Rental Company on rental company letterhead	2 X TLB	05 points for owned	Max 05 points
	Excavator	05 points for owned	Max 05 points
	2 X 10 m ³ Tipper trucks	05 points if owned/ rented	Max 05 points
Attach signed company ownership confirmation letter/ Signed letter from Rental Company on rental company letterhead	Self-Erect / Tower/Mobile Crane	05 points if owned/ rented	Max 05 points
C. COMPANY KEY PERSONNEL	BIDDERS MUST SUBMIT COPIES OF CVs & QUALIFICATIONS		MAX. 20 POINTS

Contracts Manager or equivalent	Personnel (x1) - is required to attach a Degree qualification or higher in the Built environment and have project construction experience. NB: Submit CV / Completed Personnel Form and copies of Qualifications.	6 and above projects 4 – 5 projects 0 – 3 projects	05 points 3 points 0 points
Site Agent/ Manager	Personnel 2- Attach a National Diploma qualification or higher in the Built environment/ Project management and have project construction experience NB: Submit CV / Completed Personnel Form and copies of Qualifications.	6 and above projects 4 – 5 projects 0 – 3 projects	5 points 3 points 0 points
Criteria	Evaluation Indicators	Points Allocated	Weight
Mechanical Fitter	Personnel 3- Qualifications in Mechanical NB: Submit CV / Completed Personnel Form and copies of Qualifications.	6 and above projects 4 – 5 projects 0 – 3 projects	3 points 1 points 0 points
Electrician	Personnel 4 – Wiremans License Qualification NB: Submit CV / Completed Personnel Form and copies of Qualifications.	6 and above projects 4 – 5 projects 0 – 3 projects	2 points 1 points 0 points
Safety Officer	Personnel 5- Safety officer with a NQF L5 / National Diploma or Higher Safety Qualification with experience of not less than two projects. NB: Submit CV / Completed Personnel Form and copies of Qualifications.	2 or more projects experience	5 points
D. FINANCIAL STABILITY			MAX 10 POINTS
Bank Rating Letter	Submit a bank rating letter not older than 3 months of rating of A, B, or C with a dated stamp/ date of issue	10 Points	Max 10 POINTS
MINIMUM SCORE			70
TOTAL			100

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

**NB: THE MUNICIPALITY MAY PHYSICALLY VERIFY ON OF THE COMPLETED
PROJECTS OF THE CONTRACTOR**

PERSONNEL FORM

PERSONNEL	NAME & SURNAME	ID NUMBER	NAME OF PROJECT	PROJECT VALUE	DURATION OF PROJECT
Contracts Manager or equivalent			1.		
			2.		
			3.		
			4.		
			5.		
			6.		
Site Agent/ Construction Manager or equivalent			1.		
			2.		
			3.		
			4.		
			5.		
			6.		
Mechanical Fitter			1.		
			2.		
			3.		
			4.		
			5.		
			6.		
Electrician			1.		
			2.		
			3.		
			4.		
			5.		
			6.		
Safety Officer			1.		
			2.		
			3.		

METSIMAHOLO REFERENCE FORM-1

TO: METSIMAHOLO LOCAL MUNICIPALITY

I, the undersigned being duly authorized to do so, hereby furnish a reference to Metsimaholo Local Municipality relative to bid MLM 22/2024/25 for the: **Appointment of a 8 CE/ ME or higher cidb registered contractor for the Construction for re- commencement of upgrading of Oranjeville 4 ML/ Day Wastewater Treatment Plant.**

Name of the company tendering	
Project Name	
Project Contract/Tender Number	
Contract Value	
Description of Scope of work	
Contract duration (Start & End Date)	

Below questioner to be completed in full by the client only

1. Was their project completed satisfactory?	Yes / No
<i>If No, please furnish details:</i>	
2. Was the project constructed as per the approved scope of work?	Yes / No
<i>If No, please furnish details:</i>	
3. Was the project completed within the approved timeframe?	Yes / No
4. Would you recommend this contractor for similar work	Yes / No

Name of authorized person: **Signature:**

Position

Telephone: **E-mail:**.....

Date:.....

Completed on behalf of (Name of Institution)

***NB:** This document must be completed in full by the referee and it to be included in the bid submission. Failure to adhere to this requirement will result in the bidder not being allocated points.*

OFFICIAL INSTITUTION STAMP

METSIMAHOLO REFERENCE FORM-2

TO: METSIMAHOLO LOCAL MUNICIPALITY

I, the undersigned being duly authorized to do so, hereby furnish a reference to Metsimaholo Local Municipality relative to bid MLM 22/2024/25 for the: **Appointment of a 8 CE/ ME or higher cidb registered contractor for the Construction for re- commencement of upgrading of Oranjeville 4 ML/ Day Wastewater Treatment Plant.**

Name of the company tendering	
Project Name	
Project Contract/Tender Number	
Contract Value	
Description of Scope of work	
Contract duration (Start & End Date)	

Below questioner to be completed in full by the client only

1. Was their project completed satisfactory?	Yes / No
<i>If No, please furnish details:</i>	
2. Was the project constructed as per the approved scope of work?	Yes / No
<i>If No, please furnish details:</i>	
3. Was the project completed within the approved timeframe?	Yes / No
4. Would you recommend this contractor for similar work	Yes / No

Name of authorized person: **Signature:**

Position

Telephone: **E-mail:**.....

Date:.....

Completed on behalf of (Name of Institution)

***NB:** This document must be completed in full by the referee and it to be included in the bid submission. Failure to adhere to this requirement will result in the bidder not being allocated points.*

OFFICIAL INSTITUTION STAMP

METSIMAHOLO REFERENCE FORM-3

TO: METSIMAHOLO LOCAL MUNICIPALITY

I, the undersigned being duly authorized to do so, hereby furnish a reference to Metsimaholo Local Municipality relative to bid MLM 22/2024/25 for the: **Appointment of a 8 CE/ ME or higher cidb registered contractor for the Construction for re- commencement of upgrading of Oranjeville 4 ML/ Day Wastewater Treatment Plant.**

Name of the company tendering	
Project Name	
Project Contract/Tender Number	
Contract Value	
Description of Scope of work	
Contract duration (Start & End Date)	

Below questioner to be completed in full by the client only

1. Was their project completed satisfactory?	Yes / No
<i>If No, please furnish details:</i>	
2. Was the project constructed as per the approved scope of work?	Yes / No
<i>If No, please furnish details:</i>	
3. Was the project completed within the approved timeframe?	Yes / No
4. Would you recommend this contractor for similar work	Yes / No

Name of authorized person: **Signature:**

Position

Telephone: **E-mail:**.....

Date:.....

Completed on behalf of (Name of Institution)

***NB:** This document must be completed in full by the referee and it to be included in the bid submission. Failure to adhere to this requirement will result in the bidder not being allocated points.*

OFFICIAL INSTITUTION STAMP

METSIMAHOLO REFERENCE FORM-4

TO: METSIMAHOLO LOCAL MUNICIPALITY

I, the undersigned being duly authorized to do so, hereby furnish a reference to Metsimaholo Local Municipality relative to bid MLM 22/2024/25 for the: **Appointment of a 8 CE/ ME or higher cidb registered contractor for the Construction for re- commencement of upgrading of Oranjeville 4 ML/ Day Wastewater Treatment Plant.**

Name of the company tendering	
Project Name	
Project Contract/Tender Number	
Contract Value	
Description of Scope of work	
Contract duration (Start & End Date)	

Below questioner to be completed in full by the client only

1. Was their project completed satisfactory?	Yes / No
<i>If No, please furnish details:</i>	
2. Was the project constructed as per the approved scope of work?	Yes / No
<i>If No, please furnish details:</i>	
3. Was the project completed within the approved timeframe?	Yes / No
4. Would you recommend this contractor for similar work	Yes / No

Name of authorized person: **Signature:**

Position

Telephone: **E-mail:**.....

Date:.....

Completed on behalf of (Name of Institution)

***NB:** This document must be completed in full by the referee and it to be included in the bid submission. Failure to adhere to this requirement will result in the bidder not being allocated points.*

OFFICIAL INSTITUTION STAMP

METSIMAHOLO REFERENCE FORM-5

TO: METSIMAHOLO LOCAL MUNICIPALITY

I, the undersigned being duly authorized to do so, hereby furnish a reference to Metsimaholo Local Municipality relative to bid MLM 22/2024/25 for the: **Appointment of a 8 CE/ ME or higher cidb registered contractor for the Construction for re- commencement of upgrading of Oranjeville 4 ML/ Day Wastewater Treatment Plant.**

Name of the company tendering	
Project Name	
Project Contract/Tender Number	
Contract Value	
Description of Scope of work	
Contract duration (Start & End Date)	

Below questioner to be completed in full by the client only

1. Was their project completed satisfactory?	Yes / No
<i>If No, please furnish details:</i>	
2. Was the project constructed as per the approved scope of work?	Yes / No
<i>If No, please furnish details:</i>	
3. Was the project completed within the approved timeframe?	Yes / No
4. Would you recommend this contractor for similar work	Yes / No

Name of authorized person: **Signature:**

Position

Telephone: **E-mail:**.....

Date:.....

Completed on behalf of (Name of Institution)

***NB:** This document must be completed in full by the referee and it to be included in the bid submission. Failure to adhere to this requirement will result in the bidder not being allocated points.*

OFFICIAL INSTITUTION STAMP

METSIMAHOLO REFERENCE FORM-6

TO: METSIMAHOLO LOCAL MUNICIPALITY

I, the undersigned being duly authorized to do so, hereby furnish a reference to Metsimaholo Local Municipality relative to bid MLM 22/2024/25 for the: **Appointment of a 8 CE/ ME or higher cidb registered contractor for the Construction for re- commencement of upgrading of Oranjeville 4 ML/ Day Wastewater Treatment Plant.**

Name of the company tendering	
Project Name	
Project Contract/Tender Number	
Contract Value	
Description of Scope of work	
Contract duration (Start & End Date)	

Below questioner to be completed in full by the client only

1. Was their project completed satisfactory?	Yes / No
<i>If No, please furnish details:</i>	
2. Was the project constructed as per the approved scope of work?	Yes / No
<i>If No, please furnish details:</i>	
3. Was the project completed within the approved timeframe?	Yes / No
4. Would you recommend this contractor for similar work	Yes / No

Name of authorized person: **Signature:**

Position

Telephone: **E-mail:**.....

Date:.....

Completed on behalf of (Name of Institution)

***NB:** This document must be completed in full by the referee and it to be included in the bid submission. Failure to adhere to this requirement will result in the bidder not being allocated points.*

OFFICIAL INSTITUTION STAMP

METSIMAHOLO REFERENCE FORM-7

TO: METSIMAHOLO LOCAL MUNICIPALITY

I, the undersigned being duly authorized to do so, hereby furnish a reference to Metsimaholo Local Municipality relative to bid MLM 22/2024/25 for the: **Appointment of a 8 CE/ ME or higher cidb registered contractor for the Construction for re- commencement of upgrading of Oranjeville 4 ML/ Day Wastewater Treatment Plant.**

Name of the company tendering	
Project Name	
Project Contract/Tender Number	
Contract Value	
Description of Scope of work	
Contract duration (Start & End Date)	

Below questioner to be completed in full by the client only

1. Was their project completed satisfactory?	Yes / No
<i>If No, please furnish details:</i>	
2. Was the project constructed as per the approved scope of work?	Yes / No
<i>If No, please furnish details:</i>	
3. Was the project completed within the approved timeframe?	Yes / No
4. Would you recommend this contractor for similar work	Yes / No

Name of authorized person: **Signature:**

Position

Telephone: **E-mail:**.....

Date:.....

Completed on behalf of (Name of Institution)

***NB:** This document must be completed in full by the referee and it to be included in the bid submission. Failure to adhere to this requirement will result in the bidder not being allocated points.*

OFFICIAL INSTITUTION STAMP

METSIMAHOLO REFERENCE FORM-8

TO: METSIMAHOLO LOCAL MUNICIPALITY

I, the undersigned being duly authorized to do so, hereby furnish a reference to Metsimaholo Local Municipality relative to bid MLM 22/2024/25 for the: **Appointment of a 8 CE/ ME or higher cidb registered contractor for the Construction for re- commencement of upgrading of Oranjeville 4 ML/ Day Wastewater Treatment Plant.**

Name of the company tendering	
Project Name	
Project Contract/Tender Number	
Contract Value	
Description of Scope of work	
Contract duration (Start & End Date)	

Below questioner to be completed in full by the client only

1. Was their project completed satisfactory?	Yes / No
<i>If No, please furnish details:</i>	
2. Was the project constructed as per the approved scope of work?	Yes / No
<i>If No, please furnish details:</i>	
3. Was the project completed within the approved timeframe?	Yes / No
4. Would you recommend this contractor for similar work	Yes / No

Name of authorized person: **Signature:**

Position

Telephone: **E-mail:**.....

Date:.....

Completed on behalf of (Name of Institution)

***NB:** This document must be completed in full by the referee and it to be included in the bid submission. Failure to adhere to this requirement will result in the bidder not being allocated points.*

OFFICIAL INSTITUTION STAMP

Tender data contd.

Sub-clause	Data
F.3.13	Acceptance of Tender Offer
F.3.13.1	Tender offers will only be accepted if: a) the tenderer is registered on the Central Supplier Database (CSD) for the South African government (see https://secure.csd.gov.za/) 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: 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).



METSIMAHOLO LOCAL MUNICIPALITY

BID NO: MLM **22/2024/25**

**CONSTRUCTION FOR RE-COMMENCEMENT OF UPGRADING OF ORANJEVILLE
4ML/DAY WASTEWATER TREATMENT PLANT**

PART T2 : RETURNABLE DOCUMENTS

2.1 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**TABLE OF CONTENTS**

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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 22/2024/25	CLOSING DATE:	05 March 2025	CLOSING TIME	11H00
DESCRIPTION	CONSTRUCTION FOR RE-COMMENCEMENT OF UPGRADING OF ORANJEVILLE 4ML/DAY WASTEWATER TREATMENT PLANT				
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 [TICK APPLICABLE BOX]	☐ Yes ☐ No	B-BBEE STATUS LEVEL SWORN AFFIDAVIT	☐ Yes ☐ No
[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]			
ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ No [IF YES ENCLOSE PROOF]	ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ No [IF YES, ANSWER PART B:3]
TOTAL NUMBER OF ITEMS OFFERED		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	
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)? ☐ YES ☐ NO 3.2. DOES THE ENTITY HAVE A BRANCH IN THE RSA? ☐ YES ☐ NO 3.3. DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA? ☐ YES ☐ NO 3.4. DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?

☐ YES ☐ NO

3.5. IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?

☐ YES ☐ NO

IF THE ANSWER IS “NO” TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 ABOVE.

NB: FAILURE TO PROVIDE ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.

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

SIGNATURE OF BIDDER:

CAPACITY UNDER WHICH THIS BID IS SIGNED:

DATE:

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 or not they are bidding for this contract.

YES / NO

3.14.1 If yes, furnish particulars:

.....
.....

Full details of directors / trustees / members / shareholders.

Full Name	Identity Number	State Employee Number

.....

Signature

.....

Date

.....

Capacity

.....

Name of Bidder

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?

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 **90/10** preference point system.
- b) **90/10 preference point system** will be applicable in this tender. The lowest/ highest acceptable tender will be used to determine the accurate system once tenders are received.

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

- (a) Price; and
- (b) Specific Goals

1.4 To be completed by the organ of state:

The maximum points for this tender are allocated as follows:

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

- 1.5 Failure on the part of a tenderer to submit proof or documentation required in terms of this tender to claim points for specific goals with the tender, will be interpreted to mean that preference points for specific goals are not claimed.
- 1.6 The organ of state reserves the right to require of a tenderer, either before a tender is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the organ of state.

2. DEFINITIONS

- (a) **“tender”** means a written offer in the form determined by an organ of state in response to an invitation to provide goods or services through price quotations, competitive tendering process or any other method envisaged in legislation;
- (b) **“price”** means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts;
- (c) **“rand value”** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;
- (d) **“tender for income-generating contracts”** means a written offer in the form determined by an organ of state in response to an invitation for the origination of income-generating contracts through any method envisaged in legislation that will result in a legal agreement between the organ of state and a third party that produces revenue for the organ of state, and includes, but is not limited to, leasing and disposal of assets and concession contracts, excluding direct sales and disposal of assets through public auctions; and
- (e) **“the Act”** means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

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

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

$$\begin{array}{ccc}
 \text{80/20} & \text{or} & \text{90/10} \\
 \\
 P_s = 80 \left(1 - \frac{P_t - P_{min}}{P_{min}} \right) & \text{or} & P_s = 90 \left(1 - \frac{P_t - P_{min}}{P_{min}} \right)
 \end{array}$$

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:

$$P_S = \frac{80}{20} \left(1 + \frac{P_{t-P \max}}{P_{\max}} \right) \text{ or } P_S = \frac{90}{10} \left(1 + \frac{P_{t-P \max}}{P_{\max}} \right)$$

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

P_{max} = Price of highest acceptable tender

POINTS AWARDED FOR SPECIFIC GOALS

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

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

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

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

The specific goals allocated points in terms of this tender	Number of points allocated (80/20 system) (To be completed by the organ of state)	Number of points claimed (80/20 system) (To be completed by the tenderer)
Locality	90/10	

Points Allocation

Location	Points Allocation
Bidder that is within the boundaries of the Metsimaholo Local Municipality	10
Bidder that is within the boundaries of the Fezile Dabi District Municipality	08
Bidder that is within the boundaries of the Free State Province	06
Bidder that is Outside the boundaries of the Free State Province	04

Proof of locality

The following must be submitted for proof of locality:

- Municipal account in the name of the bidder not older than 90 days or
- A valid copy of lease agreement signed by both parties, where the bidder is the lessee, or
- SARS tax pin document
- An official letter from the bank or bank statement indicating the registered business address of the bidder
- Bidders from 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.

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:

.....

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

4.2.1	If so, furnish particulars:		
4.3	Was the bidder or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	Yes ☐	No ☐
4.3.1	If so, furnish particulars:		
Item	Question	Yes	No
4.4	Does the bidder or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?	Yes ☐	No ☐
4.4.1	If so, furnish particulars:		

4.5	Was any contract between the bidder and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes ☐	No ☐
4.7.1	If so, furnish particulars:		

CERTIFICATION

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

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

.....

Signature

.....

Date

.....

Position

.....

Name of Bidder

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.

- 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.

MBD 9

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

.....

Signature

.....

Date

.....

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:

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

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

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

Insert separate page if necessary

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

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

- | | |
|---|--|
| ☐ a member of any municipal council | ☐ an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning |
| ☐ a member of any provincial legislature | |

- ☐ a member of the National Assembly or the National Council of Province

☐ a member of the board of directors of any municipal entity

☐ an official of any municipality or municipal entity

of the Public Finance Management Act, 1999 (Act 1 of 1999)

☐ a member of an accounting authority of any national or provincial public entity

☐ an employee of Parliament or a provincial legislature

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

Name of 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	_____		

SCHEDULE E: PLANT AND EQUIPMENT



METSIMAHOLO LOCAL MUNICIPALITY

BID NO. MLM 22/2024/25

**CONSTRUCTION FOR RE-COMMENCEMENT OF UPGRADING OF ORANJEVILLE
4ML/DAY WASTEWATER TREATMENT PLANT**

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 22/2024/25: CONSTRUCTION FOR RE-COMMENCEMENT OF UPGRADING OF ORANJEVILLE 4ML/DAY WASTEWATER TREATMENT PLANT

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:

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:



TENDER NO: MLM 22/2024/25
REFURBISHMENT AND UPGRADING OF THE ORANJEVILLE WWTW

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 –2nd Edition 2010, Third print", issued by the South African Institution of Civil Engineering. (Short title: "General Conditions of Contract 2010").

It is agreed that the only variations from the General Conditions of Contract 2010 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 2010 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 2010, 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.

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 TECHI ENGINEERS.

8 DANN ROAD
ASTON MANOR
KEMPTON PARK
1619

Tel: + 27 11 972 0062
+ 27 83 480 1305

4.1 Language

English

4.2 Law

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

7.1 Time for Completion

..... * (weeks). 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

Available on site free of charge.

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 35 % 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.

CONDITIONS OF CONTRACT

Bidders who receive more than one construction project from the Technical Department must provide a separate team that is dedicated to the specific project. Allocation of same team members for more than one project is prohibited and will be considered a repudiation of contract

.....
SIGNATURE

C1.2.3 DATA PROVIDED BY THE TENDERER

Special materials	Unit on which variation will be determined *	Rate or price for the base Month (Excl. VAT) **

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 22/2024/25

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

.....
(hereinafter called “the Contactor”) on the day of20.....,
for **REFURBISHMENT AND UPGRADE OF ORANJEVILLE WASTEWATER TREATMENT WORKS.**

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

SIGNED

SIGNED

by:

by:

by:

Name:

Name:

Name:

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

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

the Adjudicator in the presence
of



Witness	_____	Witness:	_____	Witness:	_____
Name:	_____	Name	_____	Name:	_____
Address:	_____	Address:	_____	Address:	_____
	_____		_____		_____
Date:	_____	Date:	_____	Date:	_____

* Delete as necessary



METSIMAHOLO LOCAL MUNICIPALITY

BID NO. MLM 22/2024/25

**CONSTRUCTION FOR RE-COMMENCEMENT OF UPGRADING OF ORANJEVILLE 4ML/DAY
WASTEWATER TREATMENT PLANT**

PART C2: PRICING DATA

C2.1 PRICING INSTRUCTIONS – CIVIL AND STRUCTURAL 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.

C2.2 PRICING INSTRUCTIONS – MECHANICAL AND ELECTRICAL WORK

1. Refer to Clause 40 of the “General Conditions of Contract for use in connection with Electrical and Mechanical Engineering Works” (first edition 1985).
2. Replace Clause 40 with the following new Clause 40
3. The terms of payment shall be as follows: -

(i) Supply and Delivery to Site, including storage (where applicable), quality assurance, painting and all necessary insurance

- a) 90% of the contract price for materials or plant upon delivery or placing into storage.
- b) 5% of the contract price for materials upon issuing of the handing over certificate.
- c) 5% of the contract price for materials upon expiry of the Defects Liability Period and the issuing of the final certificate.

Note: Preliminary and General costs to be included in the tendered rates allowed.

(ii) Handling (including double handling if stored), erection and installation

- a) 95% of the contract price for handling, erection and installation upon issuing of the handing over certificate.
- b) 5% of the contract price for handling erection and installation upon expiry of the Defects Liability Period and the issuing of the final certificate.

(iii) Commissioning

- a) 95% of the contract price for commissioning, testing and adjusting upon issuing of the handing over certificate and receipt of operating manuals.
- b) 5% of the contract price for testing, commissioning, etc. upon expiry of the Defects Liability Period and the issuing of the final certificate.

Note: The rates for Mechanical Work must allow for site visit and evaluation, retrofitting / installation methodology for approval by the Engineer, detailed workshop evaluations, retrofitting requirements and procedures for approval for the Engineer. All work must carry a guarantee of a minimum of 12 months.

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

%	=	percent
h	=	hour
ha	=	hectare
kg	=	kilogram
kl	=	kilolitre
km	=	kilometre
kPa	=	kilopascal
kW	=	kilowatt
l	=	litre
m	=	metre
mm	=	millimetre
m ²	=	square metre
m ³	=	cubic metre
MN	=	meganewton
MN.m	=	meganewton-metre
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

PREAMBLE TO THE SCHEDULE OF PRICES (MECHANICAL AND ELECTRICAL)

1. All costs involved in meeting the obligations and liabilities imposed by the Conditions of Contract and in complying generally with the requirements of the Contract shall be deemed to be apportioned to and included under the various items, and the price quoted against each item must cover the full inclusive cost of all work to be completed under the item, plus such apportionment of the general costs.
2. The Tenderer must also provide in his prices for anything not specially mentioned but obviously required to enable the plant and equipment as described to function correctly as specified.

3. Should a Tenderer wish to exclude certain items of plant and/or operations from his offer he must clearly state such exclusions in a schedule accompanying his tender. Any items of plant and/or operations which are specified in the Specification but which are not so scheduled will be deemed to be included in the Tender.
4. Any additional charges in connection with off-site storage or whatever other cause, which there may be over and above the prices quoted in the Schedule of Prices, shall be set out in detail in a separate schedule accompanying the tender.
5. A price is to be entered against each item in the Schedule of Prices. Items against which no price is entered or against which a remark is entered will be considered to be a no-charge item and the cost thereof covered by other prices in the Schedule.
6. Mistakes made by the Tenderer in the completion of the Schedule of Prices shall not be erased or painted out. A line shall be drawn through the incorrect entry and the correct entry shall be written above and the correction initialled by the Tenderer. Failure to observe this condition of Contract may lead to the Tender being disqualified.

C2.3

BILL OF QUANTITIES

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 1
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1	SABS 1200 A	<u>PRELIMINARY AND GENERAL</u>				
1.1	8.3	<u>SCHEDULED FIXED-CHARGE AND VALUE-RELATED ITEMS</u>				
1.1.1	8.3.1	<u>Contractual Requirements</u>	Sum	1		
1.1.2	8.3.2	<u>Establishment of Facilities on site</u>				
1.1.2.1	8.3.2.1	<u>Facilities for the Engineer</u>				
		(a) Furnished offices	Sum	1		
		(b) Telephone	Sum	1		
		(c) Nameboards (2no.)	Sum	1		
1.1.2.2	8.3.2.2	<u>Facilities for the Contractor</u>				
		(a) Office and storage sheds (procurement of 3 that will be donated to local NGOs)	Sum	3		
		(b) Workshops	Sum	1		
		(c) Laboratories	Sum	1		
		(d) Living Accommodation	Sum	1		
		(e) Ablution and latrine facilities	Sum	1		
		(f) Tools and Equipment	Sum	1		
		(g) Water Supplies, Electric Power and Telephone	Sum	1		
		(h) Dealing with water (sub-clause 5.5)	Sum	1		
		(i) Access (sub-clause 5.8)	Sum	1		
		(j) Plant	Sum	1		
1.1.3	8.3.3	<u>Other fixed-charge obligations</u> (including all health and safety requirements)	Sum	1		
1.1.4	8.3.4	<u>Removal of site establishment</u>	Sum	1		
1.2	8.4	<u>SCHEDULED TIME-RELATED ITEMS</u>				
1.2.1	8.4.1	<u>Contractual requirements</u>	Sum	1		
1.2.2	8.4.2	<u>Operation and maintenance of facilities on the site for the duration of construction period</u>				
1.2.2.1	8.4.2.1	<u>Facilities for the Engineer</u>				
		(a) Furnished offices	Sum	1		
		(b) Telephone	Sum	1		
		(c) Nameboards (2no.)	Sum	1		
1 - Ps & Gs	SECTION 1 PRELIMINARY AND GENERAL CARRIED TO FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 1
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1 - Ps & Gs	SECTION 1 PRELIMINARY AND GENERAL BROUGHT FORWARD					
1.2.2.2	8.4.2.2	Facilities for the Contractor				
		(a) Office and storage sheds	Sum	1		
		(b) Workshops	Sum	1		
		(c) Laboratories	Sum	1		
		(d) Living Accommodation	Sum	1		
		(e) Ablution and latrine facilities	Sum	1		
		(f) Tools and Equipment	Sum	1		
		(g) Water Supplies, Electric Power and Communication	Sum	1		
		(h) Dealing with water (sub-clause 5.5)	Sum	1		
		(i) Access (sub-clause 5.8)	Sum	1		
		(j) Plant	Sum	1		
1.2.3	8.4.3	Supervision for duration of construction	Sum	1		
1.2.4	8.4.4	Company and head office overhead costs for the duration of the contract	Sum	1		
1.2.5	8.4.5	Other Time-related obligations	Sum	1		
1.3	8.5	SUMS STATED PROVISIONALLY BY THE ENGINEER:				
		(a) (i) Remuneration of a Community Liaison Officer at R 7,000.00 per month	Prov. Sum			R168,000.00
		(ii) Engineer's Administration to the Contractor and monitoring of OHS requirements on the project at R30 000.00 per Months	Prov. Sum			R720,000.00
		(iii) Training of local labour				
		(a) Generic skills (Inclusive of local SMMEs outside the project)	Prov. Sum			R200,000.00
		(b) Entrepreneurial skills (Subcontractors)	Prov. Sum			R250,000.00
		(c) Training of Oranjeville WWTP operations staff to comply with greendrop requirements				R200,000.00
		(b) Overheads, charges and profit on items in (a) above	%	R1,538,000.00		
1.4	8.6	PRIME COST SUMS:	Prov. Sum			R2,000,000.00
		(a) Overheads, charges and profit on items in section 8.6 above	%	R2,000,000.00		
1 - Ps & Gs	SECTION 1 PRELIMINARY AND GENERAL CARRIED TO FORWARD					
CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 1

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 1
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1 - Ps & Gs		SECTION 1 PRELIMINARY AND GENERAL BROUGHT FORWARD				
1.5	8.7	Dayworks				
1.5.1		1) Normal working hours				
		a) Foreman	hour	20		
		b) Artisan	hour	20		
		c) Operator	hour	30		
		d) Labourer				
		i) unskilled	hour	200		
		ii) semi-skilled	hour	75		
		iii) skilled	hour	30		
1.5.2		2) Overtime and Saturdays				
		a) Foreman	hour	10		
		b) Artisan	hour	10		
		c) Operator	hour	10		
		d) Labourer				
		i) unskilled	hour	50		
		ii) semi-skilled	hour	30		
		iii) skilled	hour	20		
1.5.3		3) Sundays and public holidays				
		a) Foreman	hour	1		
		b) Artisan	hour	2		
		c) Operator	hour	2		
		d) Labourer				
		i) unskilled	hour	2		
		ii) semi-skilled	hour	3		
		iii) skilled	hour	2		
1.5.4		Hire of construction equipment				
1.5.4.1		1) Tipper trucks				
		a) 3 - 5 ton	hour	2		
		b) 5.1 - 10 ton	hour	2		
1.5.4.2		2) Loader (0.5m ³)	hour	3		
1.5.4.3		3) Grader CAT 140G or similar	hour	3		
1 - Ps & Gs		SECTION 1 PRELIMINARY AND GENERAL CARRIED TO FORWARD				

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 1
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1 - Ps & Gs		SECTION 1 PRELIMINARY AND GENERAL BROUGHT FORWARD				
1.5.4.4		4) LDV	hour	3		
1.5.4.5		5) Compaction rollers				
		a) Vibrator roller	hour	3		
		b) Tamping roller	hour	3		
		c) Grid roller	hour	3		
1.5.4.6		6) Hand controlled compactors				
		a) Bomag BW90	hour	4		
		b) Vibratory plate	hour	3		
		c) Rammers	hour	3		
1.5.4.7		7) Water trucks (min 10 000l)	hour	3		
1.5.4.8		8) Air compressor	hour	4		
1.6	8.8	Temporary Works				
	8.8.1	Main Access road to works	Sum	1		
	8.8.2	Accommodation of Traffic	Sum	1		
	8.8.3	Protection of services	Sum	1		
	8.8.4	Provision for detection and protection of existing services at the existing PETRO WSP Plant				
		(a) (i) Water and sewr services	Prov. Sum			R75,000.00
		(ii) Electrical and other cables	Prov. Sum			R35,000.00
		(b) Overheads, charges and profit on items in (a) above	%	R110,000.00		
1.7		Penalties				
		(a) Penalty for failure to comply with contractual requirements				
		(i) Failure to maintain valid contract guarantee	Month		-R3,000.00	
		(ii) Failure to have a project Contracts Manager	Days		-R2,000.00	
		(iii) Failure to have site Agent on site	Days		-R1,000.00	
		(iv) Failure to have OHS officer onsite	Days		-R1,000.00	
		(v) Failure to practical completion date	Days		-R5,000.00	
		(b) Penalty for failure to comply with contractual reporting requirements (to be submitted 2 days before progress meeting)				
		(i) Progress report	Days		-R1,000.00	
1 - Ps & Gs		SECTION 1 PRELIMINARY AND GENERAL CARRIED TO FORWARD				

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 1
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1 - Ps & Gs	SECTION 1 PRELIMINARY AND GENERAL BROUGHT FORWARD					
		(ii) OHS report	Days		-R1,000.00	
		(ii) EPWP report	Days		-R1,000.00	
		(c) Penalty for serious violations:				
		(i) Hazardous chemical/oil spill and/or dumping non-approved sites	No.		-R1,000.00	
		(d) Penalty for less serious violations:				
		(i) Littering on site	No.		-R1,000.00	
		(ii) Persistent or un-repaired fuel and oil leaks	No.		-R500.00	
		(ii) Excess dust or excess noise emanating from site	No.		-R1,000.00	
		(iv) Possession or use of intoxicating substances on site	No.		-R500.00	
1 - Ps & Gs	TOTAL SECTION 1 PRELIMINARY AND GENERAL CARRIED TO SUMMARY					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 2
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
2		<u>REFURBISHMENT WORKS</u>				
2.1		<u>REFURBISHMENT WORKS</u>				
2.1.1	SANS 1200C	<u>SITE CLEARANCE</u>				
2.1.1.1	8.2	<u>SCHEDULED ITEMS</u>				
2.1.1.1.1	8.2.4	Reclear surfaces	ha	1.5		
2.1.1.1.2	8.2.7	Dismantle and remove				
		(i) pipelines	m	50		
		(iii) electricity cables	m	150		
2.1.1.1.3	8.2.6	Clearing				
2.1.1.1.4		(b) Pump effluent from existing stabilisation ponds to new treatment works reactors inlet	m³	7,500		
		(c) Remove sludge from existing stabilisation ponds and spread on newly constructed drying beds	m³	5,000		
2.1.1.1.4	8.2.8	Dismantle demolish and remove				
		(i) Existing Structures	m	1		
		(ii) Existing structural steelwork structures	m	1		
		(iii) Existing structural concrete elements	m³	50		
2.1.1.1.5	8.2.9	Transport usable materials and debris to municipal dumping site	m³km	15000.00		
2.2		Allow for refurbishment of electrical and mechanical equipment	Prov. Sum			R2,500,000.00
2 - REFURBISHMENT WORKS		SECTION 2 - REFURBISHMENT WORKS CARRIED TO SUMMARY				

CONTRACT NUMBER: MLM22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 3
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
3	SANS 1200DB	SEWER				
3.0		<u>EARTHWORKS (PIPE TRENCHES)</u>				
3.1	8.3	<u>SCHEDULED ITEMS</u>				
3.1.1	8.3.2	<u>Excavation</u>				
		a) <u>Excavate in all materials for trenches for pipes up to 300mm OD, backfill, compact and dispose of surplus/unsuitable material to depths measured to bottom of trench as specified in PSDB 8.2.3, minimum base width 600mm. Excavation depth:</u>				
		i) Over 0,0 m up to 1,5 m	m	3,500		
		ii) Over 1,5 m up to 3.0 m	m	200		
		b) <u>Extra over item 2.2.1 above for:</u>				
		i) Intermediate excavation	m³	900		
		ii) Hard rock excavation	m³	300		
		c) <u>Excavate and dispose of unsuitable material from trench bottom</u>	m³	300		
3.1.2	8.3.3	<u>Excavation Ancillaries:</u>				
3.1.2.1	8.3.3.1	<u>Make up deficiency in backfill material:</u>				
		a) From other necessary excavations on site	m³	85		
		b) By importation from designated borrow pits	m³	20		
		c) By importation from commercial or off-site sources selected by the contractor	m³	100		
3.1.2.2	8.3.3.4	<u>Overhaul</u>				
		a) Limited overhaul (provisional)	m³	630		
		b) Long haul (provisional)	m³km	12,600		
3.1.3	8.3.4	<u>Particular Items</u>				
		a) Shore trench opposite structures and services	m			
3.1.4	8.3.5	<u>Existing Services that intersect or adjoin a pipe trench</u>				
		(a) Services that intersect a trench	No.	5		
		(b) Services that adjoin a trench	m	10		
	SANS 1200LB	<u>BEDDING (PIPES)</u>				
3.2	8.2	<u>SCHEDULED ITEMS</u>				
3.2.1	8.2.1	<u>Provision of bedding from trench excavations:</u>				
		(a) Selected granular material	m³	150		
3-SEWER	SECTION 3 - SEWER CARRIED TO FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 3
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
3-SEWER	SECTION 3 - SEWER BROUGHT FORWARD					
3.2.2	8.2.2	(b) Selected fill material	m ³	150		
3.2.2.3	8.2.2.3	<u>Supply only of bedding by importation:</u>				
		<u>From commercial sources</u>				
		a) Selected granular material	m ³	630		
		b) Selected fill material	m ³	630		
3.3	8.2	<u>SCHEDULED ITEMS</u>				
3.3.1	8.2.1	<u>Supply, lay, joint on bed class B and test uPVC Heavy duty 400kpa pipes/ pipes of similar class strength approved by the Engineer</u>				
		(i) 160 mm ø uPVC Heavy duty 400kPa	m	60		
		(ii) 200 mm ø uPVC Heavy duty 400kPa	m	40		
		(iii) 300 mm ø uPVC Heavy duty 400kPa	m	3,500		
		(iv) 400 mm ø uPVC Heavy duty 400kPa	m	20		
3-SEWER	TOTAL SECTION 3 - SEWER CARRIED TO SUMMARY					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 4
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
4		INLET STRUCTURES (SCREENS, GRIT REMOVAL AND FLOW MEASUREMENT STRUCTURES)				
	SABS 1200 DA 8.3	<u>EARTHWORKS (SMALL WORKS)</u>				
4.1	8.3	<u>SCHEDULED ITEMS</u>				
4.1.1	8.3.1	<u>Excavation</u>				
		(b) Loosening of all stockpiled materials and use for embankments or backfill or dispose as ordered	m³	250		
4.1.2	8.3.4	<u>Importation of material from commercial sources</u>				
		(a) Backfill with G7 material or better obtained from commercial sources compacted to 93% MDD in layers not exceeding 150mm at +/-2% OMC around the structure at maximum slope 1:2	m³	300		
		(b) Material obtained from excavation on	m³	250		
		(c) 19mm concrete stone	m³	200		
	SANS 1200G 8.2	<u>CONCRETE (STRUCTURAL)</u>				
4.2	8.2	<u>SCHEDULED FORMWORK ITEMS</u>				
4.2.1	8.2.2	<u>Smooth</u>	m²	10		
4.2.2	8.2.4	<u>Special Off-form</u>	m²	10		
4.3	8.3	<u>SCHEDULED REINFORCEMENT ITEMS</u>				
4.3.1	8.3.1	(a) High-tensile steel bars	t	2		
		(b) Wire brushing of rust	t	1		
4.4	8.4	<u>SCHEDULED CONCRETE ITEMS</u>				
4.4.2	8.4.3	30MPa concrete for remedial and new works	m³	5		
4.4.3	8.4.4	Unformed surface finishes				
		(a) Wood-floated finishes	m²	10		
4.5		Repair of all poor concrete works including repair of cracks repair of cracks and making good of honeycombs	m³	180		
	SANS 1200H	<u>STRUCTURAL STEELWORK</u> <u>(All structural steelwork to be stainless steel)</u>				
4.6	8.3	<u>SCHEDULED ITEMS</u>				
4.6.1	8.3.1	Supply, fabrication and install				
4.6.1.1	8.3.1.1	Preparation of shop drawings	Sum	1		
4.6.1.2	8.3.1.2	Steelwork				
		(i) RS40 Rectagrid	m²	29		
		(ii) 40x40x5 L Frame with lugs	kg	335		
		(iii) Handrailing Stanchions	No	85		
		(iv) Handrailing Horizontals	m	170		
4-INLET	TOTAL SECTION 4-INLET STRUCTURES CARRIED FORWARD					

CONTRACT NUMBER: MLM22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 4
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
4-INLET		SECTION 4-INLET STRUCTURES BROUGHT FORWARD				
4.7	SANS 1200L	(v) Holding down bolts 16mm chemical bolts MEDIUM PRESSURE PIPELINES (All steel pipes to be made of stainless steel)	No.	170		
4.7.1	8.2	SCHEDULED ITEMS				
4.7.1.1	8.2.1	INLET Supply, Lay, and Bed Pipes Complete with Couplings As per drawing No OWWTW/01/2019/S03				
		(i) Steel to u PVC flange adaptor 500mm	No	2		
		(ii) Flanged steel pipe 500mm face to face to face flanged one end with Puddle Flange 125mm from Plane end welded to Plain end	No	2		
		(iii) 500mm u PVC Pipe Connecting inlet works to Rising Pump Station	m	94		
		(iv) 500mmØ Link Sewer Pipe	m	115		
4.7.1.2	8.2.1	WASH WATER Supply, Lay, and Bed Pipes Complete with Couplings As per drawing No 2019/S13				
		(i) 63mm Diameter uPVC wash water pipeline	m	830		
		(ii) 80mm Flanged steel pipe 450mm FF with puddle flange 150mm from inside face	No	1		
		(iii) 80mm Flanged steel pipe 2050mm F/F	No	1		
		(iv) 80mm Flanged Steel Pipe 90° Bend 297mm C/F	No	3		
		(v) 80mm Flanged steel pipe 400mm FF	No	1		
		(vi) 80mm Flanged Steel Pipe 45° 161mm C/F	No	2		
		(vii) 80mm Flanged steel pipe 2350mm FF	No	1		
		(viii) 80mm Flanged steel pipe 440mm FF	No	1		
		(ix) 80mm Flanged equal T-piece 150mm C/F	No	4		
		(x) 80mm Flanged steel pipe 4500mm FF	No	1		
		(xi) 80mm Flanged steel pipe 300mm FF, FOE	No	1		
		(xi) 80mm Flanged steel pipe 445mm FF, FOE	No	1		
		(xiii) 80mm Flanged Adaptor	No	2		
		(xiv) 80mm Flanged steel pipe 630mm FF with puddle flange located centrally	No	2		
		(xv) 80mm Flanged steel pipe 300mm FF, FOE	No	2		
		(xvi) 80mm Flanged Adaptor	No	4		
		(xvii) 80mm Strainer 264mm F/F	No	2		
4-INLET		TOTAL SECTION 4-INLET STRUCTURES CARRIED FORWARD				

CONTRACT NUMBER: MLM22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 4
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
4-INLET	SECTION 4-INLET STRUCTURES BROUGHT FORWARD					
		(xviii) Flanged "AVK" Wedge Gate Valve 180mm F/F or Similar approved	No	4		
		(xix) 80 to 63mm Flanged Concentric Reducer 165mm F/F	No	2		
		(xx) Swing "AVK" Check Valve 260mm F/F or Similar approved	No	4		
		(xxi) 80mm Flanged steel pipe 370mm FF, FOE	No	2		
		(xxii) Air release valve "Vent"-O-Mat or similar approved	No	2		
		(xxiii) 80mm Flanged steel pipe 460mm FF	No	1		
		(xxiv) 80mm Flanged steel pipe 605mm FF	No	1		
		(xxv) 80mm Flanged steel pipe 450mm FF	No	1		
		(xxvi) 80mm Flanged steel pipe 2130mm FF	No	1		
		(xxvii) 63mm Steel to Upvc Flanged Adaptor	No	1		
4.8		MECHANICAL WORKS (Supply, deliver, installation and commissioning)				
4.8.1		<u>Screening</u>				
4.8.1.1		Inclined Screen and compactor: width 710mm depth 2080mm flow rate 4.0Ml/d Including screening collection bins	sum	1		
4.8.1.2		installation, test commission of item above	sum	1		
4.8.1.3		Hand rake : Channel width 710mm , depth 2080mm inclined at 0 deg bar screen 50mm spacing 10mm	sum	1		
4.8.1.4		Installation, test commission of item above	sum	1		
4.8.1.5		Penstocks / hand sluices : width 710mm depth 2080mm	No	4		
4.8.1.6		Installation, test commission of item above	sum	1		
4.8.2		<u>Degrit</u>				
4.8.2.1		Supply and deliver of Degrit pump - self priming pump T3 complete with mounting base v-belts coupling flow rate 15l/s head 8 m	sum	1		
4.8.2.2		installation, test commission of item above	sum	1		
4.8.2.3		Supply and deliver - grit Classifiers	sum	1		
4.8.2.4		installation, test commission of item above	sum	1		
4.8.2.5		Piping manifold DN100 piping, flanges, bends, table 1000/3, 1000/3, valves and associated works as shown on the drawing	sum	1		
4.8.2.6		Air Blower x 2	Prov Sum			R575,000.00
4-INLET	SECTION 4-INLET STRUCTURES CARRIED FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 4
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
4-INLET	SECTION 4-INLET STRUCTURES BROUGHT FORWARD					
4.8.2.7		Supply and delivery of connecting piping and valves	Prov Sum			R75 000,00
4.8.2.8		fabricate piping manifolds Installation, test commission of item for item above	sum	1		
4.8.3		<u>Flow metering</u>				
4.8.3.1		Supply , delivery and fabricate holders for transducers	sum	1		
4.8.3.2		Supply , delivery open channel / pashal flume flow meter	sum	1		
4.8.3.2		Installation, test commission of flow meters	sum	1		
4.8.4		WASH WATER PUMPS				
4.8.4.1		Installation & commissioning Only Horizontal cenrifugal, self priming pumps com[plete with electric coupling and mounting pedestals Flow rate Q= 8 l/s, Head 15,68m, refer to drawing no: TE-1903-S13	Sum	2		
4-INLET	TOTAL SECTION 4-INLET STRUCTURES CARRIED TO SUMMARY					

CONTRACT NUMBER: MLM/00/0000/00		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 5
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
5	SABS 1200 DA	BIOLOGICAL REACTORS				
		<u>EARTHWORKS (SMALL WORKS)</u>				
5.1	8.3	<u>SCHEDULED ITEMS</u>				
5.1.1	8.3.1	<u>Excavation</u>				
		(b) Loosening of all stockpiled materials and use for embankments or backfill or dispose as ordered	m³	1200		
5.1.2	8.3.4	<u>Importation of material from commercial sources</u>				
		(a) Backfill with G7 material or better obtained from commercial sources compacted to 93% MDD in layers not exceeding 150mm at +/-2% OMC around the structure at maximum slope 1:2	m³	1500		
		(b) Material obtained from excavation on	m³	1200		
		(c) 19mm concrete stone	m³	500		
	SANS 1200G	<u>CONCRETE (STRUCTURAL)</u>				
5.2	8.2	<u>SCHEDULED FORMWORK ITEMS</u>				
5.2.1	8.2.2	<u>Smooth</u>	m²	100		
5.2.2	8.2.4	<u>Special Off-form</u>	m²	2500		
5.3	8.3	<u>SCHEDULED REINFORCEMENT ITEMS</u>				
5.3.1	8.3.1	(a) High-tensile steel bars	t	135		
		(b) Wire brushing of rust	t	103		
5.4	8.4	<u>SCHEDULED CONCRETE ITEMS</u>				
5.4.2	8.4.2	15MPa blinding layer	m³	15		
5.4.3	8.4.3	30MPa concrete for structural concrete of reactor	m³	1250		
5.4.4	8.4.4	Unformed surface finishes				
		(a) Power-floated finishes	m²	950		
5.5		Joints				
		(a) Flexible plasticized PVC Waterbars with a minimum pressure rating of 15m	m	740		
5.6		Repair of all poor concrete works including repair of cracks repair of cracks and making good of honeycombs	m²	920		
	SANS 1200H	<u>STRUCTURAL STEELWORK</u> <u>(All structural steelwork to be stainless steel)</u>				
5.7	8.3	<u>SCHEDULED ITEMS</u>				
5.7.1	8.3.1	Supply, fabrication and install				
5.7.1.1	8.3.1.1	Preparation of shop drawings	Sum	1		
5 - Bio-reactors	SECTION 5-BIOLOGICAL REACTORS CARRIED FORWARD					

CONTRACT NUMBER: MLM22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 5
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
5 - Bio-reactors		SECTION 5-BIOLOGICAL REACTORS BROUGHT FORWARD				
5.7.1.2	8.3.1.2	Steelwork				
		(i) RS40 Rectagrid	m ²	28		
		(ii) 40x40x5 L Frame with lugs	kg	135		
		(iii) Handrailing Stanchions	No	650		
		(iv) Handrailing Horizontals	m	1,301		
		(v) Holding down bolts 16mm chemical bolts	No	1,300		
5.8	SANS 1200L	MEDIUM PRESSURE PIPELINES (All steel pipes to be made of stainless steel)				
5.8.1	8.2	SCHEDULED ITEMS				
5.8.1.1	8.2.1	Supply, Lay, and Bed Pipes Complete with Couplings Pressure Pipes as per Drawing No. 2019/SO4/02				
		(i) 500mm diameter Flanged steel pipe 420mm flanged one end with Bellmouth 180mm face to face welded to Plain end Puddle Flange 180mm From Bellmouth Face	No	2		
		(ii) 500mm diameter Flanged Steel Medium Radius 90° Bend 710mm Center To Face	No	1		
		(iii) 500mm diameter Flanged Steel pipe 615mm Face to Face	No	1		
		(iv) 500mm diameter Steel to uPVC Flange adaptor	m	2		
		(v) 500mm diameter Flanged Steel Pipe 2250mm Face to Face	No	1		
		(vi) 500mm diameter Flanged Steel Pipe 3200mm Face to Face	No	1		
		(vii) diameter 500mm Flanged Steel Medium Radius 7° Bend 240mm Center to Face	No	1		
		(ix) 500mm diameter Flanged Steel Pipe 3200mm Face to Face	No	1		
		(x) 500mm diameter Blank Flange	No	3		
		(xi) 200mm diameter Flanged steel pipe 443mm Flanged one end with bellmouth 102mm Face to Face welded to Plain end of Pipe Puddle Flange 102mm from Bellmouth Face	No	1		
		(xii) 200mm diameter Flanged Steel Medium Radius 90° Bend 405mm Center To Face	No	1		
		(xiii) 200mm -160mm diameter Flanged Steel Concentric Reducer 180mm Face to Face	No	1		
		(xiv) 160mm diameter Steel to uPVC Flange adaptor	No	1		
		(xv) 500 Diameter Pipe Connecting Biological Reactor No_1 From Main Works Pump Station	m	14		
5 - Bio-reactors		SECTION 5-BIOLOGICAL REACTORS CARRIED FORWARD				

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 5
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
5 - Bio-reactors		SECTION 5-BIOLOGICAL REACTORS BROUGHT FORWARD				
		(xvi) 200mm Steel to uPVC Flange Adaptor	No	1		
		(xvii) 500 Diameter uPVC pipe connecting to Biological React No1 To Settlement Tank No1	m	15		
		(xviii) 200mm diameter Flanged steel pipe 420mm flanged one end with Bellmouth 180mm face to face welded to Plain end Puddle Flange 180mm From Bellmouth Face	m	1		
		(xix) 500mm diameter Flanged Steel Medium Radius 90° Bend 710mm Center To Face	No	1		
		(xx) 500mm diameter Flanged Steel Pipe 695mm Face to Face	No	1		
		(xxi) 160mm diameter Upvc Pipe To Sludge Drying Beds	m	118		
		(xxii) 520mm diameter Concrete pipe	m	70		
5.9		<u>MECHANICAL WORKS</u> <u>(Supply delivery and installation and commissioning)</u>				
5.8.1		<u>Biological Reactors</u>				
5.9.1.1		<u>Anaerobic tank</u>				
5.9.1.1.1		Supply and delivery of 5,5kw Vertical shaft Mixer complete with mounting'base, shaft and gear box. Refer to drawings	No.	1		
5.9.1.1.2		Installation, test commission of item above	sum	1		
5.9.1.2		<u>Anoxic tank</u>				
5.9.1.2.1		5,5kw Vertical shaft Mixer complete 'with mounting'base, with mounting'base, shaft and gear box. Refer to drawings	No.	2		
5.9.1.2.2		Installation, test commission of item above	sum	2		
5.9.1.2.3		<u>Recirculation Pumps</u> Installation & commissioning only of 'Axial flow pumps: 347,22 L/S head 3,1m complete with gear box, mounting bases & coupling/ v -belts. Drawing No: TE-1903-S-04	sum	2		
5.9.1.3		<u>Aerobic tank</u>				
5.9.1.3.1		<u>Aerator</u> Vertical shaft low speed Aerator 'complete with mounting base, gearbox and impeller '50kw Oxygen Transfer Rate 85 kg/hr as per 'drawings provided	sum	2		
5.9.1.3.2		<u>Recirculation Pumps</u> Installation & commissioning only of Axial flow pumps: 462,96 L/S head 3,1 m complete with gear box, mounting bases & coupling/ v -belts. Drawing No: TE-1903-S-04	No	2		
5 - Bio-reactors		SECTION 5-BIOLOGICAL REACTORS CARRIED TO SUMMARY				

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 6
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
6	SABS 1200 DA	CLARIFIER				
		EARTHWORKS (SMALL WORKS)				
6.1	8.3	SCHEDULED ITEMS				
6.1.1	8.3.1	<u>Excavation</u>				
		(b) Loosening of all stockpiled materials and use for embankments or backfill or dispose as ordered	m³	550		
6.1.2	8.3.4	<u>Importation of material from commercial sources</u>				
		(a) Backfill with G7 material or better obtained from commercial sources compacted to 93% MDD in layers not exceeding 150mm at +/-2% OMC around the structure at maximum slope 1:2	m³	200		
		(b) Material obtained from excavation on	m³	550		
		(c) 19mm concrete stone	m³	300		
	SANS 1200G	CONCRETE (STRUCTURAL)				
6.2	8.2	SCHEDULED FORMWORK ITEMS				
6.2.1	8.2.2	<u>Smooth</u>	m²	40		
6.2.2	8.2.4	<u>Special Off-form</u>	m²	850		
6.3	8.3	SCHEDULED REINFORCEMENT ITEMS				
6.3.1	8.3.1	(a) High-tensile steel bars	t	46		
		(b) Wire brushing of rust	t	23		
6.4	8.4	SCHEDULED CONCRETE ITEMS				
6.4.2	8.4.2	15MPa blinding layer	m³	20		
6.4.3	8.4.3	30MPa concrete for bases, stub columns and casings for the pipes	m³	350		
6.4.4	8.4.4	Unformed surface finishes				
		(a) Wood-floated finishes	m²	350		
6.5	8.5	Joints				
		(a) Flexible plasticized PVC Waterbars with a minimum pressure rating of 15m	m	200		
6.6		Repair of all poor concrete works including repair of cracks repair of cracks and making good of honeycombs	m²	35		
	SANS 1200H	STRUCTURAL STEELWORK <u>(All structural steelwork to be stainless steel)</u>				
6.7	8.3	SCHEDULED ITEMS				
6.7.1	8.3.1	Supply, fabrication and install				
6.7.1.1	8.3.1.1	Preparation of shop drawings	Sum	1		
6-Clarifier	TOTAL SECTION 6-CLARIFIER CARRIED FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 6
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
6-Clarifier		SECTION 6-CLARIFIER BROUGHT FORWARD				
6.7.1.2	8.3.1.2	Steelwork				
		(i) RS Rectagrid	m ²	2		
		(ii) 40x40x5 L Frame with lugs	kg	18		
		(iii) Handrailing Stanchions	No	16		
		(iv) Handrailing Horizontals	m	20		
		(v) Holding down bolts 16mm chemical bolts	No	32		
6.8	SANS 1200L	MEDIUM PRESSURE PIPELINES (All steel pipes to be made of stainless steel)				
6.8.1	8.2	SCHEDULED ITEMS				
6.8.1.	8.2.1	Supply, Lay, and Bed Pipes Complete with Couplings Pressure Pipes as per Drawing No. 2019/SO5/01				
		(i) 500mm diameter uPVC Pipe for Center column	No	1		
		(ii) 500mm diameter Flanged Steel Medium Radius 90° Duckfoot Bend 710mm Face To Face	No	1		
		(iii) 500mm diameter Flanged Steel pipe 1615mm Face to Face with Puddle Flange 845mm from inside Face	No	1		
		(iv) 500mm diameter Flanged Steel Medium Radius 7° Bend Flanged one end 240mm Center to Face	No	1		
		(v) 500mm diameter Steel Pipe 5950mm Face to Face Plain end Preparation both ends	No	1		
		(vi) 500mm diameter Steel to u PVC Flange adaptor	No	1		
		(vii) 500mm diameter uPVC Pipe Connecting Biological Reactor to Settlement Tank	m	7		
		(ix) 560mm diameter Flanged steel pipe 550mm Flanged one end with Puddle Flange 125mm Plain End	No	2		
		(x) 560mm diameter Blank Flanged	No	1		
		(xi) 560mm diameter Steel To Upvc Flange Adapter	No	2		
		(xii) 560 mm diameter uPVC Pipe Connecting Settlement Tank to Chlorine Contact Tank	m	33		
		(xiii) 560mm diameter 90° Steel Bend, 915mm Center to Face	No	2		
		(xiv) 560mm diameter Straight Steel Pipe, Flanged, 645mm Face To Face	No	1		
		(xv) 250mm Diameter Flanged Steel Pipe 1320mm Face to Face, Flanged One End with Puddle Flange 780mm From Flanged End	No	1		
6-Clarifier		TOTAL SECTION 6-CLARIFIER CARRIED FORWARD				

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 6
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
6-Clarifier	SECTION 6-CLARIFIER BROUGHT FORWARD					
		(xvi) 250mm Diameter Steel Medium Radius 7° Bend 140mm Center to Face Plain End Preparation both Ends	No	1		
		(xvii) 250mm Diameter Steel Pipe 4790mm Face to Face Plain End Preparation Both Ends	No	1		
		(xviii) 250mm Diameter Steel Medium Radius 7° Bend 140mm Center to Face Plain End Preparation both Ends	No	1		
		(xviv) 250mm Diameter Steel Pipe 255mm Face to Face Plain End Preparation Both Ends	No	1		
		(xv) 250mm Diameter Steel Medium Radius 90° Bend 405mm Face To Face Plain End Preparation Both Ends	No	1		
		(xvi) 250mm Diameter Flanged Steel Pipe 1805mm Face to Face, Flanged one End with Puddle Flange 350mm from Plain End	No	1		
		(xvii) 250mm Diameter Telescopic Valve	No	1		
		(xviii) 250mm Diameter uPVC Pipe to Main Works Pump Station. Hydrophilic Tape To Surround Pipe where It Passes Through Concrete Settling Tank	m	60		
6.9		MECHANICAL WORKS (Supply delivery and installation and commssioning)				
6.9.1		Clarifier craper & Bridge				
6.9.1.1		Supply, delivery and install rotating clarifier bridge complete with: gratings, walkway, centre bearing, bottom scrapper, gearbox + motor+ wheel walkway	sum	1		
6-Clarifier	TOTAL SECTION 6-CLARIFIER CARRIED TO SUMMARY					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 7
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
7	SANS 1200 DA	PUMP STATION				
		<u>EARTHWORKS (SMALL WORKS)</u>				
7.1	8.3	<u>SCHEDULED ITEMS</u>				
7.1.1	8.3.1	<u>Excavation</u>				
		(b) Loosening of all stockpiled materials and use for embankments or backfill or dispose as ordered	m³	1200		
7.1.2	8.3.4	<u>Importation of material from commercial sources</u>				
		(a) Backfill with G7 material or better obtained from commercial sources compacted to 93% MDD in layers not exceeding 150mm at +/-2% OMC around the structure at maximum slope 1:2	m³	300		
		(b) Material obtained from excavation on	m³	500		
		(c) 19mm concrete stone	m³	800		
	SANS 1200G	<u>CONCRETE (STRUCTURAL)</u>				
7.2	8.2	<u>SCHEDULED FORMWORK ITEMS</u>				
7.2.1	8.2.2	<u>Smooth</u>	m²	60		
7.2.2	8.2.4	<u>Special Off-form</u>	m²	620		
7.3	8.3	<u>SCHEDULED REINFORCEMENT ITEMS</u>				
7.3.1	8.3.1	(a) High-tensile steel bars	t	36		
		(b) Wire brushing of rust	t	29		
7.4	8.4	<u>SCHEDULED CONCRETE ITEMS</u>				
7.4.2	8.4.2	15MPa blinding layer	m³	35		
7.4.3	8.4.3	30MPa concrete for bases, stub columns and casings for the pipes	m³	310		
7.4.4	8.4.4	Unformed surface finishes				
		(a) Wood-floated finishes	m²	430		
7.5	8.5	Joints				
		(a) Flexible plasticized PVC Waterbars with a minimum pressure rating of 15m	m	70		
7.6		Repair of all poor concrete works including repair of cracks repair of cracks and making good of honeycombs	m²	420		
	SANS 1200H	<u>STRUCTURAL STEELWORK</u> <u>(All structural steelwork to be stainless steel)</u> Supply and fabrication of steelwork				
7.7	8.3	<u>SCHEDULED ITEMS</u>				
7.7.1	8.3.1	Preparation of shop drawings	Sum	1		
7.7.2	8.3.2	Supply and fabrication of steelwork (i) All structural steelwork	t	2		
7-SUMP	TOTAL SECTION 7-PUMP STATION CARRIED FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 7
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
7-SUMP	SECTION 7- PUMP STATION BROUGHT FORWARD					
7.7.2	8.3.2	(ii) 1.2m high galvanized steel balustrades	m	20		
7.7.2.1	8.3.2.1	Delivery to site				
7.7.3	8.3.3	Normal delivery	t	2		
7.7.4	8.3.4	Erection on site	t	2		
7.7.5	8.3.5	Erection Bolts	t	50		
7.7.7	8.3.7	Site welding	m	1		
7.7.8	8.3.8	Handrailing Stanchions	No	68		
7.7.9	8.3.9	Handrailing Horizontals	m	132		
7.8	8.3.9	Holding down bolts 16mm chemical bolts	No	136		
7.8	SANS 1200L	<u>MEDIUM PRESSURE PIPELINES</u> <u>(All steel pipes to be made of stainless steel)</u>				
7.8.1	8.2	<u>SCHEDULED ITEMS</u>				
7.8.1.	8.2.1	<u>Supply, Lay, and Bed Pipes Complete with Couplings</u> <u>Pressure Pipes as per Drawing No. 2019/SO2</u>				
		(i) 500mm diameter Flanged Steel Pipe 715mm Face to Face, Flanged one End with Puddle Flanged 250mm from Plain End	No	1		
		(ii) 500mm diameter Steel to uPVC Flange Adaptor	No	1		
		(iii) 500mm diameter uPVC Pipe Connecting Inlet Works To Rising Main Pump Station (85)	m	85		
		(iv) 250mm diameter Flanged Steel Pipe 4150mm FOE with Bellmouth 280mm Face To Face Welded to Plain End Of Pipe	No	4		
		(v) 250mm diameter Flanged Steel Slow Radius 90° Bend 530mm F/F	No	8		
		(vi) 250mm diameter Flanged "AVK" Wedge Gate Valve 345mm Face to Face Or Similar Approved Gate Valve	No	6		
		(vii) 250mm diameter Flanged Steel Medium Radius 90° Bend 255mm F/F	No	4		
		(ix) 250 to 150 mm Flanged Concentric Reducer 255mm F/F	No	4		
		(x) 250mm diameter Flanged Steel 90° Elbow 280mm F/F	No	4		
		(xi) 250mm diameter Swing "Avk" Check Valve 600mm Face to Face Or Similar Approved	No	4		
		(xii) 250mm diameter Flanged Steel Pipe 430mm F/F	No	2		
		(xiii) 250mm diameter Flanged Steel Medium Radius 45° Bend 255mm F/F	No	2		
7-SUMP	TOTAL SECTION 7-PUMP STATION CARRIED FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 7
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
7-SUMP	SECTION 7- PUMP STATION BROUGHT FORWARD					
		(xiv) 250mm diameter Flanged Steel Pipe 1575mm F/F	m	2		
		(xv) 250mm diameter Flanged 45° Lateral 815mm Centre to Face with 45° Extension 685mm C/F	No	2		
		(xvi) 250mm diameter Flanged Steel Equal Tee Piece 280mm C/F 304 SS	No	2		
		(xvii) 250 diameter Blanked Flange 304 SS	No	2		
		(xviii) 350mm To 250mm Flanged Concentric Reducer Flat On Top at 255mm F/F	No	2		
		(xix) 350mm diameter uPVC Rising Main Pipeline to Anerobic Reactor Inlet	m	120		
		(xx) 350mm diameter Steel to u PVC Flange adaptor	No	2		
		(xxi) 560 diameter uPVC Sludge Pipe From MH5 To Main Pump Station (14m)	m	14		
		(xxii) 250mm To 150mm Flanged Eccentric Reducer Flat on Top at 215mm F/F	No	4		
		(xxiii) 250mm diameter Flanged Steel Pipe 696mm F/F	No	4		
		(xxiv) 250mm Diameter Flanged "Avk" Wedge Valve 250mm Face to Face Or Similar Approved	No	4		
		(xxv) 250mm diameter "Viking Johnson" Dismantling Join Or Similar Approved	No	4		
		(xxvi) 250mm diameter Flanged Steel Pipe 5000 mm Face to Face	No	2		
		(xxvii) 250mm diameter Flanged Steel Pipe 4000mm Face To Face	No	2		
		(xxviii) 250 to 150 mm Flanged Concentric Reducer 205mm F/F	No	2		
7.9		<u>MECHANICAL WORKS</u> <u>(Supply delivery and installation and commissioning)</u>				
7.9.1		<u>Effluent Pumps - To BNR Inlet</u>				
7.9.1.1		To BNR Inlet: Installation & commissioning only of Self priming pump set complete 115,74 L/S head 17,28m complete with gear box, mounting bases, coupling/ v belts Drg No: TE-1903-S-02	Sum	2		
7.9.1.2		To BN: Installation & commissioning only of Self priming pump set complete 46,30 L/S head 17,28m complete with gear box, mounting bases, coupling/ v belts. Drg No: TE-1903-S-02	Sum	2		
7.9.1.3		To Clinic Pump Station: Installation & commissioning only of Self priming pump set complete 115,74 L/S head 30,0m complete with gear box, mounting bases, coupling/ v belts Drg No: TE-1903-S-02	Sum	2		
7.9.1.4		Side piping manifold: DN150 piping, flanges, table 1000/3 and accessories	sum	3		
7-SUMP	TOTAL SECTION 7-PUMP STATION CARRIED FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 7
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
7-SUMP	SECTION 7- PUMP STATION BROUGHT FORWARD					
7.9.1.5		Suction piping, flanges, valves, for DN150 pipes bolts and nuts associated consumables	sum	3		
7.9.2		RESILIENT GATE VALVES FLANGED BOTH ENDS TABLE 1000/3				
7.9.2.1		DN100		2		
7.9.2.2		DN150		2		
7.9.2.3		DN 200		1		
7.9.2.4		DN 250		2		
7.9.2.5		DN 300		3		
7.9.2.6		DN 350		2		
7.9.2.7		DN 400		2		
7.9.2.8		DN 450		3		
7-SUMP	TOTAL SECTION 7-PUMP STATION CARRIED TO SUMMARY					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 8
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
8	SABS 1200 DA	CHLORINATION CONTACT PLANT				
		<u>EARTHWORKS (SMALL WORKS)</u>				
8.1	8.3	<u>SCHEDULED ITEMS</u>				
8.1.1	8.3.1	<u>Excavation</u>				
		(b) Loosening of all stockpiled materials and use for embankments or backfill or dispose as ordered	m³	1143		
8.1.2	8.3.4	<u>Importation of material from commercial sources</u>				
		(a) Backfill with G7 material or better obtained from commercial sources compacted to 93% MDD in layers not exceeding 150mm at +/-2% OMC around the structure at maximum slope 1:2	m³	0		
		(b) Material obtained from excavation on	m³	0		
		(c) 19mm concrete stone	m³	0		
	SANS 1200G	<u>CONCRETE (STRUCTURAL)</u>				
8.2	8.2	<u>SCHEDULED FORMWORK ITEMS</u>				
8.2.1	8.2.2	<u>Smooth</u>	m²	25		
8.2.2	8.2.4	<u>Special Off-form</u>	m²	310		
8.3	8.3	<u>SCHEDULED REINFORCEMENT ITEMS</u>				
8.3.1	8.3.1	(a) High-tensile steel bars	t	26		
		(b) Wire brushing of rust	t	26		
8.3.2	8.3.2	High-tensile mesh Ref 193	m²	0		
8.4	8.4	<u>SCHEDULED CONCRETE ITEMS</u>				
8.4.2	8.4.2	15MPa blinding layer	m³	8		
8.4.3	8.4.3	30MPa concrete for bases, stub columns and casings for the pipes	m³	80		
8.4.4	8.4.4	Unformed surface finishes				
		(a) Wood-floated finishes	m²	100		
8.5	8.5	Joints				
		(a) Flexible plasticized PVC Waterbars with a minimum pressure rating of 15m	m	100		
8.6		Repair of all poor concrete works including repair of cracks repair of cracks and making good of honeycombs	m²	110		
	SANS 1200H	<u>STRUCTURAL STEELWORK</u> <u>(All structural steelwork is stainless steel)</u>				
8.6	8.3	<u>SCHEDULED ITEMS</u>				
8.6.1	8.3.1	Supply, fabrication and install				
8.6.1.1	8.3.1.1	Preparation of shop drawings	Sum	1		
8-Chl	SECTION 8-CHLORINATION CONTACT PLANT CARRIED FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 8
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
8-ChI	SECTION 8-CHLORINATION CONTACT PLANT BROUGHT FORWARD					
8.6.1.2	8.3.1.2	Handrailing				
		(i) Handrailing Stanchions	No	8		
		(ii) Handrailing Horizontals	m	16		
		(iii) Holding down bolts 16mm chemicals bolts	No	16		
	SANS 1200HB	<u>CLADDING AND SHEETING</u>				
8.7.1	8.2	<u>SCHEDULED ITEMS</u>				
8.7.1	8.2.2	<u>Supply and install cladding and sheeting</u>				
8.7.1.1		Walls				
		(b) Supply and lay (SABS 227) external Face bricks pointed with square recessed and ruled horizontal and vertical joints and internal Face bricks with flash horizontal and vertical joints				
		(i) Half brick walls	m ²	100		
		(ii) Half brick walls in beam filling	m ²	3		
		(iii) One brick walls.	m ²	114		
		(iv) Extra over brickwork for face brickwork in foundations	m ²	70		
		(v) Extra over brickwork for brick-on-edge header header course lintels one course high, pointed on face and 230mm soffit.	m ²	1		
		(e) Joint forming material in movement				
		(i) 10mm thick bitumen impregnated softboard expansion joint filling, built in vertically as the proceeds, including all cutting and waste	m ²	12		
		(f) Brickwork reinforcement				
		(i) 75mm wide reinforcement built in horizontally	m	370		
		(ii) 150mm wide reinforcement built in horizontally	m	415		
8.7.1.2		<u>PLASTERING</u>				
8.7.1.2.1		30mm Thick Wood floated screeds on concrete on floors and landings	m ²	150		
8.8	SANS 1200L	<u>MEDIUM PRESSURE PIPES LINES</u> <u>(All steel pipes to be made of stainless steel)</u>				
8.8.1	8.2	<u>SCHEDULED ITEMS</u>				
8-ChI	SECTION 8-CHLORINATION CONTACT PLANT CARRIED FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 8
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
8-Chl	SECTION 8-CHLORINATION CONTACT PLANT BROUGHT FORWARD					
8.8.1.1	8.2.1	<u>Supply Lay and Bed Pipes Complete with Couplings</u> <u>Pressure Pipes as per Drawing No.</u> <u>QWWTW/01/2019/SO9</u>				
		(i) 560mm diameter Flanged Steel Pipe 600mm Face to Face with Puddle Flange Located 150mm from Inside Face	No	1		
		(ii) 560mm diameter Steel To uPVC Flange Adapter	No	1		
		(iii) 560mm diameter uPVC Pipe from Settlement Tank No. 1	m	50		
		(iv) 560mm diameter 90° Steel Bend, 915mm Center to Face	No	2		
		(v) 560mm diameter Straight Steel Pipe, Flanged, 425mm Face to Face	No	1		
		(vi) 500mm diameter Flanged Steel Pipe 600mm Face To Face Puddle Flange Located 115mm From Inside Face	No	1		
		(vii) 500mm diameter Steel To uPVC Flange Adapter	No	1		
		(viii) 500mm diameter 90° Steel Bend, 915mm Center to Face	No	2		
		(ix) 500mm diameter Straight Steel Pipe, Flanged, 425mm Face to Face	No	1		
		(x) 500mm diameter from Chlorine Contact Tank to Pump Station	m	3		
		(xi) 560mm diameter uPVC Pipe from Chlorine Tank to pump station	m	50		
8-Chl	TOTAL SECTION 8-CHLORINATION CONTACT PLANT CARRIED TO SUMMARY					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 9
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
9	SABS 1200 DA	CHLORINE ROOM <u>EARTHWORKS (SMALL WORKS)</u>				
9.1	8.3	<u>SCHEDULED ITEMS</u>				
9.1.1	8.3.1	<u>Excavation</u>				
		(b) Loosening of all stockpiled materials and use for embankments or backfill or dispose as ordered	m³	1143		
9.1.2	8.3.4	<u>Importation of material from commercial sources</u>				
		(a) Backfill with G7 material or better obtained from commercial sources compacted to 93% MDD in layers not exceeding 150mm at +/-2% OMC around the structure at maximum slope 1:2	m³	0		
		(b) Material obtained from excavation on	m³	0		
		(c) 19mm concrete stone	m³	0		
	SANS 1200G	<u>CONCRETE (STRUCTURAL)</u>				
9.2	8.2	<u>SCHEDULED FORMWORK ITEMS</u>				
9.2.1	8.2.2	<u>Smooth</u>	m²	22		
9.2.2	8.2.4	<u>Special Off-form</u>	m²	310		
9.3	8.3	<u>SCHEDULED REINFORCEMENT ITEMS</u>				
9.3.1	8.3.1	(a) High-tensile steel bars	t	26		
		(b) Wire brushing of rust	t	26		
9.3.2	8.3.2	High-tensile mesh Ref 193	m²	30		
9.4	8.4	<u>SCHEDULED CONCRETE ITEMS</u>				
9.4.2	8.4.2	15MPa blinding layer	m³	7		
9.4.3	8.4.3	30MPa concrete for bases, stub columns and casings for the pipes	m³	75		
9.4.4	8.4.4	Unformed surface finishes				
		(a) Wood-floated finishes	m²	94		
9.5	8.5	Joints				
		(a) Flexible plasticized PVC Waterbars with a minimum pressure rating of 15m	m	100		
	SANS 1200HB	<u>CLADDING AND SHEETING</u>				
9.6	8.2	<u>SCHEDULED ITEMS</u>				
9.6.1	8.2.2	<u>Supply and install cladding and sheeting</u>				
		Walls				
9-ChIRm	SECTION 9-CHLORINE ROOM CARRIED FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 9
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
9-ChlRm		SECTION 9-CHLORINE ROOM BROUGHT FORWARD				
		(b) Supply and lay (SABS 227) external Face bricks pointed with square recessed and ruled horizontal and vertical joints and internal Face bricks with flash horizontal and vertical joints				
		(i) Half brick walls	m ²	100		
		(ii) Half brick walls in beam filling	m ²	3		
		(iii) One brick walls.	m ²	114		
		(iv) Extra over brickwork for brick-on-edge header header course lintels one course high, pointed on face and 230mm soffit.	m ²	1		
		(e) Joint forming material in movement				
		(i) 10mm thick bitumen impregnated softboard expansion joint filling, built in vertically as the proceeds, including all cutting and waste	m ²	12		
		(f) Brickwork reinforcement				
		(i) 75mm wide reinforcement built in horizontally	m	370		
		(ii) 150mm wide reinforcement built in horizontally	m	415		
		(g) 230mm wide turning pieces to lintels, etc.:	No.	16		
		(g) Face brick on edge window cills	m	16		
9.6.2	8.2.3	Supply and installation of ancillaries				
		1. <u>Waterproofing</u> (Waterproofing of roofs, basements, etc shall be laid under a ten year guarantee. Waterproofing to roofs shall be laid to even falls to outlets etc with necessary ridges, hips and valleys. Descriptions of sheet or membrane waterproofing shall be deemed to include additional labour to turn-ups and turn-downs)				
		(a) Damp proofing of Walls and Floors				
		(i) One layer of 325 micron 'Consol Plastics Brickgrip DPC' embossed damp proof course sealed at edges, Laid horizontally and built under walls cills, etc.	m ²	9		
		(ii) One layer 250 micron 'consol Plastics Brickgrip DPC' waterproof sheeting sealed at laps with Gunplas Pressure Sensitive Tape, under surface beds	m ²	13		
		(b) Joint Sealants, etc.				
		(i) Polysulphide sealing compound including backing cord, bond breaker, primer, etc, in 10 x 10mm Isolation joints	m	10		
9-ChlRm		SECTION 9-CHLORINE ROOM CARRIED FORWARD				R0.00

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 9
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
9-ChIRm	SECTION 9-CHLORINE ROOM BROUGHT FORWARD					
		(ii) Two-part grey polysulphide sealing compound including backing cord, bond breaker, primer, etc, 3 x 10mm in saw cut joints in floors	m	2		
		Silicone sealant between sills and brickwork	m	10		
9.7		Pressed steel MCC Building double door and frame size 1524 x 2134mm high with louver panel to each leaf	No.	1		
9.8		MECHANICAL WORKS				
9.8.1		CHLORINE DOSING EQUIPMENT works comprises the following : Supply all equipment, materials, fittings, components for an Auto changeover chlorination system comprising of 2 X injectors, 2 X vacuum regulators, manual flow controller, vacuum and vent pipes all pre-assembled and piped on Wall-Mounted Chlorinator is designed to: Control gas feed rate Inject and mix the gas with water Auto change over system (2 x banks 70kg bottles)				
		(i) injector	No	2		
		(ii) Vacuum regulators	No	1		
		(iii) Manual flow controller 0 – 1 kg / hr	No	2		
		(iv) Vacuum and vent pipes	No	2		
		(v) Chlorine gas manifolds with liquid trap, heaters and pigtails	No	2		
		(vi) 70 Kg liquid traps and heaters	No	2		
		(vii) 70 Kg full gas cylinders secure cradle	No	6		
		(viii) Flexible connections (2 spare)		1		
		(ix) Lead washers	No	2		
		(x) Backing board must be super wood, 25mm thick and spray painted blue. Everything needs to be pre-assembled and piped complete.	No	2		
		(xi) Dual gas leak detection system complete with sensor, strobe light & siren, digital display for mute and status lamp and all cables and accessories	No	2		
		(xii) Stainless steel platform scales with ramp and remote smart indicators	No	2		
		(xiii) Manual operated extractor fan with extended flue. Switch to be mounted outside the container at door entrance	No	2		
9-ChIRm	SECTION 9-CHLORINE ROOM CARRIED FORWARD					

CONTRACT NUMBER: MLM22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 9
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
9-ChIRm	SECTION 9-CHLORINE ROOM BROUGHT FORWARD					
9.8.2		(xiii) Installation includes set-up, piping, cabling, ramps commissioning etc including pipework, wiring alarm and all cabling, cable tray, surge arrestor, accessories	Sum	1		
		CHLORINE DOSING PUMPS End suction, single stage water pump with pressure / flow switch Flow rate Q= 115 l/s, Head 6 m	Sum	2		
9-ChIRm	TOTAL SECTION 9-CHLORINE ROOM CARRIED TO SUMMARY					

CONTRACT NUMBER: MLM22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 10
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
10		MOTOR CONTROL CENTRE BUILDING				
	SANS 1200G	CONCRETE (STRUCTURAL)				
10.2	8.2	SCHEDULED FORMWORK ITEMS				
10.2.1	8.2.2	Smooth	m²	35		
10.3	8.3	SCHEDULED REINFORCEMENT ITEMS				
10.3.1	8.3.1	(a) High-tensile steel bars	t	1		
		(b) Wire brushing of rust	t	1		
10.3.2	8.3.2	High-tensile mesh Ref 193	m²	65		
10.4	8.4	SCHEDULED CONCRETE ITEMS				
10.4.1	8.4.2	10MPa blinding layer	m²	5		
10.4.2	8.4.3	30MPa concrete for bases, stub columns, slabs, beams, plinths, aprons and casings for the pipes	m³	20		
10.4.3	8.4.4	Unformed surface finishes				
		(a) Wood-floated finishes	m²	125		
	SANS 1200HB	CLADDING AND SHEETING				
10.5	8.2	SCHEDULED ITEMS				
10.5.1	8.2.2	Supply and install cladding and sheeting				
		Walls				
		(b) Supply and lay (SABS 227) external Face bricks pointed with square recessed and ruled horizontal and vertical joints and internal Face bricks with flash horizontal and vertical joints				
		(i) Half brick walls	m²	100		
		(ii) Half brick walls in beam filling	m²	3		
		(iii) One brick walls.	m²	114		
		(iv) Extra over brickwork for brick-on-edge header header course lintels one course high, pointed on face and 230mm soffit.	m²	1		
		(e) Joint forming material in movement				
		(i) 10mm thick bitumen impregnated softboard expansion joint filling, built in vertically as the proceeds, including all cutting and waste	m²	12		
		(f) Brickwork reinforcement				
		(i) 75mm wide reinforcement built in horizontally	m	370		
		(ii) 150mm wide reinforcement built in horizontally	m	415		
		(g) 230mm wide turning pieces to lintels, etc.:	No.	16		
10 - MCC	SECTION 10-MOTOR CONTROL CENTRE BUILDING CARRIED FORWARD					

CONTRACT NUMBER: MLM22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 10
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
10 - MCC	SECTION 10-MOTOR CONTROL CENTRE BUILDING BROUGHT FORWARD					
10.5.2	8.2.3	(h) Face brick on edge window cills Supply and installation of ancillaries 1. <u>Waterproofing</u> (Waterproofing of roofs, basements, etc shall be laid under a ten year guarantee. Waterproofing to roofs shall be laid to even falls to outlets etc with necessary ridges, hips and valleys. Descriptions of sheet or membrane waterproofing shall be deemed to include additional labour to turn-ups and turn-downs) (a) Damp proofing of Walls and Floors (i) One layer of 325 micron 'Consol Plastics Brickgrip DPC' embossed damp proof course sealed at edges, Laid horizontally and built under walls cills, etc. (ii) One layer 250 micron 'consol Plastics Brickgrip DPC' waterproof sheeting sealed at laps with Gunplas Pressure Sensitive Tape, under surface beds (b) Joint Sealants, etc. (i) Polysulphide sealing compound including backing cord, bond breaker, primer, etc, in 10 x 10mm isolation joints (ii) Two-part grey polysulphide sealing compound including backing cord, bond breaker, primer, etc, 3 x 10mm in saw cut joints in floors Silicone sealant between sills and brickwork	m	16		
10.5.3		Pressed steel MCC Building double door and frame size 1524 x 2134mm high with louver panel to each leaf	No.	1		
10.6		<u>IRONMONGERY</u> On request returnable samples are to be provided to the principal agent for consideration				
10.6.1		<u>Locks</u> (i) Four lever, two-key mortice lockset. As approved and fixed as per the manufactures instructions.	No.	1		
10.6.2		<u>Letters, Nameplates, etc</u> (i) Motor Control centre	No.	1		
10.7		<u>METALWORK</u>				
10.7.1		<u>Steel gates, screens, etc</u> (i) Security gate to suit 813 x 2032mm high door, to approval	No.	1		
10 - MCC	SECTION 10-TOTAL SECTION 10-MOTOR CONTROL CENTRE BUILDING CARRIED FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 10
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
10 - MCC		SECTION 10-MOTOR CONTROL CENTRE BUILDING BROUGHT FORWARD				
10.8		<u>PLASTERING</u>				
10.8.1		30mm Thick Wood floated screeds on concrete on floors and landings	m ²	150		
10.8.2		<u>Fire Appliances etc</u>				
		(a) "Chubb" or other equal approved				
		(i) 4,5kg Carbon dioxide fire extinguisher	No.	2		
		(ii) "Everyway" hose reel complete with 30m plastic hose, chromium plated stopcock, shut-off nozzle and wall bracket	No.	2		
10.9	SANS 1200HB	<u>PAINTWORK</u>				
10.9.1	8.2.4	<u>On fibre-cement</u>				
		(a) Prepare surface, apply one coat "Dulux Trade" primer for new plaster, one coat "Dulux" Trade undercoat and two coats "Dulux" Trade weathershield paint				
		(i) Barge boards and fascia board	m ²	30		
		(b) Clean, prepare surface and apply one coat "Dulux Trade" alkali resistant primer and two coats "Dulux Trade" 65 matt pva paint				
		(i) On ceilings	m ²	65		
10.9.2		<u>On metal</u>				
		(a) Security gates and screens (measured flat both sides)	m ²	20		
		(b) Doors and frames	m ²	10		
10 - MCC		TOTAL SECTION 10-MOTOR CONTROL CENTRE BUILDING CARRIED TO SUMMARY				

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 11
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
11		DRYING BEDS				
	SANS 1200C	<u>SITE CLEARANCE</u>				
11.1	8.2	<u>SCHEDULED ITEMS</u>				
11.1.1	8.2.1	Clear and grub	ha	0.22		
	SABS 1200 DA	<u>EARTHWORKS (SMALL WORKS)</u>				
11.2	8.3	<u>SCHEDULED ITEMS</u>				
11.2.1	8.3.2	<u>Restricted Excavation</u>				
		(a) Excavation for restricted foundations, footings and trenches in all materials and use for embankments or backfill or dispose as ordered	m ³	115		
11.2.2	8.3.4	Importation of material from commercial sources or from borrow pits				
		(b) 250mm thick layer of riversand layer in drying beds	m ³	880		
	SANS 1200G	<u>CONCRETE (STRUCTURAL)</u>				
11.3	8.2	<u>SCHEDULED FORMWORK ITEMS</u>				
11.3.1	8.2.2	<u>Smooth</u>	m ²	30		
11.3.2	8.2.4	<u>Special Off-form</u>		0		
11.4	8.3	<u>SCHEDULED REINFORCEMENT ITEMS</u>				
11.4.1	8.3.1	(a) High-tensile steel bars	t	2		
		(b) Wire brushing of rust	t	1		
11.4.2	8.3.2	(a) High-tensile mesh Ref 193	m ²	2,200		
		(b) Wire brushing of rust	m ²	1,300		
11.5	8.4	<u>SCHEDULED CONCRETE ITEMS</u>				
11.5.1	8.4.3	30MPa concrete for bases, stub columns and casings for the pipes	m ³	374		
11.5.2	8.4.4	Unformed surface finishes				
		(a) Wood-floated finishes	m ²	2,464		
	SANS 1200L	<u>MEDIUM PRESSURE PIPESLINES</u> <u>(All steel pipes to be made of stainless steel)</u>				
11.6	8.2	<u>SCHEDULED ITEMS</u>				
11.6.1	8.2.1	<u>Supply, Lay, and Bed Pipes Complete with Couplings Pressure Pipes as per Drawing No. 2019/SO7</u>				
		(i) 160mm diameter Flanged Steel 90° Elbow, Flanged One End 152mm Center to Face	No	7		
11 - DRYING BEDS	TOTAL SECTION 11-DRYING BEDS CARRIED FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 11
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
11 - DRYING BEDS	SECTION 11-DRYING BEDS BROUGHT FORWARD					
		(ii) 160mm diameter Flanged Gate Valve "Avk" Or Similar Approved	No	7		
		(iii) 160mm diameter Flanged Steel Medium Radius 90° Bend 387mm Center To Face	No	2		
		(iv) 160mm diameter Flanged Steel Pipe 193mm Face to Face	No	5		
		(v) 160mm diameter Flanged Steel Pipe 5380mm Face to Face	No	2		
		(vi) 160mm diameter Flanged Equal Tee Piece 180mm Face to Face	No	6		
		(vii) 160mm diameter Flanged Steel Pipe 5485mm Face to Face	No	9		
		(viii) 160mm diameter Flanged Steel Pipe 252mm Face to Face	No	1		
		(ix) 160mm diameter Flanged Steel Pipe, For 434mm Face to Face	No	1		
		(x) 160mm diameter Steel Flange Adaptor	No	1		
		(xi) 160mm diameter Flanged Steel Pipe 480mm Face to Face with Puddle Flange 115mm From Inside Face	No	1		
		(xiii) 160mm diameter Flanged Steel Pipe 4680mm Face to Face	No	1		
11 - DRYING BEDS	TOTAL SECTION 11-DRYING BEDS CARRIED TO SUMMARY					

CONTRACT NUMBER: MLM22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 12
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
12		OPERATION AND MAINTENANCE FACILITIES BUILDING				
12.1	SABS 1200 DA	<u>EARTHWORKS (SMALL WORKS)</u>				
12.1.1	8.3	<u>SCHEDULED ITEMS</u>				
12.1.1.1	8.3.4	Backfill with G6 material from commercial sources compacted to 95% MOD AASTO in layers not exceeding 150mm at +/-2% OMC in foundation, under slabs and any other disgnated areas	m³	24		
12.2	SANS 1200G	<u>CONCRETE (STRUCTURAL)</u>				
12.2.1	8.2	<u>SCHEDULED FORMWORK ITEMS</u>				
12.2.1.1	8.2.2	<u>Smooth</u>	m²	35		
12.2.3.1	8.4	<u>SCHEDULED CONCRETE ITEMS</u>				
	8.4.2	10MPa blinding layer	m³	3.50		
12.2.3.2	8.4.3	30MPa concrete for bases, stub columns, slabs, beams, plinths, aprons and casings for the pipes	m³	18.28		
12.2.3.3	8.4.4	Unformed surface finishes				
		(a) Wood-floated finishes	m²	123		
12.3	SANS 1200HB	<u>CLADDING AND SHEETING</u>				
12.3.1	8.2	<u>SCHEDULED ITEMS</u>				
12.3.1.1	8.2.2	<u>Supply and install cladding and sheeting</u>				
12.3.1.1.1		Walls				
12.4		<u>CARPENTRY AND JOINERY</u>				
12.4.2		Fibre-cement fascias and barge boards.				
12.4.2		(i) 12mm Thick x 225mm high ungrooved facias including galvanised steel H-profile joiners.	m	38		
12.4.2		Tile skirting 100mm High	m	20		
12.4.4		semi-solid flush panel single timber door complete with lockbar, flush panelled both sides with approved hardwood veneer and concealed hardwood edges.				
		(i) 40mm Thick, size 813 x 2032 with and including 120mm undercut. D4	No.	2		
		(ii) 40mm Thick, size 900 x 2032mm high, for paraplegic toilet	No.	1		
		(iii) 40mm Thick, size 813 x 2032mm high	No.	7		
12 - Maint. Staff Buildg	SECTION 12-OPERATION AND MAINTENANCE FACILITIES BUILDING CARRIED FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 12
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
12 - Maint. Staff Buildg		SECTION 12-OPERATION AND MAINTENANCE FACILITIES BUILDING BROUGHT FORWARD				
12.5		<u>CEILINGS, PARTITIONS AND ACCESS FLOORING</u> Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins or shot pinned to brickwork or concrete Items described as "plugged" shall be deemed to include screwing to fibre, plastic or metal plugs at not exceeding 600mm centres, and where described as "bolted" the bolts have been given elsewhere				
12.5.1		6.4mm Gypsum ceiling boards on and including 38 x 38mm branderling to roof truss (i) Ceilings including 50 x 50mm sawn softwood branderling at 400mm centres (ii) 75mm Coved cornices including silicon sealer (iii) Extra over ceiling for trap door (iv) Extra over ceilings for opening for light fittings. (v) 135mm thick pink aerolite insulation fitted and laid on top of ceiling.	m² m No. No. m²	65 120 2 15 65		
12.6		<u>IRONMONGERY</u> On request returnable samples are to be provided to the principal agent for consideration				
12.6.1		<u>Locks</u> (i) Four lever, two-key mortice lockset. As approved and fixed as per the manufactures instructions. (ii) Two lever mortice lockset, as approved. and fixed, as per the manufactures instructions (iii) Aluminium indicator bolt, as approved. and fixed as per the manufactures instructions. (iv) 2 x 150mm Satin chrome flush bolt and rebate conversion set, as approved, and fixed as per the manufactures instructions	No. No. No. No.	1 60 3 2		
12.6.1		<u>Handles</u> (i) Satin-chrome handles, as approved. And fixed as per the manufactures instructions. (ii) Chrome handles, as approved. And fixed as per the manufactures instructions. (iii) Strong handle on inside of door fixed with screw and nuts through doors, and fixed as per the manufactures instructions.	Pairs Pairs Pairs	1 1 6		
12.6.2		<u>Kickplates, Push Plates, Etc</u> (ii) 160 x 160mm Stainless steel push plate (iii) 800 x 300mm Stainless steel kick plate	No. No.	2 1		
12 - Maint. Staff Buildg		SECTION 12-OPERATION AND MAINTENANCE FACILITIES BUILDING CARRIED FORWARD				

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 12
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
12 - Maint. Staff Buildg		SECTION 12-OPERATION AND MAINTENANCE FACILITIES BUILDING BROUGHT FORWARD				
12.6.3		Door closer, as approved.	No.	1		
12.6.4		<u>Sundries</u>				
		(ii) Rubber door stops, as approved. And fixed as per the manufactures instructions.	No.	8		
		(iii) Coat hook, as approved. And fixed as per the manufactures instructions.	No.	2		
12.6.5		<u>Bathroom Fittings</u>				
		(i) Nuwkem range or similar approved surface mounted stainless steel toilet paper roll holder code STRX672	No.	3		
		(ii) Nuwkem range or similar approved surface mounted stainless steel soap dispenser code STRX618 and including a replaceable 1 litre container suitable for antiseptic soaps & lotions	No.	3		
		(iii) 32mm Stainless steel standard paraplegic rail	No.	2		
		(v) 32mm Stainless steel standard cistern back grab rail	No.	2		
		(vi) Nuwkem range or similar approved surface mounted stainless steel paper towel dispenser code STRX600 with a satin finish with cylinder lock with a standard key including screws and dowels, with a capacity of 300 x 400 towels	No.	3		
		(vii) Nuwkem range or similar approved surface mounted stainless steel non touch electronic warm air hand dryer code STRXHK 2400 SA with a satin finish with a blowout 240ms/hr, temp approx 60sc total rated output, 1940w. Airflow area 320mm2	No.	3		
12.6.6		<u>Letters, Nameplates, etc</u>				
		(i) Female Indicator sign	No.	1		
		(ii) Paraplegic toilet sign	No.	1		
		(iii) Male indicator sign	No.	1		
		(iv) Reception sign	No.	1		
		(v) Office	No.	1		
		(v) Server	No.	1		
		(v) DB room	No.	1		
12.6.7		<u>Blinds on all windows</u>	Item	1		
12.7		<u>METALWORK</u>				
12.7.1		<u>Steel gates, screens, etc.</u>				
		(i) Security gate to suit 813 x 2032mm high door, to approval	No.	1		
12 - Maint. Staff Buildg		SECTION 12-OPERATION AND MAINTENANCE FACILITIES BUILDING CARRIED FORWARD				

CONTRACT NUMBER: MLM22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 12
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
12 - Maint. Staff Buildg	SECTION 12-OPERATION AND MAINTENANCE FACILITIES BUILDING BROUGHT FORWARD					
12.7.2		<u>Standard Pressed Metal Door Frames</u> (a) 1.6mm Standard pressed steel double rebated factory primed door frame, complete with one pair hinges, central striking plate, lock box and rubber buffers, wall fixing lugs and shop prime, all 230mm walls (i) Frame for single door size, 813 x 2032mm high. (b) 1.2mm Standard pressed steel double rebated, factory primed door frame, complete with one one pair hinges, central striking plate, lock box and rubber, well fixing lugs and shop prime, all for 115mm walls. (i) Frame for single under door size, 813 x 2032mm high with a 120mm undercut (c) Mild Steel Windows (All windows shall be fitted with solid brass handles, screws, stays and hinge pins.) (i) Window size 1000 x 600 mm high, type W1 (ii) Window size 1200 x 600 mm high, type W2 (iii) Window size 1500 x 950 mm high, type W3 (iv) Window size 2000 x 950 mm high, type W4	No.	1		
12.8		<u>PLASTERING</u>				
12.8.1		30mm Thick Wood floated screeds on concrete on floors and landings	m ²	150		
12.9		<u>TILING</u>				
12.9.1		Supply and install Porcelain tiling (to SABS specification) on walls and floors in kitchen, toilets and bathrooms				
		(i) non-slip floor tiling (450 x 450)	m ²	65		
		(ii) Wall tiling (300 x 200)	m ²	125		
		(iii) On narrow widths	m ²	2		
12.10		<u>PLUMBING AND DRAINAGE</u>				
12.10.1		<u>Prepainted galvanised mild steel</u>				
		(i) 75mm Diameter downpipe with and including holder bats	m	15		
		(ii) Extra over 75mm diameter downpipe for swan neck.	No.	4		
		(iii) Extra over 75mm diameter downpipe for shoe.	No.	4		
12 - Maint. Staff Buildg	SECTION 12-OPERATION AND MAINTENANCE FACILITIES BUILDING CARRIED FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 12	
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT	
12 - Maint. Staff Buildg	SECTION 12-OPERATION AND MAINTENANCE FACILITIES BUILDING BROUGHT FORWARD						
12.10.2		(iv) 0.8mm Thick gutter size, size, 125 x 125mm.	m	4			
		(v) Extra over 0.8mm thick gutter, for stopped end.	No.	4			
		(vi) Extra over 0.8mm thick gutter, for corner.	No.	4			
		(vii) Extra over 0.8mm thick gutter, for cut out for and including outlet for 76 x 76mm downpipe (downpipe elsewhere).	No.	4			
		<u>Sanitary Fittings</u>					
		(a) "Vaal" or other equal approved					
		(i) WC suite "Vaal - sanitaryware" or similar approved vitreous china "Orchid" back inlet 90 degree, wall hung rim pan code 439016 complete with a bolt through the wall bracket code 806420 and a concealed flush valve	No.	3			
		(ii) WC suite "Vaal - sanitaryware" or similar approved vitreous china "Orchid" back inlet 90 degree, wall hung rim paraplegic white pan code 439016 complete with a floor bracket (code 906420 and including approved vitreous valcro 104, chrome plated 25mm BSP, female inlet, toilet flush valve with extended valve	No.	1			
		(iii) 510 x 400mm "Daisy" or similar approved white wash hand basin with intergrated overflow code back inlet 90 degree, with two semi-punched tapholes & chainstay hole and including approved disabled taps, fittings complete.	No.	3			
		(iv) "Vaal - sanitaryware" or similar approved vitreous china wall hung "Lavatera" urinal with backinlet code 705427 urinal size 800 x 385 x 380mm, supplied with 38mm domical grating, C.P. spreader complete	No.	2			
12.10.3		(v) Supply and connect to cold water 15mm "Cobra type taps to WHB".	No.	3			
		(vi) Plumbing fittings and accessories	Item	1			
		(vii) Complete shower unit with fittings and glass door	No.	3			
		(viii) 1.2mm kithchen sink unit including fittings	No.	1			
		<u>Fire Appliances etc</u>					
		(a) "Chubb" or other equal approved					
		(i) 4.5kg Carbon dioxide fire extinguisher	No.	2			
		(ii) "Everyway" hose reel complete with 30m plastic hose, chromium plated stopcock, shut-off nozzle and wall bracket	No.	2			
12 - Maint. Staff Buildg	SECTION 12-OPERATION AND MAINTENANCE FACILITIES BUILDING CARRIED FORWARD						

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 12
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
12 - Maint. Staff Buildg		SECTION 12-OPERATION AND MAINTENANCE FACILITIES BUILDING BROUGHT FORWARD				
12.10		<u>GLAZING</u> Note: Glazing of laminated safety glass into steel frames: all edges to be sealed with 15mm selotape to prevent water absorption via the vinyl interlayer. Glass to be set on 25mm neoprene rubber setting blocks of 60 - 90 degree sure hardness				
12.10.1		<u>Tops, shelves, doors, mirrors, etc</u> (a) 4 mm Obscure glass (i) Panes exceeding 0,1m2 and not exceeding 0,5m2 (b) 4 mm Clear float glass (i) Panes exceeding 0,1m2 and not exceeding 0,5m2 (ii) Panes exceeding 0,5m2 and not exceeding 2m2	m²	1		
12.10.2		<u>6mm Silvered float glass copper backed mirrors with 10mm bevelled and polished edges holed for and fixed with chromium plated dome capped mirror screws with rubber buffers to plugs in brickwork or concrete</u> (i) Mirror 600 x 900mm with polished edges, 4 x fixed to wall with chromium plated dome head screws	No.	3		
12.11	SANS 1200HB	<u>PAINTWORK</u>				
12.11.1	8.2.4	<u>On fibre-cement</u> (a) Prepare surface, apply one coat "Dulux Trade" primer for new plaster, one coat "Dulux" Trade undercoat and two coats "Dulux" Trade weathershield paint (i) Barge boards and fascia board (b) Clean, prepare surface and apply one coat "Dulux Trade" alkali resistant primer and two coats "Dulux Trade" 65 matt pva paint (i) On ceilings	m²	30		
12.11.2		<u>On metal</u> (a) Security gates and screens (measured flat both sides) (b) Doors and frames	m²	20		
12.12		<u>Perimeter Fence</u> (a) <u>Concrete Palisade fence</u> (i) Steel palisade fence	m	20		
12 - Maint. Staff Buildg		SECTION 12-OPERATION AND MAINTENANCE FACILITIES BUILDING CARRIED FORWARD				

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 12
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
12 - Maint. Staff Buildg	SECTION 12-OPERATION AND MAINTENANCE FACILITIES BUILDING BROUGHT FORWARD					
		(b) Gates				
		(i) Extra over palisade fence for steel palisade pedestrians gate 900mm wide	No.	1		
		(ii) Extra over for steel palisade manually operated sliding double vehicular gate 3m wide, including roller wheels, tracks, etc.	No.	1		
12 - Maint. Staff Buildg	TOTAL SECTION 12-OPERATION AND MAINTENANCE FACILITIES BUILDING CARRIED TO SUMMARY					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 13
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
13		ELECTRICAL WORK				
13.1		<u>MOTOR CONTROL CENTRES</u>				
13.1.1		Decommissioning/dismantling and removing of old MCC, DBs and equipment from site, loading and transporting to Employers stores	Sum	1		
13.1.2		Supply, delivery to site, handling, installation and commissioning of MOTOR CONTROL with 3 x 3 kW DOL starters and accessories at INLET WORKS complete with suitable electrical wiring and control cabling	No.	1		
13.1.3		Supply, delivery to site, handling, installation and commissioning of MOTOR CONTROL with 2 X 5.5 kW and 3 x 5.5kW DOL starters and accessories at REACTOR ANOXIC TANK for the MIXERS complete with suitable electrical wiring and control cabling	No.	1		
13.1.4		Supply, delivery to site, handling, installation and commissioning of MOTOR CONTROL with 2 X 22 kW DOL starters and accessories at REACTOR AEROBIC TANK for the AERATORS complete with suitable electrical wiring and control cabling	No.	1		
13.1.5		Supply, delivery to site, handling, installation and commissioning of MOTOR CONTROL with 2 x 18.5 kW DOL starter and accessories at SECONDARY CLARIFIERS complete with suitable electrical wiring and control cabling	No.	1		
13.1.6		Supply, delivery to site, handling, installation and commissioning of MOTOR CONTROL with 2 x 11 kW DOL starter and accessories at RAS PUMPS complete with suitable electrical wiring and control cabling	No.	1		
13.1.7		Supply, delivery to site, handling, installation and commissioning of MOTOR CONTROL with 1.1 kW DOL starter and accessories at CHLORINE DOSING SECTION complete with suitable electrical wiring and control cabling	No.	1		
13.1.8		Supply, delivery to site, handling, installation and commissioning of MOTOR CONTROL with 2 x 18.5 kW DOL starters and accessories at EFFLUENT PUMPS complete with suitable electrical wiring and control	No.	1		
13.1.9		Supply, delivery to site, handling, installation and commissioning of MAIN DISTRIBUTION BOARD with MAIN and GENERATOR SUPPLIES complete with suitable electrical wiring and control cabling	No.	1		
13.1.10		Supply, delivery to site, handling, installation and commissioning of MOTOR CONTROL with DOL starters and accessories at OLD WWTW complete with suitable electrical wiring and control cabling	No.	5		
13.1.11		Prepare and conduct FAT, quality assurance, temporary storage, of new MCC	Sum	1		
13.1.12		Conduct SAT, and Cold Commissioning	Sum	1		
13.1.13		Hot Commissioning, Test Certification documentation and Hand over	Sum	1		
13-Elec	SECTION 13-ELECTRICAL WORKS CARRIED FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 13
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
13-Elec		SECTION 13-ELECTRICAL WORKS BROUGHT FORWARD				
13.2		FIELD STOP/START STATIONS				
13.2.1		Supply, delivery to site, handling, installation and commissioning of FIELD STATIONS for INLET WORKS; REACTOR ANOXIC TANK MIXERS X 3; REACTOR AEROBIC TANK AERATORS X 2; SECONDARY CLARIFIERS X 2; RAS PUMPS AND CHLORINE DOSING PUMPS complete with suitable electrical wiring and control cabling	No.	10		
13.3		FLOW METERING				
13.3.1		Supply ; delivery ; Installation and Commissioning of Ultra sonic open channel FM, including digital display and logger complete with all the cabling at INLET CHANNEL and OUTLET	No.	2		
13.4		STANDBY GENERATOR				
13.4.1		Supply and delivery of 220kVA Standby Generator including auto change over with reputable engine	No.	1		
13.4.2		Installation; Test, Commissioning and Certification of works including preparation of plinth and enclosure	Sum	1		
13.4.3		Consumables, diesel supply and associated consumables, to allow testing and run in for at least 6hrs during trial and optimization period	Sum	1		
13.4.4		Inspection, checks and maintenance during defect and liability period	Sum	1		
13.5		CABLE TRAYS, POWER AND CONTROL CABLES				
13.5.1		Supply and delivery to site of the following Medium Duty perforated Cable tray (hot dipped galvanised)				
		(a) 200mm straight	m	220		
		(b) 200 mm 90° bend	No.	24		
		(c) 200mm riser	No.	24		
		(d) 200mm dropper	No.	24		
13.5.2		Accessories for installation of 200 mm perforated cable tray, including all supports, unistruts, threaded bar, splices, fasteners etc.	sum	1		
13.5.3		Taking delivery, handling, erection, installation, of the perforated cable tray	sum	1		
13.6		LV PVC SWA POWER AND CONTROL CABLES				
13.6.1		Supply and delivery to site of the following LV PVC SWA power cables and control cables 600/1000V copper conductor PVC/PVC/SWA/PVC ECC:				
		(a) 185 mm ² 4C from Power Supply to Main Distribution Board	m	250		
		(b) 150 mm ² 4 C from MDB to BNR and Old Pump stations Kiosks	m	500		
		(c) 35 mm ² 4C from various MCCs to motor assemblies	m	350		
13-Elec		SECTION 13-ELECTRICAL WORKS CARRIED FORWARD				

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 13
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
13-Elec	SECTION 13-ELECTRICAL WORKS BROUGHT FORWARD					
13.6.2		(d) 10 mm ² 4C from various MCCs to motor assemblies	m	500		R205,000.00
		(e) 2.5 mm ² 4C from Dosing Pump MCC to motor	m	150		
		(f) 1.5mm ² 2-pair IOS Instrumentation cable	m	1200		
		Taking delivery, installation testing and terminations of all power and control cables	sum	1		
		Trenching consisting of excavations, bedding, burial, cable marker tape and compaction	sum	1		
		Provisional amount for additional material required for additional cable for existing works	Prov sum			
		Percentage Profit on provisional sum	%	R205,000.00		
13.7	BUILDING ELECTRICAL					
13.7.1		Small power and lights Distribution Board complete including circuit breakers and associated accessories in the area listed below and as detailed in building drawings				
13.7.1.1		Supply DB Atten_Facilities	No.	1		
13.7.1.2		Install DB Atten_Facilities	No.	1		
13.7.1.3		Supply DB Chlorine Contact_Room	No.	1		
13.7.1.4		Install DB Chlorine Contact_Room	No.	1		
13.7.1.5		Supply DB Screen_Room	No.	1		
13.7.1.5		Install DB Screen_Room	No.	1		
13.7.2		Supply Type B: 2 x 36W surface mounted corrosion proof fluorescent light fittings	No.	12		
13.7.3		Install Type B: 2 x 36W surface mounted corrosion proof fluorescent light fittings	No.	12		
13.7.4		Supply Type C: 2PL9W down lighter ;waterproof	No.	9		
13.7.5		Install Type C: 2PL9W down lighter ;waterproof	No.	9		
13.7.6		Supply Type D: 2PL9W Bulkhead ;waterproof	No.	18		
13.7.7		Install Type D: 2PL9W Bulkhead ;waterproof	No.	18		
13.7.8		Supply Day Night Switch	No.	1		
13.7.9		Install Day Night Switch	No.	1		
13.7.10		Supply Day One lever one way Light Switch	No.	8		
13.7.11		Install Day One lever one way Light Switch	No.	8		
13.7.12		Supply Day Two lever Two way Light Switch	No.	2		
13.7.13		Install Day Two lever Two way Light Switch	No.	2		
13.7.14		Supply of House wire (Lights & Plugs)	sum	1		
13-Elec	SECTION 13-ELECTRICAL WORKS CARRIED FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT				SECTION 13
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
13-Elec	SECTION 13-ELECTRICAL WORKS BROUGHT FORWARD					
13.7.15		Wiring of buildings SPL and plugs	sum	1		R218,000.00
13.7.16		Supply Galvanized Conduits 20mm	Length	20		
13.7.17		Install Galvanized conduits	sum	1		
13.7.18		Galvanized accessories including couplings, adaptors, male and female bushes, locknuts and plugs, covers, fixings saddles and screws, bending, reaming, fixing, cleaning for wiring purposes, waste and the prevention and remedy of damaged building walls	sum	1		
13.7.19		2.5mm2 house wiring (lightning)	sum	1		
13.7.20		4mm2 switched socket outlet (DSO)	sum	1		
13.7.21		Provisional amount for additional material required for refurbishment of existing facilities	Prov sum			
13.7.22		Percentage Profit on provisional sum	%	R218,000.00		
13.8		PERIMETER LIGHTING				
13.8.1		Supply 4 x 55W LED fittings per ring on 10 m buried height mast and emergency control gear	No.	9		
13.8.2		Installation and commissioning of 4 x 55W LED fittings per ring on 10 m buried height mast and emergency control gear	No.	9		R163,500.00
13.8.3		Supply 16 mm sq. 2C PVC SWA	m	400		
13.8.4		Excavation	m³	50		
13.8.5		Installation	m	400		
13.8.6		Termination	No.	30		
13.8.7		Supply Distribution Kiosk	No.	1		
13.8.8		Install Distribution Kiosk	No.	1		
13.8.9		Supply and Installation of double SSO	No.	3		
13.8.10		Supply and Installation of Triple Pole 100 A field Stations	No.	3		
13.9		UPGRADE OF POWER SUPPLY				
		Electricity Upgrade Connection Fee	PC			R163,500.00
		Percentage adjustment on Item 10.9.1 for Contractor's overheads and profit (State % and extend as an amount) to liaise and follow up	%	R163,500.00		
13.10		MISCELLANEOUS				
13.10.1		Prepare as Built drawings for all schematics. SLDS and P&IDs	sum	1		
13-Elec	SECTION 13-ELECTRICAL WORKS CARRIED FORWARD					

CONTRACT NUMBER: MLM/22/2024/25		REFURBISHMENT AND UPGRADING OF ORANJEVILLE WASTEWATER TREATMENT WORKS				SECTION 13
ITEM NO	PAYMENT REFERS TO	4ML INCLUSIVE DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
13-Elec	SECTION 13-ELECTRICAL WORKS BROUGHT FORWARD					
13.10.2		Preparation of Functional Design Specification document	sum	1		
13.10.3		Technical and operations training on Site	sum	1		
13.10.4		Issue of COCs	sum	1		
13.10.5		Danger signs, Notices and Fire Extinguishers	sum	1		
13.10.6		Inspection, checks and maintenance during defect and liability period	sum	1		
13-Elec	TOTAL SECTION 13-ELECTRICAL WORKS CARRIED TO SUMMARY					

CONTRACT NUMBER: MLM/22/2024/25		CONSTRUCTION FOR UPGRADING OF ORANJEVILLE WASTE WATER TREATMENT PLANT					SUMMARY
		4ML INCLUSIVE DESCRIPTION	UNIT		QUANTITY	RATE	AMOUNT
SECTION	1	PRELIMINARY AND GENERAL					
SECTION	2	REFURBISHMENT WORKS					
SECTION	3	SEWER					
SECTION	4	INLET STRUCTURES, SCREENS, GRIT REMOVAL AND FLOW MEASUREMENT STRUCTURES					
SECTION	5	BIOLOGICAL REACTORS					
SECTION	6	CLARIFIER					
SECTION	7	PUMP STATION					
SECTION	8	CHLORINATION CONTACT PLANT					
SECTION	9	CHLORINE ROOM					
SECTION	10	MOTOR CONTROL CENTRE BUILDING					
SECTION	11	DRYING BEDS					
SECTION	12	OPERATION AND MAINTENANCE FACILITIES					
SECTION	13	ELECTRICAL WORK					
	SUBTOTAL						
	ADD 10% CONTIGENCY						
	TOTAL						
	ADD 15% VAT						
	TOTAL PROJECT CONSTRUCTION COSTS						



METSIMAHOLO LOCAL MUNICIPALITY

BID NO MLM 22/2024/25

REFURBISHMENT AND UPGRADE OF ORANJEVILLE WASTEWATER TREATMENT WORKS

C3: SCOPE OF WORK

C3.1 DESCRIPTION OF WORKS

C.3.1.1 EMPLOYER'S OBJECTIVES

The objectives of the employer for this contract are:

- (a) To ensure the WWTW has adequate capacity to effectively treat the incoming sewer inflows;
- (b) To ensure production of effluent of superior quality suitable for discharge into a watercourse, in order to comply with green drop environmental requirements;
- (c) To ensure a low capital cost facility with low operational costs;
- (d) To ensure the WWTW is simple to operate and lend itself for progressive upgrade;
- (e) To ensure the WWTW perform well despite of lack of human skills and other restrictions
- (f) To upgrade and refurbish existing plant to an acceptable standard and thereby ensuring that components of the plant are operating within their design capacity;
- (g) To prepare an operational and maintenance plan that will guide all operational and maintenance activities done on the plant
- (h) To ensure a safe working environment for operational and maintenance personnel;

N.B THE EXECUTION OF THE PROJECT WORK IS SUCH THAT THE REFURBISHMENT WORK TO THE EXISTING PLANT SHALL ONLY COMMENCE UPON COMPLETION AND COMMISSIONING OF THE CONSTRUCTION OF THE NEW BNR WASTEWATER TREATMENT WORKS

C.3.1.2 EXTENT OF WORKS

A. CIVIL AND STRUCTURAL WORKS – REFURBISHMENT OF EXISTING WORKS

1. PRETREATMENT STRUCTURES

1.1 SCREENING

Refurbishment of existing screens

- Clean, inspect for corrosion damage and refurbish screens
- Test and commission completed section in conjunction with mechanical and electrical works

1.2 GRIT REMOVAL SECTION

Refurbishment of existing grit channel

- Clean, inspect for damage and refurbish grit channel
- Test and commission completed section in conjunction with mechanical and electrical works

2. ANAEROBIC POND

Refurbish existing anaerobic pond:

- De-sludge the existing anaerobic pond by discharging sludge to drying beds.
- Refurbish and reconstruction existing anaerobic pond
- Test and commission completed section in conjunction with mechanical and electrical works

3. FACULTATIVE PONDS

Refurbish existing facultative pond:

- De-sludge the existing facultative pond by discharging sludge to drying beds.
- Refurbish and reconstruction existing facultative pond
- Test and commission completed section in conjunction with mechanical and electrical works

4. TRICKLING FILTER

Refurbish existing trickling filter:

- Refurbish and reconstruction existing trickling filter
- Test and commission completed section in conjunction with mechanical and electrical works

5. CLARIFIER

Refurbish existing secondary clarifier and construct a new secondary clarifier:

- De-sludge the existing secondary clarifier by discharging sludge to drying beds.
- Refurbish and reconstruction existing secondary clarifier

- Test and commission completed section in conjunction with mechanical and electrical works

6. MATURATION PONDS

Refurbish existing maturation pond:

- De-sludge the existing maturation pond by discharging sludge to drying beds.
- Refurbish and reconstruction existing maturation pond
- Test and commission completed section in conjunction with mechanical and electrical works

7. CHROLINATION

Refurbish existing chlorination plant.

- Refurbish and reconstruct existing chlorination plant
- Test and commission completed section in conjunction with mechanical and electrical works

8. MAINTAINANCE STUFF FACILITIES

Refurbish existing maintenance stuff facility.

- Refurbish and reconstruction existing maintenance stuff facility
- Test and commission completed section in conjunction with mechanical and electrical works

9. SLUDGE DRYING BEDS

Refurbish existing sludge drying beds and construction a new sludge drying beds:

- Construction of a sludge drying beds
- Refurbish and reconstruct existing sludge drying beds

10. ACCESS ROAD, PARKING, PATHWAYS,

- Trim grass

11. PERIMETER FENCING

Refurbish existing perimeter fencing and construct a perimeter fencing

- Construction of a perimeter fencing
- Refurbish and reconstruction existing perimeter fencing

B. CIVIL AND STRUCTURAL WORKS – CONSTRUCTION OF BNR SERIES PLANT

1. PRETREATMENT STRUCTURES

1.1 Screening

Construction of screens

- Construction of new screening screens
- Test and commission completed section in conjunction with mechanical and electrical works

1.2 Grit removal section

Construction of a grit channel

- Construction of a grit channel
- Test and commission completed section in conjunction with mechanical and electrical works

1.3 Inlet Pump house

Construction of a pump house

- Construction of a pump house
- Test and commission completed section in conjunction with mechanical and electrical works

2. Biological Nutrient Removal Series Structure

2.1 Anaerobic Plant

Construction of anaerobic plant

- Construction of new anaerobic plant
- Test and commission completed section in conjunction with mechanical and electrical works

2.2 Anoxic plant

Construction of two anoxic plants in series

- Construction of two anoxic plants in series.

- Test and commission completed section in conjunction with mechanical and electrical works

2.3 Aerobic plant

Construction of an aerobic plant.

- Construction of an aerobic plant
- Test and commission completed section in conjunction with mechanical and electrical works

3. AUXILIARY STRUCTURES

3.1 Clarifier

Construction of a clarifier

- Construction of clarifier
- Test and commission completed section in conjunction with mechanical and electrical works

3.2 Sludge Drying Beds

Construction of sludge drying beds

- Construction of sludge drying beds.
- Test and commission completed section in conjunction with mechanical and electrical works

3.3 Chlorination House and chlorine contact channel

Construction of a chlorination house.

- Construction of a chlorination house and contact channel
- Test and commission completed section in conjunction with mechanical and electrical works

3.4 Chambers

Construction of a valve and a weir chamber.

- Construction of a valve chamber to the sludge drying beds.

- Construction of a weir chamber to the sludge drying beds.
- Test and commission completed section in conjunction with mechanical and electrical works

3.4 Maintenance staff house

- Construction of a maintenance staff facilities.

3.5 Generator plinth

- Construction of a generator plinth

4. ACCESS ROAD, PARKING, PATHWAYS, GUARD RAILS AND DRAINAGE

- Construct segmented paving access road, parking, pathways
- Construct V -drainage for both the existing and new plants
- Install guard railing around ponds and reactor tanks

C. MECHANICAL & ELECTRICAL WORKS

1. PRETREATMENT STRUCTURES-HEAD OF WORKS

Refurbishment of existing screens and construction of new screens and associated structures.

- Supply, install and commission flow metering with data logging for existing and new plant
- Supply and Install hand railing

2. ANAEROBIC POND

Works include:

- Supply and Install hand railing
- Refurbish valves / sluices

3. FACULTATIVE PONDS

- Refurbish existing RAS pumps and WAS pumps
- Refurbish panels and instruments
- Supply and install new RAS and WAS pumps and MCCs
- Supply and fabricate connecting pipe works
- Supply and Install hand railing
- Refurbish valves / sluices

4. PUMP HOUSE

Refurbish existing pumps and construct new pumps:

- Supply, install and commission filter and was pumps
- Upgrade piping and valves
- Supply, install and commission new MCCs and instruments

5. CLARIFIER

Refurbish existing secondary clarifier and construct a new secondary clarifier:

- Supply, install and commission WAS pumps
- Supply and fabricate connecting pipe works
- Supply, install and commission new MCCs and instruments
- Supply and Install hand railing
- Refurbish valves

6. MATURATION PONDS

Refurbish existing maturation pond and construct a new maturation pond:

- Refurbish/ upgrade existing self-priming pumps
- Supply, install and commission WAS pumps
- Supply and fabricate connecting pipe works
- Supply, install and commission new MCCs and instruments
- Recalibrate flow meter

7. SLUDGE DRYING BEDS

- Refurbish existing sludge drying beds valves
- Supply, install and commission piping and valves for additional beds
- Supply of filter media

8. ELECTRICAL POWER

- Upgrade transformer
- Supply, install and commission diesel standby generator

9. LIGHTING

- Replace lights and fittings

A. MECHANICAL & ELECTRICAL WORKS – CONSTRUCTION OF BNR SERIES PLANT PRETREATMENT STRUCTURES

10. PRETREATMENT STRUCTURES-HEAD OF WORKS

Construction of

- Supply, install and commission mechanical screening equipment
- Supply, install and commission DE gritting pumps and grit classifier
- Supply, install and commission flow metering with data logging for existing and new plant
- Supply and Install hand railing
- Supply and install lift pumps
- Electrical panels and instruments for the equipment above

11. ANAEROBIC TANK

Works include:

- Supply and install vertical shaft mixer
- Supply and Install hand railing
- Electrical panels and instruments for the equipment above

12. ANOXIC TANK

- Supply and install activated sludge recycle pumps
- Supply and install vertical shaft mixer
- Electrical panels and instruments for the equipment above

13. ANAEROBIC TANK

- Supply and install activated sludge recycle pumps
- Supply and install vertical shaft aerators
- Supply and Install hand railing
- Electrical panels and instruments for the equipment above

14. PUMP HOUSE

Refurbish existing pumps and construct new pumps:

- Supply, install and commission filter and was pumps
- Upgrade piping and valves
- Supply, install and commission new MCCs and instruments

15. CLARIFIER

Construct a new secondary clarifier:

- Supply, install and commission WAS pumps
- Supply and fabricate connecting pipe and valves
- Supply, install and commission new MCCs and instruments
- Supply and Install hand railing

16. SLUDGE DRYING BEDS

- Supply, install and commission piping and valves for additional beds
- Supply of filter media

17. ELECTRICAL POWER

- Upgrade transformer
- Supply, install and commission diesel standby generator

18. LIGHTING

- Supply, install and commission new lighting and fitting for additional building

EXTENT OF WORKS SUMMARY

The extent of Works is summarized as follows:

- 1) Refurbishment of existing and Construction of new pre-treatment structures i.e. screens associated structures and screens, grit removal and flow measurement structures;
- 2) Refurbishment of existing anaerobic pond;
- 3) Refurbishment of existing facultative pond;
- 4) Refurbishment of existing trickling filter (TF);
- 5) Refurbishment of existing and construction of new additional secondary clarifier;
- 6) Refurbishment of existing maturation pond;
- 7) Construction of a new BNR series which consist of Anaerobic, Anoxic & Aerobic plants
- 8) Refurbishment of existing and construction of new additional chlorination plant;
- 9) Refurbishment of existing and construction of new additional maintenance staff facilities;
- 10) Upgrade and/or refurbish pumps at the end of facultative pond;
- 11) Refurbish feeder pipeline from splitter box;
- 12) Refurbish and construction of pipeline system from around the whole plant;
- 13) Refurbish and upgrading of flow measuring;
- 14) Refurbish sludge pipelines from ponds and secondary clarifiers to sludge drying beds;
- 15) Construction of sludge pipelines from BNR to sludge drying beds;
- 16) Modify and construction of overflow weirs on settling tanks and ponds;
- 17) Upgrade and extend perimeter fencing to cover existing and extension of the whole WWTW ;
- 18) Create a fenced wetland for final effluent to flow through before discharge at Vaal
- 19) Upgrade pumps; associated controls and pipelines to accommodate the new plant capacity estimated at 4 ML/day
- 20) Upgrade power supply;
- 21) Construct proper access road, parking, pathway and guardrails to make the WWTW components safely accessible.
- 22) Construct drainage system to ensure there is no flooding in the WWTW especial pump house
- 23) Refurbish area lighting at the WWTW and pump station
- 24) Refurbishments to the operator/guard facilities
- 25) Operational and maintenance manuals
- 26) Compliance with Green Drop requirements
- 27) Compliance with Green Drop requirements



METSIMAHOLO LOCAL MUNICIPALITY

BID NO: MLM 22/2024/25

**CONSTRUCTION FOR RE-COMMENCEMENT OF UPGRADING OF ORANJEVILLE
4ML/DAY WASTEWATER TREATMENT PLANT**

PORTION 2: CONTRACT

PART C3.2

GENERAL SPECIFICATIONS

PART A: GENERAL

THE WORKS

3.2 GENERAL DESCRIPTION OF THE CONTRACT

The project entails refurbishing of all the components of the existing PETRO WSP system and ensuring it receives a maximum flow of 0.45ML/day its design capacity and to build a new BNR plant to cater for remaining capacity requirements and thereby improving the quality of the treated wastewater. The components PETRO WSP system are inlet structures (screens, grit channel, flow measuring structures), anaerobic pond, facultative pond, maturation pond, all ponds inlet structures, clarifier, trickling filter, chlorination plant, and all electrical and mechanical systems of the existing plant. The BNR will consist of inlet structures (screens, grit channel, flow measuring structures), biological reactor with an anaerobic, two anoxic and an aerobic reactor, clarifier, chlorination plant and pumping.

This will ensure current demand which by far exceeds capacity and future population growths with Oranjeville and Metsimaholo areas is met and also:

- ensure the WWTW has adequate capacity to effectively treat the incoming sewer inflows;
- ensure production of effluent of superior quality suitable for discharge into a watercourse, in order to comply with green drop and other environmental requirements;
- ensure a low-capital cost facility with low operational costs;
- ensure the WWTW is simple to operate and lend itself for progressive upgrading;
- ensure the WWTW perform well despite of lack of human skills and other restrictions
- upgrade and refurbish existing plant to an acceptable standard and thereby ensuring that components of the plant are operating within their design capacity;
- prepare an operational and maintenance plan that will guide all operational and maintenance activities done on the plant

C3.2.2 DESCRIPTION OF SITE AND ACCESS

The project is located in the farms in Oranjeville area of Metsimaholo Local Municipality in the Free State Province. The GPS Coordinates for Oranjeville area are 26°58'25.15"S, 28°10'58.04" É. The area is generally flat open farming area with an unsurfaced access

road. However, there is no problem of access to the site as arterial and major distributary roads are paved.

C3.2.3 NATURE OF GROUND AND SUBSOIL CONDITIONS

The area has the following co-ordinates; Latitude 26°58'25.15"S and Longitude 28°10'58.04"E . The area is characterized a gently sloping topography and generally the soil is of a clayey nature.

3.2.4 DETAILS OF CONTRACT

The project's major work activities are earthworks which are mainly machine intensive construction methods, with a bit of mechanical and electrical works. Some of these activities are as listed below;

The proposed project consists of the following scope:

- Setting out of BNR plant and other structures
- Identification of existing services
- Protection of existing services
- Excavation for ponds and embankment platform construction
- Excavation and backfilling of pipeline trenches
- Erosion protection embankment works where necessary
- Concrete works for pre-treatment and inlet and outlet structures for treatment components
- Upgrading of existing and installation of upgraded and new electrical and mechanical components.
- Testing

Execution of works

This project consists of two components:

- 1) Upgrading the plant capacity of the waste water treatment works, which involves the construction of a new BNR waste water treatment plant
- 2) Refurbishment works on the existing Petro waste water treatment works

N. B IT MUST BE NOTED THAT THE REFURBISHMENT WORKS COMPONENT OF THE PROJECT SHALL ONLY EXECUTED UPON COMPLETION AND COMMISSIONING OF THE NEW BNR WWTW

3.2.5 CONSTRUCTION PROGRAMME

The Contractor shall submit a detailed programme within 28 days of the acceptance of the tender. The programme shall clearly show the order in which the Contractor proposes to carry out the Work, the critical path, the proposed rate of progress and a linked cash flow forecast.

The Contract Period shall include all Saturdays, Sundays, non-working days as well as an allowance for expected inclement weather and consequential delays during normal working days. The time for completion of the works shall be as stated in the Contract Data, Part C1.2, clause 5.5. A week shall consist of five working days. The programme shall be approved by the Employer's Agent prior to the implementation of the construction works.

If the construction programme has to be revised in terms of Clause 5.6.4 of the General Conditions of Contract because the Contractor is falling behind in his programme, the Contractor shall submit a revised programme of how he intends to regain lost time to ensure completion of the Works before the Due Completion Date. Any proposals by the Contractor to increase the tempo of work must incorporate positive steps to increase production either by the provision of more labour and Plant on the Site, or by using the available labour and Plant in a more efficient manner.

Failure on the part of the Contractor to submit or to work according to the programme or revised programmes shall be sufficient reason for the Employer's Agent to take steps as set out in sub clause 5.7.1 of the conditions of contract.

3.2.6 SITE FACILITIES AVAILABLE

3.2.6.1 Sources of Water Supply and Power Supply

Water and electricity services are available in the vicinity of the Site, and the Contractor shall, at his own expense, be responsible for connections to the available services, as well as for the distribution of water and electricity for construction and domestic use. The distribution of water and electricity shall be carried out in accordance with the applicable laws and regulations.

The Contractor shall make his own arrangements with the appropriate authority for water and electricity and sewerage connections.

No extension of time due to delays resulting from obtaining and maintaining these facilities will be granted.

3.2.6.2 Location of Camp and Depot

The Contractor must negotiate the location of his own camp site with the Project Steering Committee. The construction camp shall be near the Site of Works.

3.2.6.3 Housing for the Contractor's Employees

No housing is available for the Contractor's employees and the Contractor shall make his own arrangements for housing his employees or transporting them to and from the site. The Contractor is in all respects responsible for the housing and transporting of his employees and for the arrangement thereof, and no extension of time due to any delays resulting from this will be granted.

3.2.7 SITE FACILITIES REQUIRED

3.2.7.1 Facilities for the Employer's Agent

A site office, toilet and carport for the Employer's Agent and his staff are required, and the Contractor must provide suitable facilities in his own offices for the holding of site meetings. The Employer's Agent's Representative shall also be allowed the free use of the necessary survey equipment and survey assistants to enable him to carry out control work as and when required.

Office facilities shall be provided by the Contractor as described in SANS 1200 AB and PSAB of the Specification.

3.2.7.2 Equipment for Employer's Agent staff

The Contractor shall allow for all the necessary protective clothing for the Employer's Agent staff:

3.2.7.3 Water, electricity and sewage

The Contractor shall, at his own expense, be responsible for obtaining and distributing the water and electricity required for construction and domestic use. The distribution of

water and electricity shall be carried out in accordance with the applicable laws and regulations.

No separate payment will be made for obtaining and distributing water and electricity, the cost of which will be deemed to be included in the tendered rates.

3.2.7.4 Excrement Disposal

The Contractor shall, at his own expense, be responsible for safely and hygienically dealing with and disposing of all human excrement and similar matter generated on the Site during the course of the Contract, to the satisfaction of the responsible health authorities in the area of the Site and the Employer's Agent. All such excrement shall be removed from the Site and shall not be disposed of by the Contractor on the Site.

The Contractor shall further comply with any other requirements in this regard as may be stated in the Contract.

No separate payment will be made to the Contractor in respect of discharging his obligations in terms of this sub clause and the costs thereof shall be deemed to be included within the Contractor's tendered Preliminary and General items.

3.2.7.5 Site instruction book

A triplicate book shall be provided by the Employer's Agent to be used for site instructions. It shall at all times be kept on the site.

3.2.8 FEATURES REQUIRING SPECIAL ATTENTION

3.2.8.1 Access to properties

The Contractor shall organize the work in such a manner as to cause the least possible inconvenience to the public and to the property owners adjacent to or affected by the work included in this contract.

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 conditions in order to provide access to the erven and properties.

The Contractor may, with the approval of the Employer's Agent, make arrangements with the occupiers of the affected erven and properties to close off a portion of a street, road,

footpath or entrance temporarily, provided the Contractor duly notifies the occupiers of the intended closure and its probable duration and shall, as punctually as possible, re-open the route at the prescribed time. Where possible, the road shall be made safe and re-opened to traffic overnight. Any such closure shall be made by 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. The Contractor shall also comply with all the requirements of the Local Authority with regard to safety, signage and notices to the public.

3.2.8.2 Existing residential areas

Access to the adjacent residential areas shall be maintained at all times, as shall access to individual houses.

Electricity and water supply interruptions to existing residential areas shall be kept to a minimum. Whenever it is necessary to interrupt these supplies, the Employer's Agent's approval shall first be obtained. The affected residents shall then be notified in writing at least 3 days, but not more than 5 days in advance. Supplies shall be normalized by 16:00 on the same day.

Cognisance shall be taken by the Contractor of the possibility of residents from the adjacent residential areas having access, whether authorized or not, to the works. It is strongly emphasized that under no circumstances shall any claims be considered for delays or disruptions as a result of the presence of residents from the adjacent occupied areas.

3.2.8.3 Facilities to other Contractors

In addition to the requirements of clause 18 of the general conditions of contract, the Contractor must make allowance for the presence of other Contractors engaged on other contracts on the site, which may involve, inter alia, the adaption of his programme to fit in with work to be done by the other Contractors, as well as assuring other Contractors access to their sites along prescribed routes which may fall within the site of this contract.

3.2.8.4 Contractor's vehicles

All equipment and vehicles used by the Contractor shall be roadworthy at all times and all drivers and operators shall be in possession of valid drivers' licences.

3.2.8.5 Site maintenance

During the progress of the work and upon its completion, the site of the works shall be kept and left in a clean and orderly condition. The Contractor shall at all times store materials and equipment for which he is responsible in an orderly manner, and shall keep the site free from debris and obstruction. Workers shall lunch or have tea breaks only in a designated area with approved refuse and toilet facilities.

No open fires shall be permitted on the site.

Vehicles and workers must adhere to property demarcated access routes and not take or make short cuts.

3.2.8.6 Testing and quality control

3.2.8.6.1 Contractor to engage services of an independent laboratory

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

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

For the purposes of this clause, an "independent laboratory" shall mean an "SANAS accredited laboratory" which is not under the management or control of the Contractor and in which the Contractor has no financial interest, nor which has any control or financial interest in the Contractor.

Density testing must be done as per SANAS 1200LB a minimum of 6 tests should be executed per lot of at 200m.

Sewer testing should be as per SANAS 1200LB section 7.2 2

3.2.8.6.2 Additional testing required by the Employer's Agent

In addition to the provisions of sub clause PS 8.6.1: Contractor to engage services of an independent laboratory, the Employer's Agent shall be entitled at times during the Contract to require that the Contractor arrange with the independent laboratory to carry out any such tests, additional to those described in sub clause PS 8.6.1, at such times and at such locations in the Works as the Employer's Agent shall prescribe. The Contractor shall promptly and without delay arrange with the independent laboratory for carrying out all such additional testing as required by the Employer's Agent, and copies of the test results shall be promptly submitted to the Employer's Agent.

3.2.8.6.3 Costs of testing

(a) Tests in terms of sub clause 8.6.1

The costs of all testing carried out by the independent laboratory in accordance with the requirements of sub clause PS 8.6.1, above shall be borne by the Contractor and shall be deemed to be included in the tendered rates and prices for the respective items of work as listed in the Schedule of Quantities and which require testing in terms of the Specifications. No separate payments will be made by the Employer to the Contractor in respect of any testing carried out in terms of sub clause PS 8.6.1.

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

(b) Additional tests required by the Employer's Agent

The costs of any additional tests required by the Employer's Agent in terms of sub clause PS 8.6.2: Additional testing required by the Employer's Agent, shall be reimbursed to the Contractor against substitution of the Provisional Sum allowed therefore in the Schedule of Quantities; provided always that the costs of any such additional tests ordered by the Employer's Agent, the results of which indicate that the quality of the materials utilised and/or the standard of workmanship achieved are/is in accordance with the specifications. If the results

are **not** in accordance with the specifications, the costs **shall not** be reimbursable to the Contractor.

3.2.8.7 Procurement of Sub contractors

Direct preference is given on the basis of the Targeted Enterprise status of the tenderer. Functionality points are allocated on the basis of the Contract Participation Goal offered in terms of the engagement of Local Enterprises and Local Labour.

Scope of mandatory sub contract work

It is **mandatory** to subcontract work of at least thirty percent (30%) of the value to the local enterprises so as to achieve the Contract Participation Goal. The choice of who and for which portions of the work he does is to be agreed with the Project Steering Committee or the Community Forum in liaison with the Liaison Officer and the Ward Councillor.

The Contractor commits himself to work closely with the Community Forum, who will compile a local resource database to assist the Contractor in maximizing the use of local resources. In inviting local enterprises to tender for subcontracted work, the Contractor shall include the local enterprises identified by the Community Forum, except if they are deemed by the Contractor to be unfit to provide the service or deliver the goods at the required quality, taking into account the entrepreneurial training available to empower them. In the event of a dispute between the Community Forum and the Contractor as to the ability of an identified service local enterprise for a particular subcontract, the final choice shall rest with the Contractor, following discussions with the CLO and the Engineer.

The Contractor is responsible for work carried out on his behalf by subcontractors. The Employer's Agent will not liaise directly with such subcontractors, and all problems relating to payments, programming, workmanship, etc, shall be the concern of the Contractor and the subcontractor, and the Employer's Agent will not be involved.

3.2.8.8 Existing Services

Before the Contractor commences operations, he must discuss with and have the approval of the Employer, authority or owner concerned regarding the method he proposes to use for relocating or safe-guarding any services and existing works he may encounter during construction.

Available drawings of existing services may be viewed at the offices of the Employer's Agent.

The positions of existing services shown on the Drawings are given in good faith and no guarantee can be given that:

- (a) these services actually are in the approximate positions indicated.
- (b) that these are the only services in the vicinity, and
- (c) that the nature and description of these services are correct.

The Contractor shall be responsible to locate and safeguard any existing service or works he may encounter during construction and shall obtain clearance from the Employer, authority and the Employer's Agent before commencing work in the proximity of existing services or works. The Contractor shall liaise with the local authority, electricity provider, telecommunication providers regarding the presence and location of any existing services. The Contractor shall arrange that a representative of such authorities or service providers to make known the location on site, before the commencement of works.

The Contractor shall be responsible for any damage to such existing services and works in the execution of this contract and shall reimburse the Employer, authority or the owner concerned for any repairs required and for damages.

The Contractor shall be responsible for immediately notifying the Employer's Agent and the authorities concerned regarding any damage caused to public services and existing works.

Any alteration to public services shall be carried out by the Authority concerned unless the Contractor is instructed otherwise.

The Contractor shall provide the necessary assistance during any operations necessary in connection with the removal, alteration or safe-guarding of any public service.

3.2.8.10.1 General

It is a requirement of this contract that the Contractor shall provide a safe and healthy working environment and to direct all his activities in such a manner that his employees and any other persons who may be directly affected by his activities, are not exposed to hazards their health and safety. To this end the Contractor shall assume full responsibility to conform to all the provisions of the Occupational Health and Safety Act No 85 and Amendment Act No 181 of 1993, and the OHSA 1993 Construction Regulations 2014 issued on 07 February 2014 by the Department of Labour.

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

Health and Safety Specifications and Plans**a) Employer's Health and Safety Specification**

The Employer's Health and Safety Specification will be included in the tender documents as part of the Project Specifications.

b) Tenderer's Health and Safety Plan

The Tenderer shall submit with his tender his own documented Health and Safety Plan he proposes to implement for the execution of the work under the contract. His Health and Safety Plan must at least cover the following:

- i. A proper risk assessment of the works, risk items, work methods and procedures in terms of Regulations 7 to 28;
- ii. Pro-active identification of potential hazards and unsafe working conditions;
- iii. Provision of a safe working environment and equipment;
- iv. Statements of methods to ensure the health and safety of subcontractors, employees and visitors to the site, including safety training in hazards and risk areas (Regulation 5);

- v. Monitoring health and safety on the site of works on a regular basis, and keeping of records and registers as provided for in the Construction Regulations;
- vi. Details of the Construction Supervisor, the Construction Safety Officers and other competent persons he intends to appoint for the construction works in terms of Regulation 6 and other applicable regulations; and
- viii. Details of methods to ensure that his Health and Safety Plan is carried out effectively in accordance with the Construction Regulations 2014.

The Contractor's Health and Safety Plan will be subject to approval by the Employer, or amendment if necessary, before commencement of construction work. The Contractor will not be allowed to commence work, or his work will be suspended if he had already commenced work, before he has obtained the Employer's written approval of his Health and Safety Plan.

Time lost due to delayed commencement or suspension of the work as a result of the Contractor's failure to obtain approval for his safety plan, shall not be used as a reason to claim for extension of time or standing time and related costs.

Cost of compliance with the OHSA Construction Regulations

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

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

3.2.8.10.1 Requirements for Accommodation of Traffic (Read with SANS 1921 - 2: 2004) General

The Contractor will be responsible for the safe and easy passage of public traffic past and on sections of roads of which he has occupation or where work has to be done near traffic.

The travelling public shall have the right of way on public roads, and the Contractor shall make use of approved methods to control the movement of his equipment and vehicles so as not to constitute a hazard on the road.

Accommodation of traffic, where applicable shall comply with SANS 1921-2: 2004: Construction and Management Requirements for Works Contracts, Part 2: Accommodation of Traffic on Public Roads occupied by the Contractor. The Contractor shall obtain this specification from Standards South Africa if accommodation of traffic will be involved on any part of the construction works.

Basic Requirements

The travelling public shall have the right of way on public roads, and the Contractor shall make use of approved methods to control the movement of his equipment and vehicles so as not to constitute a hazard on the road.

The Contractor shall ensure that all road signs, barricades, delineators, flagmen and speed controls are effective and that courtesy is extended to the public at all times.

Failure to maintain road signs, warning signs or flicker lights and etc, in a good condition shall constitute ample reason for the Employer's Agent to suspend the work until the road signs, etc, have been repaired to his satisfaction.

The Contractor may not commence constructional activities affecting existing roads before adequate provision has been made to accommodate traffic in accordance with the requirements of this document and the South African Road Traffic Signs Manual.

The Contractor shall construct and maintain all temporary drainage works necessary for temporary deviations.

The Contractor shall provide and grant access to persons whose properties fall within or adjoin the area in which he is working.

3.2.8.11 Concurrent Construction Contracts

The Contractor's attention is drawn to the fact that other contiguous works will be executed concurrently by independent Contractor's under separate contracts in the vicinity of the Site.

The other Works which will be in progress or will come into operation on or adjacent to the Site of the Works during the progress or tenancy of this Contract are likely to include the construction and installation of sewer, water and main outfall sewers.

The Contractor shall ensure that neither his operations nor those of his subcontractors nor the activities of his employees shall interfere with or hinder the operations of the Employer or of other Contractors and he shall indemnify the Employer against all claims arising through default of this requirement.

The Contractor shall hand over portions of the Site of the Works (whether completed or not), or completed portions of the Works, to these Contractors when required by the Employer or detailed elsewhere in this document. The Contractor shall cause no interference with or delays in the execution of these contiguous contracts.

No discount or commission for the Contractor is allowed on these contracts, and it will be assumed that he has fully allowed in the Contract Price for the presence of these Contractors on Site. Any service rendered or assistance given by the Contractor to these Contractors, save as are provided for in the Project Specifications, shall be for their accounts only since the Employer shall in no way be responsible to the Contractor for any payments in this respect.

The Contractor shall protect all known existing services as well as all work being carried out and structures being erected on the Site by other Contractors. Any damage caused to these services or structures, or any obstruction or hindrance caused to other contractors by the contractor, and all claims arising there from, will be the sole responsibility of the Contractor.

All repair work shall be carried out at the Contractor's expense to the entire satisfaction of the Employer's Agent. The same obligations shall be imposed on the Employer and on other Contractors in respect of the Works being executed under this Contract.

3.2.9 INFORMATION SUPPLIED BY EMPLOYER

Certain information contained in these contract documents, or provided separately, is being offered in good faith. However, in the circumstances pertaining to the type of information supplied, no guarantee can be given that all the information is necessarily

correct or representative. More specifically this applies to all material surveys and reports and similar information, the accuracy of which is necessarily subject to the limitation of testing, sampling, the natural variation of material or formations being investigated and the measure of confidence with which conclusions can be drawn from any investigations carried out. It also applies to the positions of existing services as indicated on the drawings.

The Employer accepts no liability for the correctness or otherwise of the information supplied or for any resulting damages, whether direct or consequential, should it prove during the course of the contract that the information supplied is either incorrect or not representative. Any reliance placed by the tenderer on this information shall be at his own risk.

3.2.9.1 Labour-intensive competencies of supervisory and management staff

Established contractors shall only engage supervisory and management staff in labour intensive works that have either completed, or for the period 1 April 2019 to 30 June 2020, are registered for training towards, the skills programme outlined in Table 1.

Emerging contractors shall have personally completed, or for the period 1 April 2019 to 30 June 2020 be registered on a skills programme for the NQF level 2-unit standard. All other site supervisory staff in the employ of emerging contractors must have completed, or for the period 1 April 2019 to 30 June 2019 be registered on a skills programme for, the NQF level 2-unit standards or NQF level 4-unit standards.

Table 1: Skills programme for supervisory and management staff

Personnel	NQF level	Unit standard titles	Skills programme description
Team leader / supervisor	2	Apply Labour Intensive Construction Systems and Techniques to Work Activities	This unit standard must be completed, and
		Use Labour Intensive Construction Methods to Construct and Maintain Roads and Storm water Drainage	} any one of these 3 unit standards
		Use Labour Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour Intensive Construction Methods to Construct, Repair and Maintain Structures	
Foreman/ supervisor	4	Implement labour Intensive Construction Systems and Techniques	This unit standard must be completed, and
		Use Labour Intensive Construction Methods to Construct and Maintain Roads and Storm water Drainage	} any one of these 3 unit standards
		Use Labour Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour Intensive Construction Methods to Construct, Repair and Maintain Structures	
Site Agent / Manager (i.e. the contractor's most senior representative that is resident on the site)	5	Manage Labour Intensive Construction Processes	Skills Programme against this single unit standard
Details of these skills programmes may be obtained from the CETA ETQA manager (e-mail: gerard@ceta.co.za, tel: 011-265 5900).			

3.2.9.2 Employment of unskilled and semi-skilled workers in labour-intensive works

3.2.9.2.1 Requirements for the sourcing and engagement of labour

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

Tasks established by the contractor must be such that:

- a) the average worker completes 5 tasks per week in 40 hours or less; and
- b) the weakest worker completes 5 tasks per week in 55 hours or less.

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

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

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

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

- a) 60 % women;
- b) 20% youth who are between the ages of 18 and 25; and
- c) 2% on persons with disabilities.

3.2.9.2.2 Specific provisions pertaining to SANS 1914-5

Definitions

Targeted labour: Unemployed persons who are employed as local labour on the project.

Terms and conditions for the engagement of targeted labour

Further to the provisions of clause 3.3.2 of SANS 1914-5, written contracts shall be entered into with targeted labour.

Variations to SANS 1914-5

The definition for net amount shall be amended as follows:

Financial value of the contract upon completion, exclusive of any value added tax or sales tax which the law requires the employer to pay the contractor.

The schedule referred to in 5.2 shall in addition reflect the status of targeted labour as women, youth and persons with disabilities and the number of days of formal training provided to targeted labour.

3.2.10 EXTENSION OF TIME ARISING FROM ABNORMAL RAINFALL

See Part C1.2, Contract Data, Clause 5.12.2.2.

3.2.11 CERTIFICATES OF PAYMENT

The statement to be submitted by the Contractor in terms of clause 6 of the conditions of contract shall be prepared by the Contractor at his own cost, strictly in accordance with the standard payment certificate prescribed by the Employer's Agent, in digital electronic computer format. The Contractor shall, together with a copy of the digital electronic computer file of the statement, submit two (2) A4 size paper copies of the statement.

For the purposes of the Employer's Agent's payment certificate, the Contractor shall subsequently be responsible, at his own cost, for making such adjustments to his statement as may be required by the Employer's Agent for the purposes of accurately reflecting the actual quantities and amounts which the Employer's Agent deems to be due and payable to the Contractor in the payment certificate.

The Contractor shall, at his own cost, make the said adjustments to the statement and return it to the Employer's Agent within three (3) normal workings days from the date on which the Employer's Agent communicated to the Contractor the adjustments required. The Contractor shall submit to the Employer's Agent five (5) sets of A4 size paper copies of such adjusted statement, together with a copy of the electronic digital computer file thereof.

Any delay by the Contractor in making the said adjustments and submitting to the Employer's Agent the requisite copies of the adjusted statement for the purposes of the Employer's Agent's payment certificate will be added to the times allowed to the Employer's

Agent in terms of sub- clause 6.10.4 of the conditions of contract to submit the signed payment certificate to the Employer and the Contractor. Any such delay will also be added to the period in which the Employer is required to make payment to the Contractor

3.2.12 CONSTRUCTION IN LIMITED AREAS

In certain cases, working space may be limited. The method of construction in these restricted areas will depend largely on the Contractor's plant. However, the Contractor must note that measurement and payment will be according to the specified cross-sections and dimensions irrespective of the method used to achieve these cross-sections and dimensions, and that the rates and prices tendered shall be deemed to include full compensation for any difficulty encountered while working in limited areas and narrow widths, and that no extra payment will be made, nor will any claim for payment due to these difficulties be considered.

3.2.13 NON-WORKING DAYS

The Contractor shall not work on Sundays or on the following statutory Public Holidays: New Year's Day, Human Rights Day, Good Friday, Family Day, Freedom Day, Workers Day, Youth Day, National Women's Day, Heritage Day, Day of Reconciliation, Christmas Day and Day of Goodwill. Whenever any of the above statutory Public Holidays fall on a Sunday, the following Monday shall be a Public Holiday.

3.2.14 SPOIL MATERIAL

No indiscriminate spoiling of material will be allowed. All surplus or unsuitable material shall be spoiled in designated areas as directed by the Employer's Agent. Spoiling shall comply with the applicable statutory and Municipal regulations.

3.2.15 DRAWINGS

All "as built" information, as listed below, must be submitted to the Employer's Agent's Representative before a certificate of completion will be issued, the cost of which shall be included in the rates tendered for items PSA 8.3.1 and 8.3.2 under section 1200 A of the schedule of quantities.

3.2.15.1 List of "as built" information required- sewers

- (a) Exact coordinates and invert level of each sewer manhole and dimensioned sewer house connection details.
- (b) Positions of unknown existing services and crossings and water reticulation routes and metre numbers to be listed.

A Registered Land Surveyor shall be required to provide the above information.

Only figured dimensions shall be used and drawings shall not be scaled unless so instructed by the Employer's Agent. The Employer's Agent will supply any figured dimensions which may have been omitted from the drawings.

3.2.15.2 As-built drawings, operating manuals and maintenance schedules: Mechanical/Electrical Equipment

3.2.15.2.1 The Contractor provides the following: The Contractor shall be required to furnish three final copies of each manual/handbook for each piece of equipment in terms of this contract.

3.2.15.2.2 One copy of the preliminary handbooks shall be made available to the Project Manager two weeks prior to commissioning of the equipment.

3.2.15.2.3 One copy of the final set of handbooks will be kept at WWTW and the Contractor must bind and cover every page of this set with translucent plastic.

3.2.15.2.4 The following manuals shall be supplied as part of the contract:

- Maintenance Instruction manual
- Operator's manual
- Parts Catalogue and full detailed drawings of the components
- Training Manual
- All the above manuals in CD-Format (soft copy)

3.2.15.2.5 The Contractor provides manuals in an A4 hard covered, red, grease and waterproof binder, using 2 ring type binders. The manuals are well indexed and user friendly and include a summarized Table of Contents.

3.2.15.2.6 Drawings and charts larger than A4 are folded and those greater than A3 are enclosed in an A4 plastic pocket of adequate strength.

3.2.15.2.7 As-Built/Final Documentation

In undertaking the 'Works' (including all incidental services required), the Supplier shall conform and adhere to the requirements of the 'Contractor Document Submittal Requirements' Standard included in the Works Information.

3.2.15.2.8 Where manuals include drawings that still need to be revised to "As-Built" status, and such manuals are required prior to 'As-Built' status, the manual will not be considered to be in its final form until the "As-Built" version of each such drawing has been incorporated.

3.2.15.2.9 Installation, Maintenance and Operating Manuals and Data Books

In undertaking the 'Works' (including all incidental services required), the Supplier shall conform and adhere to the requirements of the 'Contractor Document Submittal Requirements' Standard included in the Works Information.

3.2.16 TRENCHES

No trenches may be left open during the Contractor's holiday during December and January. All trenches which have been excavated but which have not been finally backfilled and compacted at the commencement of the said holiday period shall be temporarily fully backfilled and compacted to a standard which will

- (a) prevent damage occurring to the trenches or any other part of the Works;
- (b) prevent damage to or physical loss of the property of any person and
- (c) eliminate the risk of injury to any person during the said period

All costs involved in the temporary backfilling and compaction of such trenches and the subsequent reopening of the trenches after the holiday period shall be for the Contractor's account.

3.2.17 SAMPLES

The Contractor shall at his own cost, supply all samples that may be required. Material or work not conforming to the approved samples shall be rejected. The Employer's Agent reserves to himself the right to submit samples to any tests to ensure that the material

represented by the sample conforms to the requirements of the specifications. The cost of all tests failed shall be for the Contractor's account.

3.2.18 MANUFACTURER'S INSTRUCTIONS

The recommendations of the manufacturers of patented materials must be strictly adhered to regarding the use, mixing, application, fastening, etc. thereof except when otherwise instructed in writing by the Employer's Agent.

3.2.19 PROPRIETARY MATERIALS

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 Employer's Agent.

3.2.20 NOTICES, SIGNS, BARRICADES AND ADVERTISEMENTS

The Contractor shall erect the necessary signs, notices and barricades for the duration of the contract in order to safeguard both the works and the public.

Notices, signs and barricades as well as advertisements may be used only upon approval by the Employer's Agent, and the Contractor shall be responsible for their supply, erection, maintenance and ultimate removal and shall make provision for this in his tendered rates.

The Employer's Agent shall have the right to have any sign, notice or advertisement moved to another position or to have it removed from the site of the works, should it in any way prove to be unsatisfactory, inconvenient or dangerous to the general public.

Such notices, signs and barricades shall be provided and erected at the Contractor's own expense.

A standard name board as per the included details shall be erected. The cost of which shall be included in the rates tendered for items 1.1.2 and 8.3.2 under section 1200A of the Schedule of Quantities.

3.2.21 SETTING OUT OF WORK

Reference and level beacons will be shown to the Contractor by the Employer's Agent at the commencement of the Contract and the Contractor will be responsible for transferring the data to the Site of Works.

The Contractor shall check the condition and accuracy of all reference and level beacons and satisfy himself that they have not been disturbed and are true with regard to position and level. A beacon that has been disturbed shall not be used until its true position and level have been re-established and the new values have been certified by the Employer's Agent. The Contractor shall thereafter be held entirely responsible for the protection of all reference and level beacons.

The Contractor shall employ a capable surveyor to set out the Works to the required lines and levels. The Employer's Agent shall be informed immediately should any discrepancy be discovered between the levels or dimensions obtained by the Contractor and those shown on the drawings.

Where a beacon is likely to be disturbed during construction operations, the Contractor shall establish suitable reference beacons at locations where they will not be disturbed during construction. No beacons shall be covered over, disturbed or destroyed before accurate reference beacons have been established and details of the positions and levels of such beacons have been submitted to the Employer's Agent. The Contractor's reference beacons shall be of at least the same accuracy and sturdiness of construction as the existing beacons.

The Contractor shall submit the method of setting out he proposes to employ to the Employer's Agent. Accurate control of line and level shall be provided by the Contractor at all stages of construction.

Work set out by the Contractor may be checked by the Employer's Agent and any errors found shall be rectified by the Contractor at his own expense. The Contractor shall supply any instrument, equipment, material and labour required by the Employer's Agent for this survey work. Any assistance, including checking given to the Contractor by the

Employer's Agent or any setting out done by the Employer's Agent for Contractor shall not be held as relieving the Contractor of his responsibility for the accurate construction of the Works.

The Contractor's survey instruments and survey equipment shall be suitable for the accurate setting out of the Works and shall be subject to the approval of the Employer's Agent. They shall furthermore be checked and correctly adjusted by the authorized agents before the commencement of the contract and subsequently when required by the Employer's Agent and when otherwise necessary.

When required the Contractor shall, at his own expense, provide two labourers to assist the Employer's Agent. The Employer's Agent shall have the sole right of approving of such a labourer.

Survey work shall not be measured and paid for directly and compensation for the work involved in setting out shall be deemed to be covered by the rates tendered and paid for the various items of work included under the contract.

3.2.22 WORKMANSHIP AND QUALITY CONTROL

The onus to produce work which conforms in quality and accuracy of detail to the requirements of the Specifications and Drawings rests with the Contractor, and the Contractor shall, at his own expense, institute a quality-control system and provide experienced Employer's Agents, foremen, surveyors, materials technicians, other technicians and technical staff, together with all transport, instruments and equipment, to ensure adequate supervision and positive control of the works at all times.

The costs of all supervision and process control, including testing thus carried out by the Contractor shall be deemed to be included in the rates tendered for the related items of work.

The Contractor's attention is drawn to the provisions of the various standardized specifications regarding the minimum frequency of testing that will be required for process control. The Contractor shall, at his own discretion, increase this frequency where necessary to ensure adequate control.

On completion of every part of the work and submission thereof to the Employer's Agent for examination, the Contractor shall furnish the Employer's Agent with the results of all relevant tests, measurements and levels to indicate compliance with the specifications.

3.2.23 TRANSPORT OF MATERIAL

All costs of transporting material, including overhaul, shall be included in the applicable tendered rates. All references in the specifications to transport, overhaul and haul distances shall be deleted irrespective of whether or not the deletion is included in these project specifications.

3.2.24 LIAISON WITH LOCAL AUTHORITIES

The Contractor will have to liaise with local authorities regarding the following matters:

- (a) Dealing with traffic.
- (b) Locating of existing underground services.
- (c) Protection of existing services during construction.
- (d) Access to properties.

It is the Contractor's onus to immediately contact all these authorities and to accommodate their involvement in his programme of work. The Contractor should also warn the authorities at least 48 hours before the actual work commences. Compensation for delays, losses or accidents will not be considered should the Contractor at any time have failed to keep the local authorities informed.

The Employer's Agent or Employer must immediately be notified, should the Contractor experience any problem regarding work which involves a local authority.

In all dealings with communities through which the Works are to be constructed, and in all dealings with workers employed from within such communities, the Contractor shall take due cognisance of the character, culture and circumstances of the specific community, and shall at all times use his best endeavours to avoid the development of disputes and rather to foster a spirit of co-operation and harmony towards the project.

The Contractor shall at all times, keep the Employer's Agent fully informed regarding all matters affecting or negotiated between the Contractor and the community, and he shall attend all liaison meetings as may be arranged by the Employer's Agent and / or the

Employer. All matters concerning the community shall be discussed and where possible, resolved at such meetings.

Where any resolutions during such negotiations or at such meetings shall be contrary to the terms and provisions of the Contract, the Contractor shall not give effect thereto without a prior written instruction from the Employer's Agent. Where the Contractor is of the opinion that any instruction of the Employer's Agent issued in terms of this clause will result in the incurring of additional costs which were not provided for in his tendered rates and prices and/or that a delay in the progress of the Works will result, he shall be entitled to submit a claim in terms of Clause 51 of the Conditions of Contract, provided always that the period of twenty-eight (28) days referred to in Clause 51 shall be reduced to three (3) normal working days in respect of all claims submitted in terms of this clause.

3.2.25 APPLICABLE STANDARDIZED SPECIFICATIONS

For the purposes of this contract, SABS 1200 Standardized Specifications shall apply:

SANS 1200 A	:	General (1986)
SANS 1200 C	:	Site clearance (1980)
SANS 1200 D	:	Earthworks (1988)
SANS 1200 DB	:	Earthworks (pipe trenches) (1989)
SANS 1200 GA	:	Concrete (Small Works) (1982)
SANS 1200 G	:	Concrete (Structural) (1982)
SANS 1200 L	:	Medium-pressure pipelines (1983)
SANS 1200 LB	:	Bedding (pipes) (1983)
SANS 1200 LD	:	Sewers (1982)
SANS 1200 LF	:	Erf connections (water) (1983)

Variations and additions to the following SABS 1200 Standardized Specifications are given in portion 2 of the project specifications:

SANS 1200 A	:	General
SANS 1200 C	:	Site clearance
SANS 1200 D	:	Earthworks
SANS 1200 DB	:	Earthworks (pipe trenches)
SANS 1200 GA	:	Concrete (Small Works) (1982)
SANS 1200 G	:	Concrete (Structural) (1982)
SANS 1200 LB	:	Bedding (pipes)
SANS 1200 LD	:	Sewers
SANS 1200 LF	:	Erf connections (water)

SANS 1200 PA	:	Site Finishing
SANS 1200 PLIS	:	Labour Intensive Specifications

C3.3 LIST OF DRAWINGS

Drawings for construction and project implementation will have the following information

- Overall site and services layout
- Process flow layout
- Inlet works- including screens, grit channels, and flow measurement structures
- Anaerobic reactor layouts and details
- Anoxic reactors layouts and details
- Aerobic reactors layouts and details
- Aerators, mixers, gear box assemblies' drawings
- Clarifier layouts and details
- Rising main pipeline layout and details
- Pump, valves and piping details
- MCC/ Electrical panels schematics and drawings
- Area lighting layout
- Sludge drying beds layouts and details
- Maintenance staff facilities layouts and details



METSIMAHOLO LOCAL MUNICIPALITY

BID NO. MLM 22/2024/25

**CONSTRUCTION FOR RE-COMMENCEMENT OF UPGRADING OF ORANJEVILLE
4ML/DAY WASTEWATER TREATMENT PLANT**

C3.4 Project Specifications

C3.4.1 PROJECT SPECIFICATIONS: CIVIL AND STRUCTURAL WORK

C3.4.1.1 GENERAL

PS1.1 CONSTRUCTION PROGRAMME

It is a prerequisite of this contract that minimal disruption of the public is ensured during construction.

Construction methods must be of such a nature that no property or life is endangered. The Municipality accepts no responsibility for any work done outside the site boundaries without the Engineer's approval. The Contractor himself is responsible for liaison and arrangements with the Engineer in connection with the finalization and approval of the construction programme.

The Contractor is responsible for liaison with residents and house owners via the CLO and Project Steering Committee in respect of the programming of construction through private erven and the crossing of driveways to erven. No additional payment will be made in this regard and it shall be deemed to be covered by the relevant items.

Sufficient digital photographs of all existing structures and obstructions in the pipe line routes must be taken by the Contractor, compiled electronically, indexed and handed over to the Engineer before construction commences. A special payment item is included for a digital photo record in the Schedule of Quantities under other fixed-charge obligations.

The Contractor shall submit a programme of work to the Engineer not later than 14 (fourteen) days after the Contractor has been notified of the acceptance of his tender. This programme must take into account, and allow for phased completion of the work.

The Engineer may instruct the Contractor to stop construction work at any stage and time, as may be dictated by financial constraints highlighted by the Clients *Cost Control Programme*.

If necessary, the Engineer may instruct the Contractor to adjust his programme to suit other activities.

The programme shall not be in the form of a bar chart only, but shall clearly show the anticipated quantities, the production rates and value of work to be performed each month.

A network-based programme according to the precedence method shall also be provided showing the various activities and critical path in such detail as may be required by the Engineer. The programme shall be updated monthly in accordance with the progress made by the Contractor.

Failure to comply with these requirements will entitle the Engineer to use a programme based on his own assumptions for the purpose of evaluating claims for extension of time or additional payments.

If the programme submitted by the Contractor in terms of the General Conditions of Contract, has to be revised because the Contractor is falling behind in his programme, he shall submit a revised programme of how he intends to regain lost time to ensure completion of the Works within the period defined in the General Conditions of Contract or within a granted extension of time. A proposal to increase the tempo of work must incorporate positive steps to increase production either by more labour and plant on the site, or by using the available labour and plant in a more efficient manner.

Failure on the part of the Contractor to submit or to work according to the programme or revised programmes shall be sufficient reason for the Engineer to take steps as set out in the General Conditions of Contract.

The approval by the Engineer of a programme shall have no contractual significance other than the Engineer will be satisfied if the work is carried out according to the programme. The said approval shall not limit the right of the Engineer to instruct the Contractor to vary the programme if necessary. The Contractor shall allow for the effect of normal rainfall and special non-working days in his programme.

PS1.2 ASPECTS REQUIRING SPECIAL ATTENTION

PS1.2.1 Survey Pegs

All survey and site pegs must be protected against damage. The contractor must check all the pegs and report all missing pegs to the Engineer.

Any survey or site peg disturbed by the contractor must be replaced by a Land Surveyor at the cost of the contractor.

PS1.2.2 Existing services

There are underground existing services on site. The contractor must verify all existing services with the municipality and plant operators before any excavations are done. All indicated services must be protected against damage and any damaged caused to such services will be repaired at the cost of the contractor.

PS1.2.3 Surveying

The Contractor must use the services of, or employ a competent engineering surveyor to set out of the Works to ensure that the specified tolerances are adhered to.

Payment for the setting out will be deemed inclusive in the rates and no additional payment will be made in that regard.

No beacons, reference pegs, corner pegs, etc may be disturbed or removed without the prior consent of the Engineer.

PS1.2.4 Source of Materials

The Contractor will be responsible for locating of all materials complying with the relevant minimum requirements to be used in this contract. No separate payments shall be made for this as all costs related thereto shall be deemed to be covered by the tendered rates. All materials must comply with the relevant SANS specifications where applicable.

PS1.2.5 Setting out and approval for excavation

The contractor must set out the works in accordance with the plans and dimensions provided. After setting out the layout must be approved in writing in the site book by the engineer before any excavations are done. No excavations will be allowed without a Permission to Excavate notice signed by the Engineer's Representative and Client.

PS1.2.6 Quality Management Plan

The contractor must submit his own QMP to the engineer for approval. The engineer will issue QMP schedules that must be kept to date at all times.

PS1.2.7 Closing down documentation

The following documentation must be submitted to the engineer and approved by him:

- as-built drawings
- safety file
- quality management file

PS1.2.8 Disruption of existing services

The WWTW Plants must remain in operation at all times. Any disruption of service required for the Works under this contract must be approved in writing by the Client and Engineer's Representative.

PS1.3 ITEMS NOT COVERED IN THE SPECIFICATIONS

Some of the items in the Schedule of Quantities may not be covered by the Standard Specifications. These items are detailed on the drawings or described in the Schedule of Quantities. The rates tendered must include all labour, material, etc and no additional payments will be considered.

PS1.4 ABNORMAL RAINFALL

The source for rainfall statistics shall be taken as shown in Table 2 of WB 42 of the Weather Bureau, Department of Environment Affairs, for the determination of Rn and Nn as specified in SCC 42.3.2.

The Contractor shall keep daily rainfall records and submit them to the Engineer at every site meeting. No additional payment shall be made for the supply and installation of the rain gauge or for the keeping of the rainfall records and all costs must be included in the appropriate items.

PS1.5 LOCAL LABOUR AND LOCAL SUB-CONTRACTORS

PS1.5.1 Introduction

It is envisaged that the works at Oranjeville will be constructed by one Contractor employing local labour to construct the work applying the principles of the Expanded Public Works Programme (EPWP) as far as practical.

PS1.5.2 Workload

The Contractor is required to execute certain components of this contract with labour-based construction methods as described in paragraph PS1.5.6.

PS1.5.3 Assisting ABE's

The Contractor is required to assist ABE's in accordance with the Contractor's proposal included in his/her tender.

PS1.5.4 Local Labour

It is the intention that this Contract should make maximum use of the local labour force that is presently under-employed. To this end the Contractor is expected to limit non-local employees to key personnel only and to employ and train local labour on this Contract.

The Contractor shall complete the form: Annexure as indicated in the document and state how many non-local key personnel he intends to employ in the various categories. The numbers stated on the above-mentioned form will be strictly controlled during the Contract period and any increase in numbers is subject to the approval of the Employer.

A Project Steering Committee (PSC) will be formed and will consist of representatives of the affected community, METSIMAHOLO MUNICIPALITY. The PSC is up to date with the details of the project and appointment of all local labour must be through the CLO and PSC.

The Contractor will be required to arrange his own documentation regarding a contract for locally employed labour and must include provisions for the Occupational Health and Safety Act (1993) and the Compensation for Occupational Injuries and Diseases Act. The minimum daily wage to be paid in accordance with the Wage Bill for the Free State geographical area shall be as stated in the Government Gazette in terms of Wage Determination for the Civil Engineering Industry.

PS1.5.5 Contractors Obligations

The Contractor is to supply the Engineer with copies of the agreements between himself/herself and his/her subcontractors within twenty-one (21) days of the contract being awarded.

Should the Contractor be unable to or unwilling to?

- i) Subcontract the required Works as detailed in his/her tender document;
- ii) Submit the necessary documentation to prove that he/she is subcontracting the work as specified in paragraph PS1.5.6.

- iii) Implement his/her proposed training scheme or any other scheme agreed to by the relevant parties;

the Municipality reserves the right to:

- a) nullify the said contract and re-issue it to tender;
- b) nominate available local subcontractors for the required Works;
- c) deduct payment from the monthly certificates, the value of which will be calculated as follows:
- | | | |
|---|---|--|
| X | = | Y - Z |
| X | = | Amount of deduction from the monthly certificate |
| Y | = | Value of the work that should have been undertaken by the subcontractor during the month |
| Z | = | Value of the work actually undertaken by the Subcontractor during the month; |
- d) nominate agents to undertake the proposed training at the expense of the Contractor.

PS1.5.6 Work Considered to be Labour Based

It is a condition of this contract that the following components of work must be executed using labour-based construction methods.

- 1) Excavation of soft/ intermediate / hard material in pipe trenches not deeper than 1,2 m if the uninterrupted trench length of soft material is not greater than 50 m, and the total depth of the trench consists of soft material.
- 2) Excavation of soft/ intermediate/ hard material in all pipe trenches for erf connections with no limitations.
- 3) Preparation of pipe bedding.
- 4) Laying and jointing of all pipes with a nominal diameter smaller than 300 mm:
- 5) Backfilling of all trenches with compaction excluded.
- 6) Placing of concrete for anchor blocks and toilet foundations.
- 7) Brickwork in manholes.
- 8) Basic plumbing installation in toilets.
- 9) Location of existing services.

Note:

The abovementioned work must either be done by local labourers employed by the Contractor or by local subcontractors.

In the Schedule of Quantities, as an alternative to machine excavation, the cost of a compulsory labour-based construction activity is covered by using the standard SANS 1200 payment item (where applicable). Site conditions and material present will dictate the application of labour-based trench excavation or machine excavation. A prerequisite for payment of these labour-based excavation items, is that the Contractor keeps daily written records with names of labourers, tasks completed, man-hours spent and payments made.

Items excluded from labour-based items:

- 1) Excavation in Boulders and rock material - Mechanical excavators and blasting allowed.
- 2) Compaction of bedding and backfilling - Rollers and plate compactors allowed.
- 3) Transport of materials LDV, dumpers and other transport equipment allowed.
- 4) Mixing of concrete - Mechanical mixers allowed.
- 5) Vibration of concrete - Vibrators compulsory.
- 6) Precast concrete manholes.

PS1.6 TRAINING SCHEMES

Certain members of the Contractor's staff will be selected from the locally recruited employees, to be subjected to training in tasks related to the execution of the contract. An item with a provisional sum to cover the cost of training, is included in the Schedule of Quantities.

The PSC will select the trainees and decide upon the specific training for each of them. The Contractor must guide the PSC in this regard and make all the necessary arrangements with the training institution and the trainees, to ensure that the process runs smoothly. This training must be completed before the Contractor will receive any payments. The provisional sum in the Schedule of Quantities is to cover the fees of the training institution and a R120 per day allowance for each trainee during training. All other costs, including transport of trainees, will be borne by the Contractor and should be included in the percentage handling fee of the Contractor.

PS1.7 APPLICABLE STANDARDISED SPECIFICATIONS

Although not bound in nor issued with this document, the following standardised specifications shall form part of the contract.

SANS 1200 A	- 1986	GENERAL
SANS 1200 AB	- 1986	ENGINEERS OFFICE
SANS 1200 C	- 1982	SITE CLEARANCE
SANS 1200 DB	- 1989	EARTHWORKS (PIPE TRENCHES)
SANS 1200 L	- 1983	MEDIUM-PRESSURE PIPELINES
SANS 1200 LB	- 1983	BEDDING (PIPES)
SANS 1200 LD	- 1982	SEWERS
SANS 1200 LF	- 1983	ERF CONNECTIONS (WATER)

Where in the above-standardised specifications reference is made to other standardised specifications, the latter shall also apply for the purpose of this contract.

PS1.8 STATUS

Should any discrepancies exist between the different Specifications and/or Drawings and/or Schedule of Quantities the different sections will have the following relative status in declining order:

1. Project Specifications
2. Special Conditions of Contract
3. General Conditions of Contract
4. Standard Specifications
5. Conditions of Tender
6. Contract Drawings
7. Schedule of Quantities

C3.4.2 VARIATIONS AND ADDITIONS: CIVIL AND STRUCTURAL WORK

PSAA GENERAL

All material must, where applicable, carry the SANS mark.

PSAB ENGINEERS OFFICE

Notice Board

A notice board in accordance with CESA guidelines must be erected on the Site of Works. Details of the board are provided on a drawing to be issued. The existing offices at the Works can be utilized by the Engineer.

PSD1 EARTHWORKS (Free haul)

The following free haul distances will be applicable:

Dispose material	5 km
Borrow pit – Import of material (if required)	15 km

PSD2 CONTRACTOR TO ALLOW FOR THE HANDLING OF SEEPAGE WATER IN HIS TENDER RATES

PSD3 TESTING OF PIPELINES

3.1 All pipes after completion and before scouring and disinfecting shall be tested to 1,25 x rated working pressure of pipes.

3.2 All tests must be carried out in the presence of the Engineer.

3.3 Backfilling of Pipelines

Backfilling of pipelines should be carried out in two phases:

- (a) Phase 1 involves partial backfilling to 300 mm above the pipeline before pressure testing.
- (b) Partial backfilling should leave the joints totally exposed and rise at least 300 mm above pipes.

- (c) Mechanical shovels may not be used for placing the partial backfilling in the trench.
- (d) Phase 2 involves completion of backfilling after pressure testing.
- (e) Backfilling should be compacted at their optimum moisture content to give the maximum density.
- (f) The pipeline should not be left partially exposed for longer than 1 week. Pipes should either be fully exposed or have a minimum cover of 300 mm.

3.4 Payment for pipelines

(a) Excavation

80 % of excavation tender rate will be paid after excavation and before completion of backfill and finishing-off.

(b) Pipes and fittings

80 % of tender rates will be paid after installation, but before successful testing.

PSL MEDIUM PRESSURE PIPELINE

PSL1 TRANSPORT, HANDLING AND STORAGE OF PIPES, SPECIALS AND FITTINGS

The Contractor shall be responsible for the receipt, off-loading, safe storage and/or stringing and safeguarding of **all materials** delivered to Site. The Engineer shall be afforded every opportunity of inspecting such materials on their arrival at Site prior to them being off-loaded. If their condition is unacceptable to the Engineer on arrival, the Contractor shall remove them forthwith from the Site and replace such materials at this own cost and to the satisfaction of the Engineer.

Material supplied by the Employer for incorporation into the Works shall be inspected by the Contractor on arrival and any damage to these items shall be immediately reported to the Engineer. Once these items have been offloaded on Site, the Contractor accepts liability for

their safeguarding. Subsequent damage to these items will be the Contractors fault and any costs incurred in the replacement of such items will be for the Contractors account.

Pipes, specials and fittings shall not be subjected to rough handling at any time. Under no circumstances shall they be dropped during loading or off-loading or be allowed to collide with each other.

Where pipes, specials and fittings are to be stockpiled to bulk storage yards, the Contractor shall make his own arrangements for suitable area that shall meet with the approval of the Engineer. All PVC pipes, specials and fittings shall be adequately protected from UV radiation (sunlight) at all times, the costs of which shall be included in the tendered rates.

PSL2 SPECIAL PROTECTION TO BURIED STEEL PIPEWORK AND FITTINGS

Notwithstanding the requirements of Particular Specification PA Pipes, Specials and Fittings, all buried components of steel pipes and specials shall be protected by wrapping with “Denso” tape (inner and outer wrap). The rates for buried steel pipe fittings and specials shall include for wrapping with “Denso” tape.

For the purpose of this specification, “Denso Protection” and / or “Denso Wrapping” and / or “Wrap with Denso Tape” is understood to be a three-component system made up as follows:

PSL2.1 Surface Preparation

Light commercial blast or wire brush the item to be wrapped to remove all mill scale and loose rust. All weld areas must be free of slag, weld spatter and burnt coating. Remove the grit mud and dust before priming the Denso Priming Solution or similar at a nominal coverage rate of 10 m²/litre. In presence of continuous moisture or for under water application, Denso S105 Paste should be used instead, at a nominal coverage of 3 m²/kg. Immediately after priming, the wrapping procedure should commence.

PSL2.2 Denso Petrolatum Tape Wrapping

Wrap the buried item to be protected with Denso Petrolatum Tape Wrapping, ensuring intimate contact with the buried item, sufficient overlap and the absence of air pockets between the buried item and the Denso Tape.

PSL2.3 Another Wrap

Denso PVC self-adhesive outer wrap should be wrapped around the Denso Petrolatum Wrapping, ensuring identical overlaps, which do not coincide with the overlaps on the Denso Petrolatum Tape Wrapping.

The rates for buried steel pipe fittings, valves and specials shall include for “Denso Protection” or “Denso Wrapping” or “Wrap with Denso Tape” as specified above.

PSL3 THRUST BLOCKS AND PIPE PEDESTALS

Before any thrust block or pedestal is cast, the pipe special of fitting shall be supported and secured in its correct alignment and shall be jointed to the adjacent pipework.

Concrete faces of thrust blocks, unless otherwise shown on the drawings or specified, shall be a minimum of 225 mm from flanges and 300 mm from flexible couplings centres.

The bearing face of the thrust blocks shall be cast against undisturbed soil or rock.

PSL4 TESTING

Standard testing required as per applicable SANS specification.

PSL5 STEEL PIPES (Sub clause 3.4)

PSL5.1 All steel pipes shall be in accordance with SANS 719 Grade A with a minimum wall thickness of 6.0 mm. All flanges shall be drilled according to SANS 1123 Table 1000/3 except flanges which have no holes or if otherwise specified on the drawings or in the Schedule of Quantities.

Before leaving the factory, the pipes shall be hydraulically tested in accordance with SANS 719 and a test certificate shall be provided.

Where plain ends are specified the external welds of the pipe shall be ground flush for a distance of 150 mm from the end. The pipes shall be sufficiently round to ensure that flexible coupling can fit onto the ends.

PSL5.2 Jointing Materials (Sub clause 3.8)

All flanges and couplings underground surface must be protected with denso mastic and tape. The cost of this protection must be included in the coupling / pipe rates.

i. Flexible couplings

Flexible couplings shall be Viking Johnson or approved equivalent without centre registers.

Rubber rings shall be wedge-shaped and manufactured from natural and / or synthetic rubber. Reclaimed rubber shall not be used in their manufacture.

ii. Flanges and accessories

Flanges shall be drilled to Table 1000/3 of SANS 1123. Bolts and nuts installed in an exposed (above ground) flange connection shall be hot galvanised and painted to the same finish as associated pipework.

Pipe flanges connected to proprietary items including pumps, meters, special valves, etc shall be drilled to suit the specific proprietary item.

PSG CONCRETE (STRUCTURAL) (SANS 1200 G)

PSG1 CONCRETE FINISHES

Concrete surfaces must have the following finishes:

- All visible concrete : Grade I accuracy with smooth homogeneous surface
- Inside of structures : Grade II accuracy with smooth surfaces
- Rest of concrete : Grade III accuracy

All edges to be chamfered.

PSG2 SPECIAL FOR WATER RETAINING STRUCTURE

(a) Concrete mix design

The concrete mix must be designed by an approved laboratory for water retaining structures. The aggregates used must also be approved by the laboratory. The design mix with the report from the laboratory must be submitted to the engineer. Polypropylene fibres @ 2.0 kg/m³ must be added to the concrete mix (contact BASF, Tel

(011) 203 2400 / 2405 or e-mail at quotes-za@basf.com). The concrete must also comply with the following:

- Cement/Water ratio of < 2
- Sand content 40 – 45 % to obtain maximum water tightness
- Natural sands with low water demand
- Must be designed for low shrinkage
- Approved add mixtures may be used to obtain workability
- Concrete may not be pumped

(b) Pipe and bolts and ties through concrete

Only pipes indicated on the drawings may go through the concrete and must be placed in position before the concrete is cast. Shutter ties to be fitted with an approved centre stop.

(c) Water tightness test

The structures must be tested for water tightness as follows:

- Structure to be filled @ ± 1 m/day.
- After the structure has been full for 14 days the full water level must be restored and marked.
- If the water level falls less than 5 mm in 96 hours and there are no visible leaks, the structure will be taken as watertight.

Should the structure be found not to be watertight the contractor will empty it and seal the leak(s). The structure must then be tested again, all at the cost of the contractor.

(d) Water permeability test

The design mix must be tested with regard to permeability by the NAI of the CSIR. The maximum permeability coefficient may not be more than 1×10^{-7} /second. One set of six samples must be tested for the 30 Mpa design mix. The contractor is responsible for the tests and the costs thereof.

(e) Strength tests

Two sets of three test cubes per 50 m³ concrete placed are required to be tested at 7 and 28 days. The contractor is responsible for the tests and the costs thereof.

(f) Welding of reinforcing

Reinforcing may not be welded.

(g) Curing

Curing compounds may not be used on floors. Floor curing must be done by constant wetting.

(h) Plums

Plums may not be used.

C3.4.3 PROJECT SPECIFICATIONS: MECHANICAL AND ELECTRICAL WORK

C3.4.3.1 GENERAL NOTES

It is the intention of this tender to obtain quotes for standard available equipment as far as possible. The specifications given below are more directed towards the capacities required while the physical design and operation is left to the manufacturer to submit proposals within the structural restrictions as indicated on the drawings.

The equipment must be suitable for the applications as described. The materials used for and the cleaning and operation of the equipment must be suitable for the intended operating conditions.

Full details of all equipment offered must accompany the tender and in particular the following:

Name of manufacturer

Place of manufacture

Rotation speed (where applicable)

Materials used

Mass

Corrosion protection

Head – Delivery curves for pumping equipment

Power absorbed (where applicable)

Motor capacity (where applicable)

Details of bearings (where applicable)

Efficiency (where applicable)

The rates quoted for the equipment must include for all accessories such as valves, stands, etc. and the complete installation and commissioning of the equipment.

All equipment must be fully protected against adverse operating conditions, such as inter alia overload, overheating, water condensate and any other protection the contractor considers necessary for the safe and efficient functioning of the equipment offered under the indicated conditions. Control and electrical requirements included under electrical contract.

Alternatives to the equipment as specified can be proposed provided that complete details of the equipment, as well as, operational installations are provided with the tender. The specified equipment must be priced together with pricing of the alternative equipment proposed.

C3.4.3.2 SCREENING EQUIPMENT

C3.4.3.2.1 General

The mechanical screen to comply inter alia with the following requirements:

- Suitable for raw sewage
- Average flow: 300 kl/h @ flow depth of 250 mm
- Maximum flow: 1100 kl/h @ flow depth of 800 mm
- Material: Stainless steel 304.
- Screen size: 10 mm / 25 mm
- Screening compactor with wash facilities from screened raw water. Wash system must not have any small orifices and be suitable for screened raw sewage.
- Compacted screenings outlet extension to SCIP.
- Local control box with start / stop button, hour meter and protection as specified.
- Front raked screens will be considered.

The following information to be supplied:

- Channel requirements
- Construction detail
- Capacity detail
- Installation requirements
- List of installations with contact numbers

C3.4.3.2 .2 Control of Screens

The screens shall be controlled by the liquid level in front of the screens. High level - on and low level - off. There shall also be manual overriding.

C3.4.3.2.3 Electrical Installation

The supply and installation of an acceptable, suitable electrical panel with switchgear and control equipment for these screens, compactors and conveyors is included in this tender. This panel shall be provided with doors and properly powder coated. It will be erected under a canopy. All interconnecting cable work is also included in this tender but the main supply to this panel, forms part of another contract.

C3.4.3.3 GRIT REMOVAL EQUIPMENT

C3.4.3.3.1 Grit Pumps

- Installation** : Pump units to be installed in concrete sump of Vortex degritter as detailed. Pump unit to be supplied with a 100 mm diameter flexible (rubber) delivery pipe and SS lifting chain and permanent lifting mechanism i.e. hoist. /jib.
- Pipe work** : Pipework up to grit classifier to be included complete with fixing. (Length of flexible pipe to be limited). Rest of Pipe to be GMS, wall thickness 6mm. Protection by means of sand blasting followed by hot dipped galvanising. Flanges to SANS 1123 Table 1000/3.
- Valves** : All gate valves to SABS 664 Class 10 with non-rising spindles. Right hand closing. Powder coated epoxy protected. Reflux valves to be of the ball gate type or similar approved.
- Pump duties** : To suit grit classifier – one duty pump for each degritter and one loose standby unit required. i.e. three in total. Impellers to be coated for grit erosion protection.
- Special requirements:** Lining of impellers to accommodate grit.

C3.4.3.3 .2 Grit Classifier

A stainless steel 304 grit classifier is required for each vortex degritter, to receive the grit from the vortex degritter. The grit classifier must separate the grit from the water and return the water to the vortex degritter. The grit in the classifier must be released to a grit storage SCIP $\pm 2,0$ away. The grit classifier will be located next to the vortex degritter and will be placed on a 100 mm reinforced concrete slab. The grit classifier must be sized to be compatible with the grit pumps and the anticipated grit volumes.

The installation will not be covered and the materials used must be suitable for open air installation.

The following must be supplied:

- Detail of design and construction
- Capacities
- Installation requirements

Control of Pumps and Classifiers

The pumps and classifiers shall be controlled by timer switches as well as manual overriding.

Electrical Installation

The supply and installation of an acceptable, suitable electrical panel with switchgear and control equipment for these grit pumps and grit classifiers is included in this tender. This panel shall be provided with doors and properly powder coated. It will be erected in the open air. All interconnecting cable work is also included in this tender but the main supply to this panel, forms part of another contract.

C3.4.3.4 FIXED VERTICAL SHAFT AERATORS

C3.4.3.4.1 GENERAL

Fixed mounted, vertical shafts, aerators with gearboxes, each fitted with appropriate rated kW electric motor shall be provided and installed on platforms in the aerobic basin at the existing reactor as shown on the drawings.

The aerators shall be designed for aerating and keeping in suspension waste activated sludge of the plant. Mixed liquor solids can vary between 2500 and 6000 mg/l.

Aerators shall be easily removable for maintenance of aerator blades and bearings as specified in the Particular Specification.

The aerators shall be checked for all the possible running combinations to ensure that no detrimental effects occur under any conditions. Aerators must be able to operate at maximum kW rating for prolonged periods.

Concrete draft tubes will be installed by others to meet the requirements of this contractor. The tenderer must submit installation requirements to suit his aerators.

C3.4.3.4.2 CONTROL of Aerators

The aerators shall be controlled by timers and/or DO meter readings with manually overriding. Variable speed configurations will also be applied to the motors to further control refining.

C3.4.3.4.3 ELECTRICAL Installation

The supply and installation of the electrical motors for these aerators and gearboxes, form part of this tender and the electrical switchgear, control equipment, cable work, timers and installation thereof, for the motors of these aerators, are covered under this tender.

C3.4.3.5: SURFACE MOUNTED MIXERS

Refer to Particular Specification D.

Mixers are required at the anaerobic/anoxic tanks at the reactor and at the raw sewage pumpstations balancing tanks. SS fixing brackets, guide rails and permanent lifting gear are included.

(a) Reactors

Water depth	: 4,0 – 4,7 m.
Medium	: Activated sludge with MLSS 2500 – 6000 mg/ℓ
Energy	: 6 – 8 watt / m ³
Volume	: As indicated on drawings
Type	: Submersible
Number / Installation	: To be provided by supplier/manufacturer (1 x 5,5 kW) (New)

Control of Mixers

The mixers shall be manually controlled (running continuously).

Electrical Installation

The supply delivery and installation of the electrical motors and gearboxes, the electrical switchgear, control equipment, cable work, timers and installation thereof, for these mixers, are covered by under this tender.

C3.4.3.6: CHLORINE DOSING

C3.4.3.6.1 NEW CLORINATION SYSTEM COMPRISING

- a) TWO sets gas safety connections, suitable for 1000 kg chlorine tanks complete with manifolds, catch pots, heaters etc.
- c) ONE automatic change-over system for above (wall mounted).
- c) ONE gas vacuum regulator, chlorine control valve and chlorine flow meter (wall mounted) complete with evaporator / moisture-trap / filter assembly.
- d) ONE ejector.
- e) ONE in-line strainer (50 mm ID).
- f) TWO weighing scales for one 1000 kg chlorine tank.
- g) ALL interconnecting pipe work ($\pm$ 10 m length) of 50 mm OD uPVC class 9.
- h) ONE Electrical in-blowing fan (450 mm dia) complete with Winlock frame and swivel louvre.
- i) Dry chlorine scrubber.
- i) ONE diffuser comprising 3 m length of 50 ID, PVC pipe drilled with small holes at 50 mm c/c.
- k) Atmospheric chlorine gas monitoring device (leak detector) complete with sampling fan, chlorine gas indicator and audio/visual alarm.
- l) Electrical panel (in-doors) complete with all necessary switchgear and control equipment, etc. to render the system operative.
- m) Chlorine concentration meter and probe with automatic adjustment of dosing rate.
- n) Complete set of protection equipment and signs.
- o) Eye cleaning basin.

The tenderer shall allow for all fittings, brackets and holding down bolts in grade 304 stainless steel for the pipe work.

C3.4.3.6.2 DESCRIPTION OF CHLORINE DOSING PLANT

Refer to the Figures at the end of this document. The chlorine dosing system is to be installed in a new purpose made building, built by others.

The new chlorination equipment is required to dose at rates up to a maximum of 6000 g/h in the new chlorination contact channel while accurate dosing down to one tenth of these rates shall also be possible

C3.4.3.6.3 CHLORINATOR TYPE

The chlorinator shall be of the water-induced vacuum type, of simple rugged construction, complete with vacuum valves and suitable to operate from 1000 kg tanks, complete with indicator (calibrated in g/h), ejector assembly, etc.

Failure of the motive water supply (irrigation pumps stoppage) shall automatically switch off the chlorinator.

The plant is required to administer chlorine at a rate determined by the value of a floating 4 – 20 mA signal received from the chlorine detector.

The chlorinator shall be fitted with an isolating valve, safety valve, and catch pot (to trap moisture and impurities). The layout of the chlorination equipment shall comply with that shown in the sketches attached.

The chlorinator controller shall be wall mounted and housed in a corrosion proof cabinet (G.R.P. or similar).

Particular care shall be taken to obviate the possibility of leakage of chlorine gas under all possible conditions likely to be encountered during operation of the plant. An audible alarm shall be provided to warn the operator that there is a gas leakage.

All materials used in the manufacture of equipment and pipe work shall be resistant to the corrosive action of chlorine either in gaseous or solution form.

C3.4.3.6.4 MOTIVE WATER AND IN-LINE STRAINERS

Motive water shall be obtained from the wash water/irrigation system of the plant or alternatively municipal potable water supply. Two supply pipes will be installed up to 2,0 m from building by others.

As the water supply may contain a small number of suspended solids, two in-line strainers, 50 mm in diameter with 0,5 mm apertures including manual flushing valves, (alternatively self-cleaning strainers) shall be provided between the motive water delivery pipe and the chlorine dosing plant.

The motive water installation shall be complete including all valves and specials as indicated in the sketches. All pipe work and fittings shall be made in PVC or polyethylene.

C3.4.3.6.5 ACCESSORIES FOR CHLORINATION

The following accessories are to be supplied with the chlorinator: -

- a) One spare metering tube for 0 – 6000 g/h range.
- b) 50 mm dial pressure gauges, non-return valves and isolating valves.
- c) Special spanner for gas tank.
- d) FOUR additional tank stands without weighing.
- e) Wall-mounted instruction chart for chlorine cylinder room mounted in wood/glass frame.
- f) Wall-mounted plastic engraved warning board (three languages).
- g) Self-contained breathing apparatus (respirator) including gasmask, pipe work and fittings, gas bottles and contour fitting support. A bright red wall-mounted holder for above (manufactured in G.R.P.) shall be fitted outside the building, as per MSA or approved equal.
- h) Three sets of complete and concise operating and maintenance manuals.
- i) Flashing empty indicator light mounted to outside of building as well as, a signal to the control room.
- j) Chlorine leak detector signal to alarm and control room.

- k) TWO hand held chlorine meters.

C3.4.3.6.6 IN-BLOWING FAN

The in-blowing fan shall be electrically driven with at least a 450 mm dia propeller.

It shall be provided complete with pre-cast frame (Winlock WB 66) (600 x 600 mm size) and fitted with powder coated (white) swivel louver (WLS 66)

All electrical wiring and switching are included. The fan shall be automatically switched on when the door, of the room concerned, is opened.

The fan mounting shall be of fibre glass.

The propeller guard shall be of an inert material

The propeller blades shall be either of an inert material or protected to the satisfaction of the Engineer

The fan motor and shaft shall be adequately protected from possible chlorine gas attack.

C3.4.3.6.7 DIFFUSERS

The diffuser shall consist of a tube of inert material 3 m long with an ID at of least 50 mm and drilled with small holes at 50 mm c/c in such a manner that discharge of the chlorine concentration occurs evenly spread over the 3 m length of the tube (i.e. combined area of holes shall be less than cross area of tube). Both ends of the tube shall be sealed.

C3.4.3.6.8 CONTROL OF CHLORINE DOSING

The rate at which chlorine shall be dosed, shall be dependent on the chlorine concentration in the final effluent of this plant. The tenderer will be provided with a floating 4 – 20 mA signal from the chlorine meter which will reflect the current flow rate. This signal shall adjust the rate of chlorine dosing automatically. The dosing rate shall also be manually overriding if need be.

C3.4.3.6.9 DRY CHLORINE SCRUBBERS

A dry chlorine scrubber must be provided. Capacity 1 000 kg chlorine. Full detail to be supplied with tender.

C3.4.3.6.10 Electrical Installation

The supply and installation of an acceptable, suitable electrical and electronic control panel with switchgear and control equipment for the dosing of chlorine, is included in this tender. This panel will be installed in-doors and does not require doors but must be properly powder coated. All interconnecting cable work, including a cable for the signal from the flow meter (some 20 m long), is also included in this tender.

C3.4.3.7 FLOW METERS

C3.4.3.7.1 Ultrasonic Flow meters

Ultrasonic flow meters with data loggers for 30 days complete with data extraction equipment and software to transfer the data to a Pentium computer with Windows operating system and the manipulation thereof are required. Data to be forwarded to an on-site computer.

All-together, 6 units will be installed. Five units will be installed at channels (where flumes are provided) and the other will be installed at the overflow weir of the chlorine contact tank.

Complete details of the equipment offered must be supplied with the tender. The installation must be adequately protected against lightning, surges, etc.

The equipment output must be compatible with telemetric (scada) equipment. The electronic recorder equipment will be installed in-doors.

The meter at the weir shall provide a floating 4 – 20 mA signal for controlling purposes elsewhere.

C3.4.3.7 Mag Flow Meters

Magnetic flow meters, specifically designed for measuring flow of dirty water inside uPVC pipelines, with data loggers for 30 days complete with data extraction equipment and software to transfer the data to a Pentium computer with Windows operating system and the manipulation thereof are required. As for Ultrasonic Flow Meters the data must be forwarded to the on-site computer on a continuous basis.

All together 5 units of sizes varying from 80 mm diameter to 200 mm diameter will be installed. The meters shall be supplied and installed complete with reducers and flanges both sides of which at least one flange shall be flexible to aid installation and maintenance. The meters shall be installed in existing pipelines and includes cutting the pipe at the correct length, as well as, new.

Complete details of the equipment offered must be supplied with the tender. The installation must be adequately protected against lightning, surges, etc.

The equipment output must be compatible with telemetric (scada) equipment.

The electronic recorder equipment will be installed in-doors and the meters (below ground level) in concrete boxes with adequate access.

Several of the meters shall provide a floating 4 – 20 mA signal for controlling purposes elsewhere.

All cable work between the meter and recorder is included in this contract. A length of 20 m of cable work must be allowed for every meter. Where the length exceeds this 20 m, additional payment will be affected unless otherwise stated in the schedules of prices.

Summary of the Mag Flow Meters required:

PIPE DIAMETER	METER DIAMETER	GENERAL FLOW RATE	NUMBER REQUIRED
300 / 200 mm	200 mm	70 - 80 l/s	2
200 mm	100 mm	30 l/s	1
160 mm	80 mm	15 l/s	1
160 mm	80 mm	15 l/s	1
160 mm	80 mm	15 l/s	1

SECTION 10: OPERATION AND MAINTENANCE FACILITY BUILDING AND STANDBY GEBNERATOR

GENERATOR TECHNICAL SPECIFICATION AND REQUIREMENTS

Supply and install 200 kVA Prime Rated sound attenuated enclosed diesel generator including AMF panel 400v 50 Hz

- Engine:** (Turbo Charged) 200 kVA Standby generator diesel motor
Sound attenuated enclosed generator
- Build:** 3mm folded plate base frame, incorporating 1000 liter fuel tank filled with 1000 litre of 500 PPM sulfur content, fit lockable valve on the refill cap
Built in battery box with at least 102 A/H battery
To install input and output circuits (cables)
Install cabling as in Bill of quantities
Engine and alternator close coupled and mounted on anti-vibration mounts
Set mounted industrial muffler, protruding 200mm over the front of the radiator
Mechanical engine governor
Water jacket Heater for easy starting in cold weather (to be permanently on Power supply)
Manual control override facility with key- switch

Lagging of exhaust (inside unit)
Automatic battery charger

Exhaust system: Residential mild steel muffler + flex with universal
Not to exceed 70db noise level at tail of exhaust pipe

Control panel:

Mains Isolator
Generator circuit breaker
Mains + Generator contactors electrical + mechanically interlocked
Frequency meter
Running Hour meter
Voltmeter
Voltmeter selector switch
Alternator circuit breaker
Ammeter
Ammeter selector switch
Current transformers
Hertz meter
Hour meter
Fuel level sender + gauge with low fuel level cutout
Automatic battery charger

Generator protection and alarms:

Start failure
Battery charger failure
Low oil pressure
High engine temperature
Abnormal voltage
Low fuel
Overload
Abnormal speed
Low water level switches, protection and alarm

Electrical:

Cable from Sub Station feeding DB must be disconnected and re-routed to
Generator room (DB) by means of installing a lockable housing.
Additional cable will have to be installed $\pm 25\text{m}$.

New circuit breakers will have to be installed in the lockable housings

New cable from Sub Station to Generator room must be installed with circuit breaker in Sub Station ± 40 m (185 mm x 4 core + 95^{mm} earth wire)

New cable from to SABS standards Generator to DB must be installed ± 60 m. (35^{mm} x 4 core cable + 16^{mm} Earth wire)

COC to be issued on completion

Supply and fit class 1 lightning protection

NOTES:

All safety and warning signs to be installed at work site

Safety Manual to be on site

All the above must be done in accordance



METSIMAHOLO LOCAL MUNICIPALITY

BID NO MLM 22/2024/25

**CONSTRUCTION FOR RE-COMMENCEMENT OF UPGRADING OF ORANJEVILLE
4ML/DAY WASTEWATER TREATMENT PLANT**

C3.5 Particular Specifications

C3.5 PARTICULAR SPECIFICATIONS**A PUMPING EQUIPMENT****A1 Scope**

This specification covers the supply, delivery, transport, handling, storage, erection, installation, commissioning, testing, adjustment, handing over in complete working order and upholding during the Defects Liability Period of pumping equipment complete with associated pipe work up to the limits specified in the Project Specification.

It shall however not include for any civil works in connection with the pump station, for foundations, building in of pipe work, grouting and for the electrical control board or power supply to the motor.

Any civil works required for the building in of pumping equipment, shall be carried out under the supervision of the pumping equipment contractor who will be completely responsible for the correct setting up of the equipment and the safe-guarding of the same against damage. The contractor shall also ensure, in liaison with the electrical contractor, that the power supply to the motor is correct and motor running at correct speed and direction.

A2 Materials**2.1 General**

All materials used shall be the best of their respective kinds and shall be suitable for working at the pressures and temperatures involved under all working conditions, without distortion or deterioration or the setting up of undue stresses in any part and without impairing the efficiency or reliability of the plant and the strength of its component parts. No welding, burning, filling or plugging of defective castings will be permitted without the Engineer's approval in writing.

Where corrosion of metal may be expected, the Contractor shall supply materials which are resistant to corrosion. Any equipment or material showing signs of corrosion, tuberculation or pitting before the expiry of the Maintenance Period shall be replaced by the Contractor. The tendered price will be held to include the cost of all painting or other surface treatment which is not separately specified or scheduled but which is nevertheless necessary for the protection of surfaces against corrosion.

2.2 Structural steelwork

All structural steelwork shall comply with the requirements of SANS 1200 H.

2.3 Pipe work and valves

All pipe work in pump stations shall be of flanged cast iron or steel complying with the requirements of the relevant SANS or BS Specifications as may be applicable.

Valves and pipe work accessories shall be of cast iron and shall comply with the relevant Particular Specification.

Isolation valves shall be double flanged cast iron standard waterworks pattern gate valves with non-rising spindle complying with SANS 664 and clockwise closing directions.

Check valves shall be double flanged cast iron single door valves with gunmetal trims complying with SANS 144. The valves shall close without the aid of springs or external counter weights. Flanges shall be cast iron and shall comply in all respects with SANS 1123 for the class specified in the Project Specification. Flange faces shall be machined flat i.e. without a raised joint face. Puddle flanges shall have the same dimensions as standard flanges but shall be left undrilled. Rubber insertion rings shall be of the full-face type and shall comply with the requirements of BS 3063.

A3 Pumps

3.1 General

The pumps shall be of maker's standard and approved design, capable of doing the duty required at a speed preferably not exceeding 1 500 rpm and shall be so balanced that there will be no end thrust when the pump is new or after wear has taken place, or alternatively suitable heavy duty thrust bearings must be provided. The pump casing shall be of high-grade cast iron or stainless steel. Impellers and guides shall be made of high-grade cast iron or stainless steel and the shaft of high tensile steel with suitable renewable protecting sleeves, the diameter being sufficient to withstand and transmit without whip and with ample margin of safety all torsional and bending stresses to which it may be subjected. Shaft sleeves shall be of bronze and renewable. Bearings are to be of ample bearing area, dustproof and with suitable provision for continuous lubrication.

The pumps offered are preferably to be of the self-regulating type, the power characteristic curve being such that with increase in the rate of delivery beyond a certain figure, the power

demand shall decrease, thereby ensuring that the motor shall not be overloaded in the event of a large reduction in pumping head, due to a burst occurring in the rising main or any other such contingency. Performance particulars and characteristic curves shall be submitted at the time of tendering. The electric motors shall in all cases be sized to cope with the maximum power requirements of the associated pumps.

The pumps and motors shall be capable of efficient operation over the whole range indicated by the system head curves.

3.2 Centrifugal dry well pumps

Each dry well pump and motor shall be mounted on a common base plate of rigid construction provided with suitable openings for pouring in grout and with all necessary holding down bolts for securing to the foundations. Before despatch, the motor of each pumping set shall be mounted in proper alignment with the pump on the common base plate. Concrete work of the foundations shall be finished off approximately 20 mm below the underside of the base plate. During erection of the pump and motor, the Contractor shall set up each unit to exact line or level by means of steel wedges before grouting the base plate and holding down bolts with a non-shrink grout.

Each dry well pump shall be fitted with the necessary drains with pipe connections for discharging from the drains to approved discharge points. Each pump shall also be fitted with an air cock.

Dry well pump stations shall be provided with a standby submersible drainage pump, fitted in a sump with automatic float switch control.

The method of gland sealing of the pumps, that is by gland packing or mechanical seal, is to be clearly stated at the time of tendering. Any special requirements such as a clean water supply at high pressure for sealing glands or flushing casings must be stated at the time of tendering. If sealing is to be affected by gland packing, sufficient spare packing shall be provided with each pump to re-pack each gland completely three times.

Each pump shall be supplied with a pressure gauge on the delivery side of the pump as well as on the suction side.

Self-priming pumps:

Consideration shall be given to the intended service, in which occasionally debris will lodge between the pump suction check valve and seat. The result is not only in loss of the suction leg, but also in the siphoning of the liquid from the pump casing to the approximate centre line of the impeller. Such occurrence shall be considered normal with proper installation of air release line free to atmosphere.

In consideration of such occurrence and of the unattended operation anticipated, each pump shall be designed as to retain adequate liquid in the pump casing to insure unattended automatic re-priming while operating at its rated speed in a completely open system without suction check valves and with a dry suction leg.

Openings and passages of the pump shall be large enough to permit the passage of a sphere 76 mm in diameter. Pump volute or casing shall contain no openings, such as recirculation ports, of a lesser diameter than sphere sizes specified. Screens or any internal devices that create a maintenance nuisance or interfere with priming and performance of the pump shall not be permitted.

NO SPECIAL TOOLS SHALL BE REQUIRED FOR REPLACEMENT OF ANY COMPONENTS WITHIN THE PUMP.

Re-prime performance:

Each pump must be capable of a re-prime of 6,6 m, while operating at the selected speed and the selected impeller diameter. Re-prime lift is defined as the static height of pump suction centre line above liquid that the pump casing after a delivering pump is shut down with the suction check valve removed.

Additional standards under which re-prime tests shall be run are:

1. Piping shall incorporate a discharge check valve downstream from the pump.
2. A 3 m length of 25 mm pipe shall be installed between pump and discharge check valve. This line shall be open to atmosphere at all times to duplicate the air displacement rate of a typical pump station fitted with an air release valve.
3. No restrictions shall be present in pump or suction piping which could serve to restrict the rate of siphon drop of the suction leg. Suction pipe configuration for re-prime test shall incorporate a minimum horizontal run of 600 mm and one 90° elbow.

4. Impeller shall be set at the clearances recommended by the Manufacturer in the pump service manual.
5. Re-prime lift repeatability shall be demonstrated by five sequential re-prime cycles.
6. Liquid to be used for re-prime test shall be water.

Upon request from the engineer, certified re-prime test data prepared by pump Manufacturer and certified by a registered professional engineer shall be submitted to the engineer for approval.

Suction check valve:

Pump shall incorporate a neoprene suction check valve that can be removed or installed through a removable cover plate opening without disturbing the suction piping. Sole function of the check valve shall be to eliminate re-priming with each start / stop cycle. Pumps requiring suction check valves to perform will not be acceptable

Pump casing:

Casings shall be made from Gray iron No. 30 and able to withstand a maximum operating pressure of 793 kPa. Casings shall incorporate mounting feet sized to prevent tipping or binding when pump is completely disassembled for maintenance. A filler port of 90 mm in diameter (minimum) shall be supplied for ease of filling the pump casing. A casing drains of at least 1 – ¼ in NPT shall be provided to insure complete and rapid draining.

Impeller and Shaft:

Impeller shall be of a Two-Vane, Open, non-clog design, made from Ductile Iron 65-45-12, with integral pump-out vanes on the back shroud. The impeller shall thread onto the pump shaft made from AISI 4140 alloy steel or when specified AISI 17-4 Ph stainless steel and secured with an impeller locking screw.

Cover Plate:

Pumps must be equipped with a four-point attachment lightweight removable cover plate. It must allow complete access to the pump interior to permit the clearance of blockages and to provide simple access for service and repair without disturbing suction or discharge piping. It must be fitted with an additional O-ring at the inner bore to provide added sealing between the vacuum and pressure chambers and a tapered inlet for hydraulically enhanced entrance into the eye of the impeller.

Replacement of the wear plate, impeller, and mechanical seal shall be possible through the removable cover plate if necessary. On pumps 250 mm or larger, replacement of these items shall be accomplished by removal of the suction gooseneck. In consideration of safety, a pressure relief valve made of brass shall be fitted to the pump casing as a standard component. The cover plate shall be fitted with an "easy-grip" handle to facilitate ease of handling and pusher bolt capability to facilitate removal. Once the cover plate has been removed the design must ensure that the clearance between the impeller and the wear plate is not altered and does not need to be reset after the cover plate is re-installed.

Wear Plate:

Pumps shall be fitted with a replaceable wear plate made from Carbon Steel No. 1015. The design must ensure that the impeller / wear plate clearance adjustment can be carried out BOTH from the cover plate side making use of SHIMLESS locking collars and adjusting screws AND if necessary, by adding or removing shims between the rotating assembly and volute casing.

Rotating assembly:

The complete rotating assembly, which includes the bearing housing, bearings, shaft, mechanical seal, seal plate and impeller, shall be removed as a unit without disturbing the pump volute or suction and discharge pipe. Means shall be provided for external adjustment of the impeller to the wear plate. Pusher bolt facility and cap screws shall be supplied to facilitate ease of removal. The design must allow for the fitting of double lip seals, which provide an atmospheric path for purposes of protecting the bearings when the mechanical seal has failed. Complete Super-T rotating assemblies must be interchangeable with all Classic-T units. Two independent clear sight gauges shall be fitted for purposes of monitoring the condition and levels of the oil for the Bearings and Mechanical seal.

Seal:

Pumps shall be fitted with oil-lubricated, double floating, self-aligning mechanical seals capable of withstanding temperatures of up to 71° C. The rotating and stationary seal faces shall be made from tungsten titanium carbide (or silicon carbide when specified). The cages and springs from 18-8 stainless steel and fluorocarbon elastomers from DuPont Viton.

Each seal face must be ground to produce a flatness tolerance not to exceed three light bands, as measured by an optical flat and monochromatic light. To insure seal faces are in full contact at all times, stationary seal shall be double floating and self-aligning during periods of shock loads that will cause deflection, vibration, and axial or radial movements of the pump shaft.

Mechanical seal shall be installed within removable seal plate housing and lubricated from an independent oil filled reservoir. A clear sight gauge will be fitted to provide easy monitoring of the seal oil level and condition without removing any screws. A vent system will be in place in case of overfilling or pressure. An atmospheric vent between the mechanical and seal chamber and the bearing chamber shall form part of the pump protection.

Shaft bearings:

The pump shaft bearings shall be anti-friction or ball or tapered roller bearings of ample size and proper design to withstand all radial and thrust loads that can be reasonably expected during the normal operation of the pump. Bearings shall be lubricated from a dedicated oil reservoir. Pump designs, which use the same oil reservoir to lubricate both the shaft bearings and the mechanical seal, shall not be acceptable. A clear sight gauge will be provided for easy monitoring of the oil level and condition.

Manufacturer:

The specification and project drawings depict equipment and materials manufactured by the Gorman-Rupp Company which are deemed most suitable for the service anticipated. It is not intended, however, to eliminate other products of equal quality and performance. The bidder shall prepare his bid based on the specified equipment for the purposes of determining a competitive bid. Award of a contract shall constitute an obligation to furnish the specified equipment and materials.

At time of tender the bidder may offer substitutions to the specified equipment for consideration. The equipment proposed for substitution must be of proven superiority in

both construction quality and performance to that specified in the engineer's tender document. This must be further supported by a list of current users of the proposed equipment in similar installations.

In the event the engineer allows approval of equipment substitution, the bidder shall, at his own expense, make all resulting changes to the structure, piping or electrical systems as required to accommodate the proposed equipment. Revised detail drawings illustrating the substituted equipment shall be submitted to the engineer prior to acceptance.

It will be assumed that if the cost to the purchaser is less for the proposed substitution, then the contract price shall be reduced by an amount equal to the savings.

Manufacturer Warranty:

Pumps shall carry the standard manufacturers "5 year" limited warranty.

3.2.1 Submersible pumps

Submersible pumps shall be supplied with sliding rails and handling gear of approved non-corrodible material to extract the pumps from the wet well.

3.3 Axial flow pumps

Axial flow pumps shall be supplied complete with tube, puddle ring, anchors and fasteners required for installation of the pump.

3.4.1 Scope

Design, supply, delivery, installation, testing, commissioning and upholding during the Defects Liability Period of axial flow pumps.

The Mixed Liquor Recycle pump chambers will be constructed under a separate contract generally as shown on the included drawings and as an integral part of the bio-reactor.

3.4.2 Pump impeller and Shaft

The propeller shall be cast from nodular iron or other suitable corrosion and abrasion-resistant material, keyed and bolted to the shaft in such a manner that it shall be impossible

for it to become accidentally detached while in operation. The castings shall be free from blow holes of other defects. Welding of defective castings will not be permitted.

Flow control: The level / backflow must be controlled by flap gates. Detail of construction and operation to be submitted with tender.

3.4.3 *Quality Management*

Quality management critically and major categorization: component quality plan required.

3.4.4 *Installation*

After completion of installation, the impellers shall be rotated in the presence of the Engineer to ensure accurate alignment between the impeller and the draft tube.

3.4.5 *Performance Testing*

3.4.5.1 Works Testing

Balancing of the complete impeller assembly and shaft shall be undertaken at the manufacturers works as provided for under this Specification.

3.4.5.2 Before Commissioning

- (a) Tests for correct direction of rotation of all motors.
- (b) Test for correct operation of control gear, where provided under this Contract.
- (c) Test for correct alignment of shaft.
- (d) Submit all certification, motor test certificates, pump tests (workshop), material certificates (where applicable).
- (e) Submit all operating and maintenance instructions.

3.4.5.3 Commissioning Tests

Pump delivery shall be measured and compared to the requirements stated above. Equipment will be rejected if variance is in excess of 2 %. Power usage shall be compared to that stated in the technical data sheets and variance in excess of 5 % will be rejected.

3.4.5.4 After Commissioning

Checking equipment for proper functioning, measurement of speed of rotation and power consumption during the operational acceptance period.

3.4.5.5 During Maintenance Period

- (a) Check all equipment for correct operation and functioning at 3 months, 6 months, 9 months and 12 months after plant take-over.

3.4.6 **Spares**

The following spares shall be provided:

Complete set of mechanical seals (1 No)

Complete set of bearings (1 No)

All surfaces are to be polished to a smooth finish and those which cannot be machined are to be ground and hand filed to a template. Leading edges of the blades shall be ground or filed to give a rounded section and not a sharp pointed edge.

The pump shaft shall be of solid steel construction and capable of withstanding the full load imposed by the impeller. The shaft shall be keyed into the impeller.

After manufacture the complete impeller assembly and shaft shall be statically and dynamically balanced. A detail description and arrangement drawing of the pump shall be supplied with the tender.

The pump draft tube shall be supplied in 304 SS and it shall be the contractor's responsibility to install and fix this item prior to the grouting in by the civil contractor. All grouting shall be under the supervision of the mechanical contractor.

3.4.7 **Corrosion Protection and Materials of Construction**

Corrosion protection shall be carried out in accordance with the requirements of Section K, to the following systems:

Pump shaft	:	ASTM 316 SS or 329
Pump impeller	:	SS 316L
Pump body	:	Grey cast iron + System A4 or “fusion bonded epoxy”
Draft tube anchor bolts	:	316SS
Draft tube	:	304SS, minimum thickness 4,5 mm

A4 Installation

Where dry well pumps are offered, concrete work of the foundations shall be finished to approximately 20 mm below the underside of the base plate. During erection of the pump and motor, the Contractor shall set each unit exactly to line or level by means of steel wedges where after the holding down bolts (if applicable) are grouted in and the empty space inside the base plate is filled with grout.

Bends and branches shall not cause cavitating flow conditions and the layout of the pipe work shall be such as to facilitate dismantling and inspection. The pipes are to be properly supported and so arranged that all stresses created in the pipeline by static and dynamic forces, including recoil shock, will be taken up by suitable anchors.

All suction pipe work shall be provided with a flexible coupling in a convenient position downstream of the gate valve to facilitate removal and reinstallation of a pump. Any reducers used on suction pipe work shall have level soffits (as installed).

Reflux valves on delivery mains of sludge pumps shall only be used in a horizontal position and shall be accessible for maintenance purposes.

Individual suction pipes shall be supplied for each pump. Suction pipe velocity shall not exceed 1,0 metre per second under normal operating conditions.

Delivery pipe work and valves shall have the same nominal diameter as the rising main unless otherwise indicated on the drawings.

Where reducers are used on the delivery from pumps they shall be installed directly downstream of the pumps.

A5 Painting and corrosion protection

Pipe work in wet wells (internal and external)	System I
Pipe work and valves in valve chambers (internal)	System I
Pipe work and valves in valve chambers (external)	System I
finished off with one coat bituminous aluminium paint	
Bolts not built into concrete	System B
Axial flow pump impellers and cones	As indicated
Motors, base plates, gearbox casings	System A
Galvanised mild steel grating	System E

A6 Testing and commissioning

Each pump shall be tested individually and where pumps are to operate in parallel, they shall also be treated as such. The rate of delivery during testing shall be determined by cutting off the inflow to the sump and timing the drop-in water level therein. The pumping head shall be determined as the measured static head plus the calculated friction loss in the system or alternatively by the use of temporary pressure gauges provided by the Contractor.

During the tests, the values of voltage, current drawn by the motor and power factor shall be noted and recorded.

The test results shall be compared with the tendered pump characteristics and the following tolerances will be allowed:

Delivery rate: - 0 % to + 10 %
 Overall efficiency : - 5 %

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

Control boards, electric motors and other electrical equipment shall be tested as specified in the applicable Particular Specification.

B WELDING

B1 Scope

This section of the Specification covers the general requirements for the welding of fabricated steelwork and pipe work.

B2 Materials

Welding electrodes shall comply with SANS 455. They shall bear the SANS mark unless prior approval has been obtained from the Engineer to use non-mark-bearing electrodes.

Only low-hydrogen type electrodes or electrodes with controlled hydrogen content may be used for welding work.

Electrodes older than 6 months shall not be used unless they have passed the tests laid down in SANS 455. If they have not been used within 3 months of passing these tests, they shall be retested.

Electrodes shall be stored in accordance with the requirements of the manufacturer. The Engineer may, however, prescribe the method of storing if he considers it necessary.

Special arrangements shall be made to ensure that the flux of electrodes does not absorb moisture. If they have been removed for more than 4 h from the storage prescribed by the manufacturer, they shall be oven-dried in accordance with the Manufacturer and / or the Engineer's directive before they are stored again.

Electrodes of which the flux has been damaged or which have been in direct contact with water shall not be used under any circumstances.

Welding rods used for welding stainless steel shall be of the low carbon type containing less than 0.03 % carbon. Only a matching electrode shall be used on a specific stainless-steel alloy. Tungsten electrodes used for welding stainless steel shall be alloyed with thorium and the shielding gas shall be 99.9 % argon.

B3 General Requirements

For all critical welds the Contractor shall prepare welding procedures and test samples and submit same to the Inspection Authority for evaluation and approval.

Surfaces to be welded shall be free of filing, rust, grease, paint and other foreign materials which may adversely affect the quality of the weld.

Components shall be properly lined up and not distorted or bent after welding.

All welds shall be full penetration welds with no undercut.

If grinding of a weld bead is not specified the bead shall have a slightly convex cross-section of uniform contour and shall blend smoothly with the parent metal.

Any weld spatter shall be removed.

B4 Welding procedures

All welding shall be carried out by certificated or coded welders. All welders shall be coded to ASME IX position 6G.

Welding of pipe work shall comply with BS 2633. All first welds on steel piping shall be Argon Arc followed by Arc welding. Small bore piping with diameters less than 25 mm shall be totally Argon Arc welded.

All stainless-steel pipe work shall be Argon Arc welded.

Oxyacetylene welding shall comply with BS 1821.

B5 Testing of welding

Unless other arrangements are prescribed by the Engineer, all testing, including approval tests for weld procedures, production control testing of samples and in situ testing, shall be undertaken by a Government approved inspection authority appointed by the Engineer.

The Contractor shall make the necessary arrangements for the required welding procedure and operator tests to be conducted.

All materials and facilities other than transport, lodging and testing equipment, shall be supplied by the Contractor.

The Contractor shall allow the Engineer or his representative to conduct visual as well as non-destructive and destructive examinations and tests as he may require.

The cost of testing shall be borne by the Employer except for the following costs which shall be borne by the Contractor:

- (a) Testing of operators
- (b) Testing of welding procedures
- (c) Any retests necessitated by defects

C MECHANICAL AERATORS

C1 Scope

This specification covers the supply, delivery, erection, installation, testing, putting into satisfactory operation and upholding during the Defects Liability Period of fixed mounted and floating surface aerators complete with local switchboard, switchgear and all associated electrical work up to the limits specified in the Project Specification.

C2 Materials

Materials of construction shall either be inert corrosion-proof materials or steel protected against corrosion as specified. Floats and cables constructed of stainless steel shall be preferred for floating aerators. All bolts built into concrete shall be of stainless steel. If ropes or other cables than stainless steel are offered, the Tenderer shall provide proof of

the durability of the ropes or cables in a highly corrosive and biologically active sewage spray environment.

Floats for electric cables shall be of an inert, biological non-degradable and durable material.

C3 Type of Equipment

The aerators shall be designed to both aerate and keep mixed liquor and sludge in suspension.

Full details shall be provided by the Tenderer of the aeration characteristics of the aerator offered taking full account of the specified medium, the height above sea level, the ambient temperature, the water depth in the basin and the basin geometry.

Gearboxes shall be selected for continuous operation and with a power service factor of not less than 2.0 based on installed motor power. All gears shall be hardened and ground after cutting.

Tenderers will be required to provide a catalogue of the make of gearbox offered and to indicate how the gearbox selection was made.

All bearings shall be designed for a life of 100 000 hours at a B10 rating. Proof of such rating shall accompany the tender. Gearboxes directly coupled to aerators shall have output shaft bearings designed to take up any possible bending, up thrust and down pull and shall have sufficient diameter to withstand the radial loads imposed by the aerators. A minimum service factor of 2,00 for radial and axial load and for bending moment shall be allowed. Tenderers shall indicate what these forces are and how they are to be accommodated. All calculations shall be submitted.

The gearbox casings shall be designed to prevent moisture from entering. On gearboxes with vertical output shafts a dry well for the output shaft lower bearing would be preferred to avoid complete drainage of oil in the box in the event of an oil seal failure.

The electric motors shall be coupled to the gearbox by means of flexible couplings. The aerators shall be complete with motors, gearboxes, floating platforms, anchor cables and means for removal of units from the basin.

Floating aerators shall be either of the direct coupled or with speed reducing gearbox and shall be firmly mounted on a well-balanced float. The float shall be of robust construction and shall not be detrimentally influenced by the vibrations of the aerator.

The aerator shall be mounted vertically on the float so as to produce an even spray, directed outwards. The surface of the units shall be smooth so as to minimize the accumulation of rags and dirt on the surface of the float.

The floating platforms shall be strong enough to allow lifting thereof as a unit for placing it into position or for removing it from the basin. The float shall be designed so as not to allow water to leak into the float tanks, but should this occur, the float shall be sufficiently strong to allow for the removal of same under semi-drowned conditions. A strong hook shall be provided for lifting the units and for moving them about. The stability of the float shall be such that the float surface will not be submerged under static, starting or running conditions and its safety factor against sinking shall not be less than 1,7.

The electric cable shall in addition to the motor, also be independently fixed to the frame to prevent any forces on the cable connection to the motor. The cable entry into the motor shall be completely waterproof and sealed.

The anchor cables shall be sufficiently strong to hold the units in position and for moving the units over to the side of the basin. The cables shall be smooth without any kinks or protruding wires. The cables shall be long enough to allow the units to settle to the bottom of the basin without undue strain on the anchors. When settling on the bottom of the basin the entire unit shall be seated in such a way that no damage will be caused to either the platform or the aerator.

The Tenderer shall submit full details of the physical dimensions of the unit as well as the total mass of the unit including motor and gearbox, if any. The direction of rotation of multiple units shall be as specified.

C4 Installation

4.1 Fixed mounted aerators

The aerators shall be mounted on adjustable foot screws allowing up and down adjustments of not less than 100 mm each way. The mean water level for the setting of the aerators will be confirmed by the Engineer on receipt of the successful tenderer's detailed drawings.

The approximate maximum and minimum water level with reference to the top of the mounting platform are shown on the diagram.

The aerators shall be mounted in such a way as to facilitate ease of maintenance. The Tenderer shall indicate in his tender how maintenance on the aerator blade and bearings can be carried out without lowering the water level in the basin or using a boat.

The installation shall be complete (excluding electrical work).

4.2 Floating aerators

The aerators shall be anchored to anchor blocks provided by others. The Tenderer shall either confirm the proposed anchor positions or indicate preferred anchor positions. In addition, the Tenderer shall supply the maximum pull exerted by the aerator on an anchor block.

Provision shall be made to suspend the electric cable to the motor on the water surface. Suitable floats shall be provided to prevent the cable from dropping to the floor of the basin. Floats shall not be spaced further apart than 1,0 m.

C5 Painting and corrosion protection

Except for stainless steel sections, the aerators shall be treated against corrosion as follows:

Aerator cone and shaft and floating platform	System C
Motor, gearbox, baseplate	System A
Exposed bolts	System B

C6 Testing and commissioning

Tenderers shall provide proof or sufficient evidence of oxygenation capacities and oxygenation efficiencies (for instance by submitting a report on performance by some recognized testing organization) and must state clearly how aerator performance was assessed. Failure to submit this information will lead to the rejection of the tender on the grounds of incompleteness.

Oxygenation efficiency where called for in the Technical Data Sheets shall be expressed as kilograms oxygenation capacity per kilowatt-hour i.e., as the mass of oxygen measured in kilograms which the aerator can introduce over a period into a body of completely de-oxygenated water divided by the power input to the motor over the same period, measured in kilowatt-hours.

In situ oxygenation efficiency tests may be conducted once the plant is operating effectively and Tenderers shall price the Provisional Item in the Schedule of Prices for conducting such tests.

The tests shall utilize the steady state method as follows:

In the aeration of activated sludge mixed liquor, at a temperature of T °C, the following relationship holds:

$$\frac{dC}{dt} = K_{(T)} (C_{s(T)} - C) - r$$

Where $\frac{dC}{dt}$ = rate of change of oxygen concentration (mg/ℓ/hr)

$K_{(T)}$ = oxygen transfer co-efficient in mixed liquor at T°C (hr⁻¹)

$C_{s(T)}$ = saturation concentration of oxygen in mixed liquor at T °C and at the ambient barometric pressure (mg/ℓ)

C = actual concentration of oxygen in the mixed liquor (mg/ℓ)

r = oxygen uptake rate of the mixed liquor (mg/ℓ/hr)

If it is assumed that, under normal operating conditions, a state of equilibrium exists in the system then

$$\frac{dC}{dt} = 0,$$

and $K_{(T)} (C_{s(T)} - C) = r$

$$\text{i.e. } K_{(T)} = \frac{r}{(C_{s(T)} - C)} \dots \dots \dots (1)$$

The value of $C_{s(T)}$ to be used in equation (1) is calculated from the following relationship:

$$C_{s(T)} = \frac{468 - 2,65S}{31,6 + T} \times \frac{(P - p_w)}{(760 - p_w)} \dots \dots (2)$$

where $C_{s(T)}$ = saturation concentration of oxygen in mixed liquor at T °C and P mm pressure (mg/ℓ)

S = dissolved solids in mixed liquor (parts per 1000)

T = temperature of mixed liquor (° C)

P = barometric pressure (mm Hg)

p_w = saturation vapour pressure of water at T °C (mm Hg)

In equation (1), r and C can be determined, and $C_{s(T)}$ can be obtained from equation (2) above, so that the value of $K_{(T)}$ can be calculated. It's value at 20 °C can then be obtained by the use of the following relationship:

$$K_{(T)} = K_{(20)} \times 1,02^{(T - 20)}$$

i.e. $K_{(20)} = K_{(T)} \times 1,02^{(20 - T)}$

From the value of $K_{(20)}$, the in situ oxygenation capacity of the aeration system in a particular basin, as defined above, is calculated as follows:

$$OC = K_{(20)} \times C_s^{-1}(20) \times V \times 10^{-3} \text{kg/hr}$$

Where $C_s^{-1}(20)$ = saturation concentration of oxygen in mixed liquor containing 1000 mg/ℓ dissolved solids, at 20 °C and 760 mm pressure (mg/ℓ)

$$= 9,02 \text{ mg/ℓ}$$

V = volume of mixed liquor in basin under consideration (m³)

The actual test procedure shall be proposed by the Contractor and must meet with approval from the Engineer before it is implemented.

Nevertheless, the following points shall be incorporated in the test procedure:

- the Contractor shall provide four dissolved oxygen meters, of approved make, all standardized and calibrated in accordance with the instructions supplied by the manufacturers.

- the Contractor shall provide all equipment required for conducting the oxygen uptake rate tests.
- the positions of the D.O. probes shall be to the satisfaction of the Engineer.
- the Contractor shall provide all equipment required to assess the power consumption of the aerators during the steady state oxygenation capacity test.
- at least three consecutive tests shall be conducted.
- the Contractor shall provide all test equipment required for assessing the constants to enable the in situ oxygenation efficiencies to be related to Standard Conditions.

C7 Measurement and Payment

Measurement shall be made for the complete installation and shall be paid for as specified in the Schedule of Prices.

Payment for fixed mounted aerators shall include for motors, gearboxes, mounting and adjustment screws and everything else required for a complete and operating aeration system (including liaising with electrical contractor to assure direction of rotation).

Payment for floating aerators shall include for complete units with motor and gearbox, electrical control cabinet with switchgear and controls, cabling between motors and cabinet, anchoring cables with floats and everything else required for a complete and operating aeration system.

Payment for in situ oxygenation efficiency tests shall be as provided for under the Provisional Items in the Schedule of Prices.

Payment for cable lengths (if applicable) where the distances between equipment and control boards exceed those specified in the Project Specification shall be paid per metre length for each size of cable.

D MIXERS**D1 VERTICAL SHAFT MIXERS****D1.1 Scope**

This section of the Contract covers the supply, delivery, transport, handling, storage, erection, installation, commissioning, testing, adjustment, handing over in complete working order and upholding during the Defects Liability Period of four vertical shaft mixers for the anaerobic and anoxic compartments of the activated sludge reactor.

Fifteen vertical shaft mixers are required in the anaerobic and anoxic compartments of the activated sludge reactor for keeping the solids in suspension and for gently mixing the contents of the basin without introducing oxygen through surface agitation. Only screened sewage and return activated sludge will be introduced into the compartments. Preferably, the horizontal zones of maximum turbulence should be as close to the floor of the basin as possible. Scour velocities near the bottom shall be such that sludge, which has settled during a power failure, will be lifted and brought back into suspension. The maximum concentration of the sludge will be 6 000 mg/l and the sludge will be flocculent having a SVI of between 50 and 150. The positions of the mixers are shown on the Drawings.

The impeller of the mixers must be selected such that good pumping action is obtained. A curved blade impeller is preferred for the vertical shaft mixer but the blade shall nevertheless be shaped such as to minimise the accumulation of rags thereon.

In the design of the drive shaft, the Tenderer shall pay special attention to the slenderness ratio (length to diameter) of the shaft to prevent whip-lashing.

D1.2 Duties of vertical shaft mixer

The rated output power of the motor shall be 15 % more than the maximum power requirements. A minimum of 6 Watt / m³ must be introduced into the liquid.

The speed of rotation of the vertical shaft mixer shall not exceed 25 rpm. The Tenderer shall supply all relevant information for the proper adjudication of the unit, giving information regarding the type of impeller, size and shape, the tip speed, the pattern of flow in the basin, shaft length and diameter as well as construction.

Speed reducers shall be selected for continuous operation 24 hours per day. Mechanical power ratings (according to AGMA) shall be equal of greater than twice the installed power. Thermal power ratings shall be based on an ambient temperature of 40 °C.

The speed reducers shall be of a type specifically designed to accommodate bending caused by long overhang of the shaft of the mixer. Bending of the shaft shall not damage the driving gear or the bearings. All gears and pinions must be hardened and ground after cutting. Worm gears will not be considered.

Tenderers shall provide a catalogue of the make of reducer offered.

All bearings shall be designed for a life of at least 100 000 hours at a B10 rating. In addition, the bearings on the output shaft shall be capable of withstanding the resultant forces caused by the combination of radial and axial loads (imposed by the mixer) acting simultaneously, and shall be selected such that the following condition is complied with:

$$\frac{\text{actual radial load}}{\text{permissible radial load}} + \frac{\text{actual axial load}}{\text{permissible axial load}} \leq 1$$

(where the “permissible” loads are the manufacturer’s figures for 5 000 hours at a B10 rating). Tenderers shall indicate what these forces are and how they are accommodated.

Casings shall be made of close grained cast iron and shall be designed such as to prevent moisture from entering. A dry well for the output shaft lower bearing is required.

Each speed reducer shall be fitted with a nameplate showing at least the following information:

- Speed reducer type or model number
- Serial number
- AGMA rating
- Nominal ratio
- Approximate oil quantity required

D1.3 Corrosion protection

Corrosion protection must be carried out strictly in accordance with the requirements of the Corrosion Protection Specification to the following systems:

- Impeller and shaft : System H
- Base plates : System A

D2 SUBMERSIBLE MIXERS

Submersible mixers to be sized and placed as determined by manufacturer to ensure effective mixing without ingress of oxygen to the fluid. The mixers must be adjustable with regard to depth and orientation. Each mixer must be provided with a hoist to facilitate inspection and maintenance. The required kW rating of the mixer must be provided by the manufacturer. Protection approved epoxy or as specified by the manufacturer suitable for the installation.

E SLUICE GATES

E1 General

The gates shall be self-contained with yoke and bench stand operators; self-contained with either non-rising stem extension (NRE) or rising stem extension (RSE); or gates with minimum height frames and separate stem guides and operators, in accordance with requirements of these specifications. Specific gate design and configuration shall be noted in gate schedule or as shown on plans.

E2 Frame and Cover (Slide)

The frame and cover (slide) shall be SS304 with machined seating faces. The frame shall be flatback or spigot back special mounting configuration as specified.

There shall be one adjustable HDPE wedge or slide per side, located on the vertical centreline of the ends of the gate.

E3 Stem

The stem shall be cold finished steel of suitable length and ample strength of the intended service. The stem diameter shall be capable of withstanding twice the rated output of the operator at 200N pull, and shall be supported such that the L/r ratio for the unsupported part of the stem shall not exceed 200.

When rising stem extension is used, the stem extension shall be supported such that a rigid installation shall be provided. Stem guides shall be spaced such that the L/r ratio of the stem does not exceed 200.

E4 Seals

Sluice and channel gates are fitted with Neoprene music-note ("J" type) seals. These bear against the frame surfaces, and give excellent sealing, as the higher the pressure, the greater the force pressing the seal against the frame, and the more effective the sealing action.

If, for any reason Neoprene cannot be used, metal to metal or thermoplastic seals can be provided if approved by the Engineer.

For high off-seating pressures, and for metal or thermoplastic seals, gates are fitted with adjustable wedges to ensure positive contact between seal faces.

E5 Leakage rates

Gates are designed for minimum leakage, and in practice are often found to be drop-tight. However, the permissible leakage rates as laid down in AWWA Spec. C501, which are + 2,48 l.p.m per meter for off-seating pressures up to 6 m, are guaranteed maximum.

NOTE: Correct installation is essential if these rates are not to be exceeded.

E6 Bearing strips

Hydraulic thrust is taken on low-friction H.D.P.E. strips fitted to the gate, and which slide on the frame as the gate moves. These strips are to give low bearing loading, resulting in long life and easy operation. They are also fitted to the larger sizes of channel gates for the same reasons.

E7 Operating gear

For manual operation, hand wheel diameters and gearbox ratios are matched to spindle sizes and thread pitches, so that the time required to stroke the gate is kept to a minimum, at the same time limiting hand wheel rim effort to normally acceptable levels of between 100 and 150 N.

If gearing is necessary, bevel or combined bevel / spur gearboxes are used.

E8 Spindles

Spindles are sized in accordance with calculated tensile and compressive loads which will be imposed while opening and closing the gate, and spindle guides are spaced so that buckling of the spindle under compression does not occur.

E9 Cover tubes

Spindle cover tubes can be fitted if desired. If visual indication of gate position is required, the cover tube would be supplied in clear PVC, but steel or stainless steel, being more robust, is recommended wherever possible. The design of the handwheel boss allows a cover tube to be fitted at a later stage, if it is subsequently found to be necessary.

E10 Operators

Manually operated lifting mechanisms shall be indicated on the plan drawings or in the gate schedule. Handwheel type lifts shall have threaded bronze lift nut to match stem. Threads shall be machine cut, acme type.

A maximum effort of 200N shall be required to operate the gate after it is unseated, based on the maximum specified operating head

E11 Material

Frame, Cover (slide), SS304

Hand wheel – Aluminium

Stem – SS304

Lift Nut – Bronze – ASTM B-584, Alloy 836 or 865

Assembly Hardware and Fasteners – SS A2

Paint – Manufacturer's Standard (if applicable)

E12 Optional Items Include:

J-bulb neoprene seal on SS304 seating Surfaces

Epoxy coated Rails and Yokes

Type 304 Stainless Steel Rails and Yokes

Stainless Steel (Type 304 or 316) or Brass Stems

Stainless Steel (Type 304 or 316) Assembly Hardware

Structural Steel Pipe (w/cast iron brackets) NRE & RSE Stem Extensions

Total Galvanizing per ASTM-A-123 (Frame, Cover, Rails, Lift, etc)

Special Paint Finish, Coal Tar Epoxy, Polyamide Epoxy, etc

F SETTLING TANK EQUIPMENT

F1 **General Design**

F1.1	Description
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The clarifier equipment shall be of the rim drive type, pivoting around a stationary influent column, as indicated on the drawings. The equipment shall be designed to remove settled sludge from the bottom of the tank and floating scum from around the periphery of the tank.

The clarifier shall perform the following integrated functions with the equipment / infrastructure supplied:

- a. Dissipate energy and prevent localized currents
- b. Separate solids from the clear liquid
- c. Evenly withdraw the clear liquid
- d. Transport and thicken the settled sludge
- e. Prevent sludge dilution at withdrawal point
- f. Remove scum from the clarifier surface

F1.2 Materials

All structural steel shall conform to the requirements of ASTM A36. Steel pipe used for structural members shall conform to ASTM A53. Steel members in contact with liquids, either continuously or intermittently, shall have a minimum thickness of 4,5 mm unless otherwise noted. The following materials are required:

Bridge : Hot dipped galvanized steel

Scraper hangers	:	Stainless steel 304 L
Scrapers	:	3 CR12
Scum baffle	:	3 CR12
Weir plate	:	3 CR12
Scum box and valve assembly	:	Stainless steel 304 L
Stamford baffles	:	3 CR12 (or GRP)

Material and protection certification to be submitted to Engineer.

F1.3 Fabrication

Shop fabrication and welding of structural members shall be in accordance with the latest edition of the Structural Welding Code, AWS D1, of the American Welding Society. All welding connections shall develop the full strength of the connected elements and all joined or lapped surfaces shall be completely seal welded with a minimum 4 mm fillet weld.

F1.4 Edge Grinding

Sharp projections of cut or sheared edges of ferrous metals shall be ground to a radius by multiple passes of a power grinder as required to ensure satisfactory coating adhesion.

F1.5 Shop Surface Preparation / Coating

All submerged equipment shall be 3CR12 or stainless steel as specified. The drive unit shall be coated with the supplier's standard enamel paint system.

F1.6 Structural Design

The ratio of unbraced length to least radius of gyration (slenderness ratio) shall not exceed the values listed in the SANS 0162 Design Code. For angles, the radius of gyration shall be taken about the Z-Z axis. In addition, all structural members and connections shall be designed so that the unit stresses will not exceed SANS 0162 DESIGN CODE allowable stresses by more than one-third when subject to loading of the previously listed peak torque. All steel design shall be in accordance with the SANS 0162 Design Code of Steel

Construction, latest edition. Deflection calculations the bridge under loading (1,5 kPa live load) must be submitted and be within the scraper tolerances.

F2 Drive Unit

F2.1 Design Parameters

The drive unit shall be manufactured by the clarifier equipment supplier to ensure unit responsibility. It shall turn the mechanism at the design collector tip speed. The center pivot bearing shall be designed for the total rotating mechanism loads with a minimum L-10 life of 20 years or 450 000 hours.

To ensure safety and ease of maintenance, all components of the drive shall be direct coupled.

F2.2 Physical Characteristics

The drive unit shall consist of a motor and speed reducer directly connected to the drive wheel axle. The drive shall actuate the front wheel of the carriage assembly. All speed reducers shall be fully enclosed and running in oil or grease. Readily accessible lubricant fills and drain pipes with necessary fittings shall be provided.

F2.3 Carriage Assembly

The rim drive carriage assemble shall be fixed at the outer end of the walkway. It shall be equipped with two (2) wheels having solid rubber tires for traction on top of the tank wall.

The wheels shall have self-aligning ball or roller bearings. The mounting assembly of the wheels shall be designed to allow for proper positioning of the wheels at the site in order to correct any difference between the length of the walkway and the tank diameter. The angle of the wheels to the radius of the tank shall form a right angle. The wheel assembly must be protected against weather and in particular sunlight.

The weight of the mechanism shall be evenly distributed to the two wheels. Minimum dimensions of the wheels shall be 305 mm diameter by 75 mm wide. The carriage shall be designed such that abnormal wear of the tires or misalignment shall not occur. The carriage shall also be provided with a scraper blade, set at an angle, in front of the front wheel to push off (to the outside) any obstructing matter on the wall.

F2.4 Stall Protection

The stall protection device shall consist of a proximity switch which detects movement of the idler wheel. Upon stall of the idler wheel, the proximity switch shall indicate a stall to the electrical controls and stop the motor.

F2.5 Speed Reducing Unit

The speed reducing unit shall consist of cycloidal or helical speed reducers directly connected to a motor without the use of chains or V-belts.

Speed reducer helical gearing shall be manufactures to AGMA standards. The speed reducer shall have a service factor of 1,25.

The reducers shall be fitted with radial and thrust bearings of proper size for all mechanism loads and run in a totally submerged oil bath or be grease lubricated.

F2.6 Motor

The motor shall be a squirrel cage, induction type, TEFC, ball bearing heavy duty unit of ample power for starting and operating the mechanism without overload, with a service factor of 1,15. A motor canopy shall be provided.

Power supply to the equipment shall be 380-volt, 50 hertz, 3 phases.

F2.7 Rotating Walkway

One (1) 800 mm wide walkway with handrails shall be supported by the pivot bearing assembly at the center column and the rim drive carriage at the tank perimeter, and shall be designed to safely withstand a live load of 160 kg/m².

F2.8 Influent and Sludge Removal

F2.8.1 Stationary Center Influent Column

Concrete as per detail not supplied under this contract.

F2.8.2 Center Pivot Bearing Assembly

A central pivot bearing assembly shall be mounted over the central axis of the tank and shall be bolted to the top of the center influent column. It shall include a slewing ring of

large diameter ball bearings adequately sized to withstand all radial and thrust loads encountered under design conditions.

Grease lubrication shall be provided.

A collector ring set shall be provided between the stationary bearing race and the rotating walkway. Sufficient wire leads shall be provided to accommodate all clarifier electrical functions.

F2.8.3 *Rake Arm*

The mechanism shall include a sludge rake arm with a structural steel frame, log spiral scraper blade and adjustable stainless-steel neoprene squeegees. The scraper blade depth shall vary from a minimum at the periphery of ± 300 mm to a maximum at the tank center of ± 700 mm. The blade shall insure complete scraping of the bottom once each revolution.

The rake arm shall be suspended by stainless steel supports from the rotating walkway. These supports shall be designed to maintain the blades in position as the mechanism rotates.

F2.9 **Scum Removal**

F2.9.1 *General*

The clarifier manufacturer shall furnish one (1) skimming device as part of each clarifier mechanism. The skimming mechanism shall be arranged to sweep the surface of the sedimentation compartment, automatically removing scum and floating material to a scum box at the periphery of the tank.

F2.9.2 *Skimmer Construction*

The rotating scum skimmer shall include a horizontal steel plate skimmer blade supported from the rotating walkway. The blade shall extend tangentially from the influent feed well to the hinged scum skimmer assembly at the tank periphery.

F2.9.3 *Scum Skimmer Assembly*

A hinged scum skimmer assembly shall be mounted on the outer end of the skimmer blade. The hinged scum skimmer assembly shall be designed to form a pocket for trapping the scum. The hinged arrangement shall insure continual contact and proper alignment

between wiper blade, and ramp as the blade travels up the ramp. The wiper blade shall have a wearing strip on its outer end which contacts the scum baffle and a neoprene strip on its lower and inner edge. Scum shall be trapped as the wiper blade meets the ramp and shall be raised up the ramp to be dumped into the scum trough for disposal.

F2.9.4 Scum box

The scum box shall be of the size specified, supported from the tank wall and connected to the scum withdrawal piping. It shall be made of thick welded steel plate. The box shall have a scum trough, vertical steel sides, and a sloping approach ramp that extends from above water level to below. A similar ramp shall be provided at the opposite end to allow the skimmer blade to lower back to the operating position.

F2.9.5 Scum Flushing Valve

A valve shall be attached to the scum box which automatically opens and allows clarified liquid into the scum box to flush out solids. The valve shall actuate at every pass of the scum skimmer over the scum box allowing sufficient delay after deposit of the solids before flushing begins. Delay and flush duration shall be adjustable. The valve shall be constructed of oil impregnated UHMW-PE disks with stainless steel rods and stainless-steel hardware. The opening and closing of the scum flushing valve shall be one smooth continuous movement.

F2.9.6 Scum Baffle

The baffle shall consist of 3CR12 sections with support brackets as indicated on the drawings. The baffle sections shall be curved and fastened to the launder wall with adjustable support brackets, stainless steel fasteners and anchor bolts.

F2.9.7 Effluent Removal

F2.9.7.1 Weir

An adjustable weir as detailed shall be provided around the periphery of the tank at the water surface for removal of clarified effluent. This weir shall be adjusted (with the aid of a dumpy level) to be absolutely level over its full circumference.

F2.10 Electrical

The contractor shall supply and install all required electrical items not specifically called for as furnished by the equipment supplier.

The contractor shall supply and install all field wiring required including but not limited to proper size wire, conduit, fittings and supports.

F2.11 Anchorage and Fasteners**F2.11.1 Anchor bolts**

All anchor bolts shall be a minimum of 8 mm diameter and made of type 304 stainless steel. The equipment supplier shall furnish all anchor bolts, nuts, and washers required for the equipment.

F2.11.2 Fasteners

All structural fasteners shall be a minimum of 10 mm diameter and made of type 304 stainless steel. The equipment supplier shall furnish all fasteners required for the assembly of the equipment.

F3 INSTALLATION**F3.1 General**

The equipment shall be installed properly to provide a complete working system. Installation shall follow the supplier's recommendations.

I3.2 Manuals

The equipment supplier shall furnish three (3) copies of operation and maintenance manuals, which will be retained at the installation site to assist plant operators. The manual shall include the supplier's erection and assembly recommendations and a complete list of recommended spare parts.

F3.3 Shop assembly and inspection

The equipment specified herein shall be completely factory assembled as one unit as far as practical to verify that all mating parts can be field assembled. All mating parts shall be trial fit and match-marked. The manufacturers shall submit certification of shop trial assembly and photographs of assembly before shipment. The customer and installing contractor shall be given the opportunity to witness the shop assembly.

Shop inspection shall be performed by a qualified inspector and certified by the manufacturer. The inspection shall be documented and all deficiencies noted, corrected, reinspected and final completion formally authorized. Final shipment authorization shall be by the manufacturer to ensure completion of all fabrication, assembly and inspection requirements. Inspection records and evidence of inspector qualification shall be submitted to the owner upon request.

F3.4 Field Service

The equipment supplier shall provide the service of a qualified representative for one (1) trip and one (1) day to inspect the mechanism installation, lubrication, torque test, assist in start-up, and instruct plant personnel in the proper operation and maintenance for the mechanism.

F4 SUMMARY OF EQUIPMENT TO BE SUPPLIED, INSTALLED AND COMMISSIONED AND MAINTAINED

F4.1 Settling tank bridge with log spiral scraper, rake arm, center pivot bearing assembly, motor and speed reducing unit, etc complete as specified.

F4.2 Scum removal system including skimmer, scum box, scum flushing valve and scum baffle.

F4.3 Overflow weir

F4.4 Stamford baffles

F4.5 Electrical installation up to centre bearing

F4.6 Manuals (3)

F5 PAYMENT

F5.1 Settling tank bridge and scraper assembly

Manufacture, supply, install, test, commission and maintain complete bridge and scraper assembly

Unit No

F5.2 Scum removal system

Manufacture, install, test, commission and maintain:

(a) Scum skimmer assembly

Unit No

(b) Scum baffle Unit

m

(c) Scum box including scum flushing valve

Unit No

F5.3 Overflow weir

Manufacture, install, align, commission and maintain

Unit m

F5.4 Stamford baffle

Manufacture, install, test, commission and maintain:

(a) Stamford baffle

Unit m

G VALVES AND PIPEWORK ACCESSORIES

G1 Scope

This specification covers the supply, delivery, installation and upholding during the Defects Liability Period of valves and pipework accessories in installations other than chemical dosing installations.

G2 Materials

Valves shall be constructed of cast iron, brass, bronze or stainless steel and shall be suitable for operating under the pressures and temperatures of the lines in which they are to be installed.

Cast iron valves shall be manufactured from material conforming to BS 1452 GR 14 or ASTM A 126-61T and shall be of the Waterworks Pattern.

Brass and bronze valves shall be of the corrosion and dezincification resistant (C.R.) type shall be stamped as such and shall have stainless steel trims. Bronze valves shall be manufactured from material conforming to BS 1400 LG 2-C or ASTM B62.

Stainless steel screwed and socketed and stainless-steel flanged valves shall be manufactured of AISI grades 304 or 316 stainless steel. Stainless-steel butt-welded valves shall be manufactured from grades 304L or 316L stainless steel.

Hand wheel nuts shall be of grade 304 or 316 stainless steel.

All stainless-steel products shall be manufactured from material conforming to SANS 965 for the specified grade stainless steel. Unless otherwise shown on the Drawings, the surface finishes of stainless-steel products shall conform to type 2B of BS 1449 Part 2.

G3 General requirements

All valves and pipe work accessories of one type supplied under one contract, shall be of the same manufacturer and supported by a well-established SA organization.

Unless otherwise specified, all valves shall be of the same nominal diameter as the pipe in which they are to be installed. Cast iron valves shall not be installed in hot-water lines.

All valves shall be clockwise closing with a clear forged arrow or a brass or bronze nameplate on the hand wheel indicating clearly the directions of opening and closing.

Unless prior approval has been obtained, dissimilar materials shall not be allowed to come in contact with each other but shall be properly insulated from each other by means of nylon or Teflon spacers or washers.

G3.1 Flanges

All flanges shall be of cast iron, galvanized mild steel or grade 304 L or 316 L stainless steel and unless otherwise specified, shall be of a pressure class of not less than 1000 kPa.

Flange drilling and flange and bolt sizes shall conform to the requirements of SANS 1123. Flange drilling orientation shall match the requirements of flanges of specials, fittings and valves.

Flanges shall have flat machined joint faces.

Rubber insertion rings shall comply with the requirements of BS 3063 and shall be of the reinforced full-face type.

Each flanged pipe section or fitting shall be supplied with one complete set steel bolts, nuts and washers and one reinforced rubber insertion ring, all as specified.

The bolt lengths shall be compatible with the flange, washer and insertion ring thicknesses to ensure that after the flanges have been connected and the bolts tightened, no bolt protrudes more than three threads from a nut and no bolt is short of the end of a nut.

G3.2 Bolts, nuts and washers

Bolts, nuts and washers used in conjunction with cast iron or galvanized mild steel pipe work shall be hot dipped galvanized. All other bolts nuts and washers shall be of stainless steel. Washers used on pipe work shall be of the spring-loaded anti-vibration type. All bolts and nuts shall be hexagon ISO metric conforming to the requirements of SANS 135.

Bolts shall project not more than three threads and no bolt shall be short of the end of a nut.

G3.3 Screw threads

All screw threads shall be standard ISO-7/1 pipe thread. Jointing tape shall be PTFE grade 3M. Tape shall be applied to male ends of fittings.

G3.4 Flexible joints

Flexible joints and flexible flange adaptors shall be manufactured from cast iron, bronze or stainless steel. Bolts nuts and washers shall be of stainless steel and gasket and sealing and wedge rings shall be suitable for the specified pressures and temperatures of the pipelines in which they are to be installed.

G4 Type of Valves

G4.1 Shut-off, sluice and drain valves

Only gate valves shall be used for this purpose.

The construction of gate valves shall be of the inside screw, screwed or bolted bonnet, solid tapered wedge disc, non-rising stem and hand wheel type.

Gate valves up to 50 mm diameter shall be of bronze or stainless steel with standard threaded connections and bonnet. Stems shall be of copper alloy or stainless steel and discs of bronze or stainless steel.

Gate valves of 65 to 80 mm diameter shall be of cast iron, stainless steel, bronze or brass to SANS 776 with screwed bonnets and flanged ends. Stems shall be of brass, bronze or stainless steel and discs shall be of bronze or stainless steel.

Valves of 100 mm diameter and larger shall be of cast iron or stainless steel with flanged ends and bolted bonnets. Stems shall be of brass, bronze or stainless steel and discs shall be of solid cast iron with bronze seat rings on body and disc. Trim shall be bronze.

Gate valves shall be provided with back-seating on stems to facilitate repacking under pressure.

Mild steel hand wheels shall be treated against corrosion as specified.

G4.2 Isolation, throttling and balancing valves

Gate, ball or butterfly valves may be used for temporary isolating pipeline sections. Only ball or butterfly valves shall be used for throttling or balancing. Gate, ball or butterfly valves may be used for temporary isolating pipeline sections.

G4.2.1 Ball valves

All ball valves shall be constructed of cast iron, bronze or stainless steel.

Carbon steel handles shall be treated against corrosion as specified.

Ball valves larger than 50 mm diameter shall be flanged.

G4.2.2 Butterfly valves

Butterfly valves shall have cast iron, bronze or stainless-steel bodies with internal rubber lining and flanged ends, or wafer type fitting between flanges.

The valves shall be fitted with hand lever position indication and locking mechanism.

Butterfly valves may only be installed at the very end of pipelines in sewage works and under no circumstances into sewage lines.

G4.3 Non-return valves

Non-return valves shall be manufactured from cast iron, bronze or stainless steel and shall be of the metal disc swing check or non-clog ball types. Discs shall be of bronze or stainless steel, balls shall be of stainless steel and seats shall be elastic. The valves shall be of the non-slam type.

Valves up to 50 mm diameter shall be screwed and socketed and valves larger than 50 mm shall be flanged.

G4.4 Float valves

Float valves up to 40 mm diameter shall have bronze valve bodies and working parts, screwed connections and shall be suitable to close against the system pressure.

Float valves of 50 mm diameter and larger shall have cast iron, bronze or stainless-steel bodies with flanged ends and bronze seat rings.

G4.5 Air valves

Air valves shall either be of the small diameter single orifice type of the automatic air vent type with integral stop valve and shall be manufactured of cast iron, bronze or stainless steel. Balls shall be of stainless steel.

The inlet diameter shall not be less than 10 mm and each air valve shall be equipped with a brass or stainless-steel isolation valve. The valve shall be fitted with a standard screwed end.

G4.6 Hose pipe taps

Hose pipe taps shall be of the 20 mm diameter crutch head chromium-plated brass type with standard thread for 20 mm diameter hose pipe connections.

G4.7 Hand wash basin taps

These shall be of the chromium-plated brass knee operated type bibcocks.

G4.8 Mixing valves

The valves shall be manufactured from stainless steel and / or bronze and may be chromium-plated. The valves shall receive separate supplies of cold water (between 1 °C and 20 °C) and hot water (between 74 °C and 88 °C).

The valve shall be adjustable to mix the hot and cold water supplies to obtain a controlled warm water supply of between 37 °C and 46 °C. Failure in the cold-water supply shall automatically cut off the hot water supply. The valve shall control the specified delivery temperature within an accuracy of ± 2 °C.

Each mixing valve assembly shall be provided with a tamper proof temperature probe downstream of the mixing valve. The probe shall be calibrated in degrees Celsius between 0 °C and 100 °C

G4.9 Pressure reducing valves

The valves shall be manufactured from stainless steel, bronze or corrosion resistant brass with main seat, springs and strainer of stainless steel. Rubber and plastic components shall also be suitable for a service temperature of 95 °C.

The valves shall be designed for operation under a maximum inlet pressure of 2000 kPa and system pressures of between 100 and 500 kPa. The valves shall comply with the requirements of SANS 198. The valve shall maintain a constant downstream pressure under varying upstream pressures.

All operating parts including valve seats, strainer, diaphragms and compression rings shall be easily removable for maintenance purposes.

Pressure reducing valves up to 32 mm diameter shall have standard screwed ends and valves of 40 mm and larger flanged ends.

G4.10 Expansion / Pressure relief valve

The valves shall be manufactured from stainless steel or bronze. The valve shall have an adjustable setting between 100 and 500 kPa and shall comply with the requirements of SANS 198.

The relief outlet pipe of the valve shall incorporate a swivel capable of rotating through 360 °C. The expansion water shall visually drip into a stainless-steel overflow draining downwards into the drainage system. Water shall only drip into the overflow whilst the water in the geyser is being heated.

Relief valve seat washers shall be easily removable for maintenance purposes.

The relief outlet pipe shall not be less than 20 mm in diameter and not longer than 5 m.

G4.11 Pressure gauges

Pressure gauges shall be of the Bourdon type with a 100 mm minimum gauge dial diameter and shall be manufactured from stainless steel.

Each gauge shall be provided with a cock and syphon tube.

The gauge shall be of the heavy-duty type with adjustable zero point and shall be calibrated in SI units.

G4.12 Strainers

Strainers shall be of the angle or Y-type. Strainers up to 50 mm shall have screwed ends and strainers larger than 50 mm shall have flanged ends.

The strainers shall be manufactured from stainless steel with stainless steel screens.

Screens shall be perforated as follows:

STRAINER SIZE (mm)	PERFORATION SIZE (mm)
10 – 50	1,0
65 – 150	1,5

200 and over	2,0
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Strainers shall be provided with a 50 mm blow down pipe and cock on the cap piped to the nearest drain point.

The screen area shall be at least three times the pipe area served.

The strainer shall be easily dismantled for cleaning purposes without breaking into the pipeline.

G4.13 In-line flow meters

Flow meters shall be of the stainless-steel orifice plate type, fitting between flanges.

The screwed take-off connections shall be provided with check valves.

A differential pressure gauge matching the orifice plates complete with tubes, shut-off cocks, air vents and carrying case shall be supplied for the flow meters. The differential pressure gauge shall be calibrated to give a direct rate of flow reading in SI units.

In addition, graphs or charts on which the flow quantities are plotted against pressure differential across the flow meter, shall be supplied.

G5 Installation

All valves and accessories shall be installed with removable connections or unions for servicing or replacing the valve.

All valves and hand wheels shall be easily accessible.

Reflux valves shall only be installed in horizontal lines.

G6 Painting and corrosion protection

Cast iron valves System K

Steel hand wheels System A

G7 Testing and commissioning

All valves shall be checked in operation for water tightness, vibration, ease of operation, etc.

G8 Measurement and payment

No separate measurement will be made for valves and the work shall be deemed to be included in the sums tendered for the relevant equipment.

H PAINTING AND CORROSION PROTECTION

H1 Scope

This section of the Contract covers the preparation of surfaces, the application of paints and corrosion protection systems, the testing of the same and the upholding of all the protected surfaces during the Defects Liability Period.

H2 Materials

Paints shall be of the best quality, of approved manufacture and brand and shall comply with the requirements of the following specifications:

2.1 Blast cleaning abrasive

The abrasive shall comply with the requirements of Clause 2.3.3.3 of SANS 064.

2.2 Primers

Red lead-based primer	SANS 312 type II, grade II
Wash primer (metal etch)	SANS 723
Zinc rich primer	SANS 926
Zinc chromate primers	SANS 679, type I
Calcium plumbate primer	SANS 912
Epoxy tar	SANS 801

2.3 Undercoats

Undercoats for paints	SANS 681
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2.4 Finishing coats

Steel

Structural steel paint	SANS 684, type B
High gloss paint	SANS 630, type II
High build chlorinated rubber paint	CSS 13.15
Epoxy enamel	SANS 663, type III
Epoxy tar paints	SANS 801, type I
Water dispersed epoxy paint	Non-toxic odourless two component solvent free water dispersed polyamide cured epoxy

Walls

Acrylic emulsion paint	SANS 634, grade I
Eggshell	SANS 515
High gloss alkyd enamel paints with a non-aqueous solvent base, for interior and exterior use	SANS 630, grade I

H3 General

All painting is to be undertaken in accordance with the appropriate SANS Standards and the following directives shall be adhered to:

- 3.1 Paint shall not be applied over any surfaces containing traces of grit, grease, oil, loose rust, loose mills scale or corrosion products of any kind.
- 3.2 All metal surfaces to which paint is applied shall be moisture free. Paint surfaces which are to be over coated shall be hard dry before over coating, unless stated otherwise in the maker's instructions, which the Contractor shall not fail to obtain.
 - 3.2.1 All traces of soluble salts and corrosive airborne contaminants shall be thoroughly washed from the surface prior to painting, and the surfaces dried and painted immediately thereafter.
- 3.3 Unless otherwise stated, no paint shall be applied within 50 mm of areas which are to be welded.
 - 3.3.1 Welds and adjacent parent metal shall be de-slugged, inspected and approved and all spatter shall be removed prior to painting.

- 3.4 The weld areas shall be abrasive blasted and / or ground and all contaminants shall be removed prior to painting. Wire brushing of the weld shall only be allowed if the paint specification calls for wire brushing. The weld area shall then be flushed with fresh water and allowed to dry before receiving the full specified paint system.
- 3.5 Surfaces which are to rest on concrete or other floors shall receive the full paint system prior to erection.
- 3.6 The Contractor shall protect all parts of the Works against disfigurement by spatters, splashes and smirches of paint or of paint materials. The Contractor shall be responsible for any damage, paint or dirt caused by his operations to persons or property, including plants and animals; and he will be required to provide protective measures at his expense to prevent such damage. Any paint stains which may result in an unsightly appearance shall be removed or obliterated by the Contractor at his expense.
- 3.7 Where the shop coat has been allowed to age for a few months before painting, it shall be light sanded or rubbed with steel wool or scrubbed with clean water, using a bristle brush.
- 3.8 Mating of contact surfaces shall be protected from corrosion by ensuring that the two surfaces brought into contact with each other shall be prepared and primed in accordance with the specification. The primed surfaces shall be brought together while the paint is still wet.
- 3.9 Areas which will be inaccessible after erection shall receive the full specified coating system, before erection or assembly.
- 3.10 Unless otherwise specified, steel embedded within concrete shall not be painted except to within 50 mm below the concrete / air interface.
- 3.10.1 All sharp edges shall be rounded before painting and all cut ends shall receive the specified dry film thickness of paint.
- 3.11 All air used for blast cleaning or spraying shall be free from all traces of water and oil.
- 3.12 When blast-cleaning, a satisfactory blast profile (i.e. anchor pattern) shall be achieved. If the abrasive used for blast cleaning is sand, then it shall be free of clay.
- 3.13 The Painting contractor shall ensure that the manufacturer's recommended thinners are used for any particular paint.

- 3.14 The Painting contractor shall ensure that the final finishing coat shall completely cover the previous coat.
- 3.15 The Painting contractor shall ensure that primed steelwork which is to be delivered to site is stacked on bearers and is clear of the ground. Wherever possible channels, angles, etc, shall be stacked so that water cannot collect on steel.
- 3.16 The paint manufacturer's instructions shall be strictly adhered to.
- 3.17 The compatibility of any specified paint system shall be confirmed by the Contractor prior to ordering of any paint material.
- 3.18 Pipes and fittings which are to be built into concrete shall be left bare externally where it will be in contact with concrete to within 35 mm of the surface of the concrete.
- 3.19 Except where otherwise indicated, all surface preparation and painting shall be executed in the factory. Equipment inadvertently delivered unpainted, shall be returned to the factory at the cost of the Contractor for surface preparation and painting.

H4 Surface preparation

Before paint is applied to any surface, the relevant surface shall be thoroughly prepared as specified in SANS 064, the standardized specification applicable to the paint system, this Particular Specification and the Project Specification as applicable.

H5 Application of paint

Unless otherwise specified, paint may be applied either by brush, spray or roller method, or in any combination of these methods.

- 5.1 Brushes, when used, shall have sufficient body and length of bristle to spread and paint in a uniform coat. Paint shall be evenly spread and thoroughly brushed out. If brush marks are visible, it will be considered that the paint has been improperly applied, and will not be acceptable.
- 5.2 On all surfaces which are inaccessible for painting by regular means, the paint shall be applied by sheepskin daubers, bottle brushes, or by any other acceptable method to render the required coating of paint.

- 5.3 If spray methods are used, the operator shall be thoroughly experienced. Runs, sags, thin areas in the paint coat, or skips shall be considered as unsatisfactory, and the Contractor will be required to repaint by brush.
- 5.4 A water trap and air regulating valve acceptable to the Engineer shall be furnished and installed on all equipment used in spray painting.
- 5.5 Mechanical mixers shall be used to mix paint properly when ready mixed paints are not used. Prior to application the paint shall be remixed a sufficient length of time to thoroughly mix the pigment and vehicle together. Paint shall be kept well stirred to keep the pigments in suspension during its application. No skins whatsoever will be tolerated and if it is necessary it should be removed by means of screening and if not successful the paint and paintwork already completed may be condemned at the discretion of the Engineer.
- 5.6 Paint shall not be applied when the ambient air temperature is below 5 °C or when the temperature is expected to drop below 5 °C before the paint has dried.
- 5.7 Paint shall not be applied when the relative humidity is above 85 %, in fog or mist, when it is raining or when rain is expected.
- 5.8 The final colours of all paintwork shall be decided by the Engineer.

H6 Paint systems

6.1 Paint System A

This system applies to ungalvanized steel requiring an enamel finish.

6.1.1 Surface preparation

Steel surfaces shall be abrasive blast cleaned to a Sa 2,5 (near white) finish to Swedish Standard SIS 05/59/00. The surface profile after blasting shall not exceed 50 microns.

6.1.2 Primer

Apply one coat zinc chromate primer to a minimum dry film thickness of 20 micron.

6.1.3 Undercoat

Apply one coat universal undercoat to a minimum dry film thickness of 40 micron.

6.1.4 Finishing

Apply one coat high gloss alkyd enamel to a minimum dry film thickness of 25 micron.

After installation, apply on site a second coat high gloss alkyd enamel to a minimum dry film thickness of 25 micron.

(Total dry film thickness of the system shall not be less than 110 micron).

6.2 Paint System B

This system applies to galvanized steel requiring an enamel finish.

6.2.1 Surface preparation

As specified for steel to be galvanized.

6.2.2 Galvanising

Galvanising shall be of the hot dipped heavy-duty grade as specified hereinafter.

6.2.3 Preparation for painting

Clean surface thoroughly to remove all traces of manufacturer's storage oil.

6.2.4 Primer

Apply one coat calcium plumbate primer to a minimum dry film thickness of 20 micron.

6.2.5 Undercoat

Apply one coat universal undercoat to a minimum dry film thickness of 40 micron.

6.2.6 *Finishing*

Apply one coat high gloss alkyd enamel to a minimum dry film thickness of 25 micron.

After installation, apply on site a second coat high gloss alkyd enamel to a minimum dry film thickness of 25 micron.

(Total dry film thickness of the system shall not be less than 110 micron).

6.3 **Paint System C**

This system has a vinyl enamel finish.

6.3.1 *Surface preparation*

Steel surfaces shall be abrasive blast cleaned to a Sa 2,5 (near white) finish to Swedish Standard SIS 05/59/00. The surface profile after blasting shall not exceed 50 microns.

6.3.2 *Primer*

Apply one coat twin pack inorganic zinc silicate primer to a minimum dry film thickness of 70 micron.

6.3.3 *Finishing*

Apply two coats high build vinyl to a minimum dry film thickness of 65 micron per coat (First coat's colour red oxide, second light grey).

After installation, apply on site one finishing coat of vinyl enamel to a minimum dry film thickness of 30 micron.

(Total dry film thickness of system shall not be less than 230 micron).

6.4 **Paint System D**

This system applies to ungalvanized steel surfaces requiring an epoxy tar finish.

6.4.1 *Surface preparation*

Steel surfaces shall be abrasive blast cleaned to a Sa 2,5 (near white) finish to Swedish Standard SIS 05/59/00. The surface profile after blasting shall not exceed 50 microns.

6.4.2 *Primer*

Apply one coat single pack etch primer compatible with epoxy tar compound to a dry film thickness of 25 micron.

6.4.3 *Finishing*

Apply three coats epoxy tar compound to a minimum dry film thickness of 100 micron per coat. The first coat shall be black, the second brown and the third again black. Each coat shall be applied after the previous coat has dried but within 24 hours of the application of the previous coat.

A solvent wipe shall be used between each successive coat to provide good undercoat adhesion.

(Total dry film thickness shall not be less than 325 micron).

6.5 **Paint System E**

This system applies to galvanized steel surfaces requiring an epoxy tar finish.

6.5.1 *Surface preparation*

As specified for steel to be galvanized.

6.5.2 *Galvanising*

Galvanising shall be of the hot-dipped heavy-duty grade as specified hereinafter.

6.5.3 *Preparation for painting*

Clean surface thoroughly to remove all traces of manufacturer's storage oil.

6.5.4 *Finishing*

Apply three coats epoxy tar compound to a minimum dry film thickness of 100 micron per coat. The first coat shall be black, the second brown and the third again black. Each coat shall be applied after the previous coat has dried but within 24 hours of the application of the previous coat.

A solvent wipe shall be used between each successive coat to provide good intercoat adhesion.

(Total dry film thickness shall not be less than 300 micron).

6.6 Paint System F

This system applies to ungalvanized steel surfaces requiring an aluminium epoxy tar finish.

6.6.1 Surface preparation

Steel surfaces shall be abrasive blast cleaned to a Sa 2,5 (near white) finish to Swedish standard SIS 05/59/00. The surface profile after blasting shall not exceed 50 microns.

6.6.2 Primer

Apply one coat single pack etch primer compatible with epoxy compound, to a minimum dry film thickness of 25 micron.

6.6.3 Finishing

Apply two coats epoxy tar compound (first coat black, second coat brown) to a minimum dry film thickness of 100 micron per coat followed by one coat aluminium epoxy tar compound to a minimum dry film thickness of 100 micron.

Each coat shall be applied after the previous coat has dried but within 24 hours of the application of the previous coat. A solvent wipe shall be used between each successive coat to provide good intercoat adhesion.

(Total dry film thickness of the system shall not be less than 325 micron).

6.7 Paint System G

This system applies to galvanized steel surfaces requiring an aluminium epoxy tar finish.

6.7.1 *Surface preparation*

As specified for steel to be galvanized.

6.7.2 *Galvanising*

Hot-dipped heavy-duty grade as specified hereinafter.

6.7.3 *Preparation for painting*

Clean surface thoroughly to remove all traces of manufacturer's storage oil.

6.7.4 *Finishing*

Apply two coats epoxy tar compound to a minimum dry film thickness of 100 micron per coat (first coat black, second coat brown).

Apply one coat aluminium epoxy tar compound to a minimum dry film thickness of 100 micron.

Each coat shall be applied after the previous coat has dried but within 24 hours of the previous coat. A solvent wipe shall be used between each successive coat to provide good intercoat adhesion.

(Total dry film thickness of the system shall not be less than 300 micron).

6.8 Paint System H

This system applies to ungalvanized mild steel requiring an epoxy paint finish.

6.8.1 *Surface preparation*

Steel surfaces shall be abrasive blast cleaned to a Sa 2,5 (near white) finish to Swedish Standard SIS 05/59/00. The surface profile after blasting shall not exceed 50 microns.

6.8.2 *Finishing*

Apply in multiple coats polyamide cured twin pack epoxy paint (Copon EP 2300) to a minimum dry film thickness of 75 micron per coat in red (JYA 1) and pale oxide (JYA 2) colours.

Total dry film thickness shall not be less than 250 – 350 microns.

6.9 Paint System I

This system applies to cast iron pipes requiring a bitumen finish.

6.9.1 Surface Preparation

Surfaces shall be thoroughly wire brushed and cleaned immediately before painting.

6.9.2 Finishing

Bitumen coating shall be applied by dipping when all surfaces are to be treated. When only one surface of an item must be treated the bitumen may be brush applied.

6.10 Paint System J

This system applies to cast iron pipes requiring an epoxy coating.

6.10.1 Surface Preparation

Surfaces shall be thoroughly wire brushed and cleaned immediately before painting.

6.10.2 Finishing

Epoxy coating shall be applied by dipping when all surfaces are to be treated. When only one surface must be treated, the epoxy may be brush applied.

6.11 Paint System K

This system applies to external surface painting of exposed cast iron pipes.

6.11.1 Surface Preparation

Wash down with a mild detergent, teepol or equivalent.

6.11.2 *Primer*

Apply a barrier coat of chemical resistant high build acrylic primer to a minimum dry film thickness of 60 micrometre.

6.11.3 *Undercoat*

Apply one coat of chemical resistant acrylic paint to a minimum dry film thickness of 60 micrometre.

6.11.4 *Finishing coat*

Apply a final coat of chemical resistant acrylic paint to a minimum dry film thickness of 60 micrometre to a colour approved by the Engineer.

H7 **Galvanising**

- 7.1 All hot dip galvanizing shall be executed in accordance with the SANS No 763 (as amended) specification for Hot Dip (Galvanised) Zinc Coatings, with particular reference to the following requirements.
- 7.2 All hot dipped galvanizing shall be of the heavy-duty grade.
- 7.3 Mild steel plate and sections shall be of good commercial quality, or higher grades, best suited for galvanizing. The material shall be free from slag or coarse laminations, fine fissures and rolled-in impurities.
- 7.4 Castings shall be sound, dense and clean and free from distortion, porosity, carbon and slag enclosures, blow-holes and other injurious conditions.
- 7.5 Folded, rivetted or similarly jointed metal constructions are not acceptable.
- 7.6 Welding flux shall be chipped away and all welds wire brushed before galvanizing.
- 7.7 The surfaces to be galvanized shall be free from paint, oil, grease and similar impurities.
- 7.8 All exposed surfaces including welds shall be thoroughly sand blasted prior to galvanizing.

- 7.9 The Engineer shall have the right to inspect all steel components before galvanizing, and to reject or ask for remedial treatment of any material which is considered to be unsuitable. This applies particularly to welds.
- 7.10 The galvanized coating shall be smooth, adherent, continuous and free from black spots or flux stains.
- 7.11 Globular extra heavy deposits of zinc which interfere with the intended use of the material shall not be acceptable. Excessively protuberant lumps and nodules shall be removed by hot wiping or by the skilful application of mechanical means. However, there shall remain a sufficient minimum thickness of unbroken zinc coating. Flaws on small parts and working surfaces shall be repaired only by stripping and re-dipping. The zinc bath shall contain not less than 98,5 % pure zinc.
- 7.12 The deposits required from galvanized coatings shall be as follows:

MATERIAL THICKNESS	COATING GRAMS PER m²	THICKNESS IN MICRON
5 mm and over	735	105
5 mm to 2 mm	560	80
2 mm to 1,25 mm	385	55
Bolts and nuts	315 - 385	45 - 55

H8 Protection of unpainted surfaces

8.1 Bright machined parts

All bright machined parts shall have a protective treatment applied by the manufacturer before despatch and this treatment shall be kept intact up to the time of handover unless it has to be removed for installation. If the surface is exposed after installation a further protective coating shall be applied in accordance with the manufacturer's requirements.

8.2 Non-ferrous

All exposed copper piping shall be cleaned down, degreased and all adhering materials cleaned off without damage to the installation. Where indicated on drawings or described elsewhere in this specification, exposed copper piping and sanitary fittings (chromium plated) shall be degreased, cleaned down and polished without damage to the installation.

H9 Repair of paintwork

Areas where the paint coating has been damaged during transportation, erection or by any means what so ever, shall be repaired as follows:

Rust spots shall be removed by means of a wire brush or emery paper and the surrounding paint which is still intact shall be feathered for a distance of 50 mm beyond the damaged area. Spot priming shall consist of all the coats previously applied, and shall overlap the damaged area by 20 mm.

H10 Testing of paintwork

Paint dry film thickness shall be measured using a non-destructive thickness gauge such as the "Mikrotest" or equivalent.

The Employer may subject complete paintwork to specialist inspection, the findings of such inspection being binding on the Contractor. The cost of the inspection will be borne by the Employer but the cost of any remedial work resulting from the inspection must be borne by the Contractor.

H11 Measurement and Payment

No separate payment will be made for painting and corrosion protection and the cost of this work shall be deemed to have been included in the prices tendered for the equipment.

I BRICKWORK**I1 General**

Brick work to comply with the "Specification of materials and methods to be used" as published by the Department of Public Works.

The following applicable extracts of the specification are given:

I2 Lime

Lime shall be hydrated bedding mortar lime complying with the requirements of SANS Specification 523.

I3 Cement

Cement shall be Portland cement complying with the requirements of SANS 471 or PC 15 complying with the requirements of SANS 831.

I4 Sand

Sand shall comply with the requirements of SABS Specification 1090, unless specialist advice is obtained.

I5 Works Mortar Tests

I5.1 Sampling

The frequency of sampling will be decided by the Representative / Agent. Sufficient mortar shall be taken from each of the points of lying to prepare a composite sample to make a set of three mortar cubes.

I5.2 Moulding

Cube moulds with a nominal size of 100mm, that comply with SANS 863 must be used.

Fill each mould with mortar in three equal layers and compact each layer by means of a tamper.

The tamper must be made of hard wood with a flat tamping surface with nominal dimensions of 50 x 25 mm and shaped to provide a round stem of approximately 25 mm diameter and long enough to afford sufficient hard grip. Immerse the tamper in water for 15 minutes before use.

Each layer of mortar must be compacted by means of 8 evenly spaced pressing strokes of the tamper. After the final layer has been tamped, the excess mortar must be struck off level with the top edges of the moulds.

I5.3 Curing

Cover the test cubes (in their moulds) with an impervious sheet followed by wet matting, sacks or similar material, and store them in a place free from vibration, excessive draughts and direct sunlight.

After 24 hours mark each cube so that it can be identified. After 48 hours the cubes must be removed from their moulds and placed in water in a curing tank at 22° - 25°C for a minimum period of 7 days before they are transferred to the testing laboratory. Ensure that loss of moisture is prevented during transportation and that they are well protected against damage.

I5.4 Testing of cubes

The testing of all mortar cubes will be done by the Contractor on instructions of the Engineer or by an approved laboratory in accordance with SANS STM 868.

I6 Cement Mortar

Cement mortar shall be composed of 6 parts (by volume) of sand and 1 part (by volume) of cement. The material shall be mixed dry until of uniform colour and the water added and the mixture turned over until the ingredients are thoroughly incorporated. Cement mortar shall be produced in such quantities as can be used before commencing to set as no cement mortar that has once commenced to set shall be used in any way.

Care shall be taken in mixing cement mortar to remove from the mixing machine or platform any old mortar that has already set as much mortar may not be incorporated into any new batch.

J ELECTRICAL WORK

J1 SCOPE

This specification covers the supply, delivery, installation and upholding during the Defects Liability Period of electrical equipment.

J2 EQUIPMENT SPECIFICATION

J2.1 Cables

Low voltage cables shall be for service in a 3 phase 50 cycle per second system and shall be PVC insulated, PVC sheathed, steel wire armoured, PVC covered, 660 / 1000-volt grade, complying with the requirements of SABS 150.

J2.2 Starters

Starters shall be suitable for manual as well as automatic operation and shall comply with the requirements of BS 587. For motors up to 7,5 kW the starters shall be of the direct-on-line type while for motors for more than 7,5 kW, but less than 30 kW the starters shall be of the star-delta type. Soft starters are required for motors larger than 30 kW.

Starters shall be of the air-break contactor type provided with adjustable magnetic or thermal overload trip relays with adjustable time lags in each phase, under-voltage release mechanism and protection against single phasing. The motors will not be started more than 15 times per hour.

The starters shall be provided with an isolating switch mechanically interlocked with the door of the housing, cable entry glands and an ammeter on one of the phases except in the case of starters for motors of 1 kW and lower for which ammeters are not required.

Starters may not hum or chatter in service and the contacts may not bounce on closing.

J2.3 Busbars

Control boards shall be provided with one set of solid, copper busbars in the top section extending over the entire length of the board.

Busbars shall comply with the requirements of BS 1433 and the relevant clauses of BS 159.

Busbars shall be rigidly supported at suitable intervals to prevent undue damage resulting under short circuit conditions. Ceramic or other approved busbar insulators shall be used. The busbars shall be arranged horizontally with the longer sides of the cross-sections in the vertical plane.

Busbars shall be clearly and indelibly marked red, yellow and blue for the three phases and black for neutral.

Connections to busbars shall be affected by means of cable lugs and suitably sized cadmium-plated, high tensile steel bolts and nuts with cadmium-plated cup washers or lock washers.

J2.4 Isolators

All isolators shall be of the “load-braking” and “fault making” type and shall comply with the requirements of BS 5419 where applicable.

J2.5 Fused switches

All fused switches shall be of the “load-braking” and “fault making” type complying with BS 5419 where applicable and fitted with HRC cartridge fused links to BSS 88.

J2.6 Moulded case circuit breakers

All moulded case circuit breakers shall comply with the requirements of SABS Specification 156 and shall be equal and similar to Heinemann manufacture.

These circuit breakers shall be fitted with copper terminal collector bars where more than one cable tail has to be terminated on the same terminal.

J2.7 Current transformers

All current transformers shall be of the air insulated type complying in all respects with the requirements laid down in BS 3938.

The Contractor shall carefully select the ratio, burden and accuracy class to suit its specific application in accordance with the recommendations and requirements of BS 3938.

J2.8 Indicating instruments

All indicating instruments shall comply with the requirements laid down in BS 89: Part 1 for instruments of a 2,5 Accuracy Class with exception of the kW.h meters which shall comply with BS 37: Part 4. All indicating instruments shall have 100 mm square dials.

VOLTMETERS shall be of the flush panel mounting type having a square dial approximately 100 x 100 mm and shall have a quadrant type scale. The scale shall be calibrated to suit the supply voltage. Phase selector switches shall be fitted.

AMMETERS shall be flush panel mounting type having a square dial approximately 100 x 100 mm and shall have a quadrant scale. The scale shall be calibrated to suit the equipment served. Phase selector switches shall be fitted. The meters shall be able to withstand overcurrents resulting under starting conditions and the full load current of the relevant motor shall be clearly marked in red on the face of the meter.

KILOWATT-HOUR meters shall be of the three phase 4 wire type and shall be mounted behind the panel of the distribution board with a transparent window in the front panel opposite the dial of the meter. The meter shall be of the integrating type. The current rating of the meter shall be suitable for the maximum requirements. Where a whole current type of meter is not supplied, a suitable current transformer shall be supplied with the meter.

The power factor meters shall indicate from 0,7 lagging to 0,7 leading.

The running hour meters shall have cyclometer dials indicating up to 5 digits and two decimals.

All indicating instruments shall be mounted behind and shall protrude through the front panels of the boards.

J2.9 Phase selector switch

A four-position rotary type phase selector switch shall be mounted directly below the relevant instrument, in such a way that only the selector knob and indicator plate are on the panel, and the switch itself is behind the panel.

The selector knob shall consist of bakelite, and shall have an arrow engraved on it, indicating the switch position.

The switch shall have a positively driven switching mechanism.

The indicator plate shall consist of bakelite and shall have the positions for the three phases and "OFF", engraved on it in 5 mm high lettering.

J2.10 Power factor correction capacitors and low voltage motors

Each of these capacitors shall be of the indoor switchboard mounting 50 Hz three phase self-contained type with a dead casing and shall fully comply with the requirements laid down in BS 1650.

Each capacitor unit shall be of carefully selected rating to correct the power factor of its associated motor to 0,95 lagging at full load and should not exceed a value which compensates for 85 % of the no-load magnetizing current.

The dielectric shall consist of plastic film and low-loss paper situated between aluminium foil and impregnated with a synthetic liquid agent with scavenger additive.

The capacitor losses shall not exceed 1 watt / kV.Ar.

Each of these capacitor units shall be provided with discharge resistors and a fuse for each winding element which will disconnect the affected element in event of a dielectric breakdown.

J2.11 Earth leakage protection units

The earth leakage protection units shall be rated as follows:

- (a) For motor and motor control circuits: 250 mA.
- (b) For plug circuits: 20 mA.

J2.12 Labels

All labels shall be of the laminated or screwed-on reverse engraved perspex type using stainless steel or brass screws. Labels shall be in white letters on a black background in both official languages. Small wiring shall be identified by means of a numbered ferrule of an approved type on each end of each wire.

M2.13 Level switches

Float switches shall be of the Flygt type ENH 10 mercury switches or equal.

Electronic switches shall be of the Kent LE 1 type with polypropylene electrode holder and stainless-steel electrodes.

J2.14 Control Boards

2.14.1 General

All boards shall be of dust and vermin proof construction and shall require access from the front only.

All control boards shall be subdivided into separate compartments for each incoming or outgoing circuit other than minor services and control circuits with suitable barriers and interlocking to prevent accidental access to live parts.

Unless otherwise specified in the Project Specification every control board shall provide for future connections to a single centralized indicator system for the Works as a whole.

All control boards for motors shall, for each motor served, be equipped with:

- (a) Thermal over current protection
- (b) Wiring for anti-condensation heaters
- (c) Wiring for thermistors (if specified for relevant motor)

2.14.2 Boards for installation in buildings

These boards shall be constructed of sheet metal of a minimum thickness of 2 mm with neatly machine punched slots and openings where necessary for instruments and equipment and with chromium plated brass hinges, knobs and handles as required.

2.14.3 Boards for outside erection

These boards shall be constructed of cast iron or glass fibre. Door hinges, knobs and handle shall be constructed of chromium plated brass.

The boards and doors shall be weather and waterproof.

J2.15 Electric motors

Electric motors shall be of the totally enclosed fan cooled type suitable for operation on the electric supply, at the altitude and at the ambient temperature specified in the Project Specification. Motor performance shall comply with BS 2613. The motors will not be started more than 15 times per hour and shall furthermore be rated for continuous operation at full load. Full load speed shall not be in excess of 1 500 rpm unless approved by the Engineer and the rated power shall be the nearest standard rating to the maximum power requirement of the associated equipment, but not less than 10 % in excess thereof.

Motor frames shall be of metric dimensions complying with the requirements of SABS 948 and shall be of the totally enclosed fan cooled type suitable for internal or external use, as the case may be, provided with suitable terminal boxes and glands. Insulating materials for weather and water protected dry well motors shall comply with the requirements of BS 2757 and shall be of Class E quality. Outdoor and submersible motors shall be insulated to Class F standard. Motors and terminal boxes are to be enclosed to IP 55 of SANS 948.

All motors shall be equipped with anti-condensation heaters. Bearings of motors shall be pre-lubricated sealed roller and / or ball bearings. All bearings shall be manufactured in the Republic of South Africa.

All motors with a rating of 25 kW and more shall be protected with thermistors installed in the stator windings.

All motors shall be statically and dynamically balanced to comply with the requirements of SANS 948.

Motors smaller than 3,0 kW shall be suitable for "direct-on-line" starting while motors larger than 3,0 kW shall have star-delta or soft starters. Provided starting current limitations are not exceeded and D.O.L. starting is admissible with regard to the driven load, D.O.L. starting may be used for motors up to 15 kW ratings.

The maximum starting current of these motors under locked rotor conditions with specified voltage applied to the motor terminals shall not exceed six times normal full load current.

The motors shall be suitably rated for 15 starts per hour at the specified ambient temperature and altitude.

J3**INSTALLATION**

Boards shall be installed, plumb and fixed in position.

Where boards are installed outside, all fixing bolts shall be of stainless steel.

Civil foundation for boards and motors will be provided by others to the requirements of the equipment contractor.

Fixing of equipment shall be the responsibility of the equipment contractor.

Where bolts or baseplates are to be grouted with concrete, the work shall be carried out by the civil contractor under the supervision of the equipment contractor who will remain responsible for any damage to his equipment.

J4 PAINTING AND CORROSION PROTECTION

Control boards shall be treated to SANS 064 after manufacture and shall be finished in baked enamel in the colour scheme ordered by the Engineer.

Should the board be scratched during erection, the Engineer shall have the right to order that the board be replaced.

J5 TESTING AND COMMISSIONING

J5.1 Tests at manufacturer's works

5.1.1 Control board

Each panel shall be subjected to the following tests in the manufacturer's works after manufacture:

- (a) A thorough inspection shall be carried out to ensure compliance with the Specifications and approved drawings and wiring diagrams and to ascertain that all connections are properly made.
- (b) A high voltage test on all primary connections to check the insulation between phases mutually and between each phase and earth.
- (c) The polarities and ratios of all potential and current transformers shall be checked.
- (d) Primary and secondary inspection tests shall be carried out on all switching, protection, metering, interlocking and indication circuits.

The manufacturer shall submit copies of test certificates giving details of conditions and results of tests carried out to the Engineer.

5.1.2 Electric Motors

If the motors do not carry the SABS mark, performance and efficiency tests shall be carried out to prove the guaranteed information submitted with the successful tender.

All motors shall be subjected to routine tests as prescribed in Appendix D to SANS 948.

The manufacturer shall submit to the Engineer two certified copies of the test certificates reflecting the conditions and results of the tests carried out on each motor.

J5.2 TESTS ON SITE AFTER INSTALLATION BUT PRIOR TO COMMISSIONING OF THE EQUIPMENT

5.2.1 Control board

- (a) Check all components to ensure that they are free from dust and protective packing material.
- (b) Check the operation of all components liable to damage in transit such as meters and protection relays.
- (c) The insulation of all primary circuits between phases mutually and between each phase and earth shall be measured.
- (d) All fused links shall be checked for electrical continuity.
- (e) All control supplies shall be checked.

All adjustable protection devices shall then be set and the boards and panels commissioned all in consultation with and to the instructions of the Engineer.

5.2.2 Electric Motors

- (a) Ensure that the bearings are properly lubricated.
- (b) Ensure that all power and earth connections are properly made.
- (c) Check all ventilation openings for obstruction.

- (d) Measure the insulation resistance between phases mutually and between each phase and earth to ensure that the windings are dry.
- (e) Spin the motor by briefly switching the supply on to check the correctness of the direction of rotation.
- (f) Check whether the motor runs smooth and how long it takes to accelerate up to maximum speed.
- (g) Check on the noise level the vibration and temperatures of motor and bearings.

J6 MOTOR PROTECTION SYSTEMS

J6.1 General

Unless otherwise specified protection shall be as indicated below:

TYPE OF PROTECTION	APPLICATION
Thermal Overcurrent	All motors
Magnetic Overcurrent	As short-circuit protection only when coupled to circuit-breakers
Thermistor Temperature Protection	All motors with rating excess of 25 kW
Anti-Single-Phasing	All three-phase motors with HRC fuse protection
Earth fault	Only when condensation can occur in motors e.g. standby or direct coupled cooling pump motors or outdoor motors.
Reverse Phasing	All circuits supplying centrifugal compressors or reciprocating compressors or circuits where reverse phasing can cause damage

Undervoltage	As specified.
Temperature protection mechanisms	Statormatic starters, resistor starters

J6.2 Overcurrent protection

Overcurrent protection of motors shall be provided in accordance with the requirements of BS 587. Overcurrent protection shall comprise thermal trip mechanisms or relays which are coupled to contactors, hand operated starters or circuit breakers. HRC fuses shall not be regarded as overcurrent protection.

In the cases where overcurrent protection forms an integral part of the starter, the protection shall comprise a temperature compensated bi-metal thermal element which is directly heated by separate heating elements in each phase and which is coupled in series with the load. The overcurrent protection shall be adjustable over a range of 75 % to 120 % of the full load current of the motor.

Motors subjected to frequent starting and stopping duties or to inching may be protected against overcurrent with magnetic overcurrent protection with a time delay provided the motor is suitable of this method of operation.

Magnetic overcurrent tripping devices shall not trip starting contactors but shall be coupled to circuit-breakers with suitable breaking capacities.

Adequate protection shall be provided against extended overloads, but, unnecessary tripping during starting shall be prevented. For this condition short-circuiting of the overcurrent protection, increased overcurrent settings or connection of the overcurrent protection to the delta circuit only in start-delta starters is not acceptable.

J6.3 Anti-single-phasing protection

Anti-single-phasing shall form an inherent part of the overcurrent protection unit in the case of integral motor starters.

Protection methods which rely on the overcurrent only which may occur during single-phase conditions are not acceptable.

J6.4 Short circuit protection

Refer to Project Specification for requirements of short-circuit protection.

J6.5 Thermistor protection

Thermistor protection shall be provided as specified under the Quality Specification for motors.

Thermistor control units shall where possible be integrated with the motor starter.

Thermistor protection shall not be used in lieu of overcurrent protection.

J6.6 Reverse-phasing protection

Reverse-phasing protection shall be provided as stipulated under Clause PMF-2 and on all bi-directional motors where specified.

The sensing of reverse phasing shall be done at the outgoing terminals of the motor supply.

J6.7 Combination and electronic motor protection units and relays

Motor protection units similar or equal to “GEC TYPE CTM & CTMF”, “P & B GOLDS TYPE M” or “NEWELEC TYPE MJE” may be used.

All units and relays shall be mounted in withdrawable panel-mounted enclosures.

Motor protection relays shall not be connected to current transformers used for metering purposes.

All protection relays shall be provided with test terminal blocks of the “CHAMBERLAIN & HOOKHAM” type or equal for the testing of relays, CT’s, etc.

J6.8 Control Components

The Contractor shall submit performance data on all sensing and control devices supplied and installed under this contract to the engineer for approval with his tender.

The devices shall all be suitable for operation at voltages determined by the Control System TE 380/230 V or control voltage.

Switching devices shall provide for both normally open and normally closed switching configuration for each required operation. The switching contacts shall be a silver to silver

or other approved type with a minimum continuous operating current of 6A at the chosen voltage.

Sensing and control devices shall be protected against ingress to at least IP54 to the external environment. All mounting accessories and cable entry / exit points shall be designed to retain the specified rating once equipment is installed and connected.

J7 MEASUREMENT AND PAYMENT

No separate payment will be made for electrical installations and the work shall be deemed to have been included in the rates tendered for the corresponding main equipment.

However, should cable lengths differ from those specified, the total cost for the supply and installation of extra cable length will be paid at a rate per metre length for each size of cable.

C3.6 HIV/AIDS REQUIREMENTS

C1001 SCOPE

This specification contains all requirements applicable to the Contractor for creating HIV/AIDS awareness amongst all of the Workers involved in this project for the duration of the construction period, through the following strategies:

- Raising awareness about HIV/AIDS through education and information on the nature of the disease, how it is transmitted, safe sexual behaviour, attitudes towards people affected and people living with HIV/AIDS, how to live a healthy lifestyle with HIV/AIDS, the importance of voluntary testing and counselling, the diagnosis and treatment of Sexually Transmitted Infections and the closest health Service Providers.
- Informing Workers of their rights with regard to HIV/AIDS in the workplace.
- Providing Workers with access to condoms and other awareness material that will enable them to make informed decisions about sexual practices.

C1002 DEFINITIONS AND ABBREVIATIONS

a) Definitions

Service Provider: The natural or juristic person recognised and approved by the Department of Public Works as a specialist in conducting HIV/AIDS awareness programs.

Service Provider Workshop Plan: A plan outlining the content, process and schedule of the training and education workshops, presented by a Service Provider which has been approved by the Representative/Agent.

Worker: Person in the employ of the Contractor or under the direction or supervision of the Contractor or any of his Sub-contractors, who is on site for a minimum period of 30 days in all,

b) **Abbreviations**

HIV : Human Immunodeficiency Virus

AIDS : Acquired Immune Deficiency Syndrome

STI : Sexually Transmitted Infection

C1003 BASIC METHOD REQUIREMENT

The Contractor shall, through a Service Provider, conduct onsite workshops with the Workers.

The Service Provider shall develop and compile a Service Provider Workshop Plan to be presented at the workshops and which will be best suited for this project to achieve the specified objectives with regard to HIV/AIDS awareness.

The Service Provider Workshop Plan shall be based on the following information provided by the Contractor:

- Number of Workers and Sub-contractors on site
- When new Workers or Sub-contractors will join the construction project
- Duration of Workers and Sub-contractors on site
- How the maximum number of Workers can be targeted with workshops
- How the Contractor prefers workshops to be scheduled, e.g. three hourly sessions per Worker, or one 2.5-hour workshop per Worker
- Profile of Workers, including educational level, age and gender (if available)
- Preferred time of day or month to conduct workshops
- A Gantt chart reflecting the construction programme, for scheduling of workshops

- Suitable venues for workshops

The Contractor shall submit the Service Provider Workshop Plan for approval within 14 days after the Commencement Date. After approval by the Representative/Agent, the Contractor shall make available a suitable venue that will be conducive to education and training.

The Service Provider Workshop Plan shall address, but will not be limited to the following:

- a) The nature of the disease;
- b) How it is transmitted;
- c) Safe sexual behaviour;
- d) Post exposure services such as voluntary counselling and testing (VCT) and nutritional plans for people living with HIV/AIDS;
- e) Attitudes towards other people with HIV/AIDS;
- f) Rights of the Worker in the workplace;
- g) How the Awareness Champion will be equipped prior to commencement of the HIV/AIDS awareness programme with basic HIV/AIDS information and the necessary skills to handle questions regarding the HIV/AIDS awareness programme on site sensitively and confidentially;
- h) How the Service Provider will support the Awareness Champion;
- i) Location and contact numbers of the closest clinics, VCT facilities, counselling services and referral systems;
- j) How the workshops will be presented, including frequency and duration;
- k) How the workshops will fit in with the construction programme;
- l) How the Service Provider will assess the knowledge and attitude levels of attendees to structure workshops accordingly;
- m) How the video will be used;
- n) How the Service Provider will elicit maximum participation from the Workers;
- o) A questions and answers slot (interactive session)

The Service Provider Workshop Plan shall encompass the Specific Learning Outcomes (SLO) as stipulated.

C1004 HIV/ AIDS AWARENESS EDUCATION AND TRAINING**a) Workshops**

The Contractor shall ensure that all Workers attend the workshops.

The workshops shall adequately deal with all the aspects contained in the Service Provider Workshop Plan. A video of HIV/AIDS in the construction industry, which can be obtained from all Regional Offices of the Department of Public Works, is to be screened to Workers at workshops. In order to enhance the learning experience, groups of not exceeding 25 people shall attend the interactive sessions of the workshops.

b) Recommended practice**i) Workshop Schedule**

Presenting information contained in the Service Provider Workshop Plan can be divided in as many workshop sessions as deemed practicable by the Contractor, provided that all Workers are exposed to all aspects of the workshops as outlined in the Service Provider Workshop Plan.

Breaking down the content of information to be presented to Workers into more than one workshop session however, has the added advantage that messages are reinforced over time while providing information. Workers will also have an opportunity to ask questions at a following session.

ii) Service Providers

A database of recommended Service Providers is available from all Regional Offices of the Department of Public Works.

iii) HIV/AIDS Specific Learning Outcomes and Assessment Criteria

Workers shall be exposed to workshops for a minimum duration of two-and-a-half hours.

c) Displaying of plastic laminated posters and distribution of information booklets.

The Contractor shall obtain a set of four laminated posters conveying different key messages and information booklets, which are available from all Regional Offices of the Department of Public Works.

The above-mentioned posters and information booklets have been prepared to raise awareness and to share information about HIV/AIDS and STI's.

Posters or display stands shall be displayed on site as soon as possible, but not later than 14 days after the date of site handover.

Posters shall be displayed in areas highly trafficked by Workers, including toilets, rest areas, the site office and compounds.

The posters on display must always be intact, clear and readable.

Information booklets must be distributed to all Workers as soon as possible, but not later than 14 days after site handover, or as soon as the Worker joins the site.

C1005 PROVIDING WORKERS WITH ACCESS TO CONDOMS

The Contractor shall provide and maintain condom dispensers and make both male and female condoms, complying with the requirements of SANS ISO 4074, available at all times to all Workers at readily accessible points on site, for the duration of the contract. The Contractor may obtain condom dispensers from the Department of Health and condoms may be obtained from the Local Clinic or the Department of Health.

At least one male and one female condom dispenser and a sufficient supply of condoms, all to the approval of the Representative/Agent, shall be made available on site within 14 days of site hand over. Contractors should note that arrangements to obtain condoms from the Department of Health Clinics prior to site hand over may be necessary, to ensure that condoms are available within 14 days of site handover.

Condoms shall be made available in areas highly trafficked by Workers, including toilets, the site office and compounds.

C1006 ENSURING ACCESS TO HIV/AIDS TESTING AND COUNSELLING FACILITIES AND TREATMENT OF SEXUALLY TRANSMITTED INFECTIONS (STI)

The Contractor shall provide Workers with the names of the closest Service Providers that provide HIV/AIDS testing and counselling and Clinics providing Sexually Transmitted

Infection (STI) diagnosis and treatment. Information on these Service Providers and Clinics must be displayed on a poster of a size not smaller than A1 in an area highly trafficked by Workers.

C1007 APPOINTMENT OF AN HIV/AIDS AWARENESS CHAMPION

Within 14 days of site handover the Contractor shall appoint an Awareness Champion from amongst the Workers, who speaks, reads and writes English, who speaks and understands all the local languages spoken by the Workers and who shall be on site during all stages of the construction period. The Contractor shall ensure that the Awareness Champion has been trained by the Service Provider on basic HIV/AIDS information, the support services available and the necessary skills to handle questions regarding the HIV/AIDS programme in a sensitive and confidential manner.

The Awareness Champion shall be responsible for:

- a) Liaising with the Service Provider on organising awareness workshops;
- b) Filling condom dispensers and monitoring condom distribution;
- c) Handing out information booklets;
- d) Placing and maintaining posters

C1008 MONITORING

The Contractor shall grant to the Representative/Agent reasonable access to the construction site, in order to establish that the Contractor complies with his obligations regarding HIV/AIDS awareness under this contract.

The Contractor must report problems experienced in implementing the HIV/AIDS requirements to the Representative/Agent.

C3.7 OCCUPATIONAL HEALTH AND SAFETY

D1001 GENERAL

a) **Tender Document**

This document is the pre-contract Health and Safety Specification which must be used by the Principal Contractor and Sub Contractors appointed by the Principal Contractor to compile Health and Safety Plans for this project and forms part of the tender documentation.

The Principal Contractor and Sub Contractors' particular attention is drawn to paragraph 2 of this specification whereby

"Upon award of the contract, the contractor is to assume and adopt the function and duties of the Principal Contractor as set out in the Construction Regulations 2003 No. R. 1010 promulgated 18 July 2003."

The health and safety specifications outlined herein must be taken into account and due allowance made within the pricing of appropriate items contained within the specification. Where the Tenderer is of the opinion that a requirement is missing or is not adequately specified then this shall be drawn to the Client / Client's Agent's attention during the tender period. In the absence of any direction to the contrary, the Tenderer shall as part of the tender submission, set out the details of such discrepancy together with the costs associated therewith, separately identified and included within the tender figure.

b) **Principal Contractor**

The successful Tenderer will on signing of the contract for: **REFURBISHMENT AND UPGRADE OF ORANJEVILLE WASTEWATER TREATMENT WORKS**; be required to fulfil the function and duties of the Principal Contractor as set out in the Construction Regulations 2003 No. R. 1010 promulgated 18 July 2003.

c) **Start of Construction Phase**

The construction phase shall not commence until the Principal Contractor's Health and Safety Plan was considered and approved by the Client / Client's Agent and Design Team. The Client / Client's Agent shall discuss and negotiate with the Principal Contractor the contents of the Health and Safety Plan submitted by the Principal Contractor before finally approving it for implementation.

The construction phase shall not commence until written permission is received from the Client / Client's Agent. In this respect the Client / Client's Agent may rely on the advice of the Design Team as to the adequacy and comprehensiveness of the Plan offered by the Principal Contractor.

In preparing their detailed Health and Safety Plan based on the relevant sections of this Health and safety Specifications supplied to them by the Client, Client's Agent, contractors must allow for the adoption of safe working procedures and co-ordinate and rationalize activities to avoid controllable hazards arising due to clashes of activities.

d) **Sub-Contractors, Suppliers & Designers**

The Principal Contractor shall ensure that all direct appointments in connection with this project include provisions for the compliance of his sub-contractors, suppliers and designers, etc, with the relevant provision of the Occupational Health and Safety Act (Act

85 of 1993) and its Regulations, in particular the Construction Regulations 2003 No. R. 1010 promulgated 18 July 2003.

e) **Liaison**

The Principal Contractor shall together with all his appointees, liaison with the Client / Client's Agent as required under the Regulations and agree procedures for the transfer of relevant Information in respect of designs and in connection with the preparation of the Health and Safety File.

f) **Advice**

The Tenderer shall, as part of the tender submission, indicate where advice will or may be required of the Client / Client's Agent in respect of the competence of the Tenderer's designers and the adequacy of resources allocated or to be allocated by them.

g) **Undertaking by Principal Contractor and Sub-Contractors appointed by the Principal Contractor**

The Principal Contractor as well as Sub-Contractors appointed by him / her shall undertake in writing to ensure that the provisions of the Occupational Health and Safety Act (Act 85 of 1993) and its Regulations, in particular the Construction Regulation of 2003 No. R 1010 and any amendments or re-enactments thereto are complied with. The attached Occupational Health and Safety provisions undertaking form for the Principal Contractor in Appendix 1 shall be completed and signed by the Managing Director of the company / firm awarded the tender.

h) **Client's Occupational Health and Safety Agent:**

Name: Successful Tenderer will be informed.

Address:

Tel:

Fax:

Mobile:

D1002 INFORMATION REQUIREMENTS

The contractor must provide the following information.

a) **General**

- The Principal Contractor / Sub-Contractor shall have an OHS Policy in accordance with the OHS (Occupational Health and Safety Act, Act 85 of 1993) and include a copy of the Policy in the Health and Safety Plan to be submitted by the Principal Contractor / Sub-Contractor.
- The Principal Contractor / Sub-Contractor shall promptly display a copy of the Company's OHS Policy on the OHS Notice Board for the duration of the contract and include it into information provided to persons at the contract OHS induction.
- The Principal Contractor shall develop a Contract specific OHS Management Commitment Statement based on the Company's OHS Policy.
- The Principal Contractor's Managing Director shall sign the Commitment Statement and prominently display a copy on the OHS Notice Board for the duration of the contract. A copy of the Commitment Statement shall be included in information provided to persons at the Contract OHS induction and a copy shall also be supplied to each sub-contractor.

b) **Management**

- Details of the personnel and management systems to be put in place to prepare, manage, implement, conduct and monitor the Health and Safety Plan for the project. Broadly speaking your:
 - Organisation's internal structure that establishes SHE (Safety, Health and Environmental) ROLES, RESPONSIBILITIES, ACCOUNTABILITIES, and REPORTING RELATIONSHIPS,
 - SHE (Safety, Health and Environmental) PLANS, POLICIES, PROCEDURES, DIRECTIVES and STANDARDS that provide instructions as to how activities and functions are to be carried out,
 - SHE (Safety, Health and Environmental) CONTROLS, INSPECTIONS, REVIEWS, etc. built into construction operations to ensure that performance is consistent with SHE (Safety, Health and Environmental) objectives and requirements,
 - SHE (Safety, Health and Environmental) COMMUNICATION MECHANISMS for collecting, handling and reporting information.

In other words, Management Systems that specifies WHO is going to do WHAT, WHERE, WHEN, Why and HOW.

- Details of relevant qualifications and experience held by the persons nominated above, including recent health and safety education and training undertaken.

- Procedures for determining the competence of contractors engaged on the project, whether employed by the contractor directly or by others, to fulfil their duties under the Construction Regulations 2003 (No. R. 1010 Promulgated 18 July 2003).

c) **Hazard Identification, Risk Assessment and control**

- The Principal Contractor / Sub-Contractor shall detail and implement procedures that will identify hazards, assess risks and determine suitable control measures as they arise throughout term of the contract. These procedures shall both comply with and be implemented and managed in accordance with the specification.
- The Principal Contractor / Sub-Contractor shall detail and implement procedures that ensure control measures are evaluated for effectiveness and modified as necessary. The evaluation procedure shall detail the responsibilities, timelines and records that will be kept as part of the process.
- Where Risk is controlled through administrative control measures, the Principal Contractor / Sub-Contractor shall ensure that the administrative measures are:
 - Clearly documented and those personnel responsible for implementation and management are explicitly defined;
 - Understood by all relevant personnel through training and assessment;
 - Implemented as documented and promptly reviewed for effectiveness following initial implementation;
 - Amended and authorized as required;
 - Adequately supervised, managed and audited to ensure continuing compliance;
 - Available at all times wherever the measures are being implemented.
 - Any piece of plant or equipment not complying with the specification shall cease operation until the Principal Contractor / Sub-Contractor can demonstrate to the satisfaction of the Client / Client's Agent that the piece of non-conforming plant or equipment conforms to these requirements.

d) **Health and Safety Plan**

The Principal Contractor / Sub-Contractor shall develop a Health & Safety Plan to reflect variations in design or changes in site conditions and liaise with the Client /Client's Agent.

The Principal Contractor shall develop this Health and Safety Plan so that it:

- Incorporates the contractor's approach to managing the construction work to ensure the health and safety of all persons carrying out the construction work and all persons who may be affected by their work.
- Includes the risk assessments prepared by all Contractors under their duties set out in the Construction Regulations 2003 and any other relevant legislation (i.e. the OHS Act and Regulations, etc).
- Includes the arrangements for ensuring that, where appropriate or specifically requested, all Contractors / Sub-Contractors prepare suitable and sufficient method statements for their construction works which incorporate adequate measures for ensuring the health and safety of all persons who may be affected by these works.
- Incorporates the common arrangements for site safety, statutory notices and registers etc.
- Includes the site rules to be adopted for controlling the risks to health and safety during the construction phase(s) or the project.
- Includes reasonable arrangements for monitoring compliance with health and safety legislation and site rules.
- Includes reasonable measures to ensure co-operation between all Contractors and Sub-Contractors in respect of health and safety provisions and prohibitions.
- Includes the steps to be taken to ensure that only authorised persons are allowed into any premises or parts of the site / premises where construction work is being carried out.
- Includes arrangements for emergency procedures.
- Includes arrangements for ensuring that, so far as is reasonably practicable, every Contractor and Sub-Contractor is provided with comprehensible information about the risks to health and safety of that Contractor / Sub-Contractor, or of any employees or other persons under their control, arising out of the construction works, including the emergency procedures
- Includes details of the arrangements for ensuring, so far as is reasonably practicable, that the employees or other persons under the control of any Contractor / Sub-Contractor, and any visitors to the site, receive adequate information about the risks to their health and safety arising out of the construction works and, where necessary, adequate training to carry out their work in a safe and healthy manner.

- Includes arrangements for providing all persons at work on the site and visitors to the site with the opportunity and means of discussing and offering advice on health and safety issues relating to the construction works.
- Includes arrangements for the reporting of any accidents, injuries or dangerous occurrences, including conforming to the statutory requirements.
- Can be modified as the work proceeds to take account of any information received from Contactors / Sub-Contractors, any experience gained during the course of the project or any changes necessary as a result of unforeseen circumstances or alterations to the design.

e) **Programme**

A time estimate required by the contractor to implement the Health & Safety Plan sufficiently for works to commence on site.

f) **Cost**

A detailed breakdown of costs allowed in the contractor's tender for preparing, managing, implementing and monitoring the Health and Safety Plan, and for complying with the requirements imposed on the Principal Contractors under the Construction Regulations of 2003(No. R. 1010 Promulgated 18 July 2003).

D1003 GENERAL SITE SAFETY

a) **Safety training & education**

The Principal Contractor shall detail the OHS competencies and training received by its contract management personnel.

The Principal Contractor's Health and Safety Plan shall have a detailed register of the skills and competencies for all personnel for the activities that the personnel will undertake under the contract. (E.g. Mobile plant operators, crane operators etc.)

The Principal Contractor shall demonstrate and maintain documentary evidence of competencies on site for the duration of the contract.

b) **Induction Training**

The Principal Contractor / Sub-Contractor shall develop and detail a Site Induction Training Programme as part of the Occupational Health and Safety Plan to be submitted to the Client / Client's Agent prior to commencement of construction that includes as a minimum:

- i) Training related to hazards likely to be encountered on Site and control measures that have been developed in response to these hazards;
- ii) Roles and Responsibilities;
- iii) The requirements of the Health and Safety Plan submitted and approved;
- iv) Address the identified issues in the Fire Safety, Emergency, Evacuation and Rescue Plan to ensure that all Site personnel are aware of procedures in the event of an incident or emergency occurring;

The Principal Contractor / Sub-Contractor shall evaluate all persons undertaking the site Induction Training through a written test to ensure that inductees have an understanding of the OHS (Occupational Health and Safety) requirements for the contract. The written tests shall be signed and dated by the person undertaking the induction training to attest to their understanding and be retained by the Principal Contractor / Sub-Contractor as a record that the training has been completed.

c) **Induction training for specified work**

The Principal Contractor/Sub-Contractor shall conduct Site Specific Occupational Health and Safety Induction Training for all personnel, the Client/Client's Agent and all visitors not escorted on Site by inducted persons.

The Principal Contractor / Sub-Contractor shall evaluate all persons undertaking the Site Induction Training through a written test to ensure that inductees have an understanding of the OHS (Occupational Health and Safety) requirements for the contract. The written tests shall be signed and dated by the person undertaking the induction training to attest to their understanding and be retained by the Principal Contractor / Sub-Contractor as a record that the training has been completed.

d) **Recording & reporting of injuries**

Make arrangements for all contractors to report accidents, ill health and dangerous occurrences notifiable to the Department of Labour under Section 24 of the OHS Act (Occupational Health and Safety Act, Act 85 of 1993) (Reporting to DOL (Department of Labour) Inspector regarding certain incidents).

All lost time incidents associated with the contract works or reportable as defined by Section 24 of the OHS Act shall be immediately reported to the Client / Client's Agent.

The Principal Contractor / Sub-Contractor shall provide a detailed report of all accidents / incidents, including events that could have become lost time incidents were it not for fortuitous circumstances to the Client / Client's Agent within 5 days of the incident occurring. The Principal Contractor / Sub-Contractor shall provide copies of all reports and information associated with the incidents to the Client / Client's Agent. Copies of reports must be placed on the Health and Safety File.

Where the Principal Contractor / Sub-Contractor has been:

- Served with a prohibition, contravention or improvement notice under the OHS Act; or
- Required to comply with any order issued by an inspector for the Department of Labour;

The Principal Contractor / Sub-Contractor shall immediately supply a copy of that notice, order or notification to the Client / Client's Agent.

Where the Principal Contractor / Sub-Contractor have been served with a summons or is convicted of any offence in relation to occupational health and safety, the Principal Contractor / Sub Contractor shall immediately supply a copy of that summons to the Client / Client's Agent.

The Principal Contractor / Sub-Contractor shall detail the reporting and investigation procedures for incident investigation. The procedures shall include the investigating officer responsible and the time limits imposed for reporting and investigating the incident and to implement corrective action in a timely manner so as to prevent a recurrence.

The client / Client's Agent may participate in or undertake an investigation into the incident, injury or illness at its discretion and the Principal Contractor / Sub-Contractor shall cooperate with and provide assistance to the investigation organised and undertaken by the Client / Client's Agent.

e) **First Aid**

Establish and implement a first-aid programme to provide emergency treatment to victims of accidents, chemical substances or excessive exposure to toxic substances.

The programme shall include:

- proper first aid facilities administered by qualified personnel,
- first-aid boxes,
- first-aid room, where there are 500 or more workers on site,

- training and re-training of first-aiders,
- first-aid treatment procedures,
- standard procedures,
- special procedures, e.g. for poisoning,
- maintenance of first-aid facilities

All first-aid provisions shall comply with the OHS Act (Act 85 of 1993)

f) **Fire protection and prevention**

- Appropriate measures must be taken to avoid the risk of fire.
- Sufficient and suitable storage must be provided for flammable liquids, solids and gases.
- Smoking must be prohibited and notices in this regard must be prominently displayed in all places containing readily combustible or flammable materials;
- Combustible materials must not accumulate on the construction site.
- Welding, flame cutting and other hot work may only be done after the appropriate precautions have been taken to reduce the risk of fire.
- Suitable and sufficient fire-extinguishing equipment must be placed at strategic locations and such equipment must be maintained in good working order
- A sufficient number of workers must be trained in the use of fire-extinguishing equipment.

g) **Site Emergency Procedures**

The Principal Contractor/Sub-Contractor shall establish an Emergency Evacuation and Rescue plan.

The plan shall include the following detail:

- The role and responsibility of every individual in the work area on fire safety emergency evacuation and rescue;
- General work area precautions, fire prevention, detection, protection and warning alarm systems;
- Fire fighting and rescue equipment including types of fire extinguishers;
- Fire safety measures for Site accommodation;

- Escape and communication;
- Fire brigade access, facilities and coordination;
- Fire drills and training including the use of fire fighting equipment;
- Material storage including flammable liquids, gasses and waste;

The Principal Contractor / Sub-Contractor shall ensure that all procedures, precautionary measures and safety standards stipulated in the Plan are communicated, implemented and complied with by all workers including other interfacing contractors on Site.

The Principal Contractor / Sub-Contractor shall practise their emergency preparedness within six (6) weeks of the commencement of work and at least four (4) monthly intervals thereafter.

The Principal Contractor / Sub-Contractor shall review and ensure the adequacy of the Plan as the work progress.

The Principal Contractor / Sub-Contractor shall conduct monthly checks on fire fighting equipment and test alarms and detection devices installed on Site and document findings in a register which shall be on site at all times for inspection.

The Principal Contractor / Sub-Contractor shall conduct weekly inspections of escape routes, fire brigade access, fire fighting facilities and working areas to ensure that the requirements stipulated in the Fire Safety, Emergency, Evacuation and Rescue Plan are complied with. All inspection records shall be documented in registers and kept in the Health and Safety file for inspection at any time.

h) Housekeeping

Suitable housekeeping must continuously be implemented on the construction site, including:

- proper storage of materials and equipment
- removal of scrap, waste and debris at appropriate intervals;

Loose materials shall not be placed or allowed to accumulate on the site so as to obstruct access and egress from workplaces and passageways.

i) Stacking & Storage

- Adequate storage areas are must be provided.

- Storage areas must be kept neat and under control.

j) **Illumination**

Provide adequate artificial lighting when work is carried out after dark or inside buildings.

k) **Sanitation / Hygiene**

Provision of site hygiene facilities:

- One sanitary facility for every 30 workers.
- Adequate washing facilities.
- One shower facility for every 15 workers;

Drying sheds, huts, rooms or other accommodation for sheltering during bad weather, storing clothes and taking meals. Facilities should include tables and chairs, suitable means for boiling water and a supply of wholesome drinking water.

The contractor shall provide reasonable and suitable living accommodation for the workers at construction sites which are remote from their homes and where adequate transportation between the site and their homes, or other suitable living accommodation, is not available.

l) **Personal Protective Equipment**

The Principal Contractor / Sub-Contractor shall provide and maintain suitable PPE (Personal Protective Equipment) for all employees employed on the Site.

The Principal Contractor / Sub-Contractor shall ensure that such PPE comply with the requirements of the OHS Act (Occupational Health and Safety Act, Act 85 of 1993).

The Principal Contractor / Sub-Contractor shall also ensure that all equipment is properly used by his / her employees during the course of their work.

The Principal Contractor / Sub-Contractor shall record all issues of all equipment to his / her employees in documented registers and such registers shall be kept in the Health and Safety File on site and made available for inspection at all times.

The Principal Contractor / Sub-Contractor shall provide the Client / Client's Agent with a colour code by which employees will be identified with regard to occupations, responsibilities, accountabilities, reporting relationships and access to different locations on site. (e.g. hard hats, overalls).

PPE shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards.

All personal protective equipment shall be of safe design and construction for the work to be performed.

m) **Permit to work requirements**

Institute a "hot work" permit system in respect of:

- metalwork flame cutting,
- site welding.

n) **Lock-out**

Institute a "Lock-out" procedure in respect of controlling energy so as to prevent unexpected operation or activation of machinery or equipment. This procedure must include a written policy, specific procedures, rules and supervisory follow-up, covering the positive locking of switches and valves to ensure that alterations, maintenance, set-up and or other work can be performed safely.

o) **Monthly Health and Safety Audits**

The Principal Contractor shall carry out monthly Health and Safety Audits on the measures contained within his / her Health and Safety Plan submitted to the Client / Client's Agent as well as Health and Safety Plans submitted by Sub-Contractors appointed by the Principal Contractor to demonstrate that the required level of health and safety are being achieved and maintained and compile a full report to the Client / Client's Agent on such audit.

The Client / Client's Agent will audit the Principal Contractor as well as his / her Sub-contractor's Health and Safety Plans from time to time and will advise the Principal Contractor of any matter with which he / she is not satisfied and the Principal Contractor shall take such steps as are necessary to satisfy the Client / Client's Agent.

The Client / Client's Agent will carry out such audits as he / she considers necessary but not less than monthly.

The Principal Contractor shall make available, specialist personnel as the Client / Client's Agent may consider necessary for the performance of such audits.

The Principal Contractor shall develop and maintain an Audit Schedule that details the audits planned to be undertaken by the Principal Contractor of the work under the contract, including sub-contractors, for the duration of the contract. The Audit Schedule shall form part of the Health and Safety Plan that needs to be submitted by the Principal Contractor.

Audit reports shall detail the scope of the audit, the audit questions and the audit findings.

The Client / Client's Agent shall be promptly provided with copies of all audit reports together with other documentation to show that all matters raised have been appropriately addressed.

Unless otherwise directed by the Client / Client's Agent the Principal Contractor / Sub-Contractor shall undertake its initial OHS Audit within 4 weeks of commencement of work. The Principal Contractor / Sub-Contractor shall undertake subsequent OHS Audits at a frequency not less than once every 3 months.

All Principal Contractor's OHS Audits shall include an assessment of Sub-Contractor compliance with the approved OHS Plan.

p) Management Review

The Principal Contractor shall undertake an independent review of the Health and Safety Plan for the contract in accordance with the requirements of the OHS Act, relevant Regulations and in particular the Construction Regulations 2003.

A review shall be undertaken 3 months after commencement of the contract and every 6 months thereafter for the duration of the contract.

Following the completion of the review, the Principal Contractor shall submit a written report that details the suitability, adequacy and effectiveness of the OHS Plan and to certify that the Site procedures, practises and operations are in accordance with the contract.

q) Provision of Information

- Provide Sub-Contractors appointed by him / her with the relevant sections of the Health and Safety specifications pertaining to the construction work which has to be performed.
- Where changes are brought to the design and construction, provide sufficient information and appropriate resources to the Sub-Contractor to execute the work safely.
- Discuss and negotiate with Sub-Contractors the contents of the Health and Safety Plan / Plans submitted by them and finally approve such plans for implementation.
- Ensure that copies of Health and Safety plans compiled by the Principal Contractor and his / her Sub-Contractors are available on request to an employee, DOL Inspector, contractor, Client / Client's Agent.
- The Principal Contractor / Sub-Contractor shall detail procedures that will ensure that personnel are suitably consulted and communicated with during the planning and application of work activities associated with the contract.

- The Principal Contractor / Sub-Contractor shall detail the procedures for the identification, assessment and control of hazards associated with the day-to-day work activities. These procedures shall include requirements for consultation with personnel involved in the work activity.
- The Principal Contractor / Sub-Contractor shall have procedures for ensuring that OHS information is communicated to and from its personnel. The Principal Contractor / Sub-Contractor shall hold OHS meetings with all personnel or their representatives at the site on a weekly basis.
- Minutes shall be recorded for all OHS meetings and posted on OHS notice boards within 48 hours of the meeting.
- The Principal Contractor / Sub-Contractor shall maintain at the Site an OHS Notice Board located in a prominent position and accessible to all personnel, for the distribution of OHS information.
- The Principal Contractor / Sub-Contractor shall as a minimum, establish and implement procedures for reporting relevant and timely information with regard to OHS Performance and incidents.
- The Principal Contractor / Sub-Contractor shall establish, implement and maintain a controlled copy of all Contract OHS documentation on Site.
- Where the Principal Contractor / Sub-Contractor's Health and Safety Plan references other documentation including the contract, the Principal Contractor / Sub-Contractor shall ensure that section and clause numbers are clearly denoted in its Health and Safety Plan. All documentation referenced in the Health and Safety Plan shall be available on Site for the duration of the contract.
- Ensure that Health and Safety Files kept by Sub-Contractors appointed by the Principal Contractor is kept on site and made available to an inspector, Client / Client's Agent.
- Hand over a consolidated health and safety file to the Client / Client's Agent upon completion of construction work, including all drawings, designs, materials used and other similar information concerning the completed structure.
- In addition to the Health and Safety File compile a comprehensive and updated list of all contractors on site accountable to the Principal Contractor as well as the agreements between the parties and the type of work done by them.

r) **Stop the execution of Construction Work**

Stop any construction / construction related work conducted by any person on the construction site, which is not in accordance with the Principal Contractor's health and safety plan and or the health and safety plans of Sub-Contractors which possess a threat to the health and or safety of persons.

s) **Handing over of Project Health and Safety file**

- Hand over a consolidated health and safety file to the Client / Client's Agent upon completion of construction work, including all drawings, designs, materials used and other similar information concerning the completed structure.
- In addition to the Health and Safety File compile and hand over a comprehensive and updated list of all contractors on site accountable to the Principal Contractor as well as the agreements between the parties and the type of work done by them.

t) **Records and Records Management**

- The control of records shall be in accordance with the Principal Contractor's / Sub-Contractor's approved Health and Safety Plan for the contract.
- Records shall be registered, ordered and retained on Site in the Health and Safety File for the duration of the contract.

D1004 CHEMICAL HAZARDS

The following construction materials and substances to be used in the works have been identified as potentially posing special health and/or safety hazards during the project:

a) **Substances**

- Asphalt
- Bitumen
- RTH Tar prime
- Synthetic Polymer (Polyester / Polypropylene / Polyethylene)
- Stabilising agents
- Anionic stable grade emulsion
- Rubber
- Bitumen Rubber mix
- Hydrophilic aggregates
- Cationic emulsion
- Proprietary chemical additive
- Styrene

- Butadiene rubber (SBR latex)
- Cleaning agent
- Paint
- Oxygen
- Acetylene
- Diesel
- Petrol
- Weed killer

b) **Material**

- Cement
- Lime
- Mud rock
- Shale
- Clay
- Synthetic fibre filter fabric
- Geo-textile (synthetic polymer)
- Crushed aggregate
- Weathered dolerite gravel
- Fine slurry
- Crusher dust
- Paving blocks

Adhesives / solvents which may make personnel ill by breathing in vapours, irritation if in contact with skin and eyes and can be highly flammable.

Cement can cause ill health by:

- Skin contact, cement burns and dermatitis.
 - Eye contact, irritation and inflammation.
 - Inhalation of dust, irritation to nose and throat and causes difficulty with breathing.
- Oil based paint can cause illness by breathing in vapours.

Silicone sealant with fungicide can cause skin irritation.

Timber preservative / flame retardant which can cause irritation to the skin, eyes, nose and throat and harmful if ingested.

Paving slabs which may contain silica can, when cut, create dust which may affect the lungs.

Chemical cleaners can cause ill health mainly by:

- Skin contact, acids and alkalis are highly corrosive and destructive to body tissue causing burns.
- Inhaling fumes or mist, concentrated solutions of acids and alkalis emit toxic and corrosive fumes.

All materials contained within aerosol containers which are pressurised. Contractors are required to take appropriate measures to manage the risks arising and to provide details of their proposed measures within their tenders and to incorporate adequate method statements within the Health and Safety Plan.

This is not a definitive list of all potential harmful products. Other materials and substances commonly used during construction may also present health or safety hazards, however, it is deemed that these should be familiar to the average competent Contractor as part of routine risk and OHS (Occupational Health, Safety and Hygiene) assessments and are therefore not included here.

Adopt all precautionary measures provided by manufacturers for storage, use and application of specified materials.

Data sheets for these, and any other materials that will be used for the works, are to be obtained by the contractor from the manufacturers.

D1005 SAFETY HAZARDS

a) Tools

i) Hand tools

- Employers shall not issue or permit the use of unsafe hand tools.
- Wrenches, including adjustable, pipe, end, and socket wrenches shall not be used when jaws are sprung to the point that slippage occurs.
- Impact tools, such as drift pins, wedges, and chisels, shall be kept free of mushroomed heads.
- The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tool.

ii) *Portable electrical Tools*

No person shall use a portable electric tool with an operating voltage which exceeds 50 V to earth unless –

- it is connected to a source of electrical energy incorporating an earth leakage protection device which meets the requirements of section 36 of the OHS Act or,
- it is connected to a source of high frequency electrical energy derived from a generator which is used solely for supplying energy to such portable electric tool and which arrangement is approved by the chief inspector; or
- it is clearly marked that it is constructed with double or reinforced insulation.

Portable electric tools, together with its flexible cord and plug shall be maintained in a serviceable condition.

D1006 EXCAVATIONS

- The contractor shall ensure that all excavation work is carried out under the supervision of a competent person who has been appointed in writing.
- The contractor shall evaluate the stability of the ground before excavation work begins.
- The Contractor shall take suitable and sufficient steps in order to prevent any person from being buried or trapped by a fall or dislodgement of material in an excavation;
- The contractor shall not permit any person to work in an excavation which has not been adequately shored or braced.
- Shoring and bracing may not be necessary where:
 - the sides of the excavation are sloped to at least the maximum angle of repose measured relative to the horizontal plane; or
 - such an excavation is in stable material:
 - Provided that-
 - permission being given in writing by the appointed competent person upon evaluation by him or her of the site conditions; and
 - where any uncertainty pertaining to the stability of the soil still exists, the decision from a professional engineer or a professional technologist competent in excavations shall be decisive and such a decision shall

be noted in writing and signed by both the competent person and a professional engineer or technologist, as the case may be;

- Take steps to ensure that the shoring or bracing is designed and constructed in such a manner rendering it strong enough to support the sides of the excavation in question;
- Ensure that no load, material, plant or equipment is placed or moved near the edge of any excavation where it is likely to cause its collapse and thereby endangering the safety of, any person, unless precautions such as the provision of sufficient and suitable shoring or bracing are taken to prevent the sides from collapsing;
- Cause convenient and safe means of access to be provided to every excavation in which persons are required to work and such access shall not be further than 6m from the point where any worker within the excavation is working;
- Cause every excavation, including all bracing and shoring, to be inspected-
 - daily, prior to each shift;
 - after every blasting operation;
 - after an unexpected fall of ground;
 - after substantial damage to supports; and
 - after rain,

by a competent person in order to pronounce the safety of the excavation to ensure the safety of persons, and those results are to be recorded in a register kept on site and made available to an inspector, client, client's agent, contractor or employee upon request;

- Cause every excavation which is accessible to the public or which is adjacent to public roads or thoroughfares, or whereby the safety of persons may be endangered, to be-
- adequately protected by a barrier or fence of at least one meter in height and as close to the excavation as is practicable; and
- provided with warning illuminants or any other clearly visible boundary indicators at night or when visibility is poor
- Cause warning signs to be positioned next to an excavation within which persons are working or carrying out inspections or tests.

D1007 FORMWORK & SUPPORT WORK

The contractor shall ensure that-

- all formwork and support work operations are carried out under the supervision of a competent person who has been appointed in writing for that purpose;
- all formwork and support work structures, are adequately designed, erected, supported, braced and maintained so that they will be capable of supporting all anticipated vertical and lateral loads that may be applied to them and also that no loads are imposed onto the structure that the structure is not designed to withstand.
- The designs of formwork and support work structures are done with close reference to the structural design drawings and where any uncertainty exists, the structural designer should be consulted.
- All drawing pertaining to the design of formwork or support work structures are kept on the site and are available on request by an inspector, contractor, client, client's agent or employee.
- All equipment used in the formwork or support work structure are carefully examined and checked for suitability by a competent person, before being used.
- All formwork and support work structures are inspected by a competent person immediately before, during and after the placement of concrete or any other imposed load and thereafter on a daily basis until the formwork and support work structure has been removed and the results have been recorded in a register and made available on site.
- If, after erection, any formwork and support work structure is found to be damaged or weakened to such a degree that its integrity is affected, it shall be safely removed or reinforced immediately.
- Adequate precautionary measures are taken in order to-
 - Secure any deck panels against displacement, and
 - Prevent any person from slipping on support work or formwork due to the application of formwork or support work release agents.
- The health of any person is not affected through the use of solvents or oils or any other similar substances.
- Upon casting concrete, the support work or formwork structure should be left in place until the concrete has acquired sufficient strength to support safely, not only its own weight but also any imposed loads and not removed until authorisation has been given by a competent person.

- Provision is made for safe access by means of secure ladders or staircases for all work to be carried out above the foundation bearing level.
- All employees required to erect, move or dismantle formwork and support work structures are provided with adequate training and instruction to perform these operations safely
- The foundation conditions are suitable to withstand the weight caused by the formwork and support work structure and any imposed loads, such that the formwork and support work structure are stable.

D1008 CONSTRUCTION VEHICLES

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

- are of an acceptable design and construction;
- are maintained in a good working order;
- are used in accordance with their design and the intention for which they were designed, having due regard to safety and health;
- are operated by workers who-
 - have received appropriate training and been certified competent and been authorised to operate such machinery; and
 - are physically and psychologically fit to operate such construction vehicles and mobile plant by being in possession of a medical certificate of fitness;
- have safe and suitable means of access;
- are properly organised and controlled by providing adequate signalling or other control arrangements to guard against the dangers. relating to the movement of vehicles and plant, in order to ensure their continued safe operation;
- are prevented from falling into excavations, water or any other area lower than the working surface by installing adequate edge protection, which may include guardrails and crash barriers;
- where appropriate, are fitted with structures designed to protect the operator from falling material or from being crushed should the vehicle or mobile plant overturn;
- are equipped with an electrically operated acoustic signalling device and a reversing alarm;

- are on a daily basis inspected prior to use, by a competent person who has been appointed in writing and the findings of such inspection is recorded in a register.

The contractor shall furthermore ensure that-

- no person rides or be required or permitted to ride on any construction vehicle or mobile plant otherwise than in a safe place provided thereon for that purpose;
- every construction site is organised in such a way that pedestrians and vehicles can move safely and without risks to health;
- the traffic routes are suitable for the persons using them, sufficient in number, in suitable positions and of sufficient size;
- every traffic route is, where necessary indicated by suitable signs.
- all construction vehicles and mobile plant left unattended at night, adjacent to a freeway in normal use or adjacent to construction areas where work is in progress, shall have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, in order to identify the location of the vehicles or plant;
- bulldozers, scrapers, loaders, and other similar mobile plant are, when being repaired or when not in use, fully lowered or blocked with controls in a neutral position, motors stopped and brakes set;
- whenever visibility conditions warrant additional lighting, all mobile plant are equipped with at least two headlights and two taillights when in operation;
- tools and material are secured in order to prevent movement when transported in the same compartment with employees;
- vehicles used to transport employees have seats firmly secured and adequate for the number of employees to be carried; and
- when workers are working on or adjacent to public roads, reflective indicators are provided and worn by the workers.

D1009 ELECTRICAL INSTALLATIONS

- Before construction commences and during the progress thereof, adequate steps must be taken to ascertain the 'presence of and guard against danger to workers from any electrical cable or apparatus.
- All parts of electrical installations and machinery must be of adequate strength to withstand the working conditions on construction sites;

- In working areas where the exact location of underground electric power lines is unknown, employees using jackhammers, shovels or other hand tools which may make contact with a power line, must be provided with insulated protective gloves or otherwise that the handle of the tool being used is insulated;
- All temporary electrical installations must be inspected at least once a week and electrical machinery on a daily basis before use on a construction site by competent persons and the records of these inspections must be recorded in a register to be kept on site.
- The control of all temporary electrical installations on the construction site must be designated to a competent person who has been appointed in writing.

D1010 USE & STORAGE OF FLAMMABLE LIQUIDS

- Where flammable liquids are being used, applied or stored it must be done in such a manner that would cause no fire or explosion hazard, and that the workplace is effectively ventilated:

Provided that where the workplace cannot effectively be ventilated-

- every employee involved is provided with a respirator, mask or breathing apparatus of a type approved by the chief inspector, and
- steps are taken to ensure that every such employee, while using or applying flammable liquid, uses the apparatus supplied to him or her;
- No person smokes in any place in which flammable liquid is used or stored, and the contractor shall affix a suitable and conspicuous notice at all entrances to any such areas prohibiting such smoking;
- Flammable liquids on a construction site is stored in a well-ventilated reasonably fire-resistant container, cage or room and kept locked with proper access control measures in place;
- An adequate amount of efficient fire-fighting equipment is installed in suitable locations around the flammable liquids store with the recognized symbolic signs;
- Only the quantity of flammable liquid needed for work on one day is to be taken out of the store for use;
- All containers holding flammable liquids are kept tightly closed when not in actual use and, after their contents have been used up, to be removed from the construction site and safely disposed of;

- Where flammable liquids are decanted, the metal containers are bonded or earthed;
- No flammable material such as cotton waste, paper, cleaning rags or similar material is stored together with flammable liquids.

D1011 DISPOSAL OF MATERIALS

See – Environmental Management Plan – Tender Document

D1012 WELDING & CUTTING

No contractor shall require or permit welding or flame cutting operations to be undertaken, unless –

- the person operating the equipment has been fully instructed in the safe operation and use of such equipment and in the hazards, which may arise from its use;
- effective protection is provided and used for the eyes and respiratory system and, where necessary, for the face, hands, feet, legs, body and clothing of persons performing such operations, as well as against heat, incandescent or flying particles or dangerous radiation;
- leads and electrode holders are effectively insulated; and
- the workplace is effectively partitioned off and where not practicable all other persons exposed to the hazards are warned and provided with suitable protective equipment.
- No contractor shall require or permit electric welding to be undertaken in wet or damp places, inside metal vessels or in contact with large masses of metal, unless –
- the insulation of the electrical leads is in a sound condition;
- the electrode holder is completely insulated to prevent accidental contact with current-carrying parts;
- the welder is completely insulated by means of boots, gloves or rubber mats; and
- at least one other person who has been properly instructed to assist the welder in case of an emergency is and remains in attendance during operations

No contractor shall require or permit welding, flame cutting, grinding, soldering or similar work to be undertaken in respect of any tube, tank, drum, vessel or similar object or container where such object or container –

- is completely closed, unless a rise in internal pressure cannot render it dangerous; or
- contains any substance which, under the action of heat, may –
 - ignite or explode; or
 - react to form dangerous or poisonous substances,

Where hot work involving welding, cutting, brazing or soldering operations is carried out at places, other than workplaces which have been specifically designated and equipped for such work, the employer shall take steps to ensure that proper and adequate fire precautions are taken.

D1013 BLASTING & USE OF EXPLOSIVES

a) Safety distances

The contractor shall –

- apply the safety distances for the respective categories of explosives as stipulated in Annexure 1 of the Explosives regulations;
- where less than five kilograms of explosives is used, apply to the chief inspector of occupational health and safety for a determination of a safety distance which the employer shall enforce;

b) Supervision of explosives

In order to ensure that the provisions of the Act and its regulations in relation to explosives workplaces are complied with, the contractor shall in writing appoint a competent and certificated person in a full-time capacity to be explosives manager in respect of every workplace where explosives are being used, tested, stored or manufactured:

The contractor shall appoint one or more persons, who are suitably qualified and experienced, as authorized supervisors to assist the explosives manager.

The contractor shall ensure that –

- the explosives manager
 - approves in writing the rules, methods, materials, equipment and tools to be used in the danger area;

- ensures that all persons under his or her control are informed of the hazards related to their tasks and are thoroughly trained in safe work procedures, in particular with respect to shock, friction risk of fire, or static electricity, and are familiar with the requirements of the Explosives regulations
 - prescribes all protective clothing and equipment to be used in the danger area
 - ensures that the processes and equipment specified in schedule licences are safe and appropriate for the manufacturing processes envisaged for the workplace.
- the supervising official
 - is at all times in a position to exercise control over the operations
 - reports without delay to the explosive's manager any plant or equipment under his or her control that has or may have posed a risk:
 - ensures that all rules implemented in the interest of health and safety are at all times complied with;
 - stops all work involving explosives if he or she becomes aware of any risk posed to the health and safety of persons.

c) **Safe handling of explosives**

The contractor shall ensure that –

- all explosives or ingredients thereof are at all times free of foreign material;
- all reasonable precautions are taken to prevent the spillage of explosives;
- cleaning procedures in the case of a spillage of explosives are prescribed in writing by the explosive's manager: Provided that where no cleaning procedures have been prescribed any unusual spillage of explosives shall be reported immediately to the supervising official:
- all waste, paper, timber, rags, cotton and similar materials that have been in contact with explosives or an ingredient of an explosive are disposed of in a manner prescribed in writing by the explosives manager: Provided that at the end of the working day all waste and floor sweepings from danger areas shall be deposited in the designated places;
- the explosives or partly mixed explosives are conveyed as soon and as carefully as possible and taking such precautions and in such a manner as will effectively guard against any accidental ignition or explosion

- only containers provided for the conveyance of explosives are used for transporting explosives or partly mixed explosives and that such containers are at all times kept clean, free from grit and in a good state of repair;
- vehicles containing explosives are left unattended only in designated places

The contractor shall ensure that –

- all material, equipment, tools or similar articles used in a danger area are decontaminated after such use, and that no person makes use of any such article that has not been decontaminated after use in a contaminated area;
- the certification of the decontamination process is certified and approved by the explosives manager or a person authorized by the explosive's manager.
- Unless permission has been granted by the chief inspector of occupational health and safety, no contractor shall use –
- explosives in workplaces other than explosives workplaces approved by the chief inspector of occupational health and safety;
- any explosives for which no provision is made in Explosives regulations.

No contractor shall allow unauthorized access to such explosives or bury, dump, hide or abandon any explosives.

No contractor shall use any explosive material for blasting purposes unless –

- he or she is in possession of a written permission issued by or under the authority of the chief inspector of occupational health and safety;
- he or she is undergoing training while using such blasting material under the immediate and constant supervision of a person who is in possession of permission

d) **Dangerous areas**

The contractor shall ensure that entry and exit from danger areas is only permitted

- at the permanent authorized point of entry or exit: Provided that entry or exit at any other point may be authorized by the explosives manager or a person authorized by him if the authorized gatekeeper has been informed thereof;
- for persons and vehicles authorized thereto by the explosives manager or a person authorized by him:

- to visitors under escort by an authorized person who is aware of the hazards attached to the danger area.

The contractor shall keep a register of the entries and exits and that register shall be available on the premises for inspection by an inspector.

No person shall –

- enter the danger area with –
 - tobacco;
 - matches, cigarette lighters or other devices capable of generating heat or spark sources;
 - intoxicating liquor or narcotics;
 - food, medicine or drinkable fluids: Provided that authorization to enter with such articles may be granted by the explosive's manager for purposes of consumption in licensed mess rooms and smoking areas: Provided further that special rules for the control of such consumption and smoking, approved by the chief inspector of occupational health and safety shall be made in writing and shall be enforced by the employer, self-employed person or user; or
 - radio transmitters or cellular telephones; or

The contractor shall ensure that hazard warning signs are clearly displayed at the entrance to any danger area.

D1014 VESSELS UNDER PRESSURE

a) Manufacturer's data plate

Every user of a boiler or pressure vessel shall cause a manufacturer's plate with the following minimum particulars to be securely fixed in a conspicuous place to the shell of every such a boiler or pressure vessel:

- i) Name of manufacturer;
- ii) country or origin;
- iii) year of manufacture;
- iv) manufacturer's serial number;
- v) name, number and date of the standard of design;
- vi) design gauge pressure in Pascal; (design pressure)

- vii) maximum permissible operating pressure in Pascal;
- viii) operating temperature;
- ix) capacity in cubic meters; and
- x) mark of an approved inspection authority.

No person shall remove such a manufacturer's plate or wilfully damage or alter the particulars stamped thereon.

b) **Portable Gas Containers**

No user shall use or require or permit a portable gas container to be used, and no user shall fill, place in service, handle, modify, repair, inspect or test any portable gas container, other than in compliance with standards incorporated into the Vessels under Pressure regulations.

c) **Hand held Fire extinguishers**

No user shall use, require or permit the use of a hand-held fire extinguisher unless designed, constructed, filled, recharged, reconditioned, modified, repaired, inspected or tested in accordance with a safety standard incorporated into the Vessels under Pressure regulations.

No person shall fill, recharge, recondition, modify, repair, inspect or test any hand-held fire extinguisher unless a holder of a permit issued by the South African Bureau of Standards in terms of SANS 1475.

d) **Gas Fuel use, equipment and systems**

No person shall handle, store or distribute a gas fuel in any manner, including the filling of a container, other than in accordance with a health and safety standards.

e) **Inspection and test**

Any user of a boiler or pressure vessel shall cause, where reasonably practicable, such a boiler or pressure vessel, including the appurtenances and automatic controls and indicators, to be subjected to an internal and external inspection, and

a hydraulic pressure test to 1.25 times the maximum permissible safe operating pressure as the case may be –

- by an approved inspection authority before commissioning after installation, re-erection or repairs;
- by a person appointed in writing by the user and who is competent to do such inspections and tests by virtue of their training, knowledge and experience in the operation, maintenance, inspection and testing of a boiler or pressure vessel within 36 months from the date of the previous internal and external inspection and hydraulic pressure test: Provided that where a pressure vessel is not subjected to corrosion, the user may dispense with the internal inspection and hydraulic pressure test subject to the written approval of an approved inspection authority: Provided further that an inspector may require a specific boiler or pressure vessel to be inspected or tested more frequently or permit a specific boiler or pressure vessel to be inspected or tested less frequently:

f) **Recordkeeping**

Any user of a vessel under pressure shall keep on his premises a record which shall be open for inspection by an inspector in which the results of inspections, tests, modifications and repairs shall be recorded, dated and signed by the competent person.

g) **Maintenance**

No user shall use, cause or permit a vessel under pressure or gas fuel system, including all automatic controls, indicators and appurtenances, to be used unless it is at all times maintained in a safe working condition and the efficiency thereof is proved by regular testing.

No user shall use or cause or permit a vessel under pressure to be used unless it is kept clean and free from any:

- carbonized oil or other inflammable material which may ignite under working conditions;
- material which may cause corrosion; or

- material which is liable to chemical reaction which may cause an uncontrolled rise in pressure.

D1015 PHYSICAL HAZARDS**a) Ergonomics**

- Ensure that assigned tasks do not exceed the limits of the performance capacities of the worker.
- Prevent injury or any detrimental effects to the health of the worker
- Provide that tasks and working conditions will not lead to impairments.

b) Noise

No contractor shall require or permit an employee to work in an environment in which he is exposed to an equivalent noise level equal to 85 dB(A) or higher. The contractor shall reduce the equivalent noise level to below 85 dB(A) or, where this is not reasonably practicable, he shall reduce the level to as low as is reasonably practicable and take all reasonable steps to isolate the source of the noise acoustically. Where the equivalent noise level in any workplace cannot be reduced to below 85 dB(A) the contractor shall –

- prohibit any person from entering a noise zone unless such person wears hearing protectors.

The contractor shall provide, free of charge, hearing protectors to each employee who works in or, to any person who is required or permitted to enter a noise zone, and no contractor shall require or permit any person to work in or enter such noise zone, and no person shall work in or enter such noise zone, unless he wears such hearing protectors in the correct manner: Provided that where the equivalent noise level to which employees are exposed, is such that the attenuation of the hearing protectors does not reduce the said noise to below 85 dB(A) the employer concerned shall limit the time during which employees work in that noise zone in such a way that they are not exposed to an equivalent noise level equal to 85 dB(A) or higher.

The contractor shall properly instruct any person who is required to wear hearing protectors in the use of such protectors and inform him of noise zones where the wearing thereof is compulsory.

The contractor shall –

- ensure that every employee employed in a noise zone is subjected to audiometric examinations conducted in accordance with section 7 of SANS 083, by an audiometric approved by the chief inspector;
- keep records of the results of each audiometric examination and make such records available for inspection by an inspector if he so requires; and
- keep such records for a minimum period of 30 years after termination of employment: Provided that if the employer ceases activities all such records shall be forwarded to the regional director.

c) **Vibration**

Whole-body vibration occurs when the body is supported on a surface which is vibrating (e.g., when sitting on a seat which vibrates, standing on a vibrating floor or recumbent on a vibrating surface). Whole-body vibration occurs in all forms of transport and when working near some industrial machinery.

Hand-transmitted vibration is the vibration that enters the body through the hands. It is caused by various processes where vibrating tools or work pieces are grasped or pushed by the hands or fingers. Exposure to hand-transmitted vibration can lead to the development of several disorders.

D1016 SITE WIDE ELEMENTS

a) **Site Access and Egress**

- Access to the site will involve crossing the public footpath.
- Store materials and plant away from means of access for the general public and occupants.
- Remove rubbish and demolition materials regularly. Do not allow to accumulate on flat roofs.
- Maintain free access through designated means of escape at all times
- Agree with the Client / Client's Agent delivery points for materials before commencing works.

b) **Visitors to the site**

- All visitors to report to the Principal Contractor's reception area for OHS Induction training.

- All visitors to sign the visitor's registration document.
- All visitors to be provided with a Visitors Permit to enable them to access the construction site.
- All un-inducted visitors must be accompanied on the construction site by an inducted person.
- No visitors shall be allowed to access the construction site without wearing the necessary PPE.

c) **Deliveries**

Access will involve crossing the public footpath.

d) **Emergencies**

Ensure that there are adequate escape routes and that they are kept clear at all times.

e) **Location of Temporary Site Accommodation**

See Site Layout Plan.

f) **Location of Materials unloading and storage**

Materials are to be unloaded and stored in locations which will not in any way affect access or egress to the site nor the works.

g) **Traffic and Pedestrian Routes**

The road, public footpaths and access way are to be kept open at all times. All necessary signage and barriers are to be put in place to protect pedestrians at the site entrance and access and egress points.

h) **Environment**

See Environmental Management Plan

i) **Safety**

- Ensure that all employees are aware of the Health and Safety policy and put into place arrangements to ensure that all visitors and workers new to the site are aware of the site safety provisions.
- Locate underground electricity cables, mark and take precautions to avoid.

- Ensure that cartridge operated tools are operated by trained personnel and in accordance with the maker's instructions that the gun is cleaned regularly and kept in a secure place when not in use.
- Protect people who may be exposed to health risks arising from hazardous substances.

D1017 CONTINUING LIAISON

The procedures for consideration and evaluation of the health and safety implications of Contractor designed elements of the works must follow the recognised principles of prevention and protection and take account of the issues highlighted in this OHS Specification.

The following information is to be submitted by the Contractor to the Client / Client's Agent in sufficient time to allow adequate consideration by the Client / Client's Agent and, where appropriate, the design team, and the provision of relevant information to those persons affected by the works, prior to the commencement of the relevant works:

- Suitable and sufficient information to demonstrate that health or safety issues have been adequately considered.
- Risk assessments.
- A list of health and/or safety hazards identified which cannot be designed out.
- A list of any materials or substances which are specified or inherent in the design which is potentially hazardous to health and/or safety.

a) Unforeseen Eventualities

The following action is to be taken in the event of unforeseen eventualities arising during the construction stage of the project which require significant design changes, or affect the resources required to carry out the work without risk to health and/or safety, or have other health or safety implications.

The Client / Client's Agent and, where possible, the Principal Contractor are to be advised as soon as possible.

Full details of the relevant health and safety issues involved are to be reviewed with the Client / Client's Agent and Principal Contractor as soon as possible.

Full details of any revised designs, risk assessments and identified hazards and/or hazardous materials and substances are to be issued to the Client / Client's Agent and Principal Contractor in sufficient time to allow for the revision of the Health and Safety Plan

and notification of all persons affected by the health and/or safety implications of the changes prior to the commencement of the affected works.

b) **Site Liaison**

Liaise with all other contractors and implement any agreed changes to the Health and Safety Plan arising from such liaison. Set up regular training for all operatives including induction training for all staff upon arrival to site.

c) **Health and Safety File**

Provide the Planning Supervisor with any relevant information which the contractor believes should be incorporated into the Health and Safety File.

d) **Design Development**

Provide the Client / Client's Agent with all design information prepared by sub-Contractors.

Arrange liaison meetings with sub-contractors to discuss and review health and safety issues arising from the sub-contractors' designs.

D1018 CONCLUSION

The hazards listed above were identified posing potential threats to the health and or safety of persons that will work on the contract. Although every effort were made to ensure that every possible hazard was identified OHSEC cannot guarantee this, therefore it is imperative for the contractor to conduct a comprehensive risk identification and hazard assessment in order to make certain that all hazards are identified.

C3.8 ENVIRONMENTAL MANAGEMENT REQUIREMENTS

E1001 LEGAL REQUIREMENTS

a) **General**

Construction will be according to the best industry practices, as identified in the project documents. This EMP, which forms an integral part of the contract documents, informs the contractor as to his duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. The contractor should note that obligations imposed by the EMP are legally binding in terms of environmental statutory legislation and in terms of the additional conditions to the general conditions of contract that pertain to this project. In the event that any rights and obligations contained in this document contradict those specified in the standard or project specifications then the latter shall prevail.

b) **Statutory and other applicable legislation**

The contractor is deemed to have made himself conversant with all legislation pertaining to the environment, including provincial and local government ordinances, which may be applicable to the contract.

E1002 ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS

a) **Appointment of a Designated Environmental Officer (DEO)**

For the purposes of implementing the conditions contained herein, the contractor shall submit to the engineer for approval the appointment of a nominated representative of the contractor as the DEO for the contract. The request shall be given, in writing, at least fourteen days before the start of any work clearly setting out reasons for the nomination, and with sufficient detail to enable the engineer to make a decision. The engineer will, within seven days of receiving the request, approve, reject or call for more information on the nomination. Once a nominated representative of the contractor has been approved he/she shall be the DEO and shall be the responsible person for ensuring that the provisions of the EMP are complied with during the life of the contract. The engineer will be responsible for issuing instructions to the contractor where environmental considerations call for action to be taken. The DEO shall submit regular written reports to the engineer, but not less frequently than once a month.

The engineer shall have the authority to instruct the contractor to replace the DEO if, in the engineer's opinion, the appointed officer is not fulfilling his/her duties in terms of the requirements of the EMP or this specification. Such instruction will be in writing and shall clearly set out the reasons why a replacement is required.

There shall be an approved DEO on the site at all times. The DEO will be allowed to fulfil also other duties on the contract.

b) **Administration**

Before the contractor begins each construction activity the DEO shall give to the engineer a written statement setting out the following:

- The type of construction activity.
- Locality where the activity will take place.
- Identification of the environmental aspects and impacts that might result from the activity.
- Methodology for impact prevention for each activity or aspect.
- Methodology for impact containment for each activity or aspect.

- Emergency/disaster incident and reaction procedures.
- Treatment and continued maintenance of impacted environment.

The contractor may provide such information in advance of any or all construction activities provided that new submissions shall be given to the engineer whenever there is a change or variation to the original.

The engineer may provide comment on the methodology and procedures proposed by the DEO, but he shall not be responsible for the contractor's chosen measures of impact mitigation and emergency/disaster management systems. However, the contractor shall demonstrate at inception and at least once during the contract that the approved measures and procedures function properly.

c) **Good Housekeeping**

The Contractor shall undertake "good housekeeping" practices during construction as stated in the Standard Specifications for Routine Road Maintenance - October 2001 Edition (Volume 2) as prepared by South African National Roads Agency Limited and the General Conditions of Contract 2004. This will help avoid disputes on responsibility and allow for the smooth running of the contract as a whole. Good housekeeping extends beyond the wise practice of construction methods that leaves production in a safe state from the ravages of weather to include the care for and preservation of the environment within which the site is situated.

E1003 TRAINING

The designated environmental officer (DEO) must be conversant with all legislation pertaining to the environment applicable to this contract and must be appropriately trained in environmental management and must possess the skills necessary to impart environmental management skills to all personnel involved in the contract.

The contractor shall ensure that adequate environmental training takes place. All employees shall have been given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees. The environmental training should, as a minimum, include the following:

- The importance of conformance with all environmental policies
- The environmental impacts, actual or potential, of their work activities;
- The environmental benefits of improved personal performance;

Their roles and responsibilities in achieving conformance to the environmental policy and procedures and with the requirement of the Agency's environmental management systems, including emergency preparedness and response requirements;

The potential consequences of departure from specified operating procedures;

The mitigation measures required to be implemented when carrying out their work activities.

In the case of permanent staff the contractor shall provide evidence that such induction courses have been presented. In the case of new staff (including contract labour) the contractor shall inform the engineer when and how he intends concluding his environmental training obligations.

E1004 ACTIVITIES/ASPECTS CAUSING IMPACTS

A list of possible causes of environmental impacts that occur during construction activities is given in the Table, which is to be found at the end of Part C. This list is not exhaustive, and shall be used for guideline purposes only.

E1005 ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES

a) Site Establishment

i) Site Plan

The contractor shall establish his construction camps, offices, workshops, staff accommodation and testing facilities on the site in a manner that does not adversely affect the environment. However, before construction can begin, the contractor shall submit to the engineer for his approval, plans of the exact location, extent and construction details of these facilities and the impact mitigation measures the contractor proposes to put in place.

The plans shall detail the locality as well as the layout of the waste treatment facilities for litter, kitchen refuse, sewage and workshop-derived effluents. The site offices should not be sited in close proximity to steep areas, as this will increase soil erosion. Preferred locations would be flat areas along the route. If the route traverses water courses, streams and rivers, it is recommended that the offices, and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles are located as far away as possible from any water course as possible. Regardless of the chosen site, the contractor's intended mitigation measures shall be indicated on the plan. The site plan shall be submitted not later than the first site meeting. Detailed, electronic colour photographs shall be taken of the proposed site before any clearing may commence. These records are to be kept by the engineer for consultation during rehabilitation of the site.

ii) Vegetation

The contractor has a responsibility to inform his staff of the need to be vigilant against any practice that will have a harmful effect on vegetation.

The natural vegetation encountered on the site is to be conserved and left as intact as possible. Vegetation planted at the site shall be indigenous and in accordance with instructions issued by the engineer. Only trees and shrubs directly affected by the works, and such others as may be indicated by the engineer in writing, may be felled or cleared. In wooded areas where natural vegetation has been cleared out of necessity, the same species of indigenous trees as were occurring, shall be re-established.

The project specification for the rehabilitation of the grass cover shall be strictly adhered to. Any proclaimed weed or alien species that propagates during the contract period shall be cleared by hand before seeding. Fires shall only be allowed in facilities or equipment specially constructed for this purpose. A firebreak shall be cleared and maintained around the perimeter of the camp and office sites.

iii) Rehabilitation

The area where the site offices were erected will require rehabilitation at the end of the contract. All construction material, including concrete slabs and braai areas shall be removed from the site on completion of the contract.

iv) Water for human consumption

Water for human consumption shall be available at the site offices and at other convenient locations on site.

All effluent water from the camp / office sites shall be disposed of in a properly designed and constructed system, situated so as not to adversely affect water sources (streams, rivers, pans dams etc). Only domestic type wastewater shall be allowed to enter this drain.

v) Heating and Cooking fuel

The contractor shall provide adequate facilities for his staff so that they are not encouraged to supplement their comforts on site by accessing what can be taken from the natural surroundings. The contractor shall ensure that energy sources are available at all times for construction and supervision personnel for heating and cooking purposes.

b) **Sewage treatment**

To be drained to Works.

c) **Waste Management**

The contractor's intended methods for waste management and waste minimisation shall be implemented at the outset of the contract. All personnel shall be instructed to dispose of all waste in the proper manner.

i) Solid Waste

Solid waste shall be stored in an appointed area in covered, tip proof metal drums for collection and disposal. A refuse control system shall be established for the collection and removal of refuse to the satisfaction of the engineer. Disposal of solid waste shall be at a Department of Water and Sanitation (DWS) licensed landfill site or at a site approved by DWS in the event that an existing operating landfill site is not within reasonable distance from the site offices and staff accommodation. No waste shall be burned or buried at or near the site offices, nor anywhere else on the site, including the approved solid waste disposal site.

ii) Litter

No littering by construction workers shall be allowed. During the construction period, the facilities shall be maintained in a neat and tidy condition and the site shall be kept free of litter.

Measures shall be taken to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse. At all places of work the contractor shall provide litter collection facilities for later safe disposal at approved sites.

iii) Hazardous waste

Hazardous waste such as bitumen, tar, oils etc. shall be disposed of in a Department of Water Affairs and Forestry approved landfill site. Special care shall be taken to avoid spillage of tar or bitumen products such as binders or pre-coating fluid to avoid water-soluble phenols from entering the ground or contaminating water.

Under no circumstances shall the spoiling of tar or bituminous products on the site, over embankments, in borrow pits or any burying, be allowed. Unused or rejected tar or bituminous products shall be returned to the supplier's production plant. Any spillage of tar or bituminous products shall be attended to immediately and affected areas shall be promptly reinstated to the satisfaction of the engineer.

d) **Control at the workshop**

The contractor's management and maintenance of his plant and machinery will be strictly monitored according to the criteria given below, regardless whether it is serviced on the site (i.e. at the place of construction activity or at a formalised workshop).

i) Safety

All the necessary handling and safety equipment required for the safe use of petrochemicals and oils shall be provided by the contractor to, and used or worn by, the staff whose duty it is to manage and maintain the contractor's and his subcontractor's and supplier's plant, machinery and equipment.

ii) Hazardous Material Storage

Petrochemicals, oils and identified hazardous substances shall only be stored under controlled conditions. All hazardous materials e.g. tar or bitumen binders shall be stored in a secured, appointed area that is fenced and has restricted entry. Storage of tar or bituminous products shall only take place using suitable containers to the approval of the engineer.

The contractor shall provide proof to the engineer that relevant authorisation to store such substances has been obtained from the relevant authority. In addition, hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure. Before containment or storage facilities can be erected the contractor shall furnish the engineer with details of the preventative measures he proposes to install in order to mitigate against pollution of the surrounding environment from leaks or spillage. The preferred method shall be a concrete floor that is bunded. Any deviation from the method will require proof from the relevant authority that the alternative method proposed is acceptable to that authority. The proposals shall also indicate the emergency procedures in the event of misuse or spillage that will negatively affect an individual or the environment.

iii) Fuel and Gas Storage

Fuel shall be stored in a secure area in a steel tank supplied and maintained by the fuel suppliers.. An adequate bund wall, 110% of volume, shall be provided for fuel and diesel areas to accommodate any leakage spillage or overflow of these substances. The area inside the bund wall shall be lined with an impervious lining to prevent infiltration of the fuel into the soil. Any leakage, spillage or overflow of fuel shall be attended to without delay.

Gas welding cylinders and LPG cylinders shall be stored in a secure, well-ventilated area.

iv) Oil and Lubricant Waste

Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery shall be collected in a holding tank and sent back to the supplier. Water and oil should be separated in an oil trap. Oils collected in this manner, shall be retained in a safe holding tank and removed from site by a specialist oil recycling company for disposal at approved waste disposal sites for toxic/hazardous materials. Oil collected by a mobile

servicing unit shall be stored in the service unit's sludge tank and discharged into the safe holding tank for collection by the specialist oil recycling company.

All used filter materials shall be stored in a secure bin for disposal off site. Any contaminated soil shall be removed and replaced. Soils contaminated by oils and lubricants shall be collected and disposed of at a facility designated by the local authority to accept contaminated materials.

v) **Spillages**

Streams, rivers and dams shall be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and tar or bituminous products. In the event of a spillage, the contractor shall be liable to arrange for professional service providers to clear the affected area.

Responsibility for spill treatment lies with the contractor. The individual responsible for, or who discovers a hazardous waste spill must report the incident to his/her DEO or to the engineer. The Designated Environmental Officer will assess the situation in consultation with the engineer and act as required. In all cases, the immediate response shall be to contain the spill. The exact treatment of polluted soil / water shall be determined by the contractor in consultation with the DEO and the engineer. Areas cleared of hazardous waste shall be re-vegetated according to the engineer's instructions

Should water downstream of the spill be polluted, and fauna and flora show signs of deterioration or death, specialist hydrological or ecological advice will be sought for appropriate treatment and remedial procedures to be followed. The requirement for such input shall be agreed with the engineer. The costs of containment and rehabilitation shall be for the contractor's account, including the costs of specialist input.

vi) **Noise Control**

The contractor shall endeavour to keep noise generating activities to a minimum. Noises that could cause a major disturbance, for instance blasting and crushing activities, should only be carried out during daylight hours. Compliance with the appropriate legislation with respect to noise, shall be mandatory.

Should noise generating activities have to occur at night the people in the vicinity of the drilling shall be warned about the noise well in advance and the activities kept to a minimum.

vii) **Dust Control**

Dust caused by strong winds shall be controlled by means of water spray vehicles. Dust omission from batching plants shall be subject to the relevant legislation and shall be the subject of inspection by the relevant office of the Department of Minerals and Energy.

E1006 RECORD KEEPING

The engineer and the DEO will continuously monitor the contractor's adherence to the approved impact prevention procedures and the engineer shall issue to the contractor a notice of non-compliance whenever transgressions are observed. The DEO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance shall be documented and reported to the engineer in the monthly report.

Copies of any record of decision or EMP's for specific borrow pits or quarries used on the project shall be kept on site and made available for inspection by visiting officials from the employer or relevant environmental departments.

E1007 COMPLIANCE AND PENALTIES

The contractor shall act immediately when such notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. This record shall be submitted with the monthly reports and a verbal report given at the monthly site meetings.

Any avoidable non-compliance with the above-mentioned measures shall be considered sufficient ground for the imposition of a penalty

CONTENTS	ENVIRONMENTAL IMPACTS				
	POLLUTION TYPE	DEFORMATION OF LANDSCAPE	SOIL EROSION	ALIEN VEGETATION	SENSITIVE AREAS
Camp Establishment	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
Housing, Offices and laboratories	Waste treatment Hazardous waste Water supply Spillage Storage Noise/lights	Selection of site Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
Drainage	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	

C3.9 MANAGEMENT OF THE WORKS

The management of the site shall be in accordance with the provisions of the Standard Specifications for Civil Engineering Construction SANS 1200

Training of local labour in social as well as labour intensive construction skills.



METSIMAHOLO LOCAL MUNICIPALITY

BID NO: MLM 22/2024/25

**CONSTRUCTION FOR RE-COMMENCEMENT OF UPGRADING OF ORANJEVILLE
4ML/DAY WASTEWATER TREATMENT PLANT**

PART C4: SITE INFORMATION

C4 SITE INFORMATION**C4.1 INTRODUCTION****C4.1.1 Disclaimer**

Amongst others, this document sets out the results and conclusions derived from various investigations and tests done on natural materials encountered along and in the general vicinity of, as well as the project areas.

The results of these investigations are given in good faith and there is no guarantee that these results are entirely representative of all the materials and conditions that may be encountered, the intention being to give an indication of the materials and conditions most likely to be encountered.

The results of various tests carried out on materials taken from possible sources are given in good faith and there is no guarantee that the results are entirely representative of all the materials available nor that the estimated quantities of materials are correct, the intention being to give an indication of the materials most likely to be obtained from each source.

No responsibility for any consequence arising from variations between the actual material properties and those indicated in this document will be accepted.

The specifications and contract drawings shall always overrule this section of the contract document.

C4.2 GENERAL DESCRIPTION**C4.2.1 Location description**

The project site for the Oranjeville WWTW is situated on the banks of the Wile River in the Free State Province of South Africa. The town is in the southern bank of the Vaal Dam, 14km east of Deneysille and 46km north east of Heilbron. The locality plan is indicated in Figure C4.2.1.

FIGURE C4.2.1 – LOCALITY PLAN OF ORANJEVILLE



C4.2.2 Programme approach

A short completion time will receive preference.

C4.3 PHYSIOGRAPHY

C4.3.1 Topography and Drainage

The topography of the area is in general flat to rolling terrain.

C4.3.2 Rainfall

This area is regarded as a summer rainfall region with the highest monthly rainfall recorded from November to January. Total rainfall $\pm 600 - 700$ mm / year with the maximum average month in November – January i.e. ± 100 mm / month.

C4.3.3 Temperature

Average temperatures vary between 25°C in Summer and 10°C in Winter.

The low temperatures from April to September will have an influence on construction activities such as stabilization and concrete work.

C4.3.4 Vegetation

The natural vegetation is grasslands and shrubs with trees.

C4.4 SURVEYS BEACONS AND SERVICES

C4.4.1 Survey beacons

- a. Local reference beacons will be indicated to the Contractor.
- b. The Contractor must employ a competent qualified surveyor to set the work out in accordance with the drawings.

C4.4.2 Services

Municipal

Prior to commencement of any work, contractor is obliged to obtain an excavation permit from METSIMAHOLO LOCAL MUNICIPALITY's infrastructure department.

C4.5 GEOTECHNICAL INFORMATION

The site is generally flat. The geotechnical report will provide information on the founding conditions of the soil for the design of aeration ponds, trickling filter, access road, pathways, fence and clarifier/humus tank structures. The geotechnical report will also provide insight into the resistance to excavation that is going to be encountered during the excavation for the pipeline. Any special measures which may need to be taken during project execution and project functionality pertaining to the soil will be highlighted in the geotechnical report.

C4.6 ACCESS TO SITE

Access to the site is along existing gravel and dirt roads.

C4.7 SITE SPECIFIC EIA REQUIREMENTS

The following must be controlled (Refer to Environmental Management Plan):

- Dust
- Erosion
- Pollution / Spillages
- Hazardous materials
- Work close to sensitive areas

C4.8 SITE FACILITIES REQUIRED

C4.8.1 Site Office

Site facilities must be made available.

C4.8.2 Toilets

Toilet facilities which comply with the requirements of the LM Health Department must be provided at the camp site and site of Works.

C4.8.3 Telephone

Email facilities for communication with the site must be made available complete with printer, copier, etc.

END



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WASTEWATER TREATMENT PLANT**