



CLUSTER
Trading Services

UNIT
Water and Sanitation

DEPARTMENT
Water and Sanitation Engineering

PROCUREMENT DOCUMENT
INFRASTRUCTURE

Documents are to be obtained, free of charge, in electronic format, from the [National Treasury's eTenders website](#) or the [eThekweni Municipality's website](#).

Contract No: 31367-5W

Contract Title: The Installation of Water Meters and Ancillary Works on Existing Reservoir Inlets and Outlets within the Northern Operational Areas

Est. CIDB Grade/ Class: 7 CE

CLARIFICATION MEETING AND QUERIES

Clarification Meeting: Compulsory Clarification Meeting

Meeting Location, Date, Time: Board Room 301, 3rd Floor, 3 Prior Road, eThekweni Water & Sanitation, Durban
On 09 June 2025 at 10h00

Queries can be addressed to: Ashveer Goorun Pr Tech
Tel: 031 265 6007

The Employer's Agent's Representative: eMail: Ashveer.Goorun@naiduconsulting.com. All email queries are to be submitted by 19 June 2025. All questions and answers will be consolidated and posted on eTender/Municipal website by 26 June 2025.

TENDER SUBMISSION

The Tender Box in the foyer of the Municipal Building
166 KE Masinga Road, Durban

Delivery Location: Bidders are required to also make an electronic submission via SSS. Bidders must ensure that the hard copy and electronic submission are the same, failing which the submission will be deemed invalid. Bidders are responsible for resolving all access rights and submission queries before the tender closing date.
SSS Queries Contact: Lindo Dlamini: Tel: 031-3227133/031-3227153
email: supplier.selfservice@durban.gov.za

Closing Date/ Time: Friday, 04 July 2025 **At** 11h00

FACSIMILE, eMAIL, or POSTED TENDERS WILL NOT BE ACCEPTED

Issued by:

ETHEKWINI MUNICIPALITY

Deputy Head: Water and Sanitation Engineering

Date of Issue: 23/05/2025

Document Version 01/03/2024

FOR OFFICIAL USE ONLY

| | | | |
|----------------|--------------|-----|------------------------|
| Tenderer Name: | | | VAT Registered: Yes No |
| | Price (excl) | VAT | Price (incl) |
| Submitted: R | | R | R |
| Corrected: R | | R | R |

INDEX to PROCUREMENT DOCUMENT

| TENDER PART | Part T1 | TENDERING PROCEDURES | | Page |
|-------------|---------|----------------------|---|-----------|
| | | T1.1 | Tender Notice and Invitation to Tender | |
| | | T1.1.1 | Tender Notice and Invitation to Tender | 2 |
| | | T1.2 | Tender Data | |
| | | T1.2.1 | Standard Conditions of Tender | 3 |
| | | T1.2.2 | Tender Data (<i>applicable to this tender</i>) | 3 |
| | | T1.2.3 | Additional Conditions of Tender | 11 |
| | Part T2 | RETURNABLE DOCUMENTS | | Page |
| | | T2.1 | List of Returnable Documents | 16 |
| | | T2.2 | Returnable Schedules, Forms and Certificates | 17 |

| CONTRACT PART | Part C1 | AGREEMENT AND CONTRACT DATA | | Page |
|---------------|---------|-----------------------------|---|------------|
| | | C1.1 | Form of Offer and Acceptance | |
| | | C1.1.1 | Offer | 67 |
| | | C1.1.2 | Acceptance | 68 |
| | | C1.1.3 | Schedule of Deviations | 69 |
| | | C1.2 | Contract Data | |
| | | C1.2.1 | Standard Conditions of Contract..... | 70 |
| | | C1.2.2 | Contract Data..... | 70 |
| | | C1.2.3 | Additional Conditions of Contract | 76 |
| | Part C2 | PRICING DATA | | Page |
| | | C2.1 | Pricing Assumptions / Instructions | 78 |
| | | C2.2 | Bill of Quantities (separate page numbering system)..... | 80 |
| | Part C3 | SCOPE OF WORK | | Page |
| | | C3.1 | Project Description and Scope of Contract | 126 |
| | | C3.2 | Project Specifications | 128 |
| | | C3.3 | Standard Specifications | 150 |
| | | C3.4 | Particular Specifications | 209 |
| | | C3.5 | Contract and Standard Drawings | 243 |
| | | C3.6 | Annexures | 246 |
| | Part C4 | SITE INFORMATION | | Page |
| | | C4.1 | Locality Plan | 247 |
| | | C4.2 | Conditions on Site | 247 |
| | | C4.3 | Test Results | 247 |

PART T1: TENDERING PROCEDURES**T1.1.1: TENDER NOTICE AND INVITATION TO TENDER**

Tenders are hereby invited for the works for: The Installation of Water Meters and Ancillary Works on Existing Reservoir Inlets and Outlets within the Northern Operational Areas

| Subject | Description | Tender Data Ref. |
|----------------------------------|--|------------------|
| Employer | The Employer is the eThekweni Municipality as represented by: Deputy Head: Water and Sanitation Engineering | F.1.1.1 |
| Tender Documents | Documents can only be obtained in electronic format, issued by the eThekweni Municipality. Documentation can be downloaded from the National Treasury's eTenders website or the eThekweni Municipality's Website . The <u>entire document</u> should be printed (on A4 paper) and suitably bound by the tenderer. | F.1.2 |
| Eligibility | It is <u>estimated</u> that tenderers should have a CIDB contractor grading designation of 7 CE (or higher). The CIDB provisions in relation to a Contractor's Potentially Emerging (PE) status <u>do not</u> apply. | F.2.1.1 |
| Clarification Meeting | Board Room 301, 3rd Floor, 3 Prior Road, eThekweni Water & Sanitation, Durban On 09 June 2025 at 10h00 | F.2.7 |
| Seek Clarification | Queries relating to these documents are to be addressed to the Employer's Agent's Representative whose contact details are: Ashveer Goorun Pr Tech Tel: 031 265 6007 eMail: Ashveer.Goorun@naiduconsulting.com. All email queries are to be submitted by 19 June 2025. All questions and answers will be consolidated and posted on eTender/Municipal website by 26 June 2025. Email queries to be emailed by 11 June 2025 and consolidated answers to the questions to be uploaded 18 June 2025. | F.2.8 |
| Submitting a Tender Offer | Tender offers shall be delivered to: The Tender Box in the foyer of the Municipal Building 166 KE Masinga Road, Durban. Bidders are required to also make an electronic submission via SSS. Bidders must ensure that the hard copy and electronic submission are the same, failing which the submission will be deemed invalid. Bidders are responsible for resolving all access rights and submission queries before the tender closing date. SSS Queries Contact: Lindo Dlamini: Tel: 031-3227133/031-3227153 email: selfservice@durban.gov.za | F.2.13 |
| Closing Time | Tender offers shall be delivered on or before Friday, 04 July 2025 at or before 11h00 . | F.2.15 |

| | | |
|------------------------------------|--|--------|
| Evaluation of Tender Offers | The 80/20 Price Preference Point System, as specified in the PPPFA Regulations 2022 will be applied in the evaluation of tenders. Refer to Clause F.3.11 of the Tender Data for the Specific Goal(S) for the awarding of Preference Points, and other related evaluation requirements. | F.3.11 |
|------------------------------------|--|--------|

Requirements for sealing, addressing, delivery, opening and assessment of tenders are further stated in the Tender Data

PART T1: TENDERING PROCEDURES

T1.2: TENDER DATA

T1.2.1 STANDARD CONDITIONS OF TENDER

The conditions of tender are the Standard Conditions of Tender as contained in Annex F of the CIDB Standard for Uniformity in Construction Procurement (July 2015) as published in Government Gazette No 38960, Board Notice 136 of 2015 of 10 July 2015.

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 or inconsistency between it and the Standard Conditions of Tender.

T1.2.2 TENDER DATA

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

F.1: GENERAL

F.1.1 The employer: The Employer for this Contract is the eThekweni Municipality as represented by: Deputy Head: **Water and Sanitation Engineering**

F.1.2 Tender documents: The Tender Documents issued by the Employer comprise:

- 1) This procurement document.
- 2) "General Conditions of Contract for Construction Works – 3rd Edition 2015" issued by the South African Institution of Civil Engineering (GCC 2015). This document is obtainable separately, and Tenderers shall obtain their own copies.
- 3) "SABS1200 – STANDARDISED SPECIFICATION for CIVIL ENGINEERING CONSTRUCTION" hereinafter referred to as the Standard Engineering Specifications. This document is obtainable separately, and Tenderers shall obtain their own copies of the applicable Sections.
- 4) Drawings, issued separately from this document, or bound in Section C3.5 (as an Annexure).
- 5) In addition, Tenderers are advised, in their own interest, to obtain their own copies of the following acts, regulations, and standards referred to in this document as they are essential for the Tenderer to get acquainted with the basics of construction management, the implementation of preferential construction procurement policies, and the participation of targeted enterprise and labour.
 - The Employer's current (as at advertising date) Supply Chain Management Policy.
 - The Preferential Procurement Policy Framework Act No 5 of 2000, and the Preferential

Procurement Policy Framework Act Regulations (2022).

- The Occupational Health and Safety Act No 85 and Amendment Act No 181 of 1993, and the Construction Regulations (2014).
- The Construction Industry Development Board Act No 38 of 2000 and the Regulations issued in terms of the Act (July 2013).
- SANS 1921:2018 – Construction and Management Requirements for Works Contract, Parts 1-6.
- Any other eThekwin Policy documents referenced in the Tender Documents.

Electronically downloaded documentation is obtainable from the National Treasury's **eTenders Website** or the **eThekwin Municipality's Website** at URLs:

- <https://www.etenders.gov.za/>
- <https://www.durban.gov.za/pages/business/procurement>

The entire downloaded document should be printed on white A4 paper (single-sided) and suitably bound by the tenderer.

F.1.4 Communication and employer's agent: The Employer's Agent is:

Name: Terence Thumbaya Pr Eng
Tel: 031 265 6007
eMail: Terence.Thumbaya@naiduconsulting.com

The Employer's Agent's Representative is:

Ashveer Goorun Pr Tech

Tel: 031 265 6007

eMail: Ashveer.Goorun@naiduconsulting.com. All email queries are to be submitted by 19 June 2025. All questions and answers will be consolidated and posted on eTender/Municipal website by 26 June 2025.

The Tenderer's contact details, as indicated in the Contract Data: Clause C1.2.2.2 "Data to Be Provided by Contractor", shall be deemed as the only valid contact details for the Tenderer for use in communications between the Employer's Agent and the Tenderer.

F.1.6 Procurement procedures: The competitive negotiation procedure shall be applied.

F.2: TENDERER'S OBLIGATIONS

F.2.1.1 Eligibility: General

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

- the Tenderer does not comply with the legal requirements as stated in the Employer's current SCM Policy.
- the Tenderer cannot provide proof that he is in good standing with respect to duties, taxes, levies and contributions required in terms of legislation applicable to the work in the contract.
- In the event of a Compulsory Clarification Meeting:
 - the Tenderer fails to attend the Compulsory Clarification Meeting.
 - the Tenderer fails to have form "Certificate of Attendance at Clarification Meeting / Site Inspection" (in T2.2) signed by the Employer's Agent or his representative.

- (d) in the case of JV submissions, two or more JV entities have common directors / shareholders or common entities tendering for the same works.
- (e) at the time of closing of tenders, the Tenderer is not registered on the National Treasury Central Supplier Database (CSD) as a service provider. In the case of a Joint Venture, this requirement will apply individually to each party in the Joint Venture.
- (f) The tenderer has not submitted, with this tender, a valid Letter of Good Standing from the Compensation Commissioner as proof of being registered and in good standing with the compensation fund. Reference is to be made to Returnable Document T2.2.13.
- (g) The tender fails to complete and sign the Declaration of Municipal Fees in T2.2: "Returnable Documents" and submits the required documentation. Reference is to be made to Returnable Document T2.2.12.

SCM Policy (CI.14(4)) requires suppliers/ service providers/ contractors to be registered on the eThekweni Municipality Central Supplier Database or be in a position to be so before the award.

In the event of the Tenderer not being registered on the eThekweni Municipality's Central Supplier Database, the tenderer must register on the internet at www.durban.gov.za by following these links:

- Business
- Supply Chain Management (SCM)
- Accredited Supplier and Contractor's Database.

The following are to be noted:

- (a) The information for registration as in the possession of the eThekweni Municipality will apply.
- (b) It is the Tenderer's responsibility to ensure that the details as submitted to the Municipality are correct.
- (c) Tenderers are to register prior to the submission of tenders.

F.2.1.2 Eligibility: CIDB

Only those tenderers who are registered (as "Active") with the CIDB (at time of tender closing), in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a **CE** class of construction work, are eligible to have their tenders evaluated.

Joint ventures are eligible to submit tenders provided that:

- (a) Every member of the joint venture is registered (as "Active") with the CIDB (at time of tender closing),
- (b) The lead partner has a contractor grading designation in the **CE** class of construction work and has a grading designation of not lower than one level below the required grading designation, and
- (c) The combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations (2013) is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a **CE** class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.

It should be noted that this contract is not part of a Targeted Development Programme (TDP). The CIDB provisions in relation to a Contractor's Potentially Emerging (PE) status do not apply.

F.2.2.2 The cost of the tender documents: Replace this paragraph with the following:

“Documents are to be obtained, free of charge, in electronic format, from the **National Treasury’s eTenders website** or the **eThekwini Municipality’s Website**. The entire electronically downloaded document should be printed on white A4 paper (single-sided) and suitably bound by the tenderer.

A Non-Refundable Tender Charge is applicable if hard copies are obtained from the Cashier.

F.2.6 Acknowledge addenda: Add the following paragraphs to the clause:

“Addenda will be published, in electronic format, on the websites specified in F.1.2. Tenderers are to ensure that the eTenders website is consulted for any published addenda pertaining to this tender up to three days before the tender closing time as stated in the Tender Data.”

“Acknowledgement of receipt of the addenda will be by the return of the relevant completed, dated, and signed portion of the addenda, to the physical or email address as specified on the addenda. Failure of the tenderer to comply with the requirements of the addenda may result in the tender submission being made non-responsive.”

F.2.7 Clarification meeting:

**Board Room 301, 3rd Floor, 3 Prior Road, eThekwini Water & Sanitation, Durban
On 09 June 2025 at 10h00**

In the event of a Compulsory Clarification Meeting, Tenderers must sign the attendance register in the name of the tendering entity. The Tenderer’s representative(s) at the clarification meeting must be able to clearly convey the discussions at the meeting to the person(s) responsible for compiling the entity’s tender offer.

F.2.12 Alternative tender offers: No alternative tender offers will be considered.

F.2.13 Submitting a tender offer: Submissions must be submitted on official submission documentation issued (either in hard copy or in electronic format) by the eThekwini Municipality.

Identification details to be shown on each tender offer package are:

- Contract No. : **31367-5W**
- Contract Title : **The Installation of Water Meters and Ancillary Works on Existing Reservoir Inlets and Outlets within the Northern Operational Areas**

The Employer’s address for delivery of tender offers is:

**The Tender Box in the foyer of the Municipal Building
166 KE Masinga Road, Durban**

Bidders are required to also make an electronic submission via SSS. Bidders must ensure that the hard copy and electronic submission are the same, failing which the submission will be deemed invalid. Bidders are responsible for resolving all access rights and submission queries before the tender closing date.

SSS Queries Contact: Lindo Dlamini: Tel: 031-3227133/031-3227153 email: supplier.selfservice@durban.gov.za

Parts of each tender offer communicated on paper shall be submitted as an original.

Tenderers are to include, with their paper (“hard copy”) submission, a memory-stick containing an electronically scanned (300 dpi resolution) Public Document Format (PDF) copy of their complete bid submission. This PDF file should be named using the contract number and the Tenderer’s name, eg. **“31367-5W – Tenderers Name.PDF”**.

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

F.2.15 Closing time: The closing time for delivery of tender offers is:

- Date : **Friday, 04 July 2025**
- Time : **11h00**

F.2.16 Tender offer validity: The Tender Offer validity period is 120 Days from the closing date for submission of tenders.

F.2.23 Certificates: Refer to **T2.1** for a listing of certificates that must be provided with the tender. All certificates must be valid at the time of tender closing.

Tenderers are to include, at the back of their tender submission document, a printout of the required documents/ certificates.

The Form of Offer (C1.1.1), Data to be provided by the Contractor (C1.2.2.2), and the Bill of Quantities (C2.2) are also required to be completed in full.

Tax Clearance

Reference is also to be made to returnable form T2.2.3: "Tax Compliance Status PIN/ Tax Clearance Certificate".

SARS has introduced a new Tax Compliance Status System. Tenderers must submit a **Tax Compliance Status PIN** (TCS PIN) instead of an original Tax Clearance Certificate. This TCS PIN can be used by third parties to certify the taxpayer's real-time compliance status. This TCS PIN is to be entered on Returnable Document T2.2.1: "Compulsory Enterprise Questionnaire". Separate Tax Clearance Certificates / TCS PINs are required for each entity in a Joint Venture.

Failure to comply will make the tender non-responsive.

Compensation Commissioner

Reference is also to be made to returnable form T2.2.13: "Eligibility: Registration with Compensation Commissioner".

The tenderer is to supply proof of being registered and in good standing with the compensation fund by submitting a valid **Letter of Good Standing** from the Compensation Commissioner.

Failure to comply will make the tender non-responsive.

Central Supplier Database (CSD)

Reference is also to be made to returnable form T2.2.14: "Eligibility: CSD Registration Report".

The entities (full) **CSD Registration Report**, obtained from the National Treasury Central Supplier Database, is to be included in the tender submission (<https://secure.csd.gov.za>).

Separate CSD Registration Reports are required for each entity in a Joint Venture.

CIDB Registration

Reference is also to be made to returnable form T2.2.15: "Eligibility: Verification of CIDB Registration and Status".

Registration with the CIDB must be reflected as "Active" at time of tender closing.

Tenderers are to include with their submission a printout of their **CIDB Registration**, obtained from the CIDB website (<https://registers.cidb.org.za/PublicContractors/ContractorSearch>).

The Joint Venture Grading Designation Calculator should be used when submitting as a Joint Venture (<https://registers.cidb.org.za/PublicContractors/JVGradingDesignationCalc>).

The date of obtaining the CIDB printout(s) is to be indicated on the printout.
Failure to have the date indicated on the printout will make the tender non-responsive.

F.3: THE EMPLOYER'S UNDERTAKINGS

- F.3.1.1 Respond to requests from the tenderer:** Replace the words “five working days” with “three working days”.
- F.3.2 Issue addenda:** Add the following paragraph: “Addenda will be published, in electronic format, on the same platform(s) as the Tender Notification (refer to F.1.2).”
- F.3.4 Opening of Tender Submissions:** Tenders will be opened immediately after the closing time for tenders. The public reading of tenders will take place in the SCM Boardroom, 6th Floor, Engineering Unit Building, 166 KE Masinga Road, Durban.

F.3.11 Evaluation of Tender Offers:**Eligibility**

Tenders will be checked for compliance with the ELIGIBILITY requirements, as specified in T1.2.2 Clause F.2.1. Tenderers not in compliance will be deemed non-responsive.

Functionality

FUNCTIONALITY will be evaluated to determine the responsiveness of tenders received. The minimum score for FUNCTIONALITY is **70 points**. Those tenders not achieving the minimum score will be deemed non-responsive.

The functionality Criteria, Sub-Criteria, Points per Criteria/ Sub-Criteria, Returnable Documentation and Schedules, Method of Evaluation, and Prompts for Judgement are as specified in T1.2.3: "Additional Conditions of Tender".

Preference Point System

The procedure for the evaluation of responsive tenders is **PRICE AND PREFERENCE** in accordance with the Employer's current SCM Policy, the Preferential Procurement Policy Framework Act (5 of 2000), and the Preferential Procurement Policy Framework Act Regulations (2022).

Price Points

It is unclear (at the time of advertising) which of the two preference point systems applies, either the **80/20 or 90/10** preference point system will apply, determined by the price offered by the lowest acceptable tender.

Preference Points

Reference is also to be made to T2.2.7: "MBD 6.1: Preference Points Claim".

The Preference Points (either 20 or 10) will be derived from points allocated/ claimed for **Specific Goals** as indicated in the table(s) below, according to the specified **Goal/ Category Weightings**.

- **Ownership Goal**

Goal Weighting: 100%

The tendering entity's **Percentage Ownership**, in terms of the **Ownership Category(s)** listed below, is to be used in the determination of the tenderer's claim for **Preference Points**.

| Ownership Categories | Criteria | 80/20 | 90/10 |
|----------------------|--|-------|-------|
| Race: Black (w1) | Equals 0% | 0 | 0 |
| | Between 0% and 51% | 8 | 4 |
| | Greater or equal to 51% and less than 100% | 16 | 8 |
| | Equals 100% | 20 | 10 |
| Maximum Goal Points: | | 20 | 10 |

The **Weightings** of the **Ownership Categories** will be:

- $w1 = 100\%$, $w2 = 0\%$, $w3 = 0\%$ (where: $w1 + w2 + w3 = 100\%$)

Proof of claim as declared on MBD 6.1 (1 or more of the following will be used in verifying the tenderer's status)

- Companies and Intellectual Property Commission registration document (CIPC)
- CSD report.
- B-BBEE Certificate of the tendering entity.
- Consolidated BBBEE Certificate if the tendering entity is a Consortium, Joint Venture, or Trust (Issued by verification agency accredited by the South African Accreditation System).
- Agreement for a Consortium, Joint Venture, or Trust.

F.3.13 Acceptance of tender offer: In addition to the requirements of Clause F.3.13 of the Standard Conditions of Tender, tender offers will only be accepted if:

- (a) The tenderer submits a **valid Tax Clearance Certificate OR Tax Compliance Status PIN**, issued by the TCS System of the South African Revenue Services, or has made arrangements to meet outstanding tax obligations.
- (b) The tenderer is **registered, and "Active", with the Construction Industry Development Board**, at time of tender closing, in an appropriate contractor grading designation.
- (c) 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.
- (d) The tenderer has not:
 - Abused the Employer's Supply Chain Management System; or
 - Failed to perform on any previous contract and has been given a written notice to this effect.
- (e) The tenderer has completed the **Compulsory Enterprise Questionnaire** 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.
- (f) The tenderer is **registered and in good standing with the compensation fund or with a licensed compensation insurer**.
- (g) 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**.

The Municipality does not bind itself to accept the lowest or any tender. It reserves the right to accept the whole or any part of a tender to place orders. Bidders shall not bind the Municipality to any minimum quantity per order. The successful Tenderer (s) shall be bound to provide any quantities stipulated in the specification.

The municipality has a firm intention to proceed with the work, subject to funding being identified. Notwithstanding clause F.1.1.3 of the Standard Conditions of Tender, the municipality reserves the right to award or not award the tender based on the municipalities available budget.

F.3.15 Complete adjudicator's contract: Refer to the **General Conditions of Contract** and the **Contract Data**.

F.3.17 Copies of contract: The number of paper copies of the signed contract to be provided by the Employer is **ONE (1)**.

Tenderers are to include, with their "hard copy" submission, a memory-stick containing an electronically scanned (300 dpi resolution) Public Document Format (PDF) copy of their complete bid submission. This PDF file should be named using the contract number and the Tenderer's name, eg. **"WS 7819 – Tenderers Name.PDF"**. The memory-stick must be labelled with the Tenderer's name and securely fixed to the paper submission.

T1.2.3 ADDITIONAL CONDITIONS OF TENDER**T1.2.3.1 Appeals**

In terms of Regulation 49 of the Municipal Supply Chain Management Regulations persons aggrieved by decisions or actions taken by the Municipality, may lodge an appeal within 14 days of the decision or action, in writing to the Municipality. All appeals (clearly setting out the reasons for the appeal) and queries with regard to the decision of award are to be directed to:

The City Manager
 Attention Ms S. Pillay
 eMail: Simone.Pillay@durban.gov.za
 P O Box 1394
 DURBAN, 4000

T1.2.3.2 Prohibition on awards to persons in the service of the state

Clause 44 of the Supply Chain Management Regulations states that the Municipality or Municipal Entity may not make any award to a person:

- (a) Who is in the service of the State;
- (b) If that person is not a natural person, of which a director, manager, principal shareholder or stakeholder is a person in the service of the state; or
- (c) Who is an advisor or consultant contracted with the municipality or a municipal entity.

Should a contract be awarded, and it is subsequently established that Clause 44 has been breached, the Employer shall have the right to terminate the contract with immediate effect.

T1.2.3.3 Code of Conduct and Local Labour

The Tenderers shall make themselves familiar with the requirements of the following policies that are available on web address: <ftp://ftp.durban.gov.za/cesu/StdContractDocs/>:

- Code of Conduct;
- The Use of CLOs and Local Labour.

T1.2.3.4 Functionality Specification

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

| Functionality criteria (Sub Criteria) | Maximum Points Score |
|--|----------------------|
| Experience of Tendering Firm | 35 |
| Qualifications and experience of key personnel | 35 |
| Construction Methodology | 10 |
| Preliminary Construction Programme | 10 |
| Quality Control | 10 |

Maximum possible score for Functionality (M_s) 100

Functionality shall be scored in accordance with the following schedules which are found in Part T2.2: Returnable Schedules:

And shall be scored by not less than three evaluators and the scores of each of the evaluators will be averaged, weighted and then totalled to obtain the final score for Functionality.

The minimum number of evaluation points for Functionality is **70**. Only those tenderers who achieve the minimum number of Functionality evaluation points (or greater) will be eligible to have their tenders further evaluated.

Evaluation Schedule

Functionality shall be scored in accordance with the schedules below. The threshold for this contract is **70%**. Failure to meet the threshold and where applicable, the minimum scoring requirements for the various quality criteria, will lead to disqualification of the tender.

The prompts for judgement and the required returnable schedules for each of the evaluation criteria are listed in below.

Functionality shall be scored by not less than three evaluators and the scores of each of the evaluators will be averaged, weighted and then totalled to obtain the final score for Functionality.

| Functionality Criterion: Tenderer's Experience with Similar Type Projects In The Past 10 Years (35) | | | |
|---|--|-------------------|-----------|
| Sub Criteria | Prompts for Judgement-Key Expert Criteria | Max Points | |
| Proven experience with complete Installation of <u>FABRICATED STEEL ASSEMBLIES</u> on existing pipelines of diameters DN80 to DN200 in the last 10 years and similar type projects** | Contractor failed to provide evidence of experience OR submission of no substance / irrelevant information provided. | 0 of 10 | 10 |
| | Contractor has successfully completed the construction of ONE (1) to FIFTEEN (15) installations that satisfy the sub-criteria and scope of works. | 4 of 10 | |
| | Contractor has successfully completed the construction of SIXTEEN (16) to THIRTY (30) installations that satisfy the sub-criteria and scope of works. | 7 of 10 | |
| | Contractor has successfully completed the construction of THIRTY-ONE (31) to FORTY-FIVE (45) installations that satisfy the sub-criteria and scope of works. | 9 of 10 | |
| | Contractor has successfully completed the construction of FORTY-SIX (46) to SIXTY (60) installations that satisfy the sub-criteria and scope of works. | 10 of 10 | |
| Proven experience with complete Installation of <u>FABRICATED STEEL ASSEMBLIES</u> on existing steel pipelines of diameters DN250 to DN600 in the last 10 years and similar type projects** | Contractor failed to provide evidence of experience OR submission of no substance / irrelevant information provided. | 0 of 9 | 9 |
| | Contractor has successfully completed the construction of ONE (1) to SIX (6) installations that satisfy the sub criteria and scope of works. | 4 of 9 | |
| | Contractor has successfully completed the construction of SEVEN (7) to FOURTEEN (14) installations that satisfy the sub criteria and scope of works. | 6 of 9 | |
| | Contractor has successfully completed the construction of FIFTEEN (15) to TWENTY (20) installations that satisfy the sub criteria and scope of works. | 8 of 9 | |
| | Contractor has successfully completed the construction of TWENTY-ONE (21) to TWENTY-FIVE (25) installations that satisfy the sub criteria and scope of works. | 9 of 9 | |
| Proven experience in the construction of continuously welded steel mains of diameters greater than DN250. | Contractor failed to provide evidence of experience OR submission of no substance / irrelevant information provided. | 0 of 8 | 8 |
| | Contractor has successfully completed the construction of pipeline projects for lengths totalling 2km to 5km. | 3 of 8 | |
| | Contractor has successfully completed the construction of pipeline projects for lengths totalling 5km to 10km. | 6 of 8 | |
| | Contractor has successfully completed the construction of pipeline projects for lengths totalling 10km to 15km. | 7 of 8 | |
| | Contractor has successfully completed the construction of pipeline projects for lengths totalling 15km to 20km. | 8 of 8 | |
| Proven experience in planning and coordination of <u>SHUTDOWNS</u> to live bulk mains of diameters greater than or equal to DN200 within a time period of 4 to 6 hours. NOTE: Contractor to | Contractor failed to provide evidence of experience OR submission of no substance / irrelevant information provided. | 0 of 8 | 8 |
| | The Contractor has successfully completed the planning, isolation and restoration of water within the time period of 4 – 6 hours on live steel bulk water mains for ONE (1) to FIFTEEN (15)) shutdowns and provided evidence of this experience. | 3 of 8 | |
| | The Contractor has successfully completed the planning, isolation and restoration of water within a time period of 4 – 6 hours on live steel bulk water mains for SIXTEEN (16) to THIRTY (30) shutdowns and provided evidence of this experience. | 6 of 8 | |

| | | | |
|--|---|--------|-----------|
| complete relevant documentation to back up claim. | The Contractor has successfully completed the planning, isolation and restoration of water within a time period of 4 – 6 hours on live steel bulk water mains for THIRTY-ONE (31) to FORTY-FIVE (45) shutdowns and provided evidence of this experience. | 7 of 8 | |
| | The Contractor has successfully completed the planning, isolation and restoration of water within a time period of 4 – 6 hours on live steel bulk water mains for FORTY-SIX (46) to SIXTY (60) shutdowns and provided evidence of this experience. | 8 of 8 | |
| SUB-TOTAL | | | 35 |

****NOTE: FABRICATED STEEL ASSEMBLIES include but not limited to: Pressure Reducing Valve Assemblies and Meter Assemblies with spool pieces, valves etc. OR complete Weld on Fittings such as Air Valve, Scour Valve tees, etc. Refer to T2.2.17 (Page 43)**

| Functionality Criterion: Experience of Key Personnel In Relation To The Scope Of Works (35) | | | | |
|---|--|--|--------|------------|
| Sub criteria | | Prompts for Judgement-Key Expert Criteria | | Max Points |
| Contracts Manager/ Director (7) | Qualifications | National Diploma/ Degree in Engineering or in the Built Environment, AND registration with SACPCMP as a Professional Project and Construction Manager/ECSA as a Professional Engineer/ Technologist/ Technician (Compulsory Requirement) | | |
| | Experience With relevant project experience in relation to the scope of works and with working on steel water mains. | has less than THREE (3) years post-qualification or no proof of evidence of experience | 0 of 7 | 7 |
| | | THREE (3) to FIVE (5) years post-qualification of relevant project experience | 3 of 7 | |
| | | SIX (6) to EIGHT (8) years post-qualification of relevant project experience | 5 of 7 | |
| | | NINE (9) to TEN (10) years post-qualification of relevant project experience | 6 of 7 | |
| | | ELEVEN (11) or MORE years post-qualification of relevant project experience | 7 of 7 | |
| Site Agent / Construction Manager (7) | Qualifications | National Diploma/ Degree in Civil Engineering or in the Built Environment (Compulsory Requirement) | | |
| | Experience With relevant project experience in relation to the scope of works and with working on steel water mains. | has less than THREE (3) years post-qualification or no proof of evidence of experience | 0 of 7 | 7 |
| | | THREE (3) to FIVE (5) years post-qualification of relevant project experience | 3 of 7 | |
| | | SIX (6) to EIGHT (8) years post-qualification of relevant project experience | 5 of 7 | |
| | | NINE (9) to TEN (10) years post-qualification of relevant project experience | 6 of 7 | |
| | | NINE (9) to TEN (10) years post-qualification of relevant project experience registration with SACPCMP as a Professional Project and Construction Manager/ECSA as a Professional Engineer/ Technologist/ Technician | 7 of 7 | |
| General Foreman (7) | Experience With relevant project experience in relation to the scope of works and with working on steel water mains. | has less than THREE (3) years or no proof of evidence of experience | 0 of 7 | 7 |
| | | THREE (3) to FIVE (5) years of relevant project experience | 3 of 7 | |
| | | SIX (6) to EIGHT (8) years of relevant project experience | 5 of 7 | |
| | | NINE (9) to TEN (10) years of relevant project experience | 6 of 7 | |
| | | ELEVEN (11) or MORE years of relevant project experience | 7 of 7 | |
| Pipe Fitter / Plumber (7) | Experience With relevant project experience in relation to the scope of works and with working on steel water mains. | has less than THREE (3) years or no proof of evidence of experience | 0 of 7 | 7 |
| | | THREE (3) to FIVE (5) years of relevant project experience | 3 of 7 | |
| | | SIX (6) to EIGHT (8) years of relevant project experience | 5 of 7 | |
| | | NINE (9) to TEN (10) years of relevant project experience | 6 of 7 | |

| | | | | |
|------------|--|--|--------|----|
| | | ELEVEN (11) or MORE years of relevant project experience | 7 of 7 | |
| Welder (7) | Qualifications | Welder Trade Test Certificate (Compulsory Requirement) | | |
| | Experience With relevant project experience in relation to the scope of works and with working on steel water mains. | has less than THREE (3) years post-qualification or NO proof or evidence of experience | 0 of 4 | 7 |
| | | THREE (3) to FIVE (5) years post-qualification of relevant project experience | 3 of 7 | |
| | | SIX (6) to EIGHT (8) years post-qualification of relevant project experience | 5 of 7 | |
| | | NINE (9) to TEN (10) years post-qualification of relevant project experience | 6 of 7 | |
| | | ELEVEN (11) or MORE years post-qualification of relevant project experience | 7 of 7 | |
| SUB-TOTAL | | | | 35 |

Failure to provide evidence of an accredited diploma/degree/Trade test/professional registration will result in the tenderer scoring a zero for this criterion. **Refer to T2.2.20 (Page 46)**

| Functionality Criterion: Construction Methodology (10) | | | |
|---|---|------------|----|
| Sub criteria | Prompts for Judgement-Key Expert Criteria | Max Points | |
| Construction Approach and Methodology in relation to the scope of works | No supporting evidence provided / submission of no substance / irrelevant information provided | 0 of 10 | 10 |
| | The technical approach and/or methodology is generic which does not meet any of the key elements of the scope of work and highly unlikely to satisfy the project objectives and/or requirements. | 4 of 10 | |
| | The technical approach and/or methodology is satisfactory which meets some of the key elements of the scope of work and fairly likely to satisfy the project objectives and/or requirements. | 7 of 10 | |
| | The technical approach and/or methodology is clear which meets most of the key elements of the scope of work and highly likely to satisfy the project objectives and/or requirements. | 9 of 10 | |
| | The technical approach and/or methodology is outstanding which meets all of the key elements and brings in new innovation to key elements of the scope of work and definitely likely to satisfy the project objectives and/or requirements. | 10 of 10 | |
| SUB-TOTAL | | | 10 |

| Functionality Criterion: Preliminary Construction Programme (10) | | | | |
|---|---|--|-------------------|-----------|
| Sub criteria | Prompts for Judgement-Key Expert Criteria | | Max Points | |
| Preliminary Construction Programme | No information provided OR submission of no substance / irrelevant information provided | | 0 of 10 | 10 |
| | Programme <u>does not cover</u> all the applicable individual activities which are in an acceptable sequence, with appropriate durations, and is in accordance with generally accepted construction practice, and not in line with Clause 1.1.1.14 of the Conditions of Contract (time for achieving Practical Completion). | | 4 of 10 | |
| | Programme <u>covering</u> all the applicable individual activities which are in an acceptable sequence, with appropriate durations, and is in accordance with generally accepted construction practice, and is in line with Clause 1.1.1.14 of the Conditions of Contract (time for achieving Practical Completion). | | 7 of 10 | |
| | Programme <u>covering</u> all the applicable individual activities which are in an acceptable sequence, with appropriate durations, and is in accordance with generally accepted construction practice, and is in line with Clause 1.1.1.14 of the Conditions of Contract (time for achieving Practical Completion). Plus: Shows critical path with logical linking of tasks/activities | | 9 of 10 | |

| | | | |
|------------------|---|----------|-----------|
| | <p>Programme <u>covering</u> all the applicable individual activities which are in an acceptable sequence, with appropriate durations, and is in accordance with generally accepted construction practice, and is in line with Clause 1.1.1.14 of the Conditions of Contract (time for achieving Practical Completion).</p> <p>Plus:</p> <ul style="list-style-type: none"> Shows critical path with logical linking of tasks/activities, and Detailed activity and resources breakdown. | 10 of 10 | |
| SUB-TOTAL | | | 10 |

| Functionality Criterion: Quality Control (10) | | | |
|--|--|-------------------|-----------|
| Sub criteria | Prompts for Judgement-Key Expert Criteria | Max Points | |
| Quality Control/ Assurance | No information provided; OR submission of no substance / irrelevant information provided | 0 of 10 | 10 |
| | <u>A generic statement</u> covering required sampling and testing requirements for preparatory works, process monitoring and finishing works, for all programmed activities. | 4 of 10 | |
| | <u>Site specific statement</u> covering required sampling and testing requirements for preparatory works, process monitoring and finishing works, for all programmed activities, Plus: <ul style="list-style-type: none"> Including site specific quality control check-sheet for programmed activities; ISO 9001 Accreditation. | 7 of 10 | |
| | <u>Site specific statement</u> covering required sampling and testing requirements for preparatory works, process monitoring and finishing works, for all programmed activities; Plus: <ul style="list-style-type: none"> Including site specific quality control check sheet for programmed activities; Resources to be assigned to quality control; List of subcontractor /service providers to be assigned for quality control; ISO 9001 Accreditation. | 9 of 10 | |
| | <u>Site specific statement</u> covering required sampling and testing requirements for preparatory works, process monitoring and finishing works, for all programmed activities; Plus: <ul style="list-style-type: none"> Including site specific quality control check sheet for programmed activities; Resources to be assigned to quality control; List of subcontractor /service providers to be assigned for quality control; Detailed statement on remedial action to quality control detailing the process to be followed when a programmed activity fails quality; ISO 9001 Accreditation. | 10 of 10 | |
| SUB-TOTAL | | | 10 |

PART T2: RETURNABLE DOCUMENTS

T2.1 LIST OF RETURNABLE DOCUMENTS

T2.1.1 General

The Tender Submission Documentation must be submitted in its entirety. All forms must be properly completed as required.

The Tenderer is required to complete each and every Schedule and Form listed below to the best of their 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 non-responsive.

T2.1.2 Returnable Schedules, Forms and Certificates

Entity Specific

| | | |
|---------|--|----|
| T2.2.1 | Compulsory Enterprise Questionnaire | 18 |
| T2.2.2 | Certificate of Attendance at Clarification Meeting | 20 |
| T2.2.3 | Tax Compliance Status PIN | 21 |
| T2.2.4 | Contractor's Health and Safety Declaration | 22 |
| T2.2.5 | MBD 4: Declaration of Interest | 24 |
| T2.2.6 | MBD 5: Declaration for Procurement Above R10 Million | 26 |
| T2.2.7 | MBD 6.1: Preference Points Claim Form ITO the Preferential Regulations | 27 |
| T2.2.8 | MBD 8: Declaration of Bidder's Past SCM Practices | 30 |
| T2.2.9 | MBD 9: Certificate of Independent Bid Determination | 32 |
| T2.2.10 | Joint Venture Agreements (if applicable) | 35 |
| T2.2.11 | Record of Addenda to Tender Documents (if applicable) | 36 |

Eligibility

| | | |
|---------|---|----|
| T2.2.12 | Eligibility: Declaration of Municipal Fees | 37 |
| T2.2.13 | Eligibility: Registration with Compensation Commissioner | 38 |
| T2.2.14 | Eligibility: CSD Registration Report | 39 |
| T2.2.15 | Eligibility: Verification of CIDB Registration and Status | 40 |

Technical or Functionality Evaluation

| | | |
|---------|---|----|
| T2.2.16 | Experience of Tenderer | 41 |
| T2.2.17 | Independent Reference of Tenderers Experience | 43 |
| T2.2.18 | Proposed Organisation and Staffing | 44 |
| T2.2.19 | Key Personnel | 45 |
| T2.2.20 | Experience of Key Personnel | 46 |
| T2.2.21 | Preliminary Programme | 49 |
| T2.2.22 | Construction Approach, Methodology, And Quality Control | 51 |
| T2.2.23 | Schedule Of Proposed Subcontractors | 53 |
| T2.2.24 | Plant And Equipment | 54 |
| T2.2.25 | Contractor's Health And Safety Plan | 55 |
| T2.2.26 | Contractor's Health And Safety Declaration | 56 |
| T2.2.27 | Tenderer's Financial Standing | 58 |
| T2.2.28 | Technical Data Sheet | 59 |
| T2.2.29 | Contract Participation Goal | 61 |
| T2.2.30 | Amendments, Qualifications and Alternatives | 64 |
| T2.2.31 | Performance Gaurantee | 65 |

T2.2 RETURNABLE SCHEDULES, FORMS, AND CERTIFICATES

The returnable schedules, forms, and certificates, as listed in T2.1.2, can be found on pages [18](#) to [65](#).

NOTE

The **Form of Offer** (C1.1.1), The **Data to be Provided by Contractor** (C1.2.2.2), and the **Bill of Quantities** (C2.2) are also required to be completed by the tenderer.

T2.2.1 COMPULSORY ENTERPRISE QUESTIONNAIRE

| Ref | Description | Complete or Circle Applicable |
|------|---|----------------------------------|
| 1.1 | Name of enterprise | |
| 1.2 | Name of enterprise's representative | |
| 1.3 | ID Number of enterprise's representative | |
| 1.4 | Position enterprise's representative occupies in the enterprise | |
| 1.5 | National Treasury Central Supplier Database Registration number | |
| 1.6 | eThekwini Supplier Database: Reference number (PR), if any: | |
| 1.7 | VAT registration number, if any: | |
| 1.8 | CIDB registration number, if any: | |
| 1.9 | Department of Labour: Registration number | |
| 1.10 | Department of Labour: Letter of Good Standing Certificate number | |
| 2.0 | Particulars of sole proprietors and partners in partnerships (attach separate pages if more than 4 partners) | |
| | Full Name | Identity No. |
| 2.1 | | |
| 2.2 | | |
| 2.3 | | |
| 2.4 | | |
| 3.0 | Particulars of companies and close corporations | |
| 3.1 | Company registration number, if applicable: | |
| 3.2 | Close corporation number, if applicable: | |
| 3.3 | Tax Reference number, if any: | |
| 3.4 | South African Revenue Service: Tax Compliance Status PIN: | |

4.0 Record in the service of the state (Insert on a separate page if necessary)

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

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

| 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 mths |
| | | | |
| | | | |
| | | | |

5.0 Record of spouses, children and parents in the service of the state (Insert on a separate page if necessary)

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 in the service of any of the following:

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

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

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

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

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.2 CERTIFICATE OF ATTENDANCE AT CLARIFICATION MEETING / SITE INSPECTION

Reference is to be made to Clauses F.2.1.1(c) and F.2.7 of the Tender Data.

This is to certify that:

(entity name):

of (address):

was represented by the person(s) named below at the Clarification Meeting held for all tenderers, the details of which are stated in the Tender Data (F.2.7).

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

Particulars of person(s) attending the meeting:

Name:

Name:

Signature:

Signature:

Capacity:

Capacity:

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

Name:

Signature:

Date:

T2.2.3 TAX COMPLIANCE STATUS PIN

Reference is to be made to Clauses F.2.23 and F.3.13(a) of the Tender Data.

SARS has introduced a new Tax Compliance Status System. Tenderers can submit a Tax Compliance Status PIN (TCS PIN) instead of an original Tax Clearance Certificate. This TCS PIN can be used by third parties to certify the taxpayer's real-time compliance status.

Separate TCS PINs are required for each entity in a Joint Venture.

The TCS PIN(s) are to be entered under item 3.4 on form **T2.1.2.1: Compulsory Enterprise Questionnaire**.

Tenderers are to include, at the back of their submission document, a printout of their Tax Compliance Status PIN (TCS PIN) OR an original Tax Clearance Certificate.

Failure to include the required document will make the tender submission non-responsive.

*I, the undersigned, who warrants that they are authorised to sign on behalf of the entity, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, **and that the requested documentation has been included in the submission.***

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.4 CONTRACTOR'S HEALTH AND SAFETY DECLARATION

If Functionality is applicable as part of tender evaluation, reference is to be made to Clause F3.11.9 of the Conditions of Tender.

Reference is to be made to Clauses F.2.1.1(f) and F.2.23 of the Tender Data.

In terms of Clause 5(1)(h) of the OHS 1993 Construction Regulations 2014 (referred to as "the Regulations" hereafter), a Principal Contractor may only be appointed to perform construction work if the Client is satisfied that the Principal Contractor has the necessary competencies and resources to carry out the work safely in accordance with the Occupational Health and Safety Act No 85 of 1993 and the OHS 1993 Construction Regulations 2014.

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

Declaration by Tenderer

- 1 I, the undersigned, hereby declare and confirm that I am fully conversant with the Occupational Health and Safety Act No 85 of 1993 (as amended by the Occupational Health and Safety Amendment Act No 181 of 1993), and the OHS 1993 Construction Regulations 2014.
- 2 I hereby declare that my company has the competence and the necessary resources to safely carry out the construction work under this contract in compliance with the Construction Regulations and the Employer's Health and Safety Specifications.
- 3 I propose to achieve compliance with the Regulations by one of the following **(Tenderers are to Circle Applicable - Yes or No)**:

(a) From my own competent resources as detailed in 4(a) hereafter.

(b) From my own resources still to be appointed or trained until competency is achieved, as detailed in 4(b) hereafter:

(c) From outside sources by appointment of competent specialist Subcontractors as detailed in 4(c) hereafter:

| Circle Applicable | |
|-------------------|----|
| Yes | NO |
| Yes | NO |
| YES | NO |

- 4 Details of resources I propose:

(Note: Competent resources shall include safety personnel such as a construction supervisor and construction safety officer as defined in Regulation 8, and competent persons as defined in Regulations 9, 10, 11, 12, 13, 14, 16, 17, 20, 21, 22, 23(1), 24, 25, 26, 27, 28 and 29, as applicable).

- (a) Details of the competent and qualified key persons from my company's own resources, who will form part of the contract team:

| NAMES OF COMPETENT PERSONS | POSITIONS TO BE FILLED BY COMPETENT PERSONS |
|----------------------------|---|
| | |
| | |
| | |
| | |
| | |
| | |

(b) Details of training of persons from my company's own resources (or to be hired) who still have to be trained to achieve the necessary competency:

(i) By whom will training be provided?

(ii) When will training be undertaken?

(iii) Positions to be filled by persons to be trained or hired:

| |
|--|
| |
| |
| |
| |
| |

(c) Details of competent resources to be appointed as subcontractors if competent persons cannot be supplied from own company:

Name of proposed subcontractor:

Qualifications or details of competency of the subcontractor:

| |
|--|
| |
| |
| |
| |

- 5 I, the undersigned, hereby undertake, if this tender is accepted, to provide, before commencement of the works under the contract, a suitable and sufficiently documented Health and Safety Plan in accordance with Regulation 7(1) of the Construction Regulations, which plan shall be subject to approval by the Client.
- 6 I, the undersigned, confirm that copies of this company's approved Health and Safety Plan, the Client's Safety Specifications as well as the OHSA 1993 Construction Regulations 2014 will be provided on site and will at all times be available for inspection by the Principal Contractor's personnel, the Client's personnel, the Employer's Agent, visitors, and officials and inspectors of the Department of Labour.
- 7 I, the undersigned, hereby confirm that adequate provision has been made in the tendered rates and prices in the Bill of Quantities to cover the cost of all resources, actions, training and all health and safety measures envisaged in the OHSA 1993 Construction Regulations 2014, and that I will be liable for any penalties that may be applied by the Client in terms of the said Regulations (Regulation 33) for failure on the Principal Contractor's part to comply with the provisions of the Act and the Regulations.
- 8 I, the undersigned, agree that failure to complete and execute this declaration to the satisfaction of the Client will mean that this company is unable to comply with the requirements of the OHSA 1993 Construction Regulations (2014) and accept that this tender will be prejudiced and may be rejected at the discretion of the Client.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.5 MBD 4: DECLARATION OF INTEREST

MSCM Regulations: “**in the service of the state**” means to be:

- (a) a member of:
 - (i) any municipal council.
 - (ii) any provincial legislature.
 - (iii) the national Assembly or the national Council of provinces.
- (b) a member of the board of directors of any municipal enterprise.
- (c) an official of any municipality or municipal enterprise.
- (d) an employee of any national or provincial department, national or provincial public enterprise 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 enterprise.
- (f) an employee of Parliament or a provincial legislature.

“**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.

- 1 No bid will be accepted from persons **in the service of the state**¹.
- 2 Any person, having a kinship with persons **in the service of the state**, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to **persons in service of the state**, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority and/or take an oath declaring his/her interest.
- 3 In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

3.1 Name of enterprise

Name of enterprise’s representative

3.2 ID Number of enterprise’s representative

3.3 Position enterprise’s representative occupies in the enterprise

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 / sole proprietors / partners in partnerships, their individual identity numbers and state employee numbers must be indicated in paragraph 4 below. In the case of a joint venture, information in respect of each partnering enterprise must be completed and submitted.

| |
|-----------------------------------|
| Complete T2.1.2.1 Item 1.1 |
| Complete T2.1.2.1 Item 1.2 |
| Complete T2.1.2.1 Item 1.3 |
| Complete T2.1.2.1 Item 1.4 |
| Complete T2.1.2.1 Item 3.1 or 3.2 |
| Complete T2.1.2.1 Item 3.3 |
| Complete T2.1.2.1 Item 1.7 |

3.8 Are you presently in the service of the state?

If yes, furnish particulars:

.....

3.9 Have you been in the service of the state for the past twelve months?

If yes, furnish particulars:

.....

Circle Applicable

YES NO

YES NO

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

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

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

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

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

If yes, furnish particulars:

.....

- 4 The names of all directors / trustees / shareholders / members / sole proprietors / partners in partnerships, their individual identity numbers and state employee numbers must be indicated below. In the case of a joint venture, information in respect of each partnering enterprise must be completed and submitted

| Full Name | Identity No. | State Employee No. | Personal income tax No. |
|-----------------------------------|--------------|--------------------|-------------------------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Use additional pages if necessary | | | |

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.6 MBD 5: DECLARATION FOR PROCUREMENT ABOVE R10 MILLION
(ALL APPLICABLE TAXES INCLUDED)

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

| Circle Applicable | |
|--|----|
| YES | NO |
| <p>1.0 Are you by law required to prepare annual financial statements for auditing?</p> <p>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.</p> | |
| <p>2.0 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?</p> <p>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.</p> <p>2.2 If YES, provide particulars.</p> <p>.....</p> <p>.....</p> | |
| <p>3.0 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?</p> <p>3.1 If YES, provide particulars.</p> <p>.....</p> <p>.....</p> | |
| <p>4.0 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?</p> <p>4.1 If YES, provide particulars.</p> <p>.....</p> <p>.....</p> | |

If required by 1.1 above, tenderers are to include, at the back of their tender submission document, a printout of their audited annual financial statements.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, and, if required, that the requested documentation has been included in the tender submission.

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.7 MBD 6.1: PREFERENCE POINTS CLAIM
In terms of THE PREFERENTIAL PROCUREMENT REGULATIONS (2022)

Reference is to be made to Clause F.3.11 of the Tender Data.

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

1.0 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).
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

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

1.3 Preference Points for this tender shall be awarded for:

- **Price and Specific Goals:** Either 80 or 90 (price) and 20 or 10 (specific goals), in terms of 1.2 above.
- The total Preference Points, for Price and Specific Goals, is 100.

1.4 Failure on the part of the tenderer to submit the required proof or documentation, in terms of the requirements in the Conditions of Tender for claiming specific goal preference points, will be interpreted that preference points for specific goals are not claimed.

1.5 The Municipality 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 of preferences, in any manner required by the Municipality.

2.0 DEFINITIONS

2.1 **“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.

2.2 **“price”** means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts.

2.3 **“rand value”** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes.

2.4 **“tender for income-generating contracts”** means a written offer in the form determined by Municipality 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 Municipality and a third party that produces revenue for the Municipality, 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.

2.5 **“the Act”** means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

3.0 FORMULA FOR CALCULATION OF PREFERENCE PRICE POINTS

3.1 PROCUREMENT OF GOODS AND SERVICES

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

80 / 20 Points System

$$P_s = 80 \left(1 - \frac{P_t - P_{min}}{P_{min}} \right)$$

Where:

P_s = Points scored for price of tender under consideration

P_t = Price of tender under consideration

P_{min} = Price of lowest acceptable tender

4.0 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 goal(s) stated in **Table 1** below, as supported by proof/ documentation stated in the **Conditions of 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 maximum points for each goal are indicated per the table below.Tenderers are to indicate their points claim for each of the Specific Goals in the shaded blocks.

| The Specific Goals to be allocated points in terms of this tender | Maximum Number of points ALLOCATED (80/20 system) | Maximum Number of points ALLOCATED (90/10 system) | Number of points CLAIMED (80/20 system) | Number of points CLAIMED (90/10 system) |
|---|---|---|---|---|
| Ownership Goal: Race (black) | 20 | n/a | | n/a |
| Total CLAIMED Points (20 Maximum) | | | | n/a |

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, certify that the points claimed, based on the specific goals as specified in the tender, qualifies the tendering entity for the preference(s) shown.

I acknowledge that:

- 1) The information furnished is true and correct.
- 2) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form.
- 3) 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.
- 4) 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.

NAME (Block Capitals): _____

Date

SIGNATURE: _____

T2.2.8 MBD 8: DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

- 1.0 This Municipal Bidding Document must form part of all bids invited.
- 2.0 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.
- 3.0 The bid of any bidder may be rejected if that bidder, or any of its directors have:
- a) abused the municipal entity's supply chain management system or committed any improper conduct in relation to such system.
 - b) been convicted for fraud or corruption during the past five years.
 - c) wilfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years.
 - 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).
- 4.0 In order to give effect to the above, the following questions must be completed and submitted with the bid.

- 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 audi alteram partem 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.

| Circle Applicable | |
|-------------------|----|
| YES | NO |

- 4.1.1 If YES, provide 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 YES, provide 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 YES, provide particulars.

.....

.....

4.4 Does the bidder or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?

| | |
|-----|----|
| YES | NO |
|-----|----|

4.4.1 If YES, provide 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 |
|-----|----|

4.5.1 If YES, provide particulars.

.....

.....

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both 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.

NAME (Block Capitals):

Date

.....

SIGNATURE:

.....

T2.2.9 MBD 9: CERTIFICATE OF INDEPENDENT BID DETERMINATION**NOTES**

- 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.
- 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.

- 1.0 This Municipal Bidding Document (MBD) must form part of all **bids**¹ invited.
- 2.0 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.
- 3.0 Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:
- a. take all reasonable steps to prevent such abuse;
 - b. reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and
 - c. cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.
- 4.0 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**.
- 5.0 In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid.

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:

(Name of Bidder)

that:

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.
 - (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder.
6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement, or arrangement with any competitor. However, communication between partners in a joint venture or 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.
 - (f) bidding with the intention not to win the bid.
8. In addition, there have been no consultations, communications, agreements, or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.
9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.
10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both 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.

NAME (Block Capitals):

Date

.....

SIGNATURE:

.....

.....

T2.2.10 JOINT VENTURES AGREEMENTS

Joint Venture agreement and Power of Attorney Agreements to be attached here (if applicable).

T2.2.11 RECORD OF ADDENDA TO TENDER DOCUMENTS

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

| ADD.No | DATE | TITLE OR DETAILS |
|--------|------|------------------|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

It is also confirmed that the requirements, as stated on the Addenda, have been complied with.

NAME (Block Capitals): _____

Date

SIGNATURE: _____

T2.2.12 ELIGIBILITY: DECLARATION OF MUNICIPAL FEES

Reference is to be made to Clause F.2.1.1(g) of the Tender Data.

I, the undersigned, do hereby declare that the Municipal fees of:

.....
(full name of Company / Close Corporation / partnership / sole proprietary/Joint Venture)

(hereinafter referred to as the TENDERER) are, as at the date hereunder, fully paid or an Acknowledgement of Debt has been concluded with the Municipality to pay the said charges in instalments.

The following account details relate to property of the said TENDERER:

| <u>Account</u> | <u>Account Number: to be completed by tenderer</u> | | | | | | | | | | | |
|----------------------|--|--|--|--|--|--|--|--|--|--|--|--|
| Consolidated Account | | | | | | | | | | | | |
| Electricity | | | | | | | | | | | | |
| Water | | | | | | | | | | | | |
| Rates | | | | | | | | | | | | |
| JSB Levies | | | | | | | | | | | | |
| Other | | | | | | | | | | | | |

I acknowledge that should the aforesaid Municipal charges fall into arrears, the Municipality may take such remedial action as is required, including termination of any contract, and any payments due to the Contractor by the Municipality shall be first set off against such arrears.

- Where the tenderer's place of business or business interests are outside the jurisdiction of eThekweni municipality, a copy of the accounts/ agreements from the relevant municipality are to be provided.
- Where the tenderer's Municipal Accounts are part of their lease agreement, then a copy of the agreement, or an official letter to that effect, is to be provided.

Tenderers are to include, at the back of their tender submission document, a printout of the above account's and or agreements signed with the municipality.

Failure to include the required document will make the tender submission non-responsive.

*I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, **and that the requested documentation has been included in the tender submission.***

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.13 ELIGIBILITY: REGISTRATION WITH COMPENSATION COMMISSIONER

Reference is to be made to Clause F.2.1.1(f) of the Tender Data.

The Occupational Injuries and Diseases Act (130 of 1993 as amended) (the Act) refers. A summary of the pertinent Clauses are listed below. The act is to be referenced for the full text of the clauses.

Clause 80: Employer to register with commissioner and furnish him with particulars

The Act requires that an Employer carrying out business in the Republic to register with the Compensation Commissioner. Any person who fails to comply with the provisions of the this clause is guilty of an offence.

Clause 82: Employer to furnish returns of earnings

The Act requires an Employer to furnish the commissioner with a return showing:

- The amount of earnings paid by him to his employees.
- Any further information as may be prescribed or as the commissioner may require.

Any Employer who fails to comply with the provisions of the this clause is guilty of an offence.

Clause 86: Assessment to be paid by an employer to commissioner

The Act states that an Employer will receive notices of assessment from the commissioner. The Employer must pay the commissioner the assessment amount on the notices.

Clause 89: Mandators and contractors

The Act requires a contractor (a person with a contract with a mandator) to register as an Employer in accordance with the provisions of the Act and pay the necessary assessments. Failing registration or payment of assessments, the mandator is required to pay the assessments in respect of the employees of the contractor. The mandator is allowed to recover the assessment amounts paid from the contractor.

The Department of labour issues contractors with a **Letter of Good Standing** if the contractor has complied with the requirement(s) of the Act and is in "good standing" with the Compensation Fund. Employers can check the validity of such Letters of Good Standing on the internet (<https://cfoonline.labour.gov.za/VerifyLOGS>).

Tenderers are to include, at the back of their tender submission document, a printout of their most recent Letter of Good Standing from the Department of Labour.

Failure to include the required document will make the tender submission non-responsive.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, and that the requested documentation has been included in the tender submission.

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.14 ELIGIBILITY: CSD REGISTRATION REPORT


Reference is to be made to Clauses F.2.1.1(e) and F.2.23 of the Tender Data.

The Conditions of Tender, Clause F.2.1: Eligibility, requires a tenderer to be registered, at the time of tender closing, on the **National Treasury Central Supplier Database (CSD)** as a service provider.

CSD Registration Reports can be obtained from the National Treasury's CSD website at <https://secure.csd.gov.za/Account/Login>.

The date of obtaining the printout is to be indicated on the printout.

The following is an example of the beginning of the printout obtained from the above website.

| | |
|--|-----------------------|
|  CENTRAL SUPPLIER DATABASE FOR GOVERNMENT | Report Date: |
| | <input type="text"/> |
| | Report Ran By: |
| | <input type="text"/> |

| CSD REGISTRATION REPORT | |
|--|----------------------|
| SUPPLIER IDENTIFICATION | |
| Supplier number | <input type="text"/> |
| Is supplier active? | <input type="text"/> |
| Supplier type | <input type="text"/> |
| Supplier sub-type | <input type="text"/> |
| Legal name | <input type="text"/> |
| Trading name | <input type="text"/> |
| Identification type | <input type="text"/> |
| Government breakdown | <input type="text"/> |
| Business status | <input type="text"/> |
| Country of origin | <input type="text"/> |
| South African company/CC registration number | <input type="text"/> |
| Have Bank Account | <input type="text"/> |
| Total annual turnover | <input type="text"/> |
| Financial year start date | <input type="text"/> |
| Registration date | <input type="text"/> |
| Created by | <input type="text"/> |
| Created date | <input type="text"/> |
| Edit by | <input type="text"/> |
| Edit date | <input type="text"/> |
| Restricted Supplier | <input type="text"/> |
| Restriction Last Verification Date | <input type="text"/> |

Tenderers are to include, at the back of their tender submission document, a printout of their (full) CSD Registration Report.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, and that the requested documentation has been included in the tender submission.

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.15 ELIGIBILITY: VERIFICATION OF CIDB REGISTRATION AND STATUS

Reference is to be made to Clause F.2.1.2 and F.2.23 of the Tender Data.

The Conditions of Tender, **Clause F.2.1.2: Eligibility**, requires a tenderer to be registered, as "Active", with the CIDB (at time of tender closing), in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations. The required class of construction work is specified in Clause F.2.1.1.

CIDB Registrations can be obtained from the CIDB website at <https://registers.cidb.org.za/PublicContractors/ContractorSearch>. The date of obtaining the printout is to be indicated on the printout.

The following is an example of the beginning of the printout obtained from the above website.

Home

Contractor Detail Print

Contractor Detail

CRS Number: Type of Enterprise:

Contractor Name: Registration Date:

Trading Name: Expiry Date:

Status:

Contractor Grades

Grade:

Back

Copyright © cidb 2011. All rights reserved
[Website technical enquires contact](#)

01/01/2017

Tenderers are to include, at the back of their tender submission document, a printout of their registration with the CIDB.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, and that the requested documentation has been included in the tender submission.

NAME (Block Capitals):

Date

SIGNATURE:

| Sub Criteria | Prompts for Judgement-Key Expert Criteria | Max Points | Tenderer's Self Score |
|--|---|------------|-----------------------|
| Proven experience with complete Installation of FABRICATED STEEL ASSEMBLIES on existing pipelines of diameters DN80 to DN200 in the last 10 years and similar type projects** | Contractor failed to provide evidence of experience OR submission of no substance / irrelevant information provided. | 0 of 10 | 10 |
| | Contractor has successfully completed the construction of ONE (1) to FIFTEEN (15) installations that satisfy the sub-criteria and scope of works. | 4 of 10 | |
| | Contractor has successfully completed the construction of SIXTEEN (16) to THIRTY (30) installations that satisfy the sub-criteria and scope of works. | 7 of 10 | |
| | Contractor has successfully completed the construction of THIRTY-ONE (31) to FORTY-FIVE (45) installations that satisfy the sub-criteria and scope of works. | 9 of 10 | |
| | Contractor has successfully completed the construction of FORTY-SIX (46) to SIXTY (60) installations that satisfy the sub-criteria and scope of works. | 10 of 10 | |
| Proven experience with complete Installation of FABRICATED STEEL ASSEMBLIES on existing steel pipelines of diameters DN250 to DN600 in the last 10 years and similar type projects** | Contractor failed to provide evidence of experience OR submission of no substance / irrelevant information provided. | 0 of 9 | 9 |
| | Contractor has successfully completed the construction of ONE (1) to SIX (6) installations that satisfy the sub criteria and scope of works. | 1 of 9 | |
| | Contractor has successfully completed the construction of SEVEN (7) to FOURTEEN (14) installations that satisfy the sub criteria and scope of works. | 3 of 9 | |
| | Contractor has successfully completed the construction of FIFTEEN (15) to TWENTY (20) installations that satisfy the sub criteria and scope of works. | 6 of 9 | |
| | Contractor has successfully completed the construction of TWENTY-ONE (21) to TWENTY-FIVE (25) installations that satisfy the sub criteria and scope of works. | 9 of 9 | |
| Proven experience in the construction of continuously welded steel mains of diameters greater than DN250. | Contractor failed to provide evidence of experience OR submission of no substance / irrelevant information provided. | 0 of 8 | 8 |
| | Contractor has successfully completed the construction of pipeline projects for lengths totalling 2km to 5km. | 2 of 8 | |
| | Contractor has successfully completed the construction of pipeline projects for lengths totalling 5km to 10km. | 6 of 8 | |
| | Contractor has successfully completed the construction of pipeline projects for lengths totalling 10km to 15km. | 7 of 8 | |
| | Contractor has successfully completed the construction of pipeline projects for lengths totalling 15km to 20km. | 8 of 8 | |
| Proven experience in planning and coordination of SHUTDOWNS to live bulk mains of diameters greater than or equal to DN200 within a time period of 4 to 6 hours. NOTE: Contractor to complete relevant documentation to back up claim. | Contractor failed to provide evidence of experience OR submission of no substance / irrelevant information provided. | 0 of 8 | 8 |
| | The Contractor has successfully completed the planning, isolation and restoration of water within the time period of 4 – 6 hours on live steel bulk water mains for ONE (1) to FIFTEEN (15)) shutdowns and provided evidence of this experience. | 2 of 8 | |
| | The Contractor has successfully completed the planning, isolation and restoration of water within a time period of 4 – 6 hours on live steel bulk water mains for SIXTEEN (16) to THIRTY (30) shutdowns and provided evidence of this experience. | 4 of 8 | |
| | The Contractor has successfully completed the planning, isolation and restoration of water within a time period of 4 – 6 hours on live steel bulk water mains for THIRTY-ONE (31) to FORTY-FIVE (45) shutdowns and provided evidence of this experience. | 6 of 8 | |
| | The Contractor has successfully completed the planning, isolation and restoration of water within a time period of 4 – 6 hours on live steel bulk water mains for FORTY-SIX (46) to SIXTY (60) shutdowns and provided evidence of this experience. | 8 of 8 | |
| SUB-TOTAL | | 35 | |

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.17 INDEPENDENT REFERENCE OF TENDERERS EXPERIENCE**PROFORMA REPORT ON THE TENDERERS COMPETENCE AND PERFORMANCE ON A SIMILAR PROJECT FOR TENDER RECOMMENDATION PURPOSES.**

The Tenderer shall provide details on each of the previous projects listed under the tenderers experience. The reference proforma must be completed by each of the previous Engineers, Employer or relevant Municipal Operations Manager for their respective projects completed within the last 10 years (as claimed in the Tenderers experienced schedule). Tenderers are to use the provided proforma template. No alternative proforma template will be accepted.

Project details:

Description of work:

Employer:

Engineer:

Contract duration:

Contract Value(s):

Table 1:

| Description | Quantity (No./km's) |
|--|---------------------|
| Installation of FABRICATED STEEL ASSEMBLIES such as Pressure Reducing Valve Assemblies and Meter Assemblies with spool pieces, valves etc. OR complete Weld on Fittings such as Air Valve, Scour Valve tees, etc. on existing pipelines of diameters DN80 to DN200 for pipeline material of Steel, Asbestos Cement, HDPe or PVC. | |
| Installation of FABRICATED STEEL ASSEMBLIES such as Pressure Reducing Valve Assemblies and Meter Assemblies with spool pieces, valves etc. OR complete Weld on Fittings such as Air Valve, Scour Valve tees, etc. on existing STEEL pipelines only of diameters DN250 to DN600 . | |
| Construction of continuously welded steel mains of diameters greater than DN250 . | |
| Planning and coordination of SHUTDOWNS to live bulk mains of diameters greater than or equal to DN200 within a time period of 4 to 6 hours. | |

NOTE: Tenderer to make additional copies of this form.

Any other comments:

.....

.....

Details of person completing this reference form (Reference):

Name : Signature :

Contact number: Date :

STAMP

T2.2.18 PROPOSED ORGANISATION and STAFFING

Refer to Clause F3.11.9 for Functionality Points evaluation prompts.

The tenderer should propose the structure and composition of their team i.e. the main disciplines involved, the key staff member / expert responsible for each discipline, and the proposed technical and support staff and site staff.

The roles and responsibilities of each key staff member / expert should be set out as job descriptions. In the case of an association / joint venture / consortium, it should, indicate how the duties and responsibilities are to be shared.

The tenderer must attach his / her organization and staffing proposals to this page. (this is to include both the on-site and off-site staffing resources used for this project)

NOTE: The tenderer organogram should illustrate a minimum of 3 separate site teams complete with Pipeline/ General foreman, Pipe Fitter, Welder, local labour etc

In addition to any lists, this information should also be shown in an organogram format (flow chart) clearly indicating the staff hierarchy and reporting lines, again for on- and off-site resources.

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.19 KEY PERSONNEL

Refer to Clause F3.11.9 for Functionality Points evaluation prompts.

The Tenderer shall list below the personnel which he intends to utilize on the Works, including key personnel (Contract's Manager, Site Agent, and Foremen) which may have to be brought in from outside if not available locally.

| CATEGORY OF EMPLOYEE | NUMBER OF PERSONS | |
|--|--|---|
| | KEY PERSONNEL, PART OF THE CONTRACTOR'S ORGANISATION | KEY PERSONNEL TO BE IMPORTED IF NOT AVAILABLE LOCALLY |
| Contracts Manager / Director ** | | |
| Site Agent / Construction Manager ** | | |
| Pipeline/ General Foremen ** | | |
| Pipe Fitter ** | | |
| Welder ** | | |
| Health and Safety Officer ** | | |
| Quality Assurance Office and Quality Control Officer | | |
| Others: | | |

Note to Tenderer:

**** CV's shall be provided for these personnel**

Should any personnel change from the tender submission, their CV must be submitted and approved by the Employers Representative and it shall be a like for like candidate or better.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.20 EXPERIENCE OF KEY PERSONNEL

Refer to Clause F3.11.9 for Functionality Points evaluation prompts.

The experience of assigned staff member in relation to the Scope of Work will be evaluated from three different points of view:

Should any personnel change from the tender submission, their CV must be submitted and approved by the Employers Representative and it shall be a like for like candidate or better.

- 1) General experience (total duration of professional activity), level of education and training and positions held of each discipline specific team leader.
- 2) The education, training, skills and experience of the Assigned Staff in the specific sector, field, subject, etc which is directly linked to the scope of work.
- 3) The key staff members' / experts' knowledge of issues which the tenderer considers pertinent to the project e.g. local conditions, affected communities, legislation, techniques etc.

Note to Tenderer:

A CV shall be attached to this schedule of not more than 2 pages for

- i) the Contracts Manager/ Director
- ii) Site Agent/ Project Manager
- iii) Pipeline/ General foreman
- iv) Pipe Fitter
- v) Welder
- vi) Health and Safety Officer

Each CV shall be structured according to the following template. The Tenderer shall ensure that each CV is signed by the person nominated for the key staff position and that all the information provided is true. Any inconsistency in the information provided will lead to the conclusion that the person nominated is not suitably qualified for the position or do not submit their CVs will be scored **ZERO** points.

Scoring of the Experience of Key Personnel will be as follows:

NOTE: The tenderer is to fill in the shaded cells

| Sub criteria | | Prompts for Judgement-Key Expert Criteria | Max Points | | Tenderer's Self Score |
|-----------------------------------|---|--|------------|----|-----------------------|
| Contracts Manager/ Director (7) | Qualifications | National Diploma/ Degree in Civil Engineering and Built Environment, AND registration with SACPCMP as a Professional Project and Construction Manager/ECSA as a Professional Engineer/ Technologist/ Technician (Compulsory Requirement) | | | 7 |
| | Experience With relevant project experience in relation to the scope of works and with working on steel water mains. | Has less than THREE (3) years post-qualification or no proof of evidence of experience | 0 of 7 | | |
| | | THREE (3) to FIVE (5) years post-qualification of relevant project experience | 3 of 7 | | |
| | | SIX (6) to EIGHT (8) years post-qualification of relevant project experience | 5 of 7 | | |
| | | NINE (9) to TEN (10) years post-qualification of relevant project experience | 6 of 7 | | |
| | | ELEVEN (11) or MORE years post-qualification of relevant project experience | 7 of 7 | | |
| Site Agent / Construction Manager | Qualifications | National Diploma/ Degree in Civil Engineering and Built Environment (Compulsory Requirement) | | | 7 |
| | Experience With relevant project experience in relation to the scope of works and with working on steel water mains. | Has less than THREE (3) years post-qualification or no proof of evidence of experience | 0 of 7 | | |
| | | THREE (3) to FIVE (5) years post-qualification of relevant project experience | 3 of 7 | | |
| | | SIX (6) to EIGHT (8) years post-qualification of relevant project experience | 5 of 7 | | |
| | | NINE (9) to TEN (10) years post-qualification of relevant project experience | 6 of 7 | | |
| | | NINE (9) to TEN (10) years post-qualification of relevant project experience registration with SACPCMP as a Professional Project and Construction Manager/ECSA as a Professional Engineer/ Technologist/ Technician | 7 of 7 | | |
| General Foremen (7) | Experience With relevant project experience in relation to the scope of works and with working on steel water mains. | Has less than THREE (3) years or no proof of evidence of experience | 0 of 7 | 7 | |
| | | THREE (3) to FIVE (5) years of relevant project experience | 3 of 7 | | |
| | | SIX (6) to EIGHT (8) years of relevant project experience | 5 of 7 | | |
| | | NINE (9) to TEN (10) years of relevant project experience | 6 of 7 | | |
| | | ELEVEN (11) or MORE years of relevant project experience | 7 of 7 | | |
| Pipe Fitter (7) | Experience With relevant project experience in relation to the scope of works and with working on steel water mains. | Has less than THREE (3) years or no proof of evidence of experience | 0 of 7 | 7 | |
| | | THREE (3) to FIVE (5) years of relevant project experience | 3 of 7 | | |
| | | SIX (6) to EIGHT (8) years of relevant project experience | 5 of 7 | | |
| | | NINE (9) to TEN (10) years of relevant project experience | 6 of 7 | | |
| | | ELEVEN (11) or MORE years of relevant project experience | 7 of 7 | | |
| Welder (7) | Qualifications | Welder Trade Test Certificate (Compulsory Requirement) | | | 7 |
| | Experience With relevant project experience in relation to the scope of works and with working on steel water mains. | Has less than THREE (3) years post-qualification or NO proof of evidence of experience | 0 of 4 | | |
| | | THREE (3) to FIVE (5) years post-qualification of relevant project experience | 3 of 7 | | |
| | | SIX (6) to EIGHT (8) years post-qualification of relevant project experience | 5 of 7 | | |
| | | NINE (9) to TEN (10) years post-qualification of relevant project experience | 6 of 7 | | |
| | | ELEVEN (11) or MORE years post-qualification of relevant project experience | 7 of 7 | | |
| SUB-TOTAL | | | | 35 | |

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals):

Date

.....

SIGNATURE: _____

| Personal Particulars | | | | |
|-----------------------------------|--------------|---------------------------------------|----------------|-----------|
| Full Name and Surname: | | | | |
| ID/ Passport No. | | | | |
| Age | | | | |
| Tendered Post: | | | | |
| Professional Registration Number: | | | | |
| Qualifications | | | | |
| Education / Qualifications: | | Year Qualifications Obtained: | Institution: | |
| | | | | |
| | | | | |
| Overview of Experience | | | | |
| Date | Organisation | | Position Held | |
| | | | | |
| | | | | |
| Outline of Relevant Experience | | | | |
| Start | End | Contract Title & Detailed Description | Responsibility | Reference |
| | | | | |
| | | | | |
| | | | | |
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NOTE: Make additional copies of this form if required for additional projects.

I, the undersigned, declare that all the information provided above and in forms that follow correctly describes me and my experience.

I, the undersigned do hereby agree to present myself for an interview with the Client or a representative of the Client should further clarity be required on the information provided herein.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): _____

Date _____

SIGNATURE: _____

T2.2.21 PRELIMINARY PROGRAMME

Refer to Clause F3.11.9 for Functionality Points evaluation prompts.

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

| PROGRAMME | | | | | | | | | | | | | | |
|-----------|----------------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| ACTIVITY | WEEKS / MONTHS | | | | | | | | | | | | | |
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Note: The programme must be based on the completion time as specified in the Contract Data.

Scoring of the Preliminary Construction Programme will be as follows:

NOTE: The tenderer is to fill in the shaded cells.

| Sub criteria | Prompts for Judgement-Key Expert Criteria | Max Points | Tenderer's Self Score |
|------------------------------------|--|------------|-----------------------|
| Preliminary Construction Programme | No information provided OR submission of no substance / irrelevant information provided | 0 of 10 | |
| | Programme <u>does not cover</u> all the applicable individual activities which are in an acceptable sequence, with appropriate durations, and is in accordance with generally accepted construction practice, and not in line with Clause 1.1.1.14 of the Conditions of Contract (time for achieving Practical Completion). | 4 of 10 | |
| | Programme <u>covering</u> all the applicable individual activities which are in an acceptable sequence, with appropriate durations, and is in accordance with generally accepted construction practice, and is in line with Clause 1.1.1.14 of the Conditions of Contract (time for achieving Practical Completion). | 7 of 10 | |
| | Programme <u>covering</u> all the applicable individual activities which are in an acceptable sequence, with appropriate durations, and is in accordance with generally accepted construction practice, and is in line with Clause 1.1.1.14 of the Conditions of Contract (time for achieving Practical Completion). Plus: Shows critical path with logical linking of tasks/activities | 9 of 10 | |
| | Programme <u>covering</u> all the applicable individual activities which are in an acceptable sequence, with appropriate durations, and is in accordance with generally accepted construction practice, and is in line with Clause 1.1.1.14 of the Conditions of Contract (time for achieving Practical Completion). Plus: <ul style="list-style-type: none"> Shows critical path with logical linking of tasks/activities, and Detailed activity and resources breakdown. | 10 of 10 | |
| SUB-TOTAL | | 10 | |

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.22 CONSTRUCTION APPROACH, METHODOLOGY, AND QUALITY CONTROL

Refer to Clause F3.11.9 for Functionality Points evaluation prompts.

Construction Approach and Methodology

The construction approach and methodology must respond to the Scope of Work and outline the proposed approach to undertake the work showing a detailed programme including health and safety aspects, the use of plant and resources for this Project and the extent of which shall be no more than 5 A4 pages.

The tenderer must attach their Construction Approach and Methodology to this page.

Scoring of the Construction Approach and Methodology will be as follows:

NOTE: The tenderer is to fill in the shaded cells.

| Sub criteria | Prompts for Judgement-Key Expert Criteria | Max Points | | Tenderer's Self Score |
|---|---|------------|----|-----------------------|
| Construction Approach and Methodology in relation to the scope of works | No supporting evidence provided / submission of no substance / irrelevant information provided | 0 of 10 | 10 | |
| | The technical approach and/or methodology is generic which does not meet any of the key elements of the scope of work and highly unlikely to satisfy the project objectives and/or requirements. | 4 of 10 | | |
| | The technical approach and/or methodology is satisfactory which meets some of the key elements of the scope of work and fairly likely to satisfy the project objectives and/or requirements. | 7 of 10 | | |
| | The technical approach and/or methodology is clear which meets most of the key elements of the scope of work and highly likely to satisfy the project objectives and/or requirements. | 9 of 10 | | |
| | The technical approach and/or methodology is outstanding which meets all of the key elements and brings in new innovation to key elements of the scope of work and definitely likely to satisfy the project objectives and/or requirements. | 10 of 10 | | |
| SUB-TOTAL | | | 10 | |

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals):

Date

SIGNATURE:

Quality Control

The quality control statement must discuss what tests and control measures are to be employed on site to attain the specified results and is to cover the program associated activities.

The tenderer must attach their Quality Control information to this page.

Scoring of the Quality Control criterion will be as follows:

NOTE: The tenderer is to fill in the shaded cells.

| Sub criteria | Prompts for Judgement-Key Expert Criteria | Max Points | Tenderer's Self Score |
|---------------------------------------|--|------------|-----------------------|
| Quality Control/ Assurance | No information provided; OR submission of no substance / irrelevant information provided | 0 of 10 | 10 |
| | <u>A generic statement</u> covering required sampling and testing requirements for preparatory works, process monitoring and finishing works, for all programmed activities. | 4 of 10 | |
| | <u>Site specific statement</u> covering required sampling and testing requirements for preparatory works, process monitoring and finishing works, for all programmed activities, Plus: <ul style="list-style-type: none"> Including site specific quality control check-sheet for programmed activities; ISO 9001 Accreditation. | 7 of 10 | |
| | <u>Site specific statement</u> covering required sampling and testing requirements for preparatory works, process monitoring and finishing works, for all programmed activities; Plus: <ul style="list-style-type: none"> Including site specific quality control check sheet for programmed activities; Resources to be assigned to quality control; List of subcontractor /service providers to be assigned for quality control; ISO 9001 Accreditation. | 9 of 10 | |
| | <u>Site specific statement</u> covering required sampling and testing requirements for preparatory works, process monitoring and finishing works, for all programmed activities; Plus: <ul style="list-style-type: none"> Including site specific quality control check sheet for programmed activities; Resources to be assigned to quality control; List of subcontractor /service providers to be assigned for quality control; Detailed statement on remedial action to quality control detailing the process to be followed when a programmed activity fails quality; ISO 9001 Accreditation. | 10 of 10 | |
| SUB-TOTAL | | | 10 |

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): _____

Date

SIGNATURE: _____

T2.2.24 PLANT and EQUIPMENT

Refer to Clause F3.11.9 for Functionality Points evaluation prompts.

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

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

| DESCRIPTION (type, size, capacity etc) | QUANTITY | YEAR OF MANUFACTURE |
|--|----------|---------------------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Attach additional pages if more space is required

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

| DESCRIPTION (type, size, capacity etc) | QUANTITY | HOW ACQUIRED | |
|--|----------|--------------|--------|
| | | HIRE/ BUY | SOURCE |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Attach additional pages if more space is required

The Tenderer undertakes to bring onto site without additional cost to the Employer any additional plant not listed but which may be necessary to complete the contract within the specified contract period.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.25 CONTRACTOR'S HEALTH AND SAFETY PLAN

At tender stage only a brief overview (**to be attached to this page**) of the tenderers perception on the safety requirements for this contract will be adequate.

Only the successful Tenderer shall submit separately the Contractor's Health and Safety Plan as required in terms of Regulation 7 of the Occupational Health and Safety Act 1993 Construction Regulations 2014.

The detailed safety plan will take into consideration the site specific risks as mentioned under C.3: Project Specification.

A generic health and safety plan will not be acceptable.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): _____

Date

SIGNATURE: _____

T2.2.26 CONTRACTOR'S HEALTH AND SAFETY DECLARATION

In terms of Clause 5(1)(h) of the OHS 1993 Construction Regulations 2014 (referred to as "the Regulations" hereafter), a Principal Contractor may only be appointed to perform construction work if the Client is satisfied that the Principal Contractor has the necessary competencies and resources to carry out the work safely in accordance with the Occupational Health and Safety Act No 85 of 1993 and the OHS 1993 Construction Regulations 2014.

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

Declaration by Tenderer

1. I the undersigned hereby declare and confirm that I am fully conversant with the Occupational Health and Safety Act No 85 of 1993 (as amended by the Occupational Health and Safety Amendment Act No 181 of 1993), and the OHS 1993 Construction Regulations 2014.
2. I hereby declare that my company has the competence and the necessary resources to safely carry out the construction work under this contract in compliance with the Construction Regulations and the Employer's Health and Safety Specifications.
3. I propose to achieve compliance with the Regulations by one of the following:

Tenderers are
to Circle Applicable

- | | |
|---|-----------------|
| (a) From my own competent resources as detailed in 4(a) hereafter: | YES NO |
| (b) From my own resources still to be appointed or trained until competency is achieved, as detailed in 4(b) hereafter: | YES NO |
| (c) From outside sources by appointment of competent specialist Subcontractors as detailed in 4(c) hereafter: | YES NO |

4. Details of resources I propose :

(Note: Competent resources shall include safety personnel such as a construction supervisor and construction safety officer as defined in Regulation 8, and competent persons as defined in Regulations 9, 10, 11, 12, 13, 14, 16, 17, 20, 21, 22, 23(1), 24, 25, 26, 27, 28 and 29, as applicable).

- (a) Details of the competent and qualified key persons from my company's own resources, who will form part of the contract team:

| NAMES OF COMPETENT PERSONS | POSITIONS TO BE FILLED BY COMPETENT PERSONS |
|----------------------------|---|
| | |
| | |
| | |
| | |
| | |

- (b) Details of training of persons from my company's own resources (or to be hired) who still have to be trained to achieve the necessary competency:
- (i) By whom will training be provided?
- (ii) When will training be undertaken?
- (iii) List the positions to be filled by persons to be trained or hired:

- (c) Details of competent resources to be appointed as subcontractors if competent persons cannot be supplied from own company:

Name of proposed subcontractor:

Qualifications or details of competency of the subcontractor:

.....

.....

5. I hereby undertake, if my tender is accepted, to provide, before commencement of the works under the contract, a suitable and sufficiently documented Health and Safety Plan in accordance with Regulation 7(1) of the Construction Regulations, which plan shall be subject to approval by the Client.
6. I confirm that copies of my company's approved Health and Safety Plan, the Client's Safety Specifications as well as the OHSA 1993 Construction Regulations 2014 will be provided on site and will at all times be available for inspection by the Principal Contractor's personnel, the Client's personnel, the Employer's Agent, visitors, and officials and inspectors of the Department of Labour.
7. I hereby confirm that adequate provision has been made in my tendered rates and prices in the Bill of Quantities to cover the cost of all resources, actions, training and all health and safety measures envisaged in the OHSA 1993 Construction Regulations 2014, and that I will be liable for any penalties that may be applied by the Client in terms of the said Regulations (Regulation 33) for failure on the Principal Contractor's part to comply with the provisions of the Act and the Regulations.
8. I agree that my failure to complete and execute this declaration to the satisfaction of the Client will mean that I am unable to comply with the requirements of the OHSA 1993 Construction Regulations 2014, and accept that my tender will be prejudiced and may be rejected at the discretion of the Client.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.27 TENDERER'S FINANCIAL STANDING

In terms of the Standard Conditions of Tender, the Tenderer shall provide information about his commercial position, which includes information necessary for the Employer to evaluate the tenderer's financial standing.

To that end, the Tenderer must provide with the Tender Offer a bank code or bank rating, certified by his banker, to the effect that he has the financial resources to successfully complete the contract at the tendered amount over the specified contract period. The letter of confirmation of the Tenderer's bank rating shall be attached to this form.

However, should the Tenderer be unable to provide a bank rating with the tender, he shall state the reasons as to why he was unable to do so and in addition provide the following details of his bankers and bank account that he intends using for the project.

Name of account holder:

Name of Bank: Branch:

Telephone number: Fax. No. :

Name of contact person at Bank:

Note:

Failure to provide an original (or certified) bank rating will lead to the conclusion that the Tenderer does not have the necessary financial resources at his disposal to successfully complete the contract.

The Employer undertakes to treat the information contained herein as confidential and to use it strictly for the purpose of evaluation of the Tender Offer.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals):

Date

.....

SIGNATURE:

.....

.....

T2.2.28 TECHNICAL DATA SHEETS

Completion of the following Data Sheets enclosed is mandatory for the key items of equipment that will form part of the Permanent Works, as listed below.

Technical Data Sheet 1: Valves and Mechanical Fittings

Note:

Submission of the technical data sheets will in no way relieve the Contractor from his contractual obligation to supply plant and equipment that complies with the specifications.

TECHNICAL DATA SHEET 1: VALVES AND MECHANICAL FITTINGS

NOTE: The tenderer is to fill in the shaded cells.

| DESCRIPTION | VALVE OR MECHANICAL FITTING | | | | |
|----------------------------------|--------------------------------------|--------------------------|--------------------------|----------------------------|---|
| Type of Valve | **Ultrasonic Flow Meter | Mechanical Flow Meter | Wedge Gate Valve (WGV) | Resilient Seal Valve (RSV) | Flange Adaptor/ Restrained Flange Adaptor |
| Specification | PSMA 1 | PSMA 2 | SANS 664 PSL 3.10 | SANS 664 PSL 3.10 | PSL 3.8.2 |
| Pressure Class | PN 16 | PN 16 | PN 16 | PN 16 | PN 16 |
| End Connections | Flanged SANS 1123 1600/3 or EN1092-1 | Flanged SANS 1123 1600/3 | Flanged SANS 1123 1600/3 | Flanged SANS 1123 1600/3 | Flanged SANS 1123 1600/3 |
| DN - Nominal Diameter (mm) | Refer to BoQ | Refer to BoQ | Refer to BoQ | Refer to BoQ | Refer to BoQ |
| Number Required (No) | Refer to BoQ | Refer to BoQ | Refer to BoQ | Refer to BoQ | Refer to BoQ |
| Make of Valve | | | | | |
| Name of Valve Supplier | | | | | |
| Manufacturer | | | | | |
| Place of Manufacture | | | | | |
| Factory Body Test Pressure (kPa) | | | | | |
| Factory Gate Test Pressure (kPa) | | | | | |

****Tenderers must provide full details of the minimum lengths of straight pipe required upstream and downstream for ultrasonic flow meters for each type of perturbation, so that the accuracy of the meters remains within the specified accuracies.**

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals):

Date

SIGNATURE:

CONTRACT PARTICIPATION GOALS – CONTRACTOR

Objective

The objective of eThekwini Water & Sanitation empowerment initiative is to bring about meaningful transformation in all procurement projects and in particular in the built environment through the following:

- Meaningful Economic Participation;
- Local Economic Development;
- Transfer of Technical, Management and Entrepreneurial Skills; and
- Creation of sustainable Black Enterprises

Contract Participation Goals

Contract Participation Goal (CPG) – the **final** amount of services paid to CPG Partner/s based on the **final** Contract price

At the time of awarding the Contract, the **30%** minimum CPG amount will be based on the Contract Sum exclusive of the following:

- VAT, CPA, Contingencies and P&G's

During Contract implementation, adjustments relating to Provisional Sums and Contingencies linked to the CPG allocation will be agreed upon between the parties to the Contract, as and when the need arises.

Tenderers are required to achieve at least **30%** Contract Participation Goals (CPG) of the value of goods, services and Works paid to one or more targeted enterprises to comply with eThekwini Municipality BBEE policy initiative.

Applicability

The CPG target shall be achieved through the following mechanisms:-

- The main Contractor may propose a suitable targeted enterprise or CPG partner/s provided there is a statement of no objection from eThekwini Water & Sanitation.
- Sub-contracting of the CPG Partner/s at the same rate/ prices that the tenderer would have offered eThekwini Water & Sanitation whilst making profit margins consistent to the profit margins that the main contractor would have made under normal trading processes.
- The working capital arrangements between the main contractor and the CPG Partner/s must be agreed upon between the two parties prior to commencement of works to ensure that the CPG Partner does not have cash flow challenges during contract implementation.
- Value of the work to be sub contracted shall be at least **30% (minimum)** of the total contract price excluding VAT, CPA, Contingencies and P&G's.
- From the 30% CPG, **10%** shall be allocated to Military Veterans.

| Targeted Enterprise | | | |
|----------------------------|------------------------|----------------------------------|-------------------|
| Annual Turnover | Black Ownership | Tax Clearance Certificate | CPG Target |
| TE< R15 m | >50% | Required | 30% Min. |

Applicability

- For each monthly invoice submitted by the Main Contractor, the Targeted Enterprise(s) costs per function must be clearly articulated to enable the CPG targets to be easily and regularly monitored.
- eThekwin Water & Sanitation will monitor CPG implementation onsite. This may include direct contact with the CPG Partner/s on site for verification purposes.
- The CPG Partner shall be in agreement with the measurement and payment for work completed, for the purpose of submitting payment certificates, as determined by the Contractor.
- CPG Partner/s shall attend all contractual meetings relevant to their scope of work including contract award negotiations, monthly contract site meetings and technical meeting.

The Main Contractor must withhold 10% retention of the Targeted Enterprise(s) fees until the practical completion.

The Main Contractor must pay the amount due to the Targeted Enterprise within 3 days of receiving payment from the Employer.

Eligibility Criteria for Targeted Enterprise

- The Main Contractor must not have equity holding exceeding 20%, either directly or through a flow-through principle
- SARS registration and tax clearance
- Company registration
- Must be >50% Black-owned

Black Owned

- Black people who hold at least 51% of the exercisable voting rights
- Black people who hold at least 51% of the economic interest

Penalties for not achieving the minimum CPG

In the case where the minimum CPG value of **30%** is not achieved. The Main Contractor will be penalized as follows:

| No. | CPG not achieved in contract | Penalty Factor | Application | Objective |
|-----|------------------------------|----------------|--|---|
| 1 | 1 – 30% | 0.5 | For every percentage CPG not achieved; the CPG amount not achieved in Rands will be multiplied by the corresponding penalty factor. The factored amount in Rands will be deducted from the Main Contractor's Payment Certificates. | The Main Contractor is to support and mentor the Targeted Enterprise(s) to achieve the project milestones as part of the objectives to transfer Technical, Management and Entrepreneurial skills. |

AMENDMENTS, QUALIFICATIONS AND ALTERNATIVES

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

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

(a) AMENDMENTS

| PAGE, CLAUSE OR ITEM NO | PROPOSED AMENDMENT |
|----------------------------|--------------------|
| | |
| | |
| | |
| | |

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

(b) ALTERNATIVES

| PROPOSED ALTERNATIVE | DESCRIPTION OF ALTERNATIVE |
|-------------------------|----------------------------|
| | |
| | |
| | |
| | |

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

(c) DISCOUNTS

| ITEM ON WHICH DISCOUNT IS OFFERED | DESCRIPTION OF DISCOUNT OFFERED |
|---|---------------------------------|
| | |
| | |
| | |
| | |

- (1) *The Tenderer must give full details of the discounts offered in a covering letter attached to his tender, failing which, the offer will be prejudiced.*

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals):

Date

SIGNATURE:

PERFORMANCE GUARANTEE**Employer:** (name and address)..........
.....**Contract No:**

(Contract title)

WHEREAS

(hereinafter referred to as "the Employer") entered into, on the day of 20....,

a Contract with

(hereinafter called "the Contractor") for (CONTRACT TITLE)

..... at

AND WHEREAS it is provided by said Contract that the Contractor shall provide the Employer with security by way of a guarantee for the due and faithful fulfilment of the Contract by the Contractor;**AND WHEREAS** (hereinafter referred to as the Guarantor)
has/have at the request of the Contractor, agreed to give such security;**NOW THEREFORE WE,**

do hereby guarantee to the Employer under renunciation of the benefits of division and excussion 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 me/us, have complete liberty of action to act in any manner authorised and/or contemplated by the terms of the said Contract, and/or to agree to any modifications, variations, alterations, directions or extensions of the Due 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 Due Completion Date which the Employer may make, give, concede or agree to under the said Contract.
2. The Employer shall be entitled, without reference to us, to release any securities held by it, and to give time to or compound or make any other arrangement with the Contractor.
3. This guarantee shall remain in full force and effect until the issue of an authenticated Completion Certificate 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.
4. My/Our total liability in terms hereof shall be limited to the sum of R.....
(in words)
(10 % of the tender sum) which amount I/we agree to hold at your disposal.
5. I/We declare that I/we, on behalf of the Guarantor, waive the legal exceptions available to a guarantor and undertake to pay the said amount or such portion thereof as may be demanded, immediately on receipt of a written demand from you.

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

6. I/We hereby choose domicilium citandi et executandi for all purposes arising hereof at

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

IN WITNESS WHEREOF this guarantee has been executed by us at on this
..... day of20.....

Signature:
Duly authorized to sign on behalf of: (*Guarantor*)
.....
Address

As witnesses:
1.
2.

PART C1: AGREEMENT AND CONTRACT DATA**C1.1: FORM OF OFFER AND ACCEPTANCE****C1.1.1: OFFER**

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

Contract No: **30394-5W**

Contract Title: **The Installation of Water Meters and Ancillary Works on Existing Reservoir Inlets and Outlets within the Northern Operational Areas**

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

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

*** The offered total of the prices inclusive of Value Added Tax is:**

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.

For the Tenderer:

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

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

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

Capacity (of Signatory) :

Address :

:

Telephone :

Witness:

Signature : **Date** :

Name (in capitals) :

Notes:

*** Indicates what information is mandatory.**

Failure to complete the mandatory information and sign this form will invalidate the tender.

C1.1: FORM OF OFFER AND ACCEPTANCE**C1.1.2: FORM OF ACCEPTANCE****This Form will be completed by the Employer**

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

The terms of the contract are contained in:

- Part C1 : Agreement and Contract Data, (which includes this Agreement)
- Part C2 : Pricing Data, including the Bill of Quantities
- Part C3 : Scope of Work
- Part C4 : 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 authorised representatives of both parties.

The Tenderer shall within two weeks after receiving a completed copy of this Agreement, including the Schedule of Deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the Conditions of Contract identified in the Contract Data at, or just after, the date this Agreement comes into effect. Failure to fulfill any of these obligations in accordance with those terms shall constitute a repudiation of this Agreement.

Notwithstanding anything contained herein, this Agreement comes into effect on the date when the Tenderer receives one fully completed original copy of this document, including the Schedule of Deviations (if any). Unless the Tenderer (now Contractor) within five 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 (*person authorized to sign the acceptance*) :

Name (*of signatory in capitals*) :

Capacity (*of Signatory*) :

Name of Employer (*organisation*) :

Address :

:

Witness:

Signature : **Date** :

Name(*in capitals*) : :

C1.1: FORM OF OFFER AND ACCEPTANCE
C1.1.3: SCHEDULE OF DEVIATIONS

This form will be completed by THE EMPLOYER and ONLY THE SUCCESSFUL TENDERER

1. **Subject** :
- Details** :
- :
2. **Subject** :
- Details** :
- :
3. **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

FOR THE EMPLOYER

| | | |
|-------|-----------------------------|-------|
| ..... | Signature | ..... |
| ..... | Name (<i>in capitals</i>) | ..... |
| ..... | Capacity | ..... |
| ..... | Name and Address of | ..... |
| ..... | Organisation | ..... |
| | | |
| | | |
| ..... | Witness Signature | ..... |
| ..... | Witness Name | ..... |
| ..... | Date | ..... |

C1.2: CONTRACT DATA

C1.2.1 CONDITIONS OF CONTRACT

C1.2.1.1 GENERAL CONDITIONS OF CONTRACT

The Conditions of Contract are the General Conditions of Contract for Construction Works (2015 3rd Edition), (GCC 2015) published by the South African Institution of Civil Engineering. Copies of these conditions of contract may be obtained from the South African Institution of Civil Engineering (Tel: 011-805-5947, Fax: 011-805-5971, E-mail: civilinfo@saice.org.za).

The Contract Data (including variations and additions) shall amplify, modify, or supersede, the GCC 2015 to the extent specified below, and shall take precedence and shall govern.

Each item of data given below is cross-referenced to the clause in the GCC 2015 to which it mainly applies.

C1.2.2 CONTRACT DATA

C1.2.2.1 DATA TO BE PROVIDED BY THE EMPLOYER

- 1.1.1.13 The **Defects Liability Period**, from the date of the Certificate of Completion, is **1 Year, from issuing the Practical Completion certificate for the particular installation.**
- 1.1.1.14 The **time for achieving Practical Completion**, from the Commencement Date is **730 Days**. The period as stated in 5.3.2, and the 7 days referred to in 5.3.3, are included in the above time for achieving Practical Completion. The special non-working days as stated in 5.8.1 are excluded from the above time for achieving Practical Completion.
- 1.1.1.15 The Employer is the eThekweni Municipality as represented by:
Deputy Head: **Water and Sanitation Engineering**
- 1.2.1.2 The address of the Employer is:
Physical: **3 Prior Road, Durban, 4001**
Postal: **P.O. Box 1038, DURBAN, 4000**
Telephone: **031 311 8602 (t)**
Fax: **N/A**
E-Mail: **Bhavna.Soni@durban.gov.za**
- 1.1.1.16 The **name of the Employer's Agent** is **Naidu Consulting (Pty) Ltd**
- 1.2.1.2 The address of the Employer's Agent Representative is:
Physical: **No. 5 The Boulevard, West Way Office Park, Spine Road, Westville, 3635**
Postal: **P O Box 2796, West Way Office Park, 3635**
Telephone: **031 265 6007 (t)**
Fax: **031 265 6011 (f)**
E-Mail: **Ashveer.Goorun@naiduconsulting.com**
- 1.1.1.26 The **Pricing Strategy** is by **Re-measurement Contract**.
- 3.2.3 The Employer's Agent shall obtain the **specific approval of the Employer** before executing any of his functions or duties according to the following Clauses of the General Conditions of Contract:
- 6.3: Council approval in order to authorise any expenditure in excess of the Tender Sum plus **10% contingencies**.
- 4.11.1 To carry out and complete the works, the Contractor shall employ a competent Site Agent and Foreman as part of the key staff. It is a requirement for the Contractor's Site Agent and Foreman

to each have a minimum of 3 years relevant experience including experience on projects of a similar nature. The CV's of the Site Agent and the Foreman should be submitted to the Employer's Agent's Representative for acceptance by the Department (reference is made to Cl.5.3.1 of the Contract Data).

Note:

- i) "similar nature" implies projects that were of a value of at least 70% of this tender's value, and had a comparable Scope of Work in terms of technical requirements and operations.
- ii) "experience" implies experience on projects of a similar nature.
- iii) "accredited degree / diploma" implies a minimum 3-year qualification within the built environment, from a registered University or Institute of Technology.

5.3.1 The **documentation required** before commencement with Works execution are:

- Health and Safety Plan (refer to Clause 4.3)
- Initial Programme (refer to Clause 5.6)
- Security (refer to Clause 6.2)
- Insurance (refer to Clause 8.6)

5.3.2 The **time to submit the documentation** required before commencement with Works is **28 Days**.

5.3.3 Add the following paragraph:

"If a construction work permit, in terms of Clause 3(1) of the Construction Regulations (2014), is applicable, the instruction to commence carrying out of the works may only be issued once the construction work permit has been obtained by the Employer's Agent. If a construction work permit is applicable, the contractor shall allow for a minimum period of 37 days, after the submission (or re-submission) of the documentation referred to in Clause 5.3.1., for the issuing of the construction work permit."

5.4.2 The access and possession of Site shall not be exclusive to the Contractor but as set out in the Site Information.

5.8.1 The **non-working days** are **Saturdays and Sundays**.

(5.1.1) The **special non-working** days are:

- All statutory holidays as declared by National or Regional Government.
- The year-end break:
 - Commencing on the first working day after 15 December.
 - Work resumes on the first working day after 5 January of the next year.

5.8.1 Delete the words "sunset and sunrise" and replace with "17:00 and 07:00".

5.12.2.2 **Abnormal Climatic Conditions (Rain Delays)** - The numbers of days per month, on which work is expected not to be possible as a result of rainfall, for which the Contractor shall make provision, is given in the table below. During the execution of the Works, the Employer's Agent's Representative will certify a day lost due to rainfall only if at least 75% of the work force and plant on site could not work during that specific working day.

Extension of time as a result of rainfall shall be calculated monthly being equal to the number days certified by the Employer's Agent's Representative as lost due to rainfall, less the number of days allowed for as in table below, which could result in a negative figure for certain months. The total extension of time for which the Contractor may apply, shall be the cumulative algebraic sum of the monthly extensions. Should the sum thus obtained be negative, the extension of time shall be taken as NIL.

| <u>Month</u> | <u>Days Lost</u> | <u>Average Rainfall</u> | <u>Month</u> | <u>Days Lost</u> | <u>Average Rainfall</u> |
|--------------|------------------|-------------------------|--|------------------|-------------------------|
| January | 4* | 134 | July | 1 | 39 |
| February | 3 | 113 | August | 2 | 62 |
| March | 3 | 120 | September | 2 | 73 |
| April | 2 | 73 | October | 3 | 98 |
| May | 2 | 59 | November | 3 | 108 |
| June | 1 | 28 | December | 1* | 102 |
| TOTAL | 27 | 1009mm | * = The number of working days lost allows for the annual statutory Construction holiday in December and January of each year. | | |

5.13.1 The **penalty for delay** in failing to complete the Works is **R 10 000.00** (per Day).

5.14.1 The **requirements for achieving Practical Completion** will be determined by the Employer's Agent (in consultation with the Contractor) and recorded in the minutes of the first Site Meeting / Handover Meeting. (Refer to 1.1.1.24 for a generic definition.) The requirements are to be regularly reviewed with respect to any variations to the Contract.

5.16.3 The **latent defect liability** period is **10 Years**.

6.2.1 **Security (Performance Guarantee)**: Delete the word "selected" and replace it with "stated".

The liability of the Performance Guarantee shall be as per the following table:

| Value of Contract (incl. VAT) | Performance Guarantee Required |
|---|---------------------------------------|
| Less than or equal to R 1m | Nil |
| Greater than R 1m and less than or equal to R 10m | 5% of the Contract Sum |
| Greater than R 10m | 10% of the Contract Sum |

6.5.1.2.3 The **percentage allowance** to cover overhead charges for daywork are as follows:

- **80%** of the gross remuneration of workmen and foremen actually engaged in the daywork;
- **20%** on the net cost of materials actually used in the completed work.

No allowance will be made for work done, or for materials and equipment for which daywork rates have been quoted at tender stage.

6.8.2 **Contract Price Adjustment Factor:** The value of the certificates issued shall be adjusted in accordance with the Contract Price Adjustment Schedule (GCC 2015 - page 86) with the following Indices / Descriptions / Coefficients:

- The proportion not subject to adjustment: **x = 0.10**.
- The base month will be the month prior to the month in which tenders close.
- The Index for, **Plant, Materials, and Fuel** shall be based on **2024 = 100**.
- The Index for **Labour** shall be based on **2021 = 100**.

| | STATS SA Statistical Release | Table | Description | Coefficient |
|---|---------------------------------|---------|--|-----------------|
| • "L" is the "Labour Index" | P0141 | Table A | Geographic Indices; CPI per Province; Kwa-Zulu Natal | a = 0.28 |
| • "P" is the • "Contractor's Equipment Index" | P0151.1 | Table 4 | Plant and Equipment | b = 0.28 |
| • "M" is the "Materials Index" | P0151.1 | Table 6 | Civil Engineering Material (excluding bitumen) | c = 0.38 |
| • "F" is the "Fuel Index" | P0142.1 | Table 1 | Coke, petroleum, chemical, rubber and plastic products; Coal and petroleum products; Diesel | d = 0.06 |

6.10.1.5 The **percentage advance** on materials not yet built into the Permanent Works is **80%**.

6.10.3 **Retention Money:** Delete the word "selected".

The percentage retention on the amounts due to the Contractor is 10%.

The limit of "retention money" is 5% of the Contract Sum.

Should the Contract Price exceed the Contract Sum then the limit of "retention money" is 5% of the Contract Price.

Interest will not be paid on retention withheld by the Employer.

8.6.1.1.2 The **value of Plant and materials** supplied by the Employer to be included in the insurance sum: **R 3 000 000.00**.

8.6.1.1.3 The **amount to cover professional fees** for repairing damage and loss to be included in the insurance sum: **Not Required**

8.6.1.2 **SASRIA Coupon Policy** for Special Risks to be issued in joint names of Council and Contractor for the full value of the works (including VAT).

8.6.1.3 The limit of indemnity for **liability insurance**: **R 25 000 000.00**.

8.6.1.4 **Ground Support Insurance:**

- Minimum amount for any one occurrence, unlimited as to the number of occurrences, against any claim for damages or loss caused by vibration and / or removal of lateral support: **R 5 000 000.00**.
- Maximum first excess: **R 20 000.00**.

8.6.1.5 Furthermore, the insurance cover effected by the Contractor shall meet the following requirements:

Third Party Insurance (Public Liability)

- Minimum amount for any one occurrence, unlimited as to the number of occurrences, for the period of the contract, inclusive of the maintenance period: **R 25 000 000.00.**
- Consequential loss to be covered by policy: **Yes**
- Liability section of policy to be extended to cover blasting: **Nil**
- Maximum excess per claim or series of claims arising out of any one occurrence: **R 25 000.00.**

Principal's own surrounding Property Insurance

- Minimum amount for any one occurrence unlimited as to the number of occurrences against any claim for damage which may occur to the Council's own surrounding property: **R 5 000 000.00.**
- Maximum first excess: **R 20 000.00.**

Insurance of Works

- Minimum amount for additional removal of debris (no damage): **R 1 000 000.00.**
- Minimum amount for temporary storage of materials off site, excluding Contractor's own premises: **R 2 000 000.00.**
- Minimum amount for transit of materials to site: **R 2 000 000.00.**

8.6.5 **Approval by Employer:** At the end of the sub-clause, add the following paragraph:

"Except where otherwise provided in the Special Conditions of Contract, the insurance cover effected by the Contractor in terms of this clause shall not carry a first loss amount greater than those set out below:

| Contract Price | First Loss |
|----------------------------|-------------------|
| Less than R 100,000 | R 5,000 |
| R 100,000 to R 500,000 | R 10,000 |
| R 500,000 to R 1,000,000 | R 20,000 |
| R 1,000,000 to R 2,000,000 | R 30,000 |
| R 2,000,000 to R 4,000,000 | R 40,000 |
| Greater than R 4,000,000 | R 50,000 |

The insurance policy shall contain a specific provision whereby cancellation of the policy prior to the end of the period referred to in Cause 8.2.1 cannot take place without the prior written approval of the Employer."

10.5.1 **Dispute resolution** shall be by standing adjudication.

10.5.3 The **number of members** of the Adjudication Board to be appointed: **1.**

10.7.1 Failing ad-hoc adjudication, the determination of disputes shall be by arbitration.

C1.2.2.2 DATA TO BE PROVIDED BY CONTRACTOR

1.1.1.9 The legal name of Contractor is:

.....

.....

.....

.....

1.2.1.2 The Physical address of the Contractor is:

.....

.....

.....

.....

The Postal address of the Contractor is:

.....

.....

.....

.....

The contact numbers of the Contractor are:

Telephone:

Fax:

The E-Mail address of the Contractor is:

.....

C1.2.3 ADDITIONAL CONDITIONS OF CONTRACT

C1.2.3.1 COMMUNITY LIAISON OFFICER

The Ward Councillor(s) in whose ward(s) work is to be done will, collectively, identify a community liaison officer (CLO) for the project and make the person known to the Contractor within two days of being requested to do so. The Contractor will be required to enter a written contract with the CLO that specifies:

- The hours of work and the wage rate of the CLO (200% of the Civil Engineering Industry minimum wage).
- The duration of the appointment.
- The duties to be undertaken by the CLO which could include:
 - Assisting in all respects relating to the recruitment of local labour.
 - Acting as a source of information for the community and councillors on issues related to the contract.
 - Keeping the Contractor advised on community issues and issues pertaining to local security.
 - Assisting in setting up any meetings or negotiations with affected parties.
 - Keeping a written record of any labour or community issue that may arise.
 - Any other duties that may be required by the Contractor.

Responsibility for the identification of a pool of suitable labour shall rest with the CLO, although the Contractor shall have the right to choose from that pool. The Contractor shall have the right to determine the total number labourers required at any one time and this may vary during the contract.

The Contractor shall have the right to replace labour that is not performing adequately. Should such occasion arise, it must be done in conjunction with the CLO.

Payment: The CLO will be reimbursed from the PC Sum item in the Preliminary & General Section of the Bill of Quantities.

C1.2.3.2 EMPLOYMENT OF LOCAL LABOUR

It is a condition of contract that the contractor will be required to employ local labour as specified in eThekweni Council Policy "The use of CLOs and Local Labour". The contractor will be required to ensure that a minimum of 50% of the labour force is made up of local labour. For the purposes of this contract, "Local labour" will be deemed to be any **persons who reside within Ward(s) of the reservoir site**. The contractor will be required to provide proof of authenticity of local labour. Signed confirmation by the appointed CLO will suffice for this.

No additional costs will be entertained due to this Particular Specification. The contractor will remain responsible for providing proper supervision of all labour and will be responsible for the quality of work produced.

C1.2.3.3 CONTRACTOR PARTICIPATION GOAL (CPG)

It is a condition of contract that the contractor must allow for a minimum of **30%** of the contract value (excluding PC Sum items and Fixed Cost allowances) to be subcontracted to contractors who are >51% black owned. Proof of payment to the subcontractors will be required to verify that the minimum has been achieved.

The penalty for not achieving the specified CPG will be 0.5% of the contract value (excluding PC Sum items and Fixed Cost allowances) for every 1% of CPG not achieved.

C1.2.3.4 FTE (Full Time Equivalent) EMPLOYMENT INFORMATION

It is a condition of contract that the Contractor supplies the Employer's Agent's Representative with information in respect of the employment of all foremen, artisans and labour (skilled and unskilled) employed to work on this contract. The information required is:

- Initials (per ID doc)
- Last Name (per ID doc)
- ID Number
- Disability (y / n)
- Education Level

| | | | | |
|-----------------------------|--------------------------------|-------------------------------|----------------------------|--------------------------------|
| Level 1 Unknown | Level 2 No Schooling | Level 3 Grade 1-3 | Level 4 Grade 4 | Level 5 Grade 5-6 |
| Level 6 Grade 7-8 | Level 7 Grade 9 | Level 8 Grade 10-11 | Level 9 Grade 12 | Level 10 Post Matric |

- Category of Employment

| |
|--|
| Category A: Employed as Local Labour for this contract only Category B: Temporarily employed by the Contractor Category C: Permanently employed by the Contractor |
|--|

In addition, the following information is required in respect of each person listed above, on a monthly basis:

- Number of days worked during the month;
- Daily wage rate;
- Number of training days during the month.

The information is to be forwarded in a format acceptable to the Employer's Agent's Representative, but preferably in the form of an emailed EXCEL file (an original file, to be used as a template, will be issued to the Contractor). Contractors without computer facilities will be required to submit a hard copy of the information in a format as agreed to between the Contractor and the Employer's Agent's Representative.

In addition to the tax invoice, to be submitted by the Contractor with his monthly statement, mentioned in Clause 6.10.4 of GCC 2015, the Employer reserves the right to withhold payment until the monthly FTE information has been forwarded to the Employer's Agent's Representative. No additional payment for complying with the above will be made and the Contractor is to make allowance for complying through the time related P & G items (sum) under Part AA: Preliminaries, of the Bill of Quantities.

C1.2.3.5 PERFORMANCE MONITORING OF SERVICE PROVIDERS

The Contractor shall be subjected to "Performance Monitoring" assessments in terms of the applicable Section (S.53) of the Employer's Supply Chain Management Policy.

Key Performance Indicators (KPIs) are specified in the C3: Scope of Works, or will be discussed and agreed with the Contractor before commencement of the contract.

C1.2.3.6 EXCEPTED RISKS (Clause 8.3)

Pursuant to Clause 8.3 of the Conditions of Contract (GCC 2015), the Employer shall not be liable for the payment of standing time costs as a result of the occurrence of any of the "Excepted Risks" as defined under Clause 8.3.

However, the Employer shall reimburse the Contractor in respect of plant de-establishment and re-establishment costs as a result of "Excepted risks" when a written instruction to de-establish is issued to the Contractor.

C1.2.3.7 SHUTS CANCELLED/ABORTED BY CONTRACTOR

The contractor is required to provide notice to the Employers Agent 7 days prior to any planned shutdown of any postponement or cancellation of the shutdown for any reason within the Contractors control. The penalty for failure to notify the Employer's Agent of any cancellation or postponement 7 days prior to any planned shutdown is R10,000.

C2.1: PRICING ASSUMPTIONS / INSTRUCTIONS

C2.1.1 GENERAL

The Bill of Quantities forms part of the Contract Documents and must be read and priced in conjunction with all the other documents comprising the Contract Documents (refer to F.1.2 of the Tender Data).

C2.1.2 PRICING INSTRUCTIONS AND DESCRIPTION OF ITEMS IN THE SCHEDULE

Measurement and payment shall be in accordance with the relevant provisions of **Clause 8 of each of the Standard Engineering Specifications** referred to in the Scope of Work. The Preliminary and General items shall be measured in accordance with the provisions of **C2.1.8**.

The descriptions of the items in the Bill of Quantities are for identification purposes only and comply generally with those in the Standard Engineering Specification.

Clause 8 of each Standard Engineering Specification, read together with the relevant clauses of the Scope of the works, set out what ancillary or associated work and activities are included in the rates for the operations specified. Should any requirements of the measurement and payment clause of the applicable Standard Engineering Specification, or the Scope of the works, conflict with the Bill of Quantities, the requirements of the Standard Engineering Specification or Scope of the work, as applicable, shall prevail.

C2.1.3 QUANTITIES REFLECTED IN THE SCHEDULE

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

The Works as finally completed in accordance with the Contract shall be measured and paid for as specified in the Bill of Quantities and in accordance with the General and Special Conditions of Contract, the Specifications and Project Specifications and the Drawings. Unless otherwise stated, items are measured

net in accordance with the Drawings, and no allowance has been made for waste.

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

C2.1.5 MONTHLY PAYMENTS

Unless otherwise specified in the Specifications and Project Specifications, progress payments in Interim Certificates, referred to in **Clause 6.10.1 of the General Conditions of Contract**, in respect of "sum" items in the Bill of Quantities shall be by means of interim progress instalments assessed by the Employer's Agent and based on the measure in which the work actually carried out relates to the extent of the work to be done by the Contractor.

C2.1.4 PROVISIONAL SUMS / PRIME COST SUMS

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

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

C2.1.6 PRICING OF THE BILL OF QUANTITIES

The prices and rates to be inserted by the Tenderer in the Bill of Quantities shall be the full inclusive prices to be paid by the Employer for the work described under

the several items, and shall include full compensation for all costs and expenses that may be required in and for the completion and maintenance during the defects liability period of all the work described and as shown on the drawings as well as all overheads, profits, incidentals and the cost of all general risks, liabilities and obligations set forth or implied in the documents on which the Tender is based.

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

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

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

C2.1.7 "RATE ONLY" ITEMS

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

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

For "Rate Only" items no quantities are given in the "Quantity" column but the quoted rate shall apply in the event of work under this item being required. The Tenderer shall however note that in terms of the

Tender Data the Tenderer may be asked to reconsider any such rates which the Employer may regard as unbalanced.

C2.1.8 PRELIMINARY AND GENERAL

The Preliminary and General Section is provided to cover the Contractor's expenses incurred in complying with the requirements of the tender documents and consists of the following parts:

- Part AA: Preliminaries
- Part AB: General Specifications
- Part AH: Occupational Health and Safety

Fixed Charge Items: Each item should be priced separately and, subject to the Engineer certifying in terms of **Clause 6.7 of the General Conditions of Contract** that the work has been done, payment will be made as follows:

- (i) the total amount due when the certified value fixed charge items in this section is less than 5% of the net contract price;
- (ii) when the certified value of fixed charge items in this section is greater than 5% of the net contract price, payment will be limited to 5% of the net contract price. The remainder will be paid when the value of the work done under the contract, excluding the value of fixed charge items in this section, is greater than 50% of the net contract price, excluding the value of fixed charge items in this section.

Time Related Items: Any Time Related items not priced shall be deemed to be covered by the prices of other items in the section.

Payment of Time Related items in this section will be made throughout the contract period, the amount per month being the value of the item divided by the completion in months or, if specified in weeks, the equivalent number of months, in terms of **Clause 5.5 of the General Conditions of Contract**. The final monthly increment will only be paid upon the issue of a completion certificate.

C2.2: BILL OF QUANTITIES

The Bill of Quantities follows and comprises of 41 pages. The pages are numbered 80 to 121.

SECTION 1: PRELIMINARY AND GENERAL

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|---------------------|---|------|------|------|---------------|
| 1 | SABS 1200 AA | PRELIMINARY AND GENERAL | | | | |
| 1.1 | 8.3 | FIXED-CHARGE AND VALUE RELATED ITEMS | | | | |
| 1.1.1 | 8.3.1 | Contractual Requirements | Sum | 1.00 | | |
| | 8.3.2 (a) | Provision of facilities on the site for the Engineer (SABS 1200 AB): | | | | |
| 1.1.2 | PSAB 3.2 | Furnished offices | Sum | 1.00 | | |
| 1.1.3 | PSAB 5.4 | Telephone for Engineer | Sum | 1.00 | | |
| 1.1.4 | PSAB 3.2 | Meeting room facilities | Sum | 1.00 | | |
| 1.1.5 | PSAB 3.1 | Project name boards | Sum | 1.00 | | |
| | PSAA 8.3.2 (b) | Provision of facilities on the site for the Contractor: | | | | |
| 1.1.6 | | Offices, storage sheds, workshops, ablution & latrine facilities, tools & equipment, water supplies, electric power and communications and plant. | Sum | 1.00 | | |
| 1.1.7 | PSAA 5.3 | Dealing with water | Sum | 1.00 | | |
| 1.1.8 | PSAA 5.5 | Access | Sum | 1.00 | | |
| 1.1.9 | 8.3.3 | General Responsibilities and Other fixed-charge obligations | Sum | 1.00 | | |
| 1.1.10 | PSAA 8.3.4 | Removal of site establishment | Sum | 1.00 | | |
| 1.1.11 | PS 18 | Storage of Free Issue Items | Sum | 1.00 | | |
| | AH | Occupational Health and Safety | | | | |
| 1.1.12 | | Compliance with the Occupational Health and Safety requirements | Sum | 1.00 | | |
| 1.1.13 | PEM | Complying with requirements of Environmental Management Plan | Sum | 1.00 | | |
| | | Allow for the following additional items which the tenderer requires to be priced separately | | | | |
| 1.1.14 | | a) | Sum | 1.00 | | |
| 1.1.15 | | b) | Sum | 1.00 | | |
| 1.1.16 | | c) | Sum | 1.00 | | |
| 1.1.17 | PS 4.4 | Site security for the duration of the contract | Sum | 1.00 | | |
| Total Carried Forward | | | | | | |

SECTION 1: PRELIMINARY AND GENERAL

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|-----------------|---|-------|-------|------|---------------|
| Brought Forward | | | | | | |
| 1.2 | 8.4 | TIME-RELATED ITEMS | | | | |
| 1.2.1 | 8.4.1 | Contractual requirements | Sum | 1.00 | | |
| | 8.4.2 (a) | Operations and Maintenance of Facilities on Site for the Engineer (SABS 1200 AB): | | | | |
| 1.2.2 | PSAB 3.2 | Furnished offices | Sum | 1.00 | | |
| 1.2.3 | PSAB 5.4 | Telephone for Engineer | Sum | 1.00 | | |
| 1.2.4 | PSAB 3.2 | Meeting room facilities | Sum | 1.00 | | |
| 1.2.5 | PSAB 3.1 | Project name board | Sum | 1.00 | | |
| | PSAA 8.3.2 (b) | Operations and Maintenance of Facilities on Site for the Contractor: | | | | |
| 1.2.6 | | Offices, storage sheds, workshops, ablution & latrine facilities, tools & equipment, water supplies, electric power and communications, access and plant. | Sum | 1.00 | | |
| 1.2.7 | PSAA 5.3 | Dealing with water | Sum | 1.00 | | |
| 1.2.8 | PSAA 5.5 | Access | Sum | 1.00 | | |
| 1.2.9 | 8.4.3 PS 6.5 | General Responsibilities and Other time-related obligations | Sum | 1.00 | | |
| 1.2.10 | PS 16 | Communication, Community Liaison and Public Relations | Sum | 1.00 | | |
| 1.2.11 | PS 18 | Storage of Free Issue Items | Sum | 1.00 | | |
| | AH | Occupational Health and Safety | | | | |
| 1.2.12 | | Compliance with the Occupational Health and Safety requirements | Sum | 1.00 | | |
| 1.2.13 | AH 10.2 | Deployment of Health and Safety Officer for the duration of the Contract | Sum | 1.00 | | |
| | | Allow for additional items which the tenderer requires to be priced separately | | | | |
| 1.2.14 | | a) | Sum | 1.00 | | |
| 1.2.15 | | b) | Sum | 1.00 | | |
| 1.2.16 | | c) | Sum | 1.00 | | |
| 1.2.17 | PS 4.4 | Site security for the duration of the contract | Month | 24.00 | | |
| Total Carried Forward | | | | | | |

SECTION 1: PRELIMINARY AND GENERAL

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|---------|--|----------|------------|------------|---------------|
| Brought Forward | | | | | | |
| 1.3 | 8.5 | SUMS STATED PROVISIONALLY BY ENGINEER | | | | |
| 1.3.1 | PS 17.5 | Relocation of existing services where directed by the Employers Representative | Prov Sum | 1.00 | 150,000.00 | 150,000.00 |
| 1.3.2 | | Overheads, charges and profit on item 1.3.1 | % | 150,000.00 | | |
| 1.3.3 | | Provisional sum for 3rd party inspections | Prov Sum | 1.00 | 50,000.00 | 50,000.00 |
| 1.3.4 | | Overheads, charges and profit on item 1.3.3 | % | 50,000.00 | | |
| 1.3.5 | | Provisional sum for equipment for Engineer | Prov Sum | 1.00 | 100,000.00 | 100,000.00 |
| 1.3.6 | | Overheads, charges and profit on item 1.3.5 | % | 100,000.00 | | |
| 1.3.7 | | Provisional sum for return of materials to EWS Stores | Prov Sum | 1.00 | 50,000.00 | 50,000.00 |
| 1.3.8 | | Overheads, charges and profit on item 1.3.7 | % | 50,000.00 | | |
| 1.3.9 | | Diving Services for plugging of reservoir outlets or inlets where required | Prov Sum | 1.00 | 150,000.00 | 150,000.00 |
| 1.3.10 | | Overheads, charges and profit on item 1.3.9 | % | 150,000.00 | | |
| 1.3.11 | 8.2.8 | Provisional sum for the demolition and removal of existing structures | Prov Sum | 1.00 | 50,000.00 | 50,000.00 |
| 1.3.12 | | Overheads, charges and profit on item 1.3.11 | % | 50,000.00 | | |
| 1.3.13 | | Provisional sum for additional specialised Engineering services | Prov Sum | 1.00 | 150,000.00 | 150,000.00 |
| 1.3.14 | | Overheads, charges and profit on item 1.3.13 | % | 150,000.00 | | |
| 1.3.15 | | Provisional sum for Mechanical meter electrical and telemetry requirements | Prov Sum | 1.00 | 150,000.00 | 150,000.00 |
| 1.3.16 | | Overheads, charges and profit on item 1.3.15 | % | 150,000.00 | | |
| Total Carried Forward | | | | | | |

SECTION 1: PRELIMINARY AND GENERAL

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|--------------------------|---|----------|--------|------------|---------------|
| Brought Forward | | | | | | |
| 1.4 | 8.5, PAA CI 6.5.1.2.3 | DAYWORKS | | | | |
| | | <u>Labour:</u> | | | | |
| 1.4.1 | | Foreman | hr | 50.00 | | |
| 1.4.2 | | Skilled | hr | 100.00 | | |
| 1.4.3 | | Semi-skilled | hr | 150.00 | | |
| 1.4.4 | | Unskilled | hr | 200.00 | | |
| 1.4.5 | | Surveyor with transport, instruments and labour | hr | 50.00 | | |
| 1.4.6 | | Artisan (Plumber/ Fitter) | hr | 100.00 | | |
| 1.4.7 | | Welder (Coded) with assistant | hr | 50.00 | | |
| 1.4.8 | | Electrician | hr | 20.00 | | |
| 1.4.9 | | Carpenter | hr | 20.00 | | |
| 1.4.10 | | Bricklayer | hr | 40.00 | | |
| | | <u>Plant and Equipment:</u> | | | | |
| 1.4.11 | | 1 Tonne LDV with driver | Day | 20.00 | | |
| 1.4.12 | | 6m³ Tip Truck | Day | 20.00 | | |
| 1.4.13 | | Tractor Loader Backhoe (TLB) | Day | 40.00 | | |
| 1.4.14 | | 7 Tonne flat bed with mounted crane and driver | hr | 40.00 | | |
| 1.4.15 | | Heavy duty, self powered welding machine 400A | hr | 40.00 | | |
| 1.4.16 | | Generator and Breaker 5KVA | hr | 20.00 | | |
| 1.4.17 | | Water Tanker 9000 litres | Day | 50.00 | | |
| 1.4.18 | | Bomag 60 or similar | hr | 100.00 | | |
| 1.4.19 | | Plate compactor | hr | 100.00 | | |
| 1.4.20 | | Electric breaker - single phase | Day | 20.00 | | |
| 1.4.21 | | Angle Grinder - 230mm | Day | 20.00 | | |
| 1.4.22 | | Pneumatic Hammer Drill - 1500Watt | Day | 20.00 | | |
| 1.4.23 | | Concrete mixer - 360l capacity | Day | 20.00 | | |
| | | <u>Materials:</u> | | | | |
| 1.4.24 | | Provisional sum for cost of materials | Prov Sum | 1.00 | 150,000.00 | 150,000.00 |
| Total Carried Forward | | | | | | |

SECTION 1: PRELIMINARY AND GENERAL

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|-----------------|---|---------|--------|------|---------------|
| Brought Forward | | | | | | |
| 1.5 | 8.5 | TEMPORARY WORKS | | | | |
| 1.5.1 | PSAA 8.4.5 | Accommodation of traffic for the duration of the contract (also refer to SANS 1921-2) | Sum | 1.00 | | |
| 1.5.2 | | Flagmen | man-day | 150.00 | | |
| 1.5.3 | | Portable STOP and GO-RY signs | No. | 6.00 | | |
| 1.5.4 | | Amber Flicker Lights | No. | 6.00 | | |
| 1.5.5 | | Road Signs, R & TR series | No. | 10.00 | | |
| | | Road Signs, TW series | | | | |
| 1.5.6 | | 1200 sides | No. | 4.00 | | |
| 1.5.7 | | 1800 x 300mm | No. | 4.00 | | |
| 1.5.8 | | 2400 x 400mm | No. | 4.00 | | |
| 1.5.9 | | Movable Barriers (Plastic Barriers) | m | 50.00 | | |
| | | Delineators (DT50J) 800 x 200 mm reflector size | | | | |
| 1.5.10 | | Single | No. | 25.00 | | |
| 1.5.11 | | Double | No. | 25.00 | | |
| 1.5.12 | | Traffic Cones (450) | No. | 50.00 | | |
| 1.6 | | MISCELLANEOUS | | | | |
| 1.6.1 | PSEL 2.40 | Electrical Shop Drawing | Sum | 1.00 | | |
| 1.6.2 | PS 10 | As-Built Survey | No. | 72.00 | | |
| 1.6.3 | PS 19 | Reservoir Inlet shut down | No. | 52.00 | | |
| 1.6.4 | PS 19 | Reservoir Outlet shut down | No. | 20.00 | | |
| 1.6.5 | PS 1.6 PS 19 | Extra Over for night shut down | No. | 30.00 | | |
| 1.6.6 | PS 20 | Meter Registration | No. | 72.00 | | |
| 1.6.7 | | Commissioning including calibration and test certificates for ultrasonic flow meter unit after installation | No. | 55.00 | | |
| Total Carried Forward | | | | | | |

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|----------------------------------|---------|---|------|-----|------|---------------|
| 1.7 | | STANDING TIME/ABORTED SHUTS | | | | |
| 1.7.1 | | Labour | | | | |
| 1.7.1.1 | | Pipe Fitter | Day | 5 | | |
| 1.7.1.2 | | Welder | Day | 5 | | |
| 1.7.1.3 | | General Worker | Day | 20 | | |
| 1.7.1.4 | | Foreman | Day | 5 | | |
| 1.7.1.5 | | Others (Specify)..... | Day | | | |
| 1.7.2 | | Plant | | | | |
| 1.7.2.1 | | Crane Truck | Day | 5 | | |
| 1.7.2.2 | | Small tools, generators , pumps, etc to be used on live water mains | Day | 5 | | |
| 1.7.2.3 | | Welding Machine | Day | 5 | | |
| Total Carried Forward To Summary | | | | | | |

SECTION 2: SITE CLEARANCE

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|----------------------------------|--------------------|--|----------------|----------|------|---------------|
| 2 | SABS 1200 C | SITE CLEARANCE | | | | |
| 2.1 | | CLEAR AND GRUB | | | | |
| 2.1.1 | 8.2.1 PSC 8.2.1 | Clear and grub excavation area for meter assembly installation including access. Rate to include for trees of girth up to and including 1m. | m ² | 1,300.00 | | |
| | 8.2.2 | Where instructed remove and grub large trees and tree stumps of girth and dispose of at an approved spoil site determined by the contractor: | | | | |
| 2.1.2 | 8.2.2 (a) | over 1m and up to 2m. | No. | 5.00 | | |
| 2.2 | | REMOVE TOPSOIL AND OTHER SURFACES | | | | |
| 2.2.1 | 8.2.10 PSC 8.2.10 | Remove topsoil to a depth of 150mm stockpile, maintain and reinstate | m ³ | 750.00 | | |
| 2.2.2 | PSC 8.2.11 | Saw cutting of existing asphalt surfaces | m | 170.00 | | |
| 2.2.3 | PSC 8.2.12 | Saw cutting of existing concrete surfaces | m | 170.00 | | |
| 2.2.4 | PSC 8.2.13 | Remove existing asphalt roadway and sidewalk surfacing for spoil to an approved spoil site to be determined by the contractor | m ² | 120.00 | | |
| 2.2.5 | PSC 8.2.14 | Remove existing gravel layer works to spoil to an approved spoil site to be determined by the contractor | m ³ | 100.00 | | |
| 2.2.6 | PSC 8.2.15 | Break out and remove existing concrete surfacing to spoil to an approved spoil site to be determined by the contractor | m ² | 40.00 | | |
| | PSC 8.2.5 | Dismantle existing fencing, move to store and reinstate later as directed by Engineer. | | | | |
| 2.2.7 | | a) Precast concrete fence | m | 50.00 | | |
| 2.2.8 | | b) Galvanized weld mesh fence | m | 50.00 | | |
| 2.2.9 | | c) Galvanized diamond razor wire fence | m | 50.00 | | |
| | PSC 8.2.16 | Dismantle, storing and re-erection of road signs, having surface areas of: | | | | |
| 2.2.10 | | 1 - 2.0m ² | No. | 5.00 | | |
| Total Carried Forward To Summary | | | | | | |

SECTION 3: EARTHWORKS

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|-----------------------------------|--|----------------|---------|------|---------------|
| 3 | SABS 1200 DA | EARTHWORKS | | | | |
| 3.1 | | BULK EXCAVATION (PROVISIONAL) | | | | |
| | | Excavation in all materials and stockpile for embankment/ backfill or dispose of surplus and unsuitable materials at an approved spoil site to be determined by the contractor, for: | | | | |
| 3.1.1 | 8.3.1 b) PS 7 | Excavation for CUT to FILL to create level platform to facilitate meter assembly installation where slopes are greater than 1:3 | m ³ | 1000.00 | | |
| 3.2 | | RESTRICTED EXCAVATION (PROVISIONAL) | | | | |
| 3.2.1 | DA 8.3.2 | Excavate in all materials for Mechanical Meter Chambers, backfill, compact and dispose of surplus/unsuitable materials. | m ³ | 1500.00 | | |
| | PSDA 8.3.2 PSDA 5.2.2.2 | Excavate in all materials for PIPE TRENCHES, backfill, compact to specification and dispose of surplus/unsuitable materials at an approved spoil site to be determined by the contractor, for meter assemblies of: | | | | |
| 3.2.2 | | Up to 2.0m | m ³ | 670.00 | | |
| 3.2.3 | | From 2.0m to 3.0m | m ³ | 800.00 | | |
| 3.2.4 | | From 3.0m to 4.0m | m ³ | 500.00 | | |
| 3.2.5 | | From 4.0m to 5.0m | m ³ | 240.00 | | |
| | 8.3.2 (b) | Extra-over Item 3.2.1 to 3.2.5 for the following: (All provisional) | | | | |
| 3.2.6 | | 1) Intermediate excavation | m ³ | 80.00 | | |
| 3.2.7 | | 2) Hard rock excavation | m ³ | 80.00 | | |
| 3.2.8 | PSDA 8.3.2(b) (3) PSDA 5.2.2.2 | 3) Hand excavation | m ³ | 590.00 | | |
| 3.2.9 | 8.3.5 PS 6.9 | Hand excavation to locate existing water pipelines for meter assembly installations | m ³ | 750 | | |
| 3.3 | | BACKFILL | | | | |
| | PSDA 8.3.4.1 | Selected backfill or fill material obtained from stockpile and compacted in 150mm layers, for: | | | | |
| 3.3.1 | | Embankment construction | m ³ | 50.00 | | |
| 3.3.2 | | Backfilling around structures | m ³ | 20.00 | | |
| Total Carried Forward | | | | | | |

SECTION 3: EARTHWORKS

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|----------------------------------|--------------|---|------|----------|------|---------------|
| Brought Forward | | | | | | |
| 3.3.3 | PSDA 8.3.4.2 | Backfilling of demolished structures From commercial Sources | m³ | 40.00 | | |
| | | Imported G8 material from a commercial source compacted in 150mm layers, for: | | | | |
| 3.3.4 | | Embankment construction | m³ | 50.00 | | |
| 3.3.5 | | Backfilling around structures | m³ | 20.00 | | |
| 3.3.6 | | Backfilling of demolished structures | m³ | 40.00 | | |
| 3.4 | | SELECTED BACKFILL | | | | |
| 3.4.1 | PSDA 8.3.9 | Backfill stabilized with 4% cement where ordered by the Engineer (Soil crete) | m³ | 120.00 | | |
| 3.5 | | FINISHING | | | | |
| 3.5.1 | PSDA 8.3.10 | Trimming of embankment to final level | m² | 1,260.00 | | |
| | PSDA 8.3.7 | GRASSING (Cynodon dactilon or similar approved) AS DIRECTED BY THE ENGINEER | | | | |
| 3.5.2 | | Grass Seeding of areas | m² | 1,260.00 | | |
| 3.5.3 | | Grass Sods of areas | m² | 1,260.00 | | |
| Total Carried Forward To Summary | | | | | | |

SECTION 4: EARTHWORKS (PIPE TRENCHES)

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|----------------------------------|---------------------|--|----------------|--------|------|---------------|
| 4 | SABS 1200 DB | EARTHWORKS PIPE TRENCHES | | | | |
| 4.1 | 8.3.2 | EXCAVATION | | | | |
| 4.1.1 | 8.3.2 (c) | Excavate and dispose of unsuitable material from trench bottom (Provisional) | m ³ | 500.00 | | |
| 4.2 | 8.3.3 | EXCAVATION ANCILLARIES | | | | |
| | | Make up deficiency in backfill material (Provisional) | | | | |
| 4.2.1 | 8.3.3.1 (a) | a) from other necessary excavations on site | m ³ | 230.00 | | |
| 4.2.2 | 8.3.3.1 (c) | b) by importation from commercial sources | m ³ | 230.00 | | |
| 4.3 | 8.3.5 | EXISTING SERVICES | | | | |
| 4.3.1 | 8.3.5 (a) | Services that intersect a trench | No. | 60.00 | | |
| 4.3.2 | 8.3.5 (b) | Services that adjoin a trench | m | 170.00 | | |
| Total Carried Forward To Summary | | | | | | |

SECTION 5: METER ASSEMBLY PIPEWORK (FABRICATE AND SUPPLY)

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|--------------------|--|------|-------|------|---------------|
| 5 | SABS 1200 L | INLINE ULTRASONIC METER ASSEMBLY PIPEWORK (FABRICATE AND SUPPLY) | | | | |
| | PSL 8.2.5.1 | FABRICATE AND SUPPLY SPECIALS AND FITTINGS FOR METER ASSEMBLY PIPEWORK TO SANS 1123, 1600/3 UNLESS OTHERWISE SPECIFIED AS PER DWG 59066/ 200 to 59066/ 201 | | | | |
| 5.1 | PSL 3.4.4 | ITEM 1 - FLANGED CONCENTRIC REDUCERS TO ANSI B16.9, FOR: | | | | |
| 5.1.1 | | DN200 x DN150 | No. | 2.00 | | |
| 5.1.2 | | DN250 x DN150 | No. | 10.00 | | |
| 5.1.3 | | DN300 x DN150 | No. | 1.00 | | |
| 5.1.4 | | DN300 x DN200 | No. | 16.00 | | |
| 5.1.5 | | DN300 x DN250 | No. | 2.00 | | |
| 5.1.6 | | DN350 x DN150 | No. | 1.00 | | |
| 5.1.7 | | DN350 x DN250 | No. | 2.00 | | |
| 5.1.8 | | DN400 x DN200 | No. | 4.00 | | |
| 5.1.9 | | DN400 x DN300 | No. | 20.00 | | |
| 5.1.10 | | DN450 x DN200 | No. | 1.00 | | |
| 5.1.11 | | DN450 x DN250 | No. | 2.00 | | |
| 5.1.12 | | DN450 x DN300 | No. | 2.00 | | |
| 5.1.13 | | DN450 x DN400 | No. | 2.00 | | |
| 5.1.14 | | DN500 x DN250 | No. | 2.00 | | |
| 5.1.15 | | DN500 x DN300 | No. | 2.00 | | |
| 5.1.16 | | DN500 x DN400 | No. | 10.00 | | |
| 5.1.17 | | DN600 x DN400 | No. | 12.00 | | |
| 5.1.18 | | DN600 x DN500 | No. | 2.00 | | |
| | PSL 3.8.8 | Extra over "5.1: Item 1 - Flanged Concentric Reducers" for supply and fabrication of extra spool pipe on downstream reducer only to suit length required on site for AC and PVC installations. | | | | |
| 5.1.20 | | DN150 | m | 2.00 | | |
| 5.1.21 | | DN200 | m | 2.00 | | |
| 5.1.22 | | DN250 | m | 2.00 | | |
| Total Carried Forward | | | | | | |

SECTION 5: METER ASSEMBLY PIPEWORK (FABRICATE AND SUPPLY)

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|----------|--|-------|-------|------|---------------|
| Brought Forward | | | | | | |
| 5.1.23 | PSL 3.10 | DN300 | m | 1.00 | | |
| 5.1.24 | | DN400 | m | 2.00 | | |
| 5.1.25 | | DN450 | m | 2.00 | | |
| 5.1.26 | | DN500 | m | 1.00 | | |
| 5.1.27 | | DN600 | m | 1.00 | | |
| 5.2 | | ITEM 2 - WEDGE GATE VALVE (WGV) TO SANS 664 - PN16 | | | | |
| | | Supply the following flanged WGV's, PN16 with non-rising spindle, Anti-Clockwise closing, including all gaskets, bolts, nuts and washers, for: | | | | |
| 5.2.1 | | DN150 | No. | 14.00 | | |
| 5.2.2 | | DN200 | No. | 14.00 | | |
| 5.2.3 | | DN250 | No. | 6.00 | | |
| 5.2.4 | DN300 | No. | 22.00 | | | |
| 5.2.5 | DN400 | No. | 14.00 | | | |
| 5.2.6 | DN500 | No. | 4.00 | | | |
| 5.3 | PS 17 | ITEM 3 - FLANGED STEEL SPOOL PIECES - UPSTREAM OF WATER METER, FOR: | | | | |
| 5.3.1 | | DN150 x 750mm long F/F | No. | 11.00 | | |
| 5.3.2 | | DN200 x 1000mm long F/F | No. | 13.00 | | |
| 5.3.3 | | DN250 x 1250mm long F/F | No. | 4.00 | | |
| 5.3.4 | | DN300 x 1500mm long F/F | No. | 13.00 | | |
| 5.3.5 | | DN400 x 2000mm long F/F | No. | 12.00 | | |
| 5.3.6 | | DN500 x 2500mm long F/F | No. | 2.00 | | |
| 5.4 | | ITEM 4 - ULTRASONIC FLOW METERS (free issue item) | | | | |
| | | Collect free issue ultrasonic flow meter and transmitter. (Rate to include for collection, handling, transport, off-load and store in Contractors own safe storage facility), for: | | | | |
| 5.4.1 | | DN150 | No. | 11.00 | | |
| 5.4.2 | | DN200 | No. | 13.00 | | |
| 5.4.3 | | DN250 | No. | 4.00 | | |
| 5.4.4 | | DN300 | No. | 13.00 | | |
| Total Carried Forward | | | | | | |

SECTION 5: METER ASSEMBLY PIPEWORK (FABRICATE AND SUPPLY)

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|------------------------|---|-------|-------|------|---------------|
| Brought Forward | | | | | | |
| 5.4.5 | PSMA 1 | DN400 | No. | 12.00 | | |
| 5.4.6 | | DN500 | No. | 2.00 | | |
| 5.5 | | ITEM 4A - ULTRASONIC FLOW METERS | | | | |
| | | SUPPLY of flanged ultrasonic flow meter and transmitter. (Rate to include for supply, collection, handling, transport, off-load and store in Contractors own safe storage facility), for: | | | | |
| 5.5.1 | | DN150 | No. | 11.00 | | |
| 5.5.2 | | DN200 | No. | 13.00 | | |
| 5.5.3 | | DN250 | No. | 4.00 | | |
| 5.5.4 | | DN300 | No. | 13.00 | | |
| 5.5.5 | | DN400 | No. | 12.00 | | |
| 5.5.6 | | DN500 | No. | 2.00 | | |
| 5.6 | PSL 3.8.2.5 | ITEM 5 - RESTRAINED FLANGE ADAPTOR - PN16 | | | | |
| | | Supply restrained flange adaptor (Kamflex, Viking Johnson or similar approved) to suit steel fabricated special, for: | | | | |
| 5.6.1 | PSL 8.2.5.1 | DN150 | No. | 11.00 | | |
| 5.6.2 | | DN200 | No. | 13.00 | | |
| 5.6.3 | | DN250 | No. | 4.00 | | |
| 5.6.4 | | DN300 | No. | 13.00 | | |
| 5.6.5 | | DN400 | No. | 12.00 | | |
| 5.6.6 | | DN500 | No. | 2.00 | | |
| 5.7 | | ITEM 6 - FLANGED STEEL SPOOL PIECES - DOWNSTREAM OF METER, FOR: | | | | |
| | | Fabricate and Supply flanged to SANS 1123, 1600/3. Unless Otherwise Specified. Rate to include restraining flange for Item 5. | | | | |
| 5.7.1 | | DN150 x 450mm long F/F | No. | 11.00 | | |
| 5.7.2 | | DN200 x 600mm long F/F | No. | 13.00 | | |
| 5.7.3 | DN250 x 750mm long F/F | No. | 4.00 | | | |
| 5.7.4 | DN300 x 900mm long F/F | No. | 13.00 | | | |
| Total Carried Forward | | | | | | |

SECTION 5: METER ASSEMBLY PIPEWORK (FABRICATE AND SUPPLY)

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|-----------|---|------|-------|------|---------------|
| Brought Forward | | | | | | |
| 5.7.5 | | DN400 x 1200mm long F/F | No. | 12.00 | | |
| 5.7.6 | | DN500 x 1500mm long F/F | No. | 2.00 | | |
| 5.8 | | ITEM 7 - FLANGE ADAPTORS (PN16) Supply Flange Adaptors to suit uPVC OR mPVC pipelines (Kamflex, Viking Johnson or similar approved), for: | | | | |
| 5.8.1 | | DN150 | No. | 6.00 | | |
| 5.8.2 | | DN200 | No. | 2.00 | | |
| 5.8.3 | | DN250 | No. | 2.00 | | |
| | | Supply Flange Adaptors/ Stepped Flange Adaptors to suit ASBESTOS CEMENT pipelines (Kamflex, Viking Johnson or similar approved), for: | | | | |
| 5.8.4 | | DN150 | No. | 4.00 | | |
| 5.8.5 | | DN200 | No. | 2.00 | | |
| 5.8.6 | | DN250 | No. | 2.00 | | |
| 5.8.7 | | DN300 | No. | 6.00 | | |
| 5.8.8 | | DN350 | No. | 1.00 | | |
| 5.8.9 | | DN400 | No. | 2.00 | | |
| | | Supply Flange Adaptors to suit STEEL pipelines (Kamflex, Viking Johnson or similar approved) to suit Steel pipelines, for: | | | | |
| 5.8.10 | | DN150 | No. | 1.00 | | |
| 5.8.11 | | DN200 | No. | 2.00 | | |
| 5.8.12 | | DN250 | No. | 8.00 | | |
| 5.8.13 | | DN300 | No. | 22.00 | | |
| 5.8.14 | | DN350 | No. | 2.00 | | |
| 5.8.15 | | DN400 | No. | 20.00 | | |
| 5.8.16 | | DN450 | No. | 2.00 | | |
| 5.8.17 | | DN600 | No. | 12.00 | | |
| 5.9 | | ITEM 8 - FLANGED STEEL SPOOL PIECES COMPLETE WITH PUDDLE FLANGE CENTRALLY PLACED | | | | |
| | PSL 3.8.8 | Rate to include FOR PUDDLE FLANGE to SANS 1123, 1600/3. | | | | |
| Total Carried Forward | | | | | | |

SECTION 5: METER ASSEMBLY PIPEWORK (FABRICATE AND SUPPLY)

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|----------------------------------|-----------|--|------|-------|------|---------------|
| Brought Forward | | | | | | |
| 5.9.1 | PSMA1 (g) | DN150 x 1000mm long F/F | No. | 1.00 | | |
| 5.9.2 | | DN200 x 1000mm long F/F | No. | 4.00 | | |
| 5.9.3 | | DN250 x 1000mm long F/F | No. | 16.00 | | |
| 5.9.4 | | DN300 x 1000mm long F/F | No. | 44.00 | | |
| 5.9.5 | | DN400 x 1000mm long F/F | No. | 40.00 | | |
| 5.10 | | EXTRA OVER ITEM 3 AND ITEM 6 | | | | |
| | | Extra over "Item 3 and Item 6" for supply and fabrication of additional spool pipe to increase the minimum straight pipe requirements for the supply of ITEM 4A by the Contractor. | | | | |
| 5.10.1 | | DN150 | m | 1.00 | | |
| 5.10.2 | | DN200 | m | 2.00 | | |
| 5.10.3 | | DN250 | m | 2.00 | | |
| 5.10.4 | | DN300 | m | 3.00 | | |
| 5.10.5 | | DN400 | m | 1.00 | | |
| 5.10.6 | | DN500 | m | 1.00 | | |
| | | | | | | |
| Total Carried Forward To Summary | | | | | | |

SECTION 6: METER ASSEMBLY PIPEWORK (INSTALLATION)

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|--------------------|---|------|-------|------|---------------|
| 6 | SABS 1200 L | INLINE ULTRASONIC METER ASSEMBLY PIPEWORK (INSTALLATION) | | | | |
| | PSL 8.2.5.2 | INSTALLATION OF FABRICATED SPECIALS AND FITTINGS FOR METER ASSEMBLY PIPEWORK AS PER DWG 59066/ 200 to 59066/201 | | | | |
| 6.1 | PSL 3.4.4 | ITEM 1 - FLANGED CONCENTRIC REDUCERS TO ANSI B16.9, FOR: | | | | |
| 6.1.1 | | DN200 x DN150 | No. | 2.00 | | |
| 6.1.2 | | DN250 x DN150 | No. | 10.00 | | |
| 6.1.3 | | DN300 x DN150 | No. | 1.00 | | |
| 6.1.4 | | DN300 x DN200 | No. | 16.00 | | |
| 6.1.5 | | DN300 x DN250 | No. | 2.00 | | |
| 6.1.6 | | DN350 x DN150 | No. | 1.00 | | |
| 6.1.7 | | DN350 x DN250 | No. | 2.00 | | |
| 6.1.8 | | DN400 x DN200 | No. | 4.00 | | |
| 6.1.9 | | DN400 x DN300 | No. | 20.00 | | |
| 6.1.10 | | DN450 x DN200 | No. | 1.00 | | |
| 6.1.11 | | DN450 x DN250 | No. | 2.00 | | |
| 6.1.12 | | DN450 x DN300 | No. | 2.00 | | |
| 6.1.13 | | DN450 x DN400 | No. | 2.00 | | |
| 6.1.14 | | DN500 x DN250 | No. | 2.00 | | |
| 6.1.15 | | DN500 x DN300 | No. | 2.00 | | |
| 6.1.16 | | DN500 x DN400 | No. | 10.00 | | |
| 6.1.17 | | DN600 x DN400 | No. | 12.00 | | |
| 6.1.18 | | DN600 x DN500 | No. | 2.00 | | |
| 6.2 | PSL 3.10 | ITEM 2 - WEDGE GATE VALVE (WGV) TO SANS 664 - PN16 | | | | |
| 6.2.1 | | DN150 | No. | 14.00 | | |
| 6.2.2 | | DN200 | No. | 14.00 | | |
| 6.2.3 | | DN250 | No. | 6.00 | | |
| 6.2.4 | | DN300 | No. | 22.00 | | |
| 6.2.5 | | DN400 | No. | 14.00 | | |
| 6.2.6 | | DN500 | No. | 4.00 | | |
| Total Carried Forward | | | | | | |

SECTION 6: METER ASSEMBLY PIPEWORK (INSTALLATION)

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|--------------------|---|------|-------|------|---------------|
| Brought Forward | | | | | | |
| 6.3 | | ITEM 3 - FLANGED STEEL SPOOL PIECES - UPSTREAM OF WATER METER, FOR: | | | | |
| 6.3.1 | | DN150 x 750mm long F/F | No. | 11.00 | | |
| 6.3.2 | | DN200 x 1000mm long F/F | No. | 13.00 | | |
| 6.3.3 | | DN250 x 1250mm long F/F | No. | 4.00 | | |
| 6.3.4 | | DN300 x 1500mm long F/F | No. | 13.00 | | |
| 6.3.5 | | DN400 x 2000mm long F/F | No. | 12.00 | | |
| 6.3.6 | | DN500 x 2500mm long F/F | No. | 2.00 | | |
| 6.4 | | ITEM 4 - ULTRASONIC FLOW METERS | | | | |
| | | Collect from Contractors own storage facility. Rate to include for collection, handling, transport to site, off-loading, installation, test and commission ultrasonic flow meter as per specification, for: | | | | |
| 6.4.1 | | DN150 | No. | 11.00 | | |
| 6.4.2 | | DN200 | No. | 13.00 | | |
| 6.4.3 | | DN250 | No. | 4.00 | | |
| 6.4.4 | | DN300 | No. | 13.00 | | |
| 6.4.5 | | DN400 | No. | 12.00 | | |
| 6.4.6 | | DN500 | No. | 2.00 | | |
| 6.5 | PSL 3.8.2.5 | ITEM 5 - RESTRAINED FLANGE ADAPTOR - PN16 | | | | |
| 6.5.1 | | DN150 | No. | 11.00 | | |
| 6.5.2 | | DN200 | No. | 13.00 | | |
| 6.5.3 | | DN250 | No. | 4.00 | | |
| 6.5.4 | | DN300 | No. | 13.00 | | |
| 6.5.5 | | DN400 | No. | 12.00 | | |
| 6.5.6 | | DN500 | No. | 2.00 | | |
| 6.6 | | ITEM 6 - FLANGED STEEL SPOOL PIECES - DOWNSTREAM OF METER, FOR: | | | | |
| 6.6.1 | | DN150 x 450mm long F/F | No. | 11.00 | | |
| 6.6.2 | | DN200 x 600mm long F/F | No. | 13.00 | | |
| 6.6.3 | | DN250 x 750mm long F/F | No. | 4.00 | | |
| Total Carried Forward | | | | | | |

SECTION 6: METER ASSEMBLY PIPEWORK (INSTALLATION)

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|----------------------------------|---------|---|------|-------|------|---------------|
| Brought Forward | | | | | | |
| 6.6.4 | | DN300 x 900mm long F/F | No. | 13.00 | | |
| 6.6.5 | | DN400 x 1200mm long F/F | No. | 12.00 | | |
| 6.6.6 | | DN500 x 1500mm long F/F | No. | 2.00 | | |
| 6.7 | | ITEM 7 - FLANGE ADAPTORS (PN16) | | | | |
| 6.7.1 | | DN150 | No. | 11.00 | | |
| 6.7.2 | | DN200 | No. | 6.00 | | |
| 6.7.3 | | DN250 | No. | 12.00 | | |
| 6.7.4 | | DN300 | No. | 28.00 | | |
| 6.7.5 | | DN350 | No. | 3.00 | | |
| 6.7.6 | | DN400 | No. | 22.00 | | |
| 6.7.7 | | DN450 | No. | 3.00 | | |
| 6.7.8 | | DN600 | No. | 12.00 | | |
| 6.8 | | ITEM 8 - FLANGED STEEL SPOOL PIECES COMPLETE WITH PUDDLE FLANGE CENTRALLY PLACED | | | | |
| 6.8.1 | | DN150 x 1000mm long F/F | No. | 1.00 | | |
| 6.8.2 | | DN200 x 1000mm long F/F | No. | 4.00 | | |
| 6.8.3 | | DN250 x 1000mm long F/F | No. | 16.00 | | |
| 6.8.4 | | DN300 x 1000mm long F/F | No. | 44.00 | | |
| 6.8.5 | | DN400 x 1000mm long F/F | No. | 40.00 | | |
| Total Carried Forward To Summary | | | | | | |

SECTION 7: BY-PASS MECHANICAL METER ASSEMBLY PIPEWORK (FABRICATED AND SUPPLY)

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|--------------------|--|------|-------|------|---------------|
| 7 | SABS 1200 L | BY-PASS MECHANICAL METER ASSEMBLY PIPEWORK (FABRICATE AND SUPPLY) | | | | |
| | PSL 8.2.5.1 | FABRICATE AND SUPPLY SPECIALS AND FITTINGS FOR METER ASSEMBLY PIPEWORK TO SANS 1123, 1600/3 UNLESS OTHERWISE SPECIFIED AS PER DWG 59066/ 202 | | | | |
| 7.1 | | ITEM 1 - FLANGED STEEL SPOOL PIECES | | | | |
| | | Rate to include for up to 2 mitres if required and loose flange one end. Final length to be determined on site. | | | | |
| 7.1.1 | | DN50 x 1000mm long F/F | No. | 1.00 | | |
| 7.1.2 | | DN100 x 1000mm long F/F | No. | 1.00 | | |
| 7.1.3 | | DN150 x 1000mm long F/F | No. | 18.00 | | |
| 7.1.4 | | DN200 x 1000mm long F/F | No. | 14.00 | | |
| 7.2 | | ITEM 2 - FLANGED TEE/ REDUCING TEE STEEL, FOR: | | | | |
| 7.2.1 | | DN50 x DN50 (500mm F/F, 250mm B/F) | No. | 1.00 | | |
| 7.2.2 | | DN80 x DN80 (500mm F/F, 250mm B/F) | No. | 1.00 | | |
| 7.2.3 | | DN100 x DN100 (500mm F/F, 250mm B/F) | No. | 1.00 | | |
| 7.2.4 | | DN100 x DN80 (500mm F/F, 250mm B/F) | No. | 1.00 | | |
| 7.2.5 | | DN150 x x DN50 (500mm F/F, 250mm B/F) | No. | 1.00 | | |
| 7.2.6 | | DN150 x DN80 (500mm F/F, 250mm B/F) | No. | 1.00 | | |
| 7.2.7 | | DN150 x DN100 (500mm F/F, 250mm B/F) | No. | 16.00 | | |
| 7.2.8 | | DN200 x DN80 (500mm F/F, 250mm B/F) | No. | 1.00 | | |
| 7.2.9 | | DN200 x DN100 (500mm F/F, 250mm B/F) | No. | 12.00 | | |
| 7.3 | | ITEM 3 - FLANGED STEEL SPOOL PIECES | | | | |
| | | Final length to be determined on site, Approx Maximum Length = 800mm F/F. | | | | |
| Total Carried Forward | | | | | | |

SECTION 7: BY-PASS MECHANICAL METER ASSEMBLY PIPEWORK (FABRICATED AND SUPPLY)

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|----------|--|------|-------|------|---------------|
| Brought Forward | | | | | | |
| 7.3.1 | | DN50 | No. | 1.00 | | |
| 7.3.2 | | DN80 | No. | 1.00 | | |
| 7.3.3 | | DN100 | No. | 1.00 | | |
| 7.3.4 | | DN150 | No. | 9.00 | | |
| 7.3.5 | | DN200 | No. | 7.00 | | |
| 7.4 | PSL 3.10 | ITEM 4 - WEDGE GATE VALVE (WGV) TO SANS 664 - PN16 Supply the following flanged WGV's, PN16 with non-rising spindle, Anti-Clockwise closing, including all gaskets, bolts, nuts and washers, for: | | | | |
| 7.4.1 | | DN50 | No. | 2.00 | | |
| 7.4.2 | | DN80 | No. | 1.00 | | |
| 7.4.3 | | DN100 | No. | 1.00 | | |
| 7.4.4 | | DN150 | No. | 9.00 | | |
| 7.4.5 | | DN200 | No. | 7.00 | | |
| 7.5 | PSL 3.10 | ITEM 5 - RESILIENT SEAL VALVE (RSV) TO SANS 664 - PN16 Supply the following flanged RSV's, PN16 with non-rising spindle, Anti-Clockwise closing, including all gaskets, bolts, nuts and washers, for: | | | | |
| 7.5.1 | | DN50 | No. | 1.00 | | |
| 7.5.2 | | DN80 | No. | 6.00 | | |
| 7.5.3 | | DN100 | No. | 28.00 | | |
| 7.6 | | ITEM 6 - FLANGED STEEL SPOOL PIECES | | | | |
| 7.6.1 | | DN50 x 1000mm long F/F | No. | 1.00 | | |
| 7.6.2 | | DN80 x 1000mm long F/F | No. | 6.00 | | |
| 7.6.3 | | DN100 x 1000mm long F/F | No. | 28.00 | | |
| 7.7 | | ITEM 7 - FLANGED 90DEG LONG RADIUS BEND WITH 100mm SPOOL BOTH ENDS | | | | |
| 7.7.1 | | DN50 | No. | 1.00 | | |
| 7.7.2 | | DN80 | No. | 3.00 | | |
| 7.7.3 | | DN100 | No. | 28.00 | | |
| Total Carried Forward | | | | | | |

SECTION 7: BY-PASS MECHANICAL METER ASSEMBLY PIPEWORK (FABRICATED AND SUPPLY)

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|----------------------------------|---------------|--|------|-------|------|---------------|
| Brought Forward | | | | | | |
| 7.8 | | ITEM 8 - FLANGED DIRT BOX TO STANDARD DWG 45483 | | | | |
| 7.8.1 | | DN50 | No. | 1.00 | | |
| 7.8.2 | | DN80 | No. | 3.00 | | |
| 7.8.3 | | DN100 | No. | 14.00 | | |
| 7.9 | | ITEM 9 - FLANGED STEEL SPOOL PIECES | | | | |
| 7.9.1 | | DN50 x 150mm long F/F | No. | 1.00 | | |
| 7.9.2 | | DN80 x 250mm long F/F | No. | 3.00 | | |
| 7.9.3 | | DN100 x 300mm long F/F | No. | 14.00 | | |
| 7.10 | PSMA 2 | ITEM 10 - FLANGED MECHANICAL FLOW METERS ("SENSUS MEISTREAM" OR SIMILAR APPROVED TO PN16) | | | | |
| 7.10.1 | | DN50 | No. | 1.00 | | |
| 7.10.2 | | DN80 | No. | 3.00 | | |
| 7.10.3 | | DN100 | No. | 14.00 | | |
| 7.11 | | ITEM 11 - FLANGE ADAPTORS (PN16) | | | | |
| | | Supply Flange Adaptors/ Stepped Flange Adaptors to suit Steel, PVC or AC pipelines (Kamflex, Viking Johnson or similar approved), for: | | | | |
| 7.11.1 | | DN50 | No | 1.00 | | |
| 7.11.2 | | DN80 | No. | 1.00 | | |
| 7.11.3 | | DN100 | No. | 1.00 | | |
| 7.11.4 | | DN150 | No. | 18.00 | | |
| 7.11.5 | | DN200 | No. | 14.00 | | |
| Total Carried Forward To Summary | | | | | | |

SECTION 8: BY-PASS MECHANICAL METER ASSEMBLY PIPEWORK (INSTALLATION)

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|-------------|--|------|-------|------|---------------|
| 8 | PSL 8.2.5.2 | BY-PASS MECHANICAL METER ASSEMBLY PIPEWORK(INSTALLATION) | | | | |
| | | INSTALLATION OF FABRICATED SPECIALS AND FITTINGS FOR METER ASSEMBLY PIPEWORK AS PER DWG 59066/ 202 | | | | |
| 8.1 | | ITEM 1 - FLANGED STEEL SPOOL PIECES | | | | |
| 8.1.1 | | DN50 x 1000mm long F/F | No. | 1.00 | | |
| 8.1.2 | | DN100 x 1000mm long F/F | No. | 1.00 | | |
| 8.1.3 | | DN150 x 1000mm long F/F | No. | 18.00 | | |
| 8.1.4 | | DN200 x 1000mm long F/F | No. | 14.00 | | |
| 8.2 | | ITEM 2 - FLANGED TEE/ REDUCING TEE STEEL SPOOL PIECES - UPSTREAM OF WATER METER, FOR: | | | | |
| 8.2.1 | | DN50 x DN50 (500mm F/F, 250mm B/F) | No. | 1.00 | | |
| 8.2.2 | | DN80 x DN80 (500mm F/F, 250mm B/F) | No. | 1.00 | | |
| 8.2.3 | | DN100 x DN100 (500mm F/F, 250mm B/F) | No. | 1.00 | | |
| 8.2.4 | | DN100 x DN80 (500mm F/F, 250mm B/F) | No. | 1.00 | | |
| 8.2.5 | | DN150 x x DN50 (500mm F/F, 250mm B/F) | No. | 1.00 | | |
| 8.2.6 | | DN150 x DN80 (500mm F/F, 250mm B/F) | No. | 1.00 | | |
| 8.2.7 | | DN150 x DN100 (500mm F/F, 250mm B/F) | No. | 16.00 | | |
| 8.2.8 | | DN200 x DN80 (500mm F/F, 250mm B/F) | No. | 1.00 | | |
| 8.2.9 | | DN200 x DN100 (500mm F/F, 250mm B/F) | No. | 12.00 | | |
| 8.3 | | ITEM 3 - FLANGED STEEL SPOOL PIECES | | | | |
| 8.3.1 | | DN50 | No. | 1.00 | | |
| 8.3.2 | | DN80 | No. | 1.00 | | |
| 8.3.3 | | DN100 | No. | 1.00 | | |
| 8.3.4 | | DN150 | No. | 9.00 | | |
| Total Carried Forward | | | | | | |

SECTION 8: BY-PASS MECHANICAL METER ASSEMBLY PIPEWORK (INSTALLATION)

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|----------|--|------|-------|------|---------------|
| Brought Forward | | | | | | |
| 8.3.5 | PSL 3.10 | DN200 | No. | 7.00 | | |
| 8.4 | | ITEM 4 - WEDGE GATE VALVE (WGV) TO SANS 664 - PN16 | | | | |
| 8.4.1 | | DN50 | No. | 2.00 | | |
| 8.4.2 | | DN80 | No. | 1.00 | | |
| 8.4.3 | | DN100 | No. | 1.00 | | |
| 8.4.4 | PSL 3.10 | DN150 | No. | 9.00 | | |
| 8.4.5 | | DN200 | No. | 7.00 | | |
| 8.5 | | ITEM 5 - RESILIENT SEAL VALVE (RSV) TO SANS 664 - PN16 | | | | |
| 8.5.1 | | DN50 | No. | 1.00 | | |
| 8.5.2 | | DN80 | No. | 6.00 | | |
| 8.5.3 | PSL 3.10 | DN100 | No. | 28.00 | | |
| 8.6 | | ITEM 6 - FLANGED STEEL SPOOL PIECES | | | | |
| 8.6.1 | | DN50 x 1000mm long F/F | No. | 1.00 | | |
| 8.6.2 | | DN80 x 1000mm long F/F | No. | 6.00 | | |
| 8.6.3 | | DN100 x 1000mm long F/F | No. | 28.00 | | |
| 8.7 | PSL 3.10 | ITEM 7 - FLANGED 90DEG LONG RADIUS BEND WITH 100mm SPOOL BOTH ENDS | | | | |
| 8.7.1 | | DN50 | No. | 1.00 | | |
| 8.7.2 | | DN80 | No. | 3.00 | | |
| 8.7.3 | | DN100 | No. | 14.00 | | |
| 8.8 | | ITEM 8 - FLANGED DIRT BOX TO STANDARD DWG 45483 | | | | |
| 8.8.1 | PSL 3.10 | DN50 | No. | 1.00 | | |
| 8.8.2 | | DN80 | No. | 3.00 | | |
| 8.8.3 | | DN100 | No. | 14.00 | | |
| 8.9 | | ITEM 9 - FLANGED STEEL SPOOL PIECES | | | | |
| 8.9.1 | | DN50 x 150mm long F/F | No. | 1.00 | | |
| 8.9.2 | PSL 3.10 | DN80 x 250mm long F/F | No. | 3.00 | | |
| 8.9.3 | | DN100 x 300mm long F/F | No. | 14.00 | | |
| Total Carried Forward | | | | | | |

SECTION 8: BY-PASS MECHANICAL METER ASSEMBLY PIPEWORK (INSTALLATION)

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|----------------------------------|---------------|--|------|-------|------|---------------|
| Brought Forward | | | | | | |
| 8.10 | PSMA 2 | ITEM 10 - FLANGED MECHANICAL FLOW METERS ("SENSUS MEISTREAM" OR SIMILAR APPROVED TO PN16) | | | | |
| 8.10.1 | | DN50 | No. | 1.00 | | |
| 8.10.2 | | DN80 | No. | 3.00 | | |
| 8.10.3 | | DN100 | No. | 14.00 | | |
| 8.11 | | ITEM 11 - FLANGE ADAPTORS (PN16) | | | | |
| 8.11.1 | | DN50 | No | 1.00 | | |
| 8.11.2 | | DN80 | No. | 1.00 | | |
| 8.11.3 | | DN100 | No. | 1.00 | | |
| 8.11.4 | | DN150 | No. | 18.00 | | |
| 8.11.5 | | DN200 | No. | 14.00 | | |
| Total Carried Forward To Summary | | | | | | |

SECTION 9: MEDIUM PRESSURE PIPELINES

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|--------------------|--|------|-------|------|---------------|
| 9 | SABS 1200 L | MEDIUM PRESSURE PIPELINES | | | | |
| 9.1 | | CUT INTO EXISTING PIPELINES AND END PREPARATION | | | | |
| | | <u>EXISTING STEEL PIPELINES</u> | | | | |
| | PSL 8.2.17 | Cut into existing STEEL pipeline for new meter assembly and end preparation for WELD ON FLANGE, for: | | | | |
| 9.1.1 | | DN150 | No. | 4.00 | | |
| 9.1.2 | | DN200 | No. | 8.00 | | |
| 9.1.3 | | DN250 | No. | 10.00 | | |
| 9.1.4 | | DN300 | No. | 26.00 | | |
| 9.1.5 | | DN350 | No. | 6.00 | | |
| 9.1.6 | | DN400 | No. | 26.00 | | |
| 9.1.7 | | DN450 | No. | 4.00 | | |
| 9.1.8 | | DN500 | No. | 24.00 | | |
| 9.1.9 | | DN600 | No. | 18.00 | | |
| 9.1.10 | | DN700 | No. | 4.00 | | |
| | | Supply and install SANS 1123 - Table 1600/3 (PN16) steel slip on pipe flanges onto EXISTING STEEL pipeline, for: | | | | |
| | | Rate to include welding, NDT testing of joints and reinstatement at the joint for external coating and internal lining damage complete in accordance with the project specification. | | | | |
| 9.1.11 | | DN150 | No. | 2.00 | | |
| 9.1.12 | | DN200 | No. | 4.00 | | |
| 9.1.13 | | DN250 | No. | 5.00 | | |
| 9.1.14 | | DN300 | No. | 13.00 | | |
| 9.1.15 | | DN350 | No. | 3.00 | | |
| 9.1.16 | | DN400 | No. | 13.00 | | |
| 9.1.17 | | DN450 | No. | 2.00 | | |
| 9.1.18 | | DN500 | No. | 12.00 | | |
| 9.1.19 | | DN600 | No. | 9.00 | | |
| 9.1.20 | | DN700 | No. | 2.00 | | |
| Total Carried Forward | | | | | | |

SECTION 9: MEDIUM PRESSURE PIPELINES

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|------------|--|------|-------|------|---------------|
| Brought Forward | | | | | | |
| | PSL 8.2.18 | <u>EXISTING ASBESTOS CEMENT PIPELINES</u> Cut into existing ASBESTOS CEMENT pipeline for new meter assembly and end preparation for FLANGE ADAPTOR to suit AC pipeline, for: | | | | |
| 9.1.21 | | DN150 | No. | 2.00 | | |
| 9.1.22 | | DN200 | No. | 6.00 | | |
| 9.1.23 | | DN250 | No. | 10.00 | | |
| 9.1.24 | | DN300 | No. | 26.00 | | |
| 9.1.25 | | DN400 | No. | 4.00 | | |
| 9.1.26 | | DN450 | No. | 4.00 | | |
| 9.1.27 | | DN600 | No. | 2.00 | | |
| | PSL 8.2.19 | <u>EXISTING uPVC/ mPVC OR GRP PIPELINES</u> Cut into existing pipeline for new meter assembly and end preparation for FLANGE ADAPTOR to suit uPVC/ mPVC or GRP pipeline, for: | | | | |
| 9.1.28 | | DN150 | No. | 4.00 | | |
| 9.1.29 | | DN200 | No. | 6.00 | | |
| 9.1.30 | | DN250 | No. | 4.00 | | |
| 9.1.31 | | DN400 | No. | 2.00 | | |
| Total Carried Forward | | | | | | |

SECTION 9: MEDIUM PRESSURE PIPELINES

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|---------------------|---|------|-------|------|---------------|
| Brought Forward | | | | | | |
| 9.2 | | ADDITIONAL FABRICATED FITTINGS (provisional quantities) | | | | |
| | PSL 8.2.1 PSL 3.4.6 | Supply and Install steel pipes manufactured from X42 grade steel for additional steel specials where required. | | | | |
| 9.2.1 | | DN150 - DN200 | m | 41.00 | | |
| 9.2.2 | | DN250 - DN300 | m | 26.00 | | |
| 9.2.3 | | DN350 - DN400 | m | 19.00 | | |
| 9.2.4 | | DN450 - DN500 | m | 17.00 | | |
| 9.2.5 | | DN550 - DN600 | m | 11.00 | | |
| 9.2.6 | | DN650 - DN700 | m | 2.00 | | |
| | PSL 8.2.2 | Extra Over Item 9.2.1 to 9.2.6 for fabrication and installation of following specials: | | | | |
| | PSL 3.4.4.2 | Manufacturing of Simple and Compound Bends complete, inclusive of cutting, welding, testing, reinstatement of external coating and internal lining, transportation and handling, for: | | | | |
| | | <u>0 to 15 deg, for:</u> | | | | |
| 9.2.7 | | DN150 - DN200 | No. | 4.00 | | |
| 9.2.8 | | DN250 - DN300 | No. | 4.00 | | |
| 9.2.9 | | DN350 - DN400 | No. | 3.00 | | |
| 9.2.10 | | DN450 - DN500 | No. | 3.00 | | |
| 9.2.11 | | DN550 - DN600 | No. | 2.00 | | |
| 9.2.12 | | DN650 - DN700 | No. | 2.00 | | |
| | | <u>15 to 30 deg, for:</u> | | | | |
| 9.2.13 | | DN150 - DN200 | No. | 4.00 | | |
| 9.2.14 | | DN250 - DN300 | No. | 4.00 | | |
| 9.2.15 | | DN350 - DN400 | No. | 3.00 | | |
| 9.2.16 | | DN450 - DN500 | No. | 3.00 | | |
| 9.2.17 | | DN550 - DN600 | No. | 2.00 | | |
| 9.2.18 | | DN650 - DN700 | No. | 2.00 | | |
| | | <u>31 to 45 deg, for:</u> | | | | |
| 9.2.19 | | DN150 - DN200 | No. | 4.00 | | |
| Total Carried Forward | | | | | | |

SECTION 9: MEDIUM PRESSURE PIPELINES

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|-----------|---|------|-------|------|---------------|
| Brought Forward | | | | | | |
| 9.2.20 | PSL 8.2.2 | DN250 - DN300 | No. | 4.00 | | |
| 9.2.21 | | DN350 - DN400 | No. | 3.00 | | |
| 9.2.22 | | DN450 - DN500 | No. | 3.00 | | |
| 9.2.23 | | DN550 - DN600 | No. | 2.00 | | |
| 9.2.24 | | DN650 - DN700 | No. | 2.00 | | |
| | | Supply and Installation of SANS 1123 - Table 1600/3 (PN16) steel slip on pipe flanges, for: | | | | |
| | | Rate to include cutting of pipe, joint preparation, welding, NDT testing of joints and reinstatement at the joint for external coating and internal lining damage in accordance with the project specification. | | | | |
| 9.2.25 | | DN150 - DN200 | No. | 12.00 | | |
| 9.2.26 | | DN250 - DN300 | No. | 12.00 | | |
| 9.2.27 | | DN350 - DN400 | No. | 9.00 | | |
| 9.2.28 | | DN450 - DN500 | No. | 9.00 | | |
| 9.2.29 | | DN550 - DN600 | No. | 6.00 | | |
| Total Carried Forward | | | | | | |

SECTION 9: MEDIUM PRESSURE PIPELINES

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|------------|---|----------------|----------|------|---------------|
| Brought Forward | | | | | | |
| 9.3 | | FREE ISSUE ITEMS | | | | |
| 9.3.1 | PSL 8.2.20 | Collect signboards from EWS Stores in Springfield Park and install | No. | 1,000.00 | | |
| 9.4 | | MISCELLANEOUS | | | | |
| 9.4.1 | | Supply and install precast concrete spacer rings as per EWS Standard Drawing, Plan No. 6. | No. | 500.00 | | |
| 9.4.2 | PSL 8.2.16 | Supply, install and paint precast concrete valve marker as per EWS Standard Drawing, Plan No. 27. (Markers to be installed on either end of the pipe assembly and directly above the meter) | No. | 286.00 | | |
| 9.4.3 | | Supply and install valve Cover (Belltoby) as per EWS Standard Detail Drawing, Plan No. 28 | No. | 166.00 | | |
| 9.4.4 | | Supply and installation of additional temporary anchors and ties, or struts | No. | 20.00 | | |
| 9.4.5 | PSL 8.2.11 | Construct concrete thrust blocks using grade 20MPa concrete inclusive of shuttering and excavation | m ³ | 80.00 | | |
| 9.4.6 | | Supply and Install Ref 888 mesh for thrust blocks complete with Y12 clips where required | m ² | 150.00 | | |
| 9.4.7 | | Construct concrete surround (25MPa) for valve covers and markers inclusive of 75mm Asphalt layer where required | m ³ | 31.00 | | |
| 9.4.8 | | Construct concrete meter/ pipe plinths (25MPa) inclusive of all shuttering as directed by the Engineer | m ³ | 5.00 | | |
| | | Supply all labour, plant and materials and wrap steel pipeline with "Denso 1250/300" Tape wrapping system 600mm long to manufacturer's specifications where pipe is passing through brick walls | | | | |
| 9.4.9 | | DN80 - DN200 pipe | No. | 20.00 | | |
| 9.4.10 | | DN250 - DN500 pipe | No. | 31.00 | | |
| | | Supply and Install Valve spindle extension complete as as per Detail 1 on Dwg 59066/ 205, for lengths: | | | | |
| 9.4.11 | | up to 1m | No. | 30.00 | | |
| 9.4.12 | | 1.0m to 2.0m | No. | 20.00 | | |
| 9.4.13 | | 2.0m to 3.0m | No. | 20.00 | | |
| Total Carried Forward | | | | | | |

SECTION 9: MEDIUM PRESSURE PIPELINES

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|----------------------------------|---------|--|------|-------|------|---------------|
| Brought Forward | | | | | | |
| 9.5 | PSCP | CATHODIC PROTECTION | | | | |
| 9.5.1 | | Cathodic bonding across meter assembly with 2 x 16mm ² black PVC copper cables including all works and testing for continuity | No. | 65.00 | | |
| Total Carried Forward To Summary | | | | | | |

SECTION 10: BEDDING (PIPES)

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|----------------------------------|-----------------------------|---|------|--------|------|---------------|
| 10 | SABS 1200 PSLB 8.1 | BEDDING (PIPES) | | | | |
| 10.1 | 8.2.1 PSLB 8.2.1 | PROVISION OF BEDDING FROM TRENCH EXCAVATIONS: | | | | |
| 10.1.1 | | Selected granular material for 200mm bedding cradle below pipe invert | m³ | 110.00 | | |
| 10.1.2 | | Selected granular material for fill blanket to 300mm above pipe crown | m³ | 100.00 | | |
| 10.1.3 | PSLB 8.2.1 | Extra Over for screening of material from the trench excavation, to achieve grading suitable to comply with the bedding and blanket material specification (Provisional Quantity) | m³ | 210.00 | | |
| 10.2 | 8.2.2.3 PSLB 8.2.2.3 | FROM COMMERCIAL SOURCES: | | | | |
| 10.2.1 | | Selected granular material for 200mm bedding cradle below pipe invert | m³ | 70.00 | | |
| 10.2.2 | | Selected granular material for fill blanket to 300mm above pipe crown | m³ | 70.00 | | |
| 10.3 | | EXCAVATION ANCILLARIES | | | | |
| 10.3.1 | PSDA 8.3.9 | Cement stabilised selected bedding and fill (Soilcrete Bedding - 4% CEMENT). | m³ | 40.00 | | |
| Total Carried Forward To Summary | | | | | | |

SECTION 11: CHAMBERS AND CONCRETE WORKS

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|---------------------|--|----------------|--------|------|---------------|
| 11 | | CHAMBERS AND CONCRETE WORKS | | | | |
| 11.1 | SANS 1200 GA | CONCRETE (SMALL WORKS) | | | | |
| | 8.2 | <u>FORMWORK</u> | | | | |
| | 8.2.2 | Smooth Horizontal, for: | | | | |
| 11.1.1 | | Soffit of Roof slab of meter chambers | m ² | 60.00 | | |
| | 8.2.3 | Smooth Vertical Narrow Widths, for: | | | | |
| 11.1.2 | | 250mm high for meter chamber bases | m | 180.00 | | |
| 11.1.3 | | 200mm high smooth vertical face to meter chamber roof slab including chamfer. | m | 160.00 | | |
| 11.1.4 | | 200mm high smooth side for 1070x1070 box out opening for chamber lids | No. | 17.00 | | |
| | 8.3 | <u>REINFORCEMENT</u> | | | | |
| 11.1.5 | 8.3.1 | Steel bars: High Tensile | kg | 25.00 | | |
| 11.1.6 | 8.3.1 | Steel bars: Mild steel | kg | 25.00 | | |
| 11.1.7 | 8.3.2 | Ref 888 Welded mesh | m ² | 130.00 | | |
| | 8.4 | <u>CONCRETE</u> | | | | |
| | 8.4.2 | Grade Concrete (15 Mpa/19mm) | | | | |
| 11.1.8 | | Blinding layer minimum 50mm thick | m ³ | 6.00 | | |
| | 8.4.3 | Grade Concrete (25 Mpa/19mm) | | | | |
| 11.1.9 | | Chamber floors | m ³ | 30.00 | | |
| 11.1.10 | | Chambers roof slabs | m ³ | 24.00 | | |
| | 8.4.4 | <u>UNFORMED SURFACE FINISHES</u> | | | | |
| | 8.4.4 (a) | Wood-floated finish to: | | | | |
| 11.1.11 | | Chamber floors. | m ² | 120.00 | | |
| | 8.4.4 (b) | Steel-floated finish to: | | | | |
| 11.1.12 | | Chambers roof slabs | m ² | 65.00 | | |
| 11.2 | PSX | BRICKWORK CHAMBERS | | | | |
| | | (Refer to DWG 59066/ 202 and 59066/ 205 for details for Brickwork Chamber walls) | | | | |
| | | <u>BRICKWORK BELOW GROUND</u> | | | | |
| Total Carried Forward | | | | | | |

SECTION 11: CHAMBERS AND CONCRETE WORKS

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|---------|--|------|--------|------|---------------|
| Brought Forward | | | | | | |
| 11.2.1 | | Brickwork in stretcher bond. Approved Clay Common Bricks. (All inclusive of bagging to outer face of internal skin with 1:3 cement sand slurry and apply two coats approved cold bitumastic emulsion, cleaning brickwork and making good on completion). 110mm chamber external face including brick force every course up to 2 courses below NGL | m² | 400.00 | | |
| 11.2.2 | | Brickwork in stretcher bond. "Roan Satin" face brick. (All inclusive of cleaning brickwork and making good on completion). 110mm chamber internal face including brick force every course up to 2 courses below NGL | m² | 320.00 | | |
| 11.2.3 | | <u>BRICKWORK ABOVE GROUND</u> Brickwork in stretcher bond. "Roan Satin" face brick. 230mm walls including brick force every 2nd course up to roof slab. All inclusive of bitumen sealant between wall and roof slab, cleaning brickwork and making good on completion. | m² | 80.00 | | |
| 11.2.4 | | <u>WATERPROOFING</u> 375 Micron "Brickgrip DPC" or similar approved embossed black polyethylene sheeting to base of walls | m | 180.00 | | |
| 11.2.5 | | 250 Micron "USB Green" polyethylene waterproof sheeting with 150mm overlaps for underneath chamber floors | m² | 120.00 | | |
| 11.2.6 | | <u>BOX OUT HOLES</u> Neatly box out and making good void in building walls where pipework passes through including "Denso 1250" or similar approved wrapping of pipe through wall | No. | 60.00 | | |
| 11.3 | | METER PROTECTION Supply and Install Meter Protection steel sleeve as per Dwg 59066/ 203, for: | | | | |
| 11.3.1 | | DN150 - DN200 | No. | 35.00 | | |
| 11.3.2 | | DN250 - DN300 | No. | 15.00 | | |
| Total Carried Forward | | | | | | |

SECTION 11: CHAMBERS AND CONCRETE WORKS

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|---------|---|----------------|--------|------|---------------|
| Brought Forward | | | | | | |
| | | Supply and Install Meter Protection Culvert complete as per Dwg 59066/ 204 | | | | |
| | | Type 1, for Meter Sizes: | | | | |
| 11.3.3 | | DN150 - DN300 | No. | 10.00 | | |
| 11.3.4 | | DN350 - DN400 | No. | 6.00 | | |
| | | Type 2, for Meter Sizes: | | | | |
| 11.3.5 | | DN450 - DN600 | No. | 23.00 | | |
| | | Meter Protection Sleeve Extras | | | | |
| 11.3.6 | | Single skin NFX brick wall for end closing of culvert complete with brickforce every second course as per Dwg 59066/ 204 | m ² | 100.00 | | |
| 11.3.7 | | Bagging of 1:3 cement and sand mixture on external facing face | m ² | 100.00 | | |
| 11.3.8 | | Two coats "Brickseal" or approved bitumen emulsion waterproof coating on bagged brick walls | m ² | 100.00 | | |
| 11.4 | | MISCELLANEOUS AND CHAMBER EXTRAS | | | | |
| 11.4.1 | | Supply and place 19mm stone | m ³ | 20.00 | | |
| 11.4.2 | | Paint roof slab of chamber with 2 coats of yellow road marking paint including stenciling with black road marking paint to approved Contractor's Detail | m ² | 150.00 | | |
| 11.4.3 | | Supply and install bolted GRP ladders including stringers and rungs, 'Fibretek' or similar approved. | m | 75.00 | | |
| 11.4.4 | | Supply and install bolted GRP ladder safety cage where required 'Fibretek' or similar approved. | m | 15.00 | | |
| 11.4.5 | | Supply and install GRP Handrail assembly complete with stanchions, bends and ends 'Fibretek' or similar approved for chamber access hatches as detailed on DWG 59066/ 205 | No. | 30.00 | | |
| 11.4.6 | | Construction of air vents as per Detail 2 on DWG 59066/ 205. Rate to include all work and fabrication of air vents. | No. | 60.00 | | |
| 11.4.7 | | Lifting holes cast into roof slab complete as per Detail 3 on DWG 59066/ 205 | No. | 120.00 | | |
| Total Carried Forward | | | | | | |

SECTION 11: CHAMBERS AND CONCRETE WORKS

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|----------------------------------|---------|---|------|-------|------|---------------|
| Brought Forward | | | | | | |
| 11.4.8 | | Galvanised mild steel lockable 1200x1200 access manhole lid for chambers as per Dwg 58308 | No. | 30.00 | | |
| Total Carried Forward To Summary | | | | | | |

SECTION 12: ROADS

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|------------------------|--|----------------|--------|------|---------------|
| 12 | SABS 1200 ME/MF | ROADS | | | | |
| 12.1 | SABS 1200 ME | SELECTED SUBBASE | | | | |
| 12.1.1 | 8.3.3 | Construct 150mm thick G7 subbase course with material from commercial sources and compact to 95% MOD AASHTO | m ³ | 109.00 | | |
| 12.2 | SABS 1200 MF | BASE | | | | |
| | 8.3.3 | Construct 26.5mm graded crushed stone base with material from commercial source, (G2 quality material to TRH4 compliance) compacted to 100% Mod AASHTO Density, for: | | | | |
| 12.2.1 | | 150mm thick for Asphalt Roads | m ³ | 109.00 | | |
| 12.3 | SANS 1200 MH | ASPHALT SURFACING | | | | |
| | 8.5.1 | Prime Coat: Prime coat using MC 30 bitumen (or similar approved) at 0.7 Litres/m ² | | | | |
| 12.3.1 | | Carriageway | m ² | 725.00 | | |
| | 8.5.3 | Tack Coat: | | | | |
| 12.3.2 | | Spray surface using 30% stable grade emulsion at 0.3 litres/m ² | m ² | 725.00 | | |
| | PSMH 8.5.4 | Asphalt: | | | | |
| 12.3.3 | | Continuously medium graded asphalt using 35/50 Pen. Grade bitumen, thickness 30-50mm to roads | m ² | 725.00 | | |
| | 8.5.5 | Variations in quantities of prime: | | | | |
| 12.3.4 | | MC 30 | liter | 7.00 | | |
| 12.4 | SANS 1200 MK | CONCRETE, CONCRETE KERBING AND CHANELLING | | | | |
| 12.4.1 | | Reinstate bitumen driveways, footways and kerbs | m ² | 36.00 | | |
| 12.4.2 | | Reinstate concrete driveways, footways and kerbs with 25Mpa concrete | m ³ | 36.00 | | |
| 12.4.3 | 8.2.2 | All precast concrete kerb. | m | 100.00 | | |
| 12.4.4 | | All asphalt kerb. | m | 100.00 | | |
| | 8.4 | Scheduled items for Road Markings | | | | |
| Total Carried Forward | | | | | | |

SECTION 12: ROADS

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|----------------------------------|---------|---|----------------|--------|------|---------------|
| Brought Forward | | | | | | |
| 12.4.5 | | Retro- reflective road marking paint applied at nominal rate of 0.42l/m ² (including glass beads, setting out and pre-marking for characters, symbols & traffic islands) | m ² | 100.00 | | |
| Total Carried Forward To Summary | | | | | | |

SECTION 13: ELECTRICAL

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|------------------|---|----------------|----------|------|---------------|
| 13 | | ELECTRICAL SUPPLY AND INSTALLATION | | | | |
| 13.1 | | CLEAR SITE | | | | |
| 13.1.1 | PSC 8.2.1 | Clear and grub cable routes. Rate to include for trees of girth up to and including 1m. | m ² | 275.00 | | |
| 13.1.2 | PSC 8.2.10 | Remove topsoil to a depth of 150mm stockpile, maintain and reinstate for cable routes | m ³ | 720.00 | | |
| 13.1.3 | PSC 8.2.11 | Saw cutting of existing asphalt surfaces from 30mm to 60mm thickness | m | 550.00 | | |
| 13.1.4 | PSC 8.2.12 | Saw cutting of existing concrete surface of between 30mm and 60mm thickness | m | 550.00 | | |
| 13.1.5 | PSC 8.2.13 | Remove existing asphalt roadway and sidewalk surfacing for spoil to an approved spoil site to be determined by the contractor | m ³ | 15.00 | | |
| 13.1.6 | PSC 8.2.14 | Remove existing gravel layer works to spoil to an approved spoil site to be determined by the contractor | m ³ | 50.00 | | |
| 13.1.7 | PSC 8.2.15 | Break out and remove existing concrete surfacing to spoil to an approved spoil site to be determined by the contractor | m ³ | 50.00 | | |
| 13.2 | | EXCAVATION AND BACKFILL | | | | |
| | | Excavate in all materials for 300mm wide x 1050mm deep cable trench, backfill, compact and dispose of surplus/ unsuitable material, for: | | | | |
| 13.2.1 | PSEL 3.1 | Main Supply cable from existing distribution board to flow transmitter kiosk/ meter chamber | m | 5,500.00 | | |
| 13.2.2 | PSEL 3.2 | Communication Cable duct from flow trasmitter kiosk to flow sensor | m | 280.00 | | |
| 13.2.3 | PSEL 1.19 | Supply and install SABS approved cable warning tape above cable in trench | m | 5,500.00 | | |
| 13.2.4 | PSEL 3.4 | Import and place suitable bedding material to 300mm wide trench to a depth of 200mm (50mm plus cover over cables / cable ducts to a depth of 150mm) | m | 5,500.00 | | |
| 13.3 | PSEL 2.20 | CABLE SLEEVE PIPES | | | | |
| Total Carried Forward | | | | | | |

SECTION 13: ELECTRICAL

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|-----------|---|------|----------|------|---------------|
| Brought Forward | | | | | | |
| 13.3.1 | | Supply and install flexible sleeves in trench with draw wire in accordance with SANS 61386-24. To be laid insitu into soil or concrete. To include long radius bends, at kiosks and buildings. | | | | |
| 13.3.2 | | Supply 110mm diameter | m | 5,500.00 | | |
| 13.3.3 | | Install 110mm diameter | m | 5,500.00 | | |
| 13.4 | PSEL 3.5 | Supply and install cable protection encasement complete with 25/19 MPA concrete, conduit, draw wire, reinforcing and formwork as per Detail 1 on Dwg 59066/ 301 | m | 500.00 | | |
| | | FLOW METER SUPPLY CABLING | | | | |
| | | Supply and install into open trench, 300/500V XPLE insulated galvanised steel wire armoured (SWA) instrumentation cabling. Conductors plain annealed class 4 bunched copper, numbered , twisted pairs with individual and overall tinned copper drain wire including individual & overall aluminium Mylar screen. | | | | |
| 13.4.1 | | Supply 1.5mm ² 16-core | m | 5,500.00 | | |
| 13.4.2 | | Install 1.5mm ² 16-core | m | 5,500.00 | | |
| 13.4.3 | | Terminate 1.5mm ² 16-core | No. | 110.00 | | |
| 13.5 | PSEL 3.6 | COMMUNICATION CABLE | | | | |
| | | Take possession, Install and connect free-issue communication cable between transmitter in kiosk to flow meter sensors. Shall be installed by the instrumentation specialist. The rate shall include the pulling of cable in duct to the sensor device. | | | | |
| 13.5.1 | | 5m Communication Cable | No. | 55.00 | | |
| | | Install and connect communication cable between transmitter in kiosk to flow meter sensors. Shall be installed by the instrumentation specialist. The rate shall include the pulling of cable in duct to the sensor device. | | | | |
| 13.5.2 | | 10m Communication Cable | No. | 55.00 | | |
| 13.6 | PSEL 2.10 | SURGE PROTECTION | | | | |
| Total Carried Forward | | | | | | |

SECTION 13: ELECTRICAL

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|-----------|--|------|-------|------|---------------|
| Brought Forward | | | | | | |
| | PSEL3.7 | Supply & Install DIN rail mounted pre-fused surge arresters and fuses. Surge Arresters to be combined lightning current and surge arrester for protecting power supply and information systems To be installed as indicated on the schematic diagram as per Dwg 59066/ 300 | | | | |
| 13.6.1 | PSEL3.7.1 | Supply 2-Pole 30VDC Type 3 Surge Arrester with remote signalling contact | No. | 55.00 | | |
| 13.6.2 | | Install 2-Pole 30VDC Type 3 Surge Arrester with remote signalling contact | No. | 55.00 | | |
| 13.6.3 | PSEL3.7.2 | Supply 2-Pole 180VDC Surge Arrester with wireless condition monitoring | No. | 55.00 | | |
| 13.6.4 | | Install 2-Pole 180VDC Surge Arrester with wireless condition monitoring | No. | 55.00 | | |
| 13.6.5 | PSEL3.7.3 | Supply 4-Pole 180VDC Surge Arrester with wireless condition monitoring | No. | 55.00 | | |
| 13.6.6 | | Install 4-Pole 180VDC Surge Arrester with wireless condition monitoring | No. | 55.00 | | |
| 13.6.7 | PSEL3.7.4 | Supply 18-48 V Surge Arrester Condition Monitoring module with lifecheck sensor and RS485 interface | No. | 55.00 | | |
| 13.6.8 | | Install 18-48 V Surge Arrester Condition Monitoring module with lifecheck sensor and RS485 interface | No. | 55.00 | | |
| 13.7 | PSEL 3.8 | EQUIPMENT KIOSKS Supply and install "Cathtech concrete bunker 150 type" for the housing and protection of equipment. Concrete bunker to be minimum 35mPA re-enforced concrete. To include 5mm 3CR12 stainless steel door with double throw lockset, Master Key system (keyed alike), M16 Lifting Eyes, gland plate and all necessary accessories as per specifications as per Dwg 59066/ 300 | | | | |
| 13.7.1 | | Supply Cathtech concrete bunker 150 type or similar approved | No. | 55.00 | | |
| 13.7.2 | | Install Cathtech concrete bunker 150 type or similar approved | No. | 55.00 | | |
| Total Carried Forward | | | | | | |

SECTION 13: ELECTRICAL

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|-----------------------|------------------|--|------|--------|------|---------------|
| Brought Forward | | | | | | |
| 13.7.3 | PSEL 3.9 | 25Mpa concrete foundation slab for concrete equipment kiosk (1200 x 850 x 300mm with 2x110 entries to suit cable entry to the bunker). Bunker to be installed into foundation slab (Cast in situ) . Rate to include for the foundation slab and fixing of bunker to slab and 2 x layers of Ref 888 mesh. | No. | 55.00 | | |
| 13.8 | PSEL 3.10 | FLOW METERS | | | | |
| 13.8.1 | | Take possession and Installation of free-issue IP67 Flow Meter Transmitter Unit into kiosk | No. | 55.00 | | |
| 13.8.2 | | Installation of IP67 Flow Meter Transmitter Unit into kiosk | No. | 55.00 | | |
| 13.9 | PSEL 3.11 | ENCLOSURES & TRUNKING | | | | |
| 13.9.1 | | Supply 186mm x 146mm x 75mm IP 65 Polycarbonate box surface mounted in equipment kiosk with Clear lid and 2 x rows of DIN Rail. | No. | 55.00 | | |
| 13.9.2 | | Install 186mm x 146mm x 75mm IP 65 Polycarbonate box surface mounted in equipment kiosk with Clear lid and 2 x rows of DIN Rail. | No. | 55.00 | | |
| 13.9.3 | | Supply 200 x 120 x 75mm IP65, Polycarbonate box surface mounted in equipment kiosk with Clear lid and 1x row of DIN Rail and 20 Terminal DIN Mount block | No. | 55.00 | | |
| 13.9.4 | | Install 200 x 120 x 75mm IP65, Polycarbonate box surface mounted in equipment kiosk with Clear lid and 1x row of DIN Rail and 20 Terminal DIN Mount block | No. | 55.00 | | |
| 13.9.5 | | Supply 40 x 25mm PVC Trunking on inside of Kiosk to hold internal wiring with cover and all necessary fixings and accessories. | m | 165.00 | | |
| 13.9.6 | | Install 40 x 25mm PVC Trunking on inside of Kiosk to hold internal wiring with cover and all necessary fixings and accessories. | m | 165.00 | | |
| 13.10 | PSEL 3.12 | EARTHING | | | | |
| | | An equipment earth bar shall be installed on the inside of one of the walls of the kiosk. The earth bar shall be copper and be pre-drilled with three holes to accept 10mm brass bolts. The earth bar shall be securely fixed to the wall so that there is a 50mm space between it and the wall. | | | | |
| Total Carried Forward | | | | | | |

SECTION 13: ELECTRICAL

| ITEM NO | PAYMENT | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (RAND) |
|----------------------------------|------------------------|---|------|--------|------|---------------|
| Brought Forward | | | | | | |
| 13.10.1 | PSEL 3.12.1 | Supply earth bar 200 x 50 x 6mm thick | No. | 55.00 | | |
| 13.10.2 | | Install earth bar 200 x 50 x 6mm thick | No. | 55.00 | | |
| | | Supply Install copper Earth spike in Crows Foot formation. To include conductor clamps and all necessary accessories. | | | | |
| 13.10.3 | PSEL 3.12.2 | Supply 1.8m long 16mm diameter earth rod | No. | 220.00 | | |
| 13.10.4 | | Install 1.8m long 16mm diameter earth rod | No. | 220.00 | | |
| 13.11 | | EARTHING OF EQUIPMENT | | | | |
| | | Connection between earth spikes. To include all required lugs, nuts, & bolts. | | | | |
| 13.11.1 | | Supply 35mm ² Bare Copper Earth Wire | m | 275.00 | | |
| 13.11.2 | | Install 35mm ² Bare Copper Earth Wire | m | 275.00 | | |
| 13.11.3 | | Terminate Bare Copper Earth Wire | No. | 330.00 | | |
| 13.11.4 | | Supply 35mm ² PVC Insulated Copper Earth Wire | m | 275.00 | | |
| 13.11.5 | | Install 35mm ² PVC Insulated Copper Earth Wire | m | 275.00 | | |
| 13.11.6 | | Terminate Insulated Copper Earth Wire | No. | 110.00 | | |
| 13.11.7 | | Supply PVC earth inspection pit complete with cover. 200mm x 500mm | No. | 220.00 | | |
| 13.11.8 | | Install PVC earth inspection pit complete with cover. 200mm x 500mm | No. | 220.00 | | |
| 13.12 | | TESTING & COMMISSIONING | | | | |
| | | Earth Resistance | | | | |
| 13.12.1 | PSEL 2.24.3 | Test earth resistance of the system between the earth bar and ground and submit the results to the Engineer. | No. | 55.00 | | |
| 13.12.2 | PSEL 2.25 PSEL 2.26 | Test the installation accordance with SANS10142-1 and provide an Earthing Certificate | No. | 55.00 | | |
| 13.12.3 | PSEL 2.39 | Provide As-built drawings of the electronic installation | No. | 55.00 | | |
| 13.13 | PSEL 2.27 | MAINTENANCE | | | | |
| 13.13.1 | | Maintain the installation for 12-months, throughout the defects liability period for each installations. | No. | 72.00 | | |
| Total Carried Forward To Summary | | | | | | |

SUMMARY OF SECTIONS

| SECTION | DESCRIPTION | AMOUNT (RAND) |
|--|---|------------------|
| 1 | SECTION 1: PRELIMINARY AND GENERAL | |
| 2 | SECTION 2: SITE CLEARANCE | |
| 3 | SECTION 3: EARTHWORKS | |
| 4 | SECTION 4: EARTHWORKS (PIPE TRENCHES) | |
| 5 | SECTION 5: METER ASSEMBLY PIPEWORK (FABRICATE AND SUPPLY) | |
| 6 | SECTION 6: METER ASSEMBLY PIPEWORK (INSTALLATION) | |
| 7 | SECTION 7: BY-PASS MECHANICAL METER ASSEMBLY PIPEWORK (FABRICATED AND SUPPLY) | |
| 8 | SECTION 8: BY-PASS MECHANICAL METER ASSEMBLY PIPEWORK (INSTALLATION) | |
| 9 | SECTION 9: MEDIUM PRESSURE PIPELINES | |
| 10 | SECTION 10: BEDDING (PIPES) | |
| 11 | SECTION 11: CHAMBERS AND CONCRETE WORKS | |
| 12 | SECTION 12: ROADS | |
| 13 | SECTION 13: ELECTRICAL | |
| | SUB-TOTAL | |
| | Add 15% VAT | |
| TOTAL CARRIED FORWARD TO FORM OF OFFER | | |

PART C3: SCOPE OF WORK

| | <u>PAGE</u> |
|-------------|--|
| C3.1 | PROJECT DESCRIPTION AND SCOPE OF CONTRACT |
| | 126 |
| C3.2 | PROJECT SPECIFICATIONS |
| | 128 |
| C3.3 | STANDARD SPECIFICATIONS |
| | 150 |
| C3.4 | PARTICULAR SPECIFICATIONS |
| | 209 |
| C3.5 | CONTRACT AND STANDARD DRAWINGS |
| | 243 |
| C3.6 | ANNEXURES |
| | 246 |

C3.1: PROJECT DESCRIPTION AND SCOPE OF CONTRACT

TABLE OF CONTENTS

| | Page |
|--|-------------------------------------|
| C3.1.1 GENERAL DESCRIPTION OF ALL WORKS | Error! Bookmark not defined. |
| C3.1.2 OVERVIEW AND DETAILS OF CONTRACT | Error! Bookmark not defined. |
| C3.1.2.1 Overview | Error! Bookmark not defined. |
| C3.1.2.2 Main Components of The Works | Error! Bookmark not defined. |
| C3.1.2.3 Temporary Works | 127 |
| C3.1.3 DESCRIPTION OF THE SITE AND ACCESS | 127 |
| C3.1.4 NATURE OF GROUND AND SUBSOIL CONDITIONS..... | 127 |

C3.1: PROJECT DESCRIPTION AND SCOPE OF CONTRACT

C3.1.1 GENERAL DESCRIPTION OF ALL WORKS

eThekwini Municipality's Water and Sanitation (EWS) Unit has identified within its bulk reservoir supply network the need to introduce and replace Bulk Reservoir Meters on existing infrastructure.

This Contract has been prepared to assist EWS in achieving the objectives of its service delivery charter improving and upgrading key infrastructure components and providing a service that is efficient, effective, affordable and sustainable.

C3.1.2 OVERVIEW AND DETAILS OF CONTRACT

C3.1.2.1 OVERVIEW

The contract involves the installation of ultrasonic and mechanical water meters on reservoir inlets and outlets for identified reservoirs within eThekwini Municipality supply boundary. The supply regions are defined as Central, North, South and West.

The total number of meter installations scheduled are an estimate of the number of installations required per Contract and is subject to change.

| Contract No. | Number of Reservoirs Sites | Number of Inlet Meters to be Installed | Number of Outlet Meters to be Installed |
|---|-----------------------------------|---|--|
| 31367-5W: Northern Operational Areas | 48 | 52 | 20 |

C3.1.2.1 MAIN COMPONENTS OF THE WORKS

The scope of works to be carried under this Contract is shown on the drawings and described in the specifications and may be described as comprising but not limited to the following:

- Planning and ordering of meters from EWS;
- Proving and locating reservoir inlet and outlet pipes at the reservoir sites that require metering;
- Confirming existing pipeline material and diameters;
- Performing survey and/ or levelling to obtain existing pipeline horizontal and/ or vertical alignment;
- Preparing detailed pipe fabrication drawings for approval by the Employer's Representative (Refer to PS 6.4.3);
- Planning and liaising with eThekwini Operations for shutdowns of reservoir inlet supply pipelines or reservoir outlet pipelines, including all risk assessments and method statements which are to be approved by the Employer's Representative and EWS Operations;
- Erection of water disruption sign boards 72 hours prior to tie in (where applicable);
- Earthworks including access where applicable, pipeline and cable trenching, laying, bedding and backfilling of meter installation, power supply cables and meter signal cable;
- Barricading all earthworks and trenches;
- Accommodation of traffic where works is required in existing roads;
- Fabrication, supplying, laying, jointing, testing of pipes, pipe specials and fittings, that shall connect to the existing pipework (All flow meters are to be Free Issue);
- Installation of an above ground kiosk (where applicable) for meter signal converter complete with electrical components;
- Construction of meter protection sleeves or culverts;
- Reinstatement of site to original condition;

- Demolition of existing chambers and backfilling (where applicable or directed by the Employer's Representative);
- Such other work as may be deemed necessary by the Employer's Representative for the completion of the project.

NOTE:

The Contractor is to take note that the works called for under this Contract is subject to confirmation of existing infrastructure and that proving may be required at numerous locations per reservoir site for the proposed location of the meter installation, in order to confirm the location of existing services and other cross connection points within the reservoir site.

The Employer's Representative will instruct the Contractor on areas to prove and will not be limited by the number of sites.

C3.1.2.3 TEMPORARY WORKS

The Contractor shall carry out such temporary work, including the necessary access and construction roads, shoring of trenches and excavations etc., as he may require enabling the permanent work to be constructed. He shall allow for the cost of all temporary works, including design and their removal, in his tendered rates.

Temporary works are expected to include:

- necessary site access and deviations for traffic where new meter installation will disrupt traffic;
- shoring, dewatering and related temporary works required during excavation of trenches and excavations as required to enable the permanent works to be constructed;
- Any temporary support structures required to protect and maintain services;
- Any temporary pipe specials and fittings.

C3.1.3 DESCRIPTION OF THE SITE AND ACCESS

The location of the sites is shown in C4.1 and issued as a Google Earth file on the CD of Drawings per Contract.

All the reservoir sites are located within the eThekweni Municipality Supply Region. The Employer will provide access to all the sites.

C3.1.4 NATURE OF GROUND AND SUBSOIL CONDITIONS

Refer to Section C4.2: Site Information.

C3.2: PROJECT SPECIFICATION**TABLE OF CONTENTS****Page**

| | | |
|-------------|--|------------|
| PS 1 | CONSTRUCTION PROGRAMME | 131 |
| PS 1.1 | Time for Completion | 131 |
| PS 1.2 | Preliminary Programme | 131 |
| PS 1.3 | Programme in Terms of Clause 5.6 of GCC | 131 |
| PS 1.4 | Key Construction Activities | 131 |
| PS 1.4.1 | Ordering of Ultrasonic Flow Meters from EWS | 132 |
| PS 1.4.2 | Proving, locating and confirming existing pipelines | 132 |
| PS 1.4.3 | Preparing detailed pipe fabrication drawings for approval | 133 |
| PS 1.4.4 | Shutdown of reservoir inlet supply or closure of reservoir outlet | 133 |
| PS 1.4.5 | Mock Fitting of Installation | 133 |
| PS 1.5 | Working Hours | 133 |
| PS 1.6 | Working Outside Normal Working Hours | 133 |
| PS 1.7 | Extension of Time Arising from Abnormal Rainfall | 134 |
| PS 2 | INTENTIONALLY LEFT BLANK | 134 |
| PS 3 | SITE FACILITIES AVAILABLE | 134 |
| PS 3.1 | Source of Water Supply | 134 |
| PS 3.2 | Source of Power Supply and Other Services | 134 |
| PS 3.3 | Location of Camp | 134 |
| PS 3.4 | Accommodation of Employees | 135 |
| PS 4 | SITE FACILITIES REQUIRED | 135 |
| PS 4.1 | Temporary Offices | 135 |
| PS 4.1.1 | Employer's Representative's Office | 135 |
| PS 4.1.2 | Contractor's Office | 135 |
| PS 4.2 | Laboratory and Testing of Materials | 135 |
| PS 4.3 | Sanitary Facilities | 136 |
| PS 4.4 | Security | 136 |
| PS 5 | CONSTRUCTION AND MANAGEMENT REQUIREMENTS | 136 |
| PS 5.1 | General | 136 |
| PS 5.2 | Quality Assurance (QA) | 136 |
| PS 5.3 | Survey Beacons | 137 |
| PS 5.4 | Management of The Environment | 137 |
| PS 5.4.1 | Natural Vegetation | 137 |
| PS 5.4.2 | Fires | 137 |
| PS 5.5 | Environmental Management Plan | 137 |
| PS 5.6 | Health and Safety | 137 |
| PS 5.6.1 | Employer's Health and Safety Specification | 137 |
| PS 5.6.2 | Compliance with the OHSa Construction Regulations | 137 |
| PS 6 | CONSTRUCTION REQUIREMENTS REQUIRING SPECIAL ATTENTION | 137 |
| PS 6.1 | In Amplification of Clause 4.12 of General Conditions of Contract 2015 | 137 |
| PS 6.2 | Employer's Representative Supervision and Inspection | 138 |

| | | |
|--------------|--|------------|
| PS 6.2.1 | Site Supervision | 138 |
| PS 6.2.2 | Daily Records | 138 |
| PS 6.3 | Submission of Insurances and Sureties | 138 |
| PS 6.4 | Personnel..... | 139 |
| PS 6.4.1 | Site Personnel..... | 139 |
| PS 6.4.2 | Contractor's Fabrication, Fitting and Plumbing Teams | 139 |
| PS 6.5 | Contractor's Plant | 139 |
| PS 6.6 | Existing Services | 139 |
| PS 6.7 | Protection of Existing Services | 139 |
| PS 6.8 | Proving Underground Services..... | 140 |
| PS 6.8.1 | Proving of the existing pipework (to be read in conjunction with Clause PS 1.4.2)..... | 140 |
| PS 6.9 | Construction Hold Points | 141 |
| PS 7 | ADDITIONAL CONSTRUCTION REQUIREMENTS REQUIRING ATTENTION | 141 |
| PS 7.1 | Watermains..... | 141 |
| PS 7.1.1 | General | 141 |
| PS 7.1.2 | Water Main Valve Access | 141 |
| PS 7.2 | Restriction on Excavation Equipment..... | 141 |
| PS 7.2.1 | Shoring of Excavation | 142 |
| PS 7.3 | Restriction on Compactive Equipment | 142 |
| PS 7.4 | Finishing, Tidying and Site Maintenance..... | 142 |
| PS 7.5 | Construction in Limited Areas..... | 142 |
| PS 7.6 | Barricading of Excavations | 142 |
| PS 7.7 | Spoil Material..... | 143 |
| PS 7.8 | Construction on Steep Slopes | 143 |
| PS 7.9 | Dealing with Water | 143 |
| PS 7.10 | Road Reinstatement..... | 143 |
| PS 7.11 | Level Working Platform to Facilitate Meter Installation | 143 |
| PS 8 | METHOD STATEMENTS | 143 |
| PS 9 | DRAWINGS | 144 |
| PS 10 | RECORD DRAWINGS AND AS-BUILT DATA..... | 144 |
| PS 10.1 | As Built Point Accuracy | 145 |
| PS 10.2 | As-built to be captured..... | 145 |
| PS 11 | LABOUR | 145 |
| PS 12 | COMPLIANCE WITH STATUTORY REQUIREMENTS | 145 |
| PS 12.1 | Occupational Health and Safety | 145 |
| PS 13 | PERMITS | 145 |
| PS 14 | ATTENDANCE AT SITE MEETINGS..... | 145 |
| PS 15 | CERTIFICATES OF PAYMENT | 146 |
| PS 16 | PUBLIC RELATIONS OFFICER (ISD CONSULTANT)..... | 146 |
| PS 17 | PROCUREMENT AND FREE ISSUE ITEMS..... | 147 |
| PS 17.1 | Materials Supplied by The Employer..... | 147 |
| PS 17.2 | Procedure for The Collection or Withdrawal of Materials | 147 |
| PS 17.3 | Ownership of Materials Once Collected by Contractors | 147 |
| PS 17.4 | Losses of And Damage to Materials | 147 |
| PS 17.5 | Return of Materials | 148 |

| | | |
|--------------|--|------------|
| PS 18 | STORAGE AREAS AND PIPE YARDS | 148 |
| PS 19 | RESERVOIR SHUTDOWNS | 148 |
| PS 20 | PROCEDURE FOR METER INSTALLATION AND REGISTRATION | 149 |
| PS 21 | PRACTICAL COMPLETION | 149 |
| PS 21.1 | Practical Completion for any individual installation | 149 |
| PS 21.2 | Practical Completion of the whole of the works..... | 150 |

PREAMBLE

In the event of any discrepancy between a part or parts of the Standard or Particular Specifications and the Project Specification, the Project Specification shall take precedence. In the event of a discrepancy between the Specifications, (including the Project Specifications) and the drawings and / or the Bill of Quantities, the discrepancy shall be resolved by the Employer's Agent before the execution of the work under the relevant item.

PS 1 CONSTRUCTION PROGRAMME

PS 1.1 TIME FOR COMPLETION

The time for completion of the Contract is as specified in the Contract Data.

PS 1.2 PRELIMINARY PROGRAMME

The preliminary programme submitted as part of the Tender Returnable Documents shall be in the form of a simplified bar chart with sufficient details to show clearly how the works will be performed within the time for completion as stated in the Contract Data.

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

PS 1.3 PROGRAMME IN TERMS OF CLAUSE 5.6 OF GCC

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

The Contractor is to provide a detailed programme showing how he proposes to carry out the works and which clearly indicates the programme critical path. In this regard, the Contractor's attention is drawn to Clause 5.12 of the General Conditions of Contract, where consideration will only be given to claims for extension of time associated with critical path activities.

The programme is to be submitted together with monthly labour and plant requirements, resource register, proposed sub-contractors and anticipated expenditure. The programme shall detail separately the various construction activities involved with each of the elements of the contract and shall be subject to the approval of the Employer's Agent.

Electronic versions of the updated construction programme shall be made available to the Employer's Representative in MS Project format at all times.

The construction programme must take into account the procedures set out under C3.3.2.2, PS 1.4 and PS 6.5.2.

PS 1.4 KEY CONSTRUCTION ACTIVITIES

The overall programme must be scheduled to allow for following key construction activities per meter installation.

Reservoir outlet closures will only take place on a Tuesday, Wednesday and Thursday of every week.

Reservoir shut downs will not take place over holiday periods, these are the Christmas Holiday (15 December until 15 January) and Easter Weekend holiday periods.

The times for reservoir outlet closures will be from 08h00 to 16h00, or a night shut from 22h00 to 04h00, on the above-mentioned days and will be determined by Water Operational Staff and communicated to the Contractor per site. This is to allow for the line to be drained and recharged within the same shift of Water Operational Staff to ensure that “no water” complaints and/ or bursts in the system are attended to timeously.

Reservoir outlet closures running concurrently must have a team at each closure. No more than 3 reservoirs closures may happen concurrently. The Contractor will not be allowed to programme outlet closures to run consecutively (see Clause PS 19).

The contractor will need to programme some closures at night.

The programme shall be supported by the method statements for work to be executed.

PS 1.4.1 ORDERING OF ULTRASONIC FLOW METERS FROM EWS

The Contractor is to programme for a minimum lead time of 12 weeks for ordering of flow meter to taking delivery of meter from EWS.

It may be that no Free Issue meters will be available during the Contract and the Contractor must programme for expected delivery times for procuring meters from their supplier.

PS 1.4.2 PROVING, LOCATING AND CONFIRMING EXISTING PIPELINES

The Contractor is to programme this activity to have a lead time to ensure no delays with fittings and fabricated pipe specials such as flange adaptors, reducers, bends etc.

A minimum of 2 proving slots per meter installation is required and is to be done by hand.

The first proving location is defined as the first tie in point to the existing pipeline and must take cognisance of new meter assembly length to ensure that the next proving slot will be unobstructed by any structure. The Contractor is to identify the direction and slope of the pipe before proving the second point.

The second proving slot is to be at the meter assembly's full length away from proving slot 1, this is defined as tie in point 2 into the existing pipeline.

Existing pipeline material and diameters to be confirmed by the Contractor in writing.

For Asbestos Cement (AC) pipelines, the Contractor shall be required to locate and prove at the pipe couplings. All meter assemblies on existing AC pipelines are to be installed for a minimum of a full pipe length from socket to socket. No cutting of existing AC or PVC pipelines will be allowed closer than 1 meter from an existing joint or coupling unless new meter assembly pipework replaces the joint completely.

More proving slots may be required to identify the vertical and horizontal alignment of the existing pipeline.

It is the Contractor's responsibility to undertake any measurements and survey they deem necessary of the existing pipeline for the fabrication of pipework and/ or materials required for construction including, pipe lengths, fittings and adaptors, stepped adaptors etc. This is to ensure the new meter assembly aligns with the existing pipeline.

The Contractor is to also ensure that he allows time for any design changes or issuing of revised design drawings after the proving of services. In the Construction Programme, the

contractor must allow at least 7 working days for every 4 sites that have been proved from the date that the Contractor confirms the existing pipeline diameters and material.

PS 1.4.3 PREPARING DETAILED PIPE FABRICATION DRAWINGS FOR APPROVAL

Only once PS 1.4.2 is complete will the Contractor be able to submit detailed pipe fabrication details for approval by the Employer's Representative.

The drawings are to illustrate existing pipeline material and diameter, reducer sizes (where applicable), method of connecting to existing pipeline and any other pipe specials (horizontal, vertical or compound bends, tees, additional spool pieces, etc.)

Items that are dependent on the existing pipeline diameter or material and/ or alignment shall only be fabricated once pipe fabricate drawings are approved by the Employer's Representative for that meter installation.

PS 1.4.4 SHUTDOWN OF RESERVOIR INLET SUPPLY OR CLOSURE OF RESERVOIR OUTLET

The Contractor is to provide EWS operations and the Employer's Representative a method statement and risk assessment per reservoir shutdown and meter installation, this is to be provided to EWS Operations with a minimum 14 day notice period;

The Contractor is to provide EWS operations with 14 calendar day notice period prior to the shutdown of inlet supply or closure of reservoir outlet with the Contractor being a signatory to the procedure;

Erection of water disruption sign boards (where applicable)

PS 1.4.5 MOCK FITTING OF INSTALLATION

The Contractor is required to complete a mock fitting of the installation on the side of the trench including all internal and external coating repairs and site holiday testing.

The mock fitting must also include that the meter signal converter is connected to the meter and working.

The existing pipeline may only be cut to suit once the mock fitting has been inspected and approved by the Employer's Representative.

PS 1.5 WORKING HOURS

Normal working hours are considered to be between 07h00 in the morning and 17h00 in the afternoon, Monday to Friday with full cognisance to be taken of the information in the Contract Data and the description of working days.

All road signs, temporary road works, barricading and/or temporary structures required to make the site safe after normal working hours shall be in place after every work session or by 17h00 of every working day, whichever occurs first. No road signs, temporary road works, barricading and/or temporary structures required to make the site safe after normal working hours shall be removed before 07h00.

Working after normal working hours will not be allowed, unless it is approved by the Employer's Representative as work required to be executed under extra ordinary circumstances. (See Clause PS 1.6)

PS 1.6 WORKING OUTSIDE NORMAL WORKING HOURS

The Contractor will be required to execute work outside normal working hours due to operation criteria of EWS. Some reservoir shutdowns will be night shutdowns and the bill of quantities

allows for these shutdowns. The rate shall include all additional costs required to perform the works such as security, power, lighting, workmen overtime etc.

PS 1.7 EXTENSION OF TIME ARISING FROM ABNORMAL RAINFALL

The numbers of days per month, on which work is expected not to be possible as a result of rainfall, for which the Contractor shall make provision, is given in Contract Data.

During the execution of the Works, the Employer's Representative Assistant will certify a day lost due to rainfall only if at least 75% of the work force and plant on site could not work during that specific working day.

Extension of time as a result of rainfall shall be calculated monthly being equal to the number days certified by the Employer's Representative Assistant as lost due to rainfall, less the number of days allowed for in the Contract Data, which could result in a negative figure for certain months.

The total extension of time for which the Contractor may apply, shall be the cumulative algebraic sum of the monthly extensions. Should the sum thus obtained be negative, the extension of time shall be taken as nil.

PS 2 INTENTIONALLY LEFT BLANK

PS 3 SITE FACILITIES AVAILABLE

PS 3.1 SOURCE OF WATER SUPPLY

Water and electricity services are available in the area. The Contractor is responsible for making all arrangements for the necessary connections to these services. The cost of providing these services is deemed to be included in the tendered rates.

PS 3.2 SOURCE OF POWER SUPPLY AND OTHER SERVICES

The Contractor is responsible for making all arrangements for the necessary connections to these services and shall bear the cost of all power consumed and costs for other services, including the connection fees.

PS 3.3 LOCATION OF CAMP

The Contractor is responsible to provide a suitable site for his camp and to provide off-site accommodation for his personnel and labourers. The Employer may place an area of ground at the disposal of the Contractor at one of the reservoir sites to enable him to erect his site offices, workshops and stores if required.

All tendered rates shall be deemed to include for all costs related to Site Offices and Fabrication Yards, regardless of their location.

The occupation and use of the land by the Contractor for a site office and storage areas are subject to the following conditions:

The Employer is indemnified in all respects through the occupation and use of the land and buildings including any claims from third parties.

The allocated land and buildings is to be used only for site offices and for storage of materials and strictly for work pertaining to this contract.

The Contractor is fully responsible for any damage caused to the land and buildings, or improvements on it including services and for reinstating it to its former condition when vacated.

The land and buildings used for the Contractor's camp shall be cleared and vacated by the Contractor within 14 days of the date of completion of the contract unless written permission from the Employer's Representative is obtained to occupy the site for a longer period.

PS 3.4 ACCOMMODATION OF EMPLOYEES

No employees except for security guards will be allowed to be accommodated on the site.

No housing is available for the Contractor's employees and the Contractor shall make his own arrangements to house his employees and to transport them to site.

No informal housing or squatting will be allowed.

PS 4 SITE FACILITIES REQUIRED

PS 4.1 TEMPORARY OFFICES

PS 4.1.1 EMPLOYER'S REPRESENTATIVE'S OFFICE

An office is required for the use of the Employer's Representative Assistant on site. (See SABS 1200 AB as amended in the project specifications).

PS 4.1.2 CONTRACTOR'S OFFICE

The Contractor may erect an office for his own use and any temporary sheds for the workmen or materials as may be necessary. Should the Contractor choose to construct an office or temporary sheds, the construction and location of such offices shall be to the approval of the Employer's Representative and they shall be maintained in a satisfactory condition and removed on completion of the contract.

PS 4.2 LABORATORY AND TESTING OF MATERIALS

The Contractor shall arrange for all tests required for process control to be done by a laboratory acceptable to and approved by the Employer's Representative.

The Contractor may establish his own laboratory on site or he may employ the services of an independent commercial laboratory. Whatever method is used, the Contractor must submit the results of tests carried out on materials and workmanship when submitting work for acceptance by the Employer's Representative. The costs for these tests shall be deemed to be included in the relevant rates and no additional payment will be made for testing as required.

The tests required by the specifications which are to be carried out by the Employer's Representative will be conducted as expeditiously as possible, and the Employer shall not be liable for damages caused by any delays resulting from such tests.

The cost of carrying out these tests will be borne by the Employer, provided that the results are satisfactory, but the Contractor will be required to bear the costs of any tests which indicate a failure to comply with the requirements of this specification.

In addition, the Contractor shall supply, free of charge, quantities of all materials which are truly representative of the materials to be used in the works for testing when required to do so by the Employer's Representative. Each sample shall be labelled, stating the sources of supply and the purpose for which it will be used. The Employer's Representative may, from

time to time, instruct the Contractor to supply a further sample or samples to ensure that the quality of materials supplied remains up to standard.

PS 4.3 SANITARY FACILITIES

Water-borne sewerage reticulation is not available in the area.

The Contractor shall provide at his own cost the necessary ablution facilities at his camp site and the site of the works for the use of his employees. Chemical toilets only will be allowed where temporary facilities have to be provided. Such conveniences, which shall comply with Municipal regulations, shall be maintained in a clean and hygienic condition and shall be properly secluded from public view and their use shall be strictly enforced. On removal of such conveniences the sites thereof shall be left in a clean, sanitary and tidy condition.

PS 4.4 SECURITY

No employees, other than those required for security purposes may be housed on site and the Contractor must make his own arrangements for the housing of staff.

The Contractor is responsible for all security measures required on site and at work fronts of the construction of the Works.

The Contractor shall provide security watchmen for the contract as he deems fit at no extra cost for the Employer. The Contractor must ensure that all his employees as well as the Employees of his subcontractors are able to identify themselves as members of the construction team.

All costs required for security measures taken on site shall be deemed to be covered in the billed rates of the Bill of Quantities.

PS 5 CONSTRUCTION AND MANAGEMENT REQUIREMENTS

The Contractor shall pay special attention to the following:

PS 5.1 GENERAL

The Contractor is referred to SANS 1921: 2004: Construction and Management Requirements for Works Contracts, Part 1: General Engineering and Construction Works, and Part 2: Accommodation of Traffic on Public Roads. These specifications shall be applicable to the contract under consideration and the Contractor shall comply with all requirements relevant to the project.

PS 5.2 QUALITY ASSURANCE (QA)

(Read with SANS 1921 – 1: 2004 clause 4.4)

The Contractor will be solely responsible for the production of work that complies with the Specifications to the satisfaction of the Employer's Representative. To this end it will be the full responsibility of the Contractor to institute an appropriate Quality Assurance (QA) system on site. The Employer's Representative will audit the Contractor's quality assurance (QA) system on a regular basis to verify that adequate independent checks and tests are being carried out and to ensure that the Contractor's own control is sufficient to identify any possible quality problems which could cause a delay or failure.

The Contractor shall ensure that efficient supervisory staff, the required transport, instruments, equipment and tools are available to control the quality of his own workmanship in accordance with his QA-system. His attention is drawn to the fact that it is not the duty of the Employer's Representative or the Employer's Representative Assistant to act as foreman or surveyor.

PS 5.3 SURVEY BEACONS

(Read with SANS 1921 - 1: 2004 clause 4.15)

The Contractor shall take special precautions to protect all permanent survey beacons or pegs such as bench-marks, stand boundary pegs and trigonometrical beacons, regardless whether such beacons or pegs were placed before or during the execution of the Contract. If any such beacons or pegs have been disturbed by the Contractor or his employees, the Contractor shall have them replaced by a registered land surveyor at his own cost.

PS 5.4 MANAGEMENT OF THE ENVIRONMENT**PS 5.4.1 NATURAL VEGETATION**

The Contractor shall confine his operation to as small an area of the site as may be practical for the purpose of constructing the works.

Only those trees and shrubs directly affected by the works and such others as the Employer's Agent may direct in writing shall be cut down and stumped. The natural vegetation, grassing and other plants shall not be disturbed other than in areas where it is essential for the execution of the work or where directed by the Employer's Representative.

PS 5.4.2 FIRES

The Contractor shall comply with the statutory and local fire regulations. He shall also take all necessary precautions to prevent any fires. In the event of fire the Contractor shall take active steps to limit and extinguish the fire and shall accept full responsibility for damages and claims resulting from such fires which may have been caused by him or his employees.

PS 5.5 ENVIRONMENTAL MANAGEMENT PLAN

In addition to the above, all requirements according to the Environmental Management Plan as detailed in C3.4: Particular Specifications, will be adhered to.

PS 5.6 HEALTH AND SAFETY**PS 5.6.1 EMPLOYER'S HEALTH AND SAFETY SPECIFICATION**

The Employer's Health and Safety Specification is included in Part C3.4: Particular Specifications and Part C3.6 Annexures.

PS 5.6.2 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.

Items that may qualify for remuneration will be specified in the Schedule of Quantities.

PS 6 CONSTRUCTION REQUIREMENTS REQUIRING SPECIAL ATTENTION**PS 6.1 IN AMPLIFICATION OF CLAUSE 4.12 OF GENERAL CONDITIONS OF CONTRACT 2015**

It shall be noted that the Contractor will be required to strictly observe his obligations regarding adequate full time superintendence of the works, with particular reference to accuracy of setting out, excavations, correct steel fixing, properly constructed formwork, positioning of foundation bolts and /or bolt pockets, placing of concrete, etc in order to achieve the high standard of workmanship required of him.

The Site Agent may not leave the works whilst work is in progress without the Employer's Representative written approval.

Adequate facilities for superintendence of his work shall be provided by the Contractor and the Employer's Representative's staff is under no circumstances expected to act in this capacity on his behalf.

Should the Contractor's key personnel change from what was tendered or at any time during the contract period the Contractor shall replace these personnel with equally experienced or qualified staff to the satisfaction of the Employer's Representative and the Employer.

PS 6.2 EMPLOYER'S REPRESENTATIVE SUPERVISION AND INSPECTION

PS 6.2.1 SITE SUPERVISION

The works will be supervised and inspected by the Employer's Representative and / or his authorised representative. Except in cases of emergency, the Contractor shall give the Employer's Representative at least 24 hours' notice if he requires his presence on site to discuss any particular matter or to give any particular approvals which may be required during the course of construction activities.

Supervision and inspection by the Employer's Representative shall in no way relieve the Contractor of his obligation and responsibility for performing the works in accordance with the Contract.

PS 6.2.2 DAILY RECORDS

The Contractor shall submit a daily report per work team to the Employer's Representative showing construction activities and progress, disposition of labour and plant, materials used and delivered to site and weather conditions and effects there from on progress. These daily reports shall be in a format approved by the Employer's Representative.

Daily reports shall be submitted to the Employer's Representative's office on the next working day following the day to which they appertain and shall be signed by both the Employer's Representative and the Contractor, who may keep duplicate copies if he so wishes.

PS 6.3 SUBMISSION OF INSURANCES AND SURETIES

In order that delays in acceptance by the Employer of insurances and sureties required in terms of this document be avoided, the Contractor is advised that the necessary documentation is to be submitted as follows:

Sureties and any bank guarantees to the Tenders Section, 6th Floor, Municipal Buildings, 166 K.E. Masinga Road (Formerly Old Fort Road) Durban.

Proof of the Contractor's good standing in terms of the Workmans Compensation Act to the Insurance Section of the City Treasurers Department, 6th Floor, Municipal Buildings, 166 K.E. Masinga Road (Formerly Old Fort Road) Durban (for attention Mr C Mercer).

The complete insurance policy is to be submitted to the Employer's Representative for approval by an independent insurance consultant appointed by the Employer. Once

approved, this document will be forwarded to the Insurance Section of the City Treasurers Department by the Employer's Representative.

PS 6.4 PERSONNEL

PS 6.4.1 SITE PERSONNEL

It shall be a requirement of this contract that a Construction Manager/ site agent is assigned to this contract on site on a full-time basis and a site foreman is assigned to each work team on site on a full-time basis.

PS 6.4.2 CONTRACTOR'S FABRICATION, FITTING AND PLUMBING TEAMS

The Contractor is to programme for 1 specialised plumbing team per Contract to undertake the works required as described. The team must consist of all personnel required to complete a meter installation (welders, fitters, plumbers, local labour, general foreman, etc).

PS 6.5 CONTRACTOR'S PLANT

The Employer's Representative and/or Employer's Representative Assistant shall have the right to order the immediate removal from the site of any plant which he may deem to be unsatisfactory for the proper execution of the work. The Contractor shall obtain without delay satisfactory plant to replace that removed. Any costs arising out of the removal and subsequent replacement of plant shall be to the Contractor's account.

PS 6.6 EXISTING SERVICES

The Tenderer's attention is drawn to the existing services in the area. Although every effort has been made to depict these services accurately the positions shown must be regarded as approximate.

PS 6.7 PROTECTION OF EXISTING SERVICES

The Contractor shall take all the necessary steps to ascertain the location of existing services before commencing any section of the Works and shall exercise the greatest care when working in the vicinity of such services.

The Contractor shall take all necessary steps to protect any existing works or service whatsoever, against damage which may arise as a result of his operations on Site. The Contractor shall bear the cost of the repair of damage to any known service, the possible existence of which could reasonably have been ascertained by him beforehand.

Work is to take place alongside existing high pressure water pipelines, electricity cables, fibre optic cables and there like, and this is of regional strategic importance and must therefore remain in service at all times during the construction of this project.

Unless otherwise instructed by the Employer's Representative, no services shall be left exposed after its exact location has been determined and all excavations carried out for the purpose of exposing underground services shall be promptly backfilled and compacted. Services left exposed shall be suitably protected from damage and in such a manner as will eliminate any danger arising there from to the public and/or workmen.

Should damage occur to any existing services, the Contractor shall immediately inform the Employer's Representative, or when this is not possible, the relevant authority, and obtain instructions as to who should carry out repairs. In urgent cases, the Contractor shall take appropriate steps to minimise damage to and interruption of the service. No repairs of telecommunication cables and electrical powerlines and cables shall be attempted by the Contractor.

PS 6.8 PROVING UNDERGROUND SERVICES

The Contractor shall procure the required equipment which will enable him to prove services.

This clause must be read in conjunction with Clause PS 1.4.2, PS 6.9.1 and Clause DB.5.1.2, the requirements of which shall be extended to cover all earthworks operations whether for trenching or bulk earthworks, in the vicinity of underground services.

Prior to excavation of a pipe trench, the Contractor will be required to prove existing pipeline and any existing services crossing or adjacent to the pipeline route by careful hand excavation, to avoid unnecessary damage to existing services. The Contractor shall be held responsible for any damage caused to existing services that can reasonably be traced and located.

In all cases where underground power or telephone cables, watermains or other services are shown on the drawings, either crossing or adjacent to the pipe, or where from site observations it can reasonably be accepted that such services are likely to exist where excavations are to take place, the Contractor shall, without instructions from the Employer's Representative, carefully excavate by hand, to expose and prove position of such prior to the commencement of the main trenching operations in the area. However, if any buried service is not located by the excavation of pilot trenches in the expected position the Contractor shall immediately report such a circumstance to the Employer's Representative who will decide what further searching or other necessary action is to be carried out and instruct the Contractor accordingly. The cost of this additional searching shall be to the Employer's cost.

Such exploratory work shall at all times be carried out well in advance of normal construction so that any possible changes to the design of the works necessitated by the proving of services, can be carried out without delay to the construction programme. The position of these services located must be co-ordinated and levelled by the Contractor, and the information given in writing to the Employer's Agent's Representative.

An item has been included in the Schedule of Quantities to cover the cost of such work.

Should any service be damaged by the Contractor in carrying out the works and should it be found that the procedure as laid down in this clause has not been followed then all costs in connection with the repair of the service will be to the Contractor's account.

The top surface of all existing thrust blocks are to be proven and sufficiently protected before any excavation near these thrust blocks takes place. Such thrust blocks shall be defined as a "service".

It should be noted that 33,000 Volt and 132,000 Volt cables may only be exposed by the eThekweni Electricity's personnel. The cables are usually protected by concrete covering slabs, and therefore if the slabs are inadvertently exposed, excavation work must stop, and the eThekweni Electricity shall be contacted immediately on the above telephone numbers.

The requirements of this clause do not relieve the Contractor of any obligations as detailed in the Conditions of Contract or under Clause 4.17 of SANS 1921-1.

The trench width required for proving of services need only be of sufficient width to enable the service to be exposed.

PS 6.8.1 PROVING OF THE EXISTING PIPEWORK (TO BE READ IN CONJUNCTION WITH CLAUSE PS 1.4.2)

Prove the existing pipework and report any discrepancies to the Employer's Representative.

Prove the suitability of the installation position with a slot trench. Any underground services and/ or obstructions are to be reported to the Employer's Representative immediately prior to any work proceeding.

All proving to be done by hand.

Any damage to underground services are to be reported to the Employer's Representative immediately and repaired by the contractor or relevant Service Provider.

Take measurements for the fabrication of pipework and/ or materials required for construction including, pipe lengths, fittings and adaptors etc.

Confirm the pipework configuration material requirements with the Employer's Representative prior to the installation thereof.

Barricade all open excavations in accordance with the safety specification.

Take photographs of the excavated areas for submission to the Employer's Representative.

PS 6.9 CONSTRUCTION HOLD POINTS

The following hold points will be required during construction:

- Inspection of proving slot trenches

- Inspection of trenches;

- Mock Fitting of meter installation;

- Inspection of pipework prior to backfill;

A photographic record must be kept for all stages of construction. Concurrent tie-ins must have an approved team assigned per tie-in point.

PS 7 ADDITIONAL CONSTRUCTION REQUIREMENTS REQUIRING ATTENTION

PS 7.1 WATERMAINS

PS 7.1.1 GENERAL

Tenderer's attention is drawn to the following points regarding the watermains to be installed as part of this contract.

PS 7.1.2 WATER MAIN VALVE ACCESS

Due to the dangerous situation occurring when water main valves are covered over, the Contractor shall maintain access to all water main valves at all times. During asphalt layer work, after each pass by the paving machine, the valves shall be exposed and access maintained in a safe condition.

Whatever method the Contractor chooses to use for this work, the cost of raising the valves from existing level to ultimate level shall be paid only once, irrespective of the number of times the valve is uncovered. Spacer rings required for the height adjustment of valve covers shall be supplied by the Water and Sanitation Unit. Before final setting in position of valve covers the Contractor shall liaise with the Employer's Agent regarding the direction in which covers shall be placed.

PS 7.2 RESTRICTION ON EXCAVATION EQUIPMENT

The Contractor is to note that existing watermains traverse the site of the works and special care is to be taken in close proximity to these mains and connections. The existing mains and connections shall be proved on site by the Contractor prior to any construction work commencing in the vicinity of the watermains.

The Contractor is to further note that no excavation machinery may excavate within 300 mm vertically or horizontally of existing water pipelines unless otherwise agreed by the Employer's Representative, the balance of the excavation being carried out is to be done by hand or by other means approved by the Employer's Representative.

PS 7.2.1 SHORING OF EXCAVATION

The Contractor is to note that shoring will be required on this Contract.

PS 7.3 RESTRICTION ON COMPACTIVE EQUIPMENT

Under no circumstances will heavy road-making equipment, other heavy plant or vibratory compaction equipment be permitted to operate within 800 mm vertically or horizontally of the existing mains or connections. The permissible compaction plant within this restricted area shall be the equivalent of a "Bomag 90" under static compaction, or similar approved plant. When the roadworks are far enough advanced to provide a minimum of 800 mm cover to the existing mains, the above restriction will fall away.

The Contractor is to take cognisance of the above requirements when entering rates in the Bill of Quantities and in the programming of the works. No claim for additional payment based on the inability to use plant as a result of the requirements of this clause will be accepted. The Contractor will be held liable for any costs should the watermain or electrical cables be damaged during construction.

PS 7.4 FINISHING, TIDYING AND 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.

Progressive and systematic finishing and tidying will form an essential part of this Contract. On no account, must spoil, rubble, materials, equipment or unfinished operations be allowed to accumulate in such a manner as to unnecessarily impede the activities of others, and in the event of this occurring, the Employer shall have the right to withhold payment for as long as may be necessary in respect of the relevant Works in the area(s) concerned without thereby prejudicing the rights of others to institute claims against the Contractor on the ground of unnecessary obstruction.

Finishing and tidying must not be deferred to the end of the Contract. The works will not be certified as practically complete, until the whole of the works including all finishing and tidying, has been fully completed to the satisfaction of the Employer's Representative.

All finishing and tidying shall be carried out to the best advantage of the project as a whole and in the closest co-operation with other Contractors.

PS 7.5 CONSTRUCTION IN LIMITED AREAS

In certain cases, working space may be limited due to the presence of buildings, structures and certain underground and overhead services which exist on the site. The method of construction in these restricted areas will depend largely on the Contractor's resources. tenderers are to take cognisance of this fact and allow for the difficulty of working in a restricted space in the rates. no additional payment will be made for this requirement.

PS 7.6 BARRICADING OF EXCAVATIONS

All excavations must be barricaded to demarcate the working area and prevent pedestrians or animals from falling into the excavations. Spoil material from excavations must not be stockpiled closer than 2.0m to the edges of roads. On completion, all surplus soil must be

removed from site. The Contractor is to make allowances for this in the tendered excavation rates. Refer to Clause PSDA 5.1.1.1.

PS 7.7 SPOIL MATERIAL

No indiscriminate spoiling of material will be allowed. All surplus or unsuitable material shall be spoiled in designated areas determined by the Contractor and agreed by the Employer's Representative.

PS 7.8 CONSTRUCTION ON STEEP SLOPES

In certain cases, work has to be executed on steep slopes. The method of construction under these circumstances will depend largely on the Contractor's plant. However, the Contractor shall note that measurement and payment will be according to the specified payment items irrespective of the method used to achieve the required end result, and that the rates and prices tendered shall be deemed to include for full compensation for any difficulty encountered while working on steep slopes.

The Contractor shall familiarize himself of construction activities required on steep slopes and the impact that this have on the safety of his employees as well as the safety of the general public living on or near such steep slopes or general public passing by.

All tendered rates shall be deemed to include for compliance with the relevant Health and Safety specification and legislation.

PS 7.9 DEALING WITH WATER

The Contractor shall take adequate precautions for the protection of the works from stormwater runoff during periods of prolonged heavy rainfall. The Contractor shall be responsible for dealing with all water during construction from whatever source, and the cost of all dewatering, shall be deemed to be included in the tendered rates.

The Contractor shall provide temporary stormwater drainage and due cognisance must be taken of the highly erodible nature of the insitu material.

The Contractor shall be responsible for all repair works necessary to reinstate any damage caused by stormwater runoff to the requirements of this specification, subject to the approval of the Employer's Representative.

PS 7.10 ROAD REINSTATEMENT

The Contractor will be required to reinstate existing roads and driveways to the existing level of service i.e. like for like replacement of insitu material, layerworks and surfacing. Provision has been made in the Bill of Quantities for these items.

PS 7.11 LEVEL WORKING PLATFORM TO FACILITATE METER INSTALLATION

The Contractor shall excavate in embankments to create a level working platform where new meters are being installed on steep terrain, this Clause is to be read with PS 7.7.

PS 8 METHOD STATEMENTS

The Contractor shall furnish the Employer's Representative with a method statement for all construction activities and in particular, but not limited to, reservoir shut downs, reservoir night shut downs, meter assembly tie-ins, traffic management techniques in congested areas as result of construction, method of application of tape wrap systems, method of repair of external coatings, method of repair of internal epoxy lining, method of effecting hydraulic compaction of fill around pipe, dealing with water, blasting, etc.).

Method statements shall be submitted to the Employer's Representative with the programme for construction. Method statements shall be in sufficient detail for the Employer's Representative to determine their practicality and suitability and as a minimum shall include details of construction methods, work methods, plant and equipment particulars including details of critical standby equipment.

Method statements shall refer to Quality Control plans in order to assess suitability of same for the execution of the works in terms of the set Quality Control standards.

Method statements shall be cross referenced to the relevant Quality Control documentation and upon evaluation of the programme for construction, the method statements and quality Control documentation shall support the programme in order for the Employer's Representative to realistically evaluate the programme.

The Contractor is to provide EWS operations and the Employer's Representative a method statement and risk assessment per reservoir shutdown and meter installation, this is to be provided to EWS Operations with a minimum 14 day notice period.

PS 9 DRAWINGS

Refer to section C4.4 for the Drawings.

Only figured dimensions shall be used in the execution of the works and drawings are not to be scaled by the Contractor unless so instructed by the Employer's Representative who shall supply any figured dimensions which may have been omitted from the drawings.

It is the Contractors responsibility to clarify any drawings and dimensions should they not be shown.

PS 10 RECORD DRAWINGS AND AS-BUILT DATA

Any information in the possession of the Contractor which is necessary for the completion of the "as built" drawings must be submitted and approved by the Employer's Representative before he will issue a Completion Certificate.

The Contractor is responsible for as-built point data capturing and redlining the pipework drawings for each installation. The Employer's Representative will be responsible for GIS mapping of the meter installation to the required EWS standards using approved EWS survey equipment.

The Contractor may only backfill on instruction by the Employer's Representative and shall not backfill before the As-Built point data is captured.

The Contractor shall submit each "As Built" data point to the Engineer's Representative which shall be suitably coded and identifiable and be supplied on a computer disk in an ascii file or .csv file in tabulated format with the following column headings:-

Code
X Co-ordinate
Y Co-ordinate
Level (msl)
Description

The above information is to be given to an accuracy of three decimal places and is to be surveyed by a registered person. It is imperative that the surveyor utilises the nearest survey control point and notifies us thereof. The survey shall be undertaken in WGS84 LO31 projection.

PS 10.1 AS BUILT POINT ACCURACY

Survey of pipelines, bends, specials and fittings to accuracy of less than 100mm.

The Contractor will be required to prove the accuracy of the GPS device he intends on using prior to any as built data being captured. The Employer's Representative may request further accuracy tests during the Contract should he deem it necessary.

Suitable checks on the accuracy of the information provided may be carried out by the Engineer's Representative and should any of the information provided be found to be inaccurate or untrue, the Employer's Representative reserves the right on behalf of the Employer to withhold payment or to employ the services of an engineering surveyor to re-survey all the works listed above, at the Contractor's expense.

The Employer shall request a minimum of three quotations from three independent engineering surveyors of his choice, and the lowest quotation will be appointed and the cost thereof will be deducted from monies owing to the Contractor.

PS 10.2 AS-BUILT TO BE CAPTURED

| Item | Description | Co-Ordinates and Levels for the following |
|-----------|---|---|
| Pipelines | Positions and levels of buried and above ground pipes, valves, specials and fittings installed. | Centre of crown of pipes, bends, tee's, reducing tee's and reducers; All flanges; Stem of buried isolation valves; Centre of Water Meters and PRVs; Pipelines to be surveyed every 12m and/or every change in direction |

PS 11 LABOUR

The Contractor shall comply with the relevant laws governing the employment of labour. All arrangements affecting his labour force shall be the sole responsibility of the Contractor.

PS 12 COMPLIANCE WITH STATUTORY REQUIREMENTS**PS 12.1 OCCUPATIONAL HEALTH AND SAFETY**

The Contractor shall allow for all costs necessary to ensure that all work is undertaken in a safe manner and in compliance with the Occupational Health and Safety Act, Act No. 85 of 1993 and all statutory and local regulations and requirements.

The cost of complying with the requirements of the clause shall be deemed to be included in the rates.

PS 13 PERMITS

The Contractor shall be responsible for obtaining all necessary permits to transport materials to the area, blasting if required etc.

PS 14 ATTENDANCE AT SITE MEETINGS

The Contractor and Sub-Contractors shall attend regular site meetings as and when these are required by the Employer's Representative. The objectives of such meetings will be to review

progress and ensure compliance with the programme, discuss, and where possible solve any problems that may arise and generally liaise with all parties concerned with the works.

The cost of attending such meetings shall be included in the Tendered Price and instructions given by the Employer's Representative at such meetings and confirmed in the minutes shall be considered as a written instruction by the Employer's Representative, as referred to in the General Conditions of Contract. Site Meetings will generally be held every two weeks.

PS 15 CERTIFICATES OF PAYMENT

The statement to be submitted by the Contractor in terms of the General Conditions of Contract shall be prepared in accordance with the standard payment certificate prescribed by the Employer's Representative and shall consist of one (1) original set of A4-sized paper copy. Payment Certificates shall be submitted to the Employer's Representative for approval by the 20th of each month.

The Contractor's submission is to include all required backup documentation to substantiate his Targeted Procurement goals.

All costs resulting from the preparation and submission of the statements shall be borne by the Contractor.

The Contractor is to keep a photographic record of the following activities per site, which is to be submitted with each payment certificate or as required by the Employer's Representative:

- Site handovers;
- Exposed pipework prior to tie-ins;
- All pipework installed;
- All stages of construction

PS 16 PUBLIC RELATIONS OFFICER (ISD CONSULTANT)

The Contractor shall have a part time Public Relations Officer (PRO) that is available on a when required scenario that concern themselves with all aspects of Public Relations and Communication as set out in this Specification. The issues to be addressed by the Contractor shall include, but is not limited to:

- Maintain healthy relationships with members of the public.
- Attend public meetings as and when required.
- Liaise with the public on construction progress. (Ability to communicate in Zulu and English)
- Set out to interact with the public on a one on one basis when required and liaise with the public on construction progress this also includes arranging of public meeting for progress and community issues.
- Act as the CLO throughout the project across all wards.
- Facilitate emerging contractors.
- Labour procurement and labour desk related activities, facilitate discussions between the Contractor and community through available structures; Support to labour desk officer.
- Ensure that communities play their role during construction, which includes inter alia, protecting the works for the appointed contractor to implement the project within the stipulated timeframes;
- Assist the appointed contractor's supervisory staff in the management of workers. Resolving disputes between the appointed Contractor, workers and community;

The individual rate tendered for is included under the relevant item for Communication and Public Relations under Section 1: Preliminary and General, time-related items.

PS 17 PROCUREMENT AND FREE ISSUE ITEMS

The Contractor will be expected to procure both ultrasonic and mechanical flow meters of various sizes for the duration of the Contract should the Employer not be able to supply the Contract with meters. The Contractor must make provision for this in his tendered rates.

PS 17.1 MATERIALS SUPPLIED BY THE EMPLOYER

The Employer shall supply ultrasonic flow meters for the project if they are available to the Employer.

Once the materials are delivered to site, the Employer's Representative is to be notified in order that arrangements may be made for the inspection of the materials. No materials are to be utilised until they have been accepted by the Employer's Representative in writing. Such written acceptance shall not prejudice the right of the Employer's Representative to reject such materials should they be shown to be defective at a later stage.

PS 17.2 PROCEDURE FOR THE COLLECTION OR WITHDRAWAL OF MATERIALS

The following Clause is to be read in conjunction with Clause PS 1.4.1.

The Contractor will be required to take delivery of all free issue ultrasonic flow meters from the Employer and store the meters at his own storage facility. The Employer shall inform the Contractor to collect meters which will happen once the meter arrives in South Africa and is cleared by customs. The Contractor, the Employer's Representative and the Employer shall all be present.

The Contractor's rate for collection of the meter from the supplier is to include for collection, handling, transport, off-load and store at Contractor's own storage facility. The Contractor must supply craneage where required.

PS 17.3 OWNERSHIP OF MATERIALS ONCE COLLECTED BY CONTRACTORS

All materials supplied by the Employer as free issue items remain the property of the Employer even after being collected by the Contractor. However, the Contractor shall become fully responsible for these materials once he has drawn them from the Employer.

An item has been allowed for insuring the materials supplied by the Employer. However, should the Contractor wish to receive additional payment for the responsibility of accepting the materials, he may include an additional item at the end of the Preliminary and General section of the Schedule of Quantities.

PS 17.4 LOSSES OF AND DAMAGE TO MATERIALS

It shall be the responsibility of the Contractor to check, on receiving, the condition of all materials supplied to him by the Employer. All defects shall be recorded on the delivery forms and the Employer's Representative shall be notified in writing. The Employer will then:

replace the defective materials, or

repair the defective materials, or

instruct the Contractor to repair the materials at the Employer's cost.

However, should the Employer's Representative not be notified in writing of any defective or damaged materials, it will be assumed that all materials were handed over to the Contractor in sound condition. Any damage reported thereafter will be to the Contractor's account.

The Contractor shall be responsible for any loss of materials supplied by the Employer.

PS 17.5 RETURN OF MATERIALS

The Contractor shall be responsible for the return of all surplus materials or old fittings (hydrants, valves, valve covers etc) to the Employer's stores at Electron Road, Springfield or where directed by the Employer's Representative.

Contractors are to note that materials may only be returned to the stores/pipe yard between 08h00 and 14h00 on weekdays and must notify the Employer's Representative of their intention to do so.

This shall include for the provision of craneage at the Employer's store/pipe yard for the off-loading of all material.

PS 18 STORAGE AREAS AND PIPE YARDS

The Contractor shall store all items so that no damage occurs whilst awaiting installation and shall provide safe and secure storage facility with 24 hour security for the duration of the contract to store free issue items (ultrasonic flow meters etc). The storage facility location will be at the discretion of the Contractor but preferably within the supply region where the Contractor is working (Central, North, South or West supply region) and must allow for craneage access for offloading and loading.

No stacking of the meters will be allowed. The rate for storage of free issue items is to include for the storage facility, security and craneage.

The Contractor shall take full responsibility for the safety and security of all meters once collected from the Employer. The Contractor's attention is drawn to the clauses "Losses of and Damages to Materials" and "Damage to Coating and Lining" in respect of pipes stored in this area.

On collection of the meters, the Contractor, together with the Employer and Employer's Representative Assistant shall inspect all the meters and shall mutually agree the extent of damage. This information shall be made known to the Employer's Representative in writing. From the date of collection, the Contractor shall become fully responsible for the meters, and any damages found and not recorded at the time of hand-over shall be deemed the Contractor's responsibility.

All piping, pipe fittings, and equipment stored outside or awaiting installation are to be protected from the weather and storm water and soil wash, using plastic sheeting and storing same on pre-prepared concrete surfaces.

PS 19 RESERVOIR SHUTDOWNS

Undertake work of the removal or installation of valves and meters. Shutdowns can be on live inlet or outlet water mains at reservoirs. Shutdowns will be planned to fit in with supply and demands experienced with EWS Operations.

Maximum shutdown duration will be 8 hours and is subjected to being reduced. Contractor must plan and programme the works to be done during shutdown periods such that it will fit in a single shutdown period. The Contractor must plan such that a reservoir is at full capacity unless otherwise agreed with EWS Operations for closure of inlet supply.

Some shutdowns will be after normal working hours (refer to PS 1.6). Each shutdown requires planning and liaising with eThekweni Operations including all risk assessments and method statements which are to be approved by the Employer's Representative and EWS Operations, this is to be provided to EWS Operations with the minimum 14-day notice period.

Where valves are not operational the contractor must bring it to the Employer's Representative attention and provision must be made for divers to plug reservoir outlets.

Reservoir closures running concurrently must have a team at each closure. No more than 3 reservoirs closures may happen concurrently.

The Contractor will not be allowed to programme outlet or inlet closures to run consecutively.

A minimum of 7 days must be allowed for between shutdowns of two reservoir nodes which are supplied by the same bulk supply pipeline unless otherwise agreed with EWS Operations and the Employer's Representative.

The Contractor will be paid for one shutdown per site unless otherwise agreed with the Employer's Representative. The rate for shutdown must include for but not limited to all planning, risk assessments, method statements, shop drawings and other works as described in Clause PS 1.4.

The Contractor shall be paid for an agreed planned shutdown should the Client cancelled said shutdown on or one day prior to shutdown date.

PS 20 PROCEDURE FOR METER INSTALLATION AND REGISTRATION

The Contractor will be responsible for the following procedure for installation of ultrasonic meters:

Inform Bulk Metering Technician for EWS of intention to install a reservoir meter. The following information must be provided in writing to bulk metering Technician:

- Meter number
- Meter size
- Meter type
- Property Key were meter is installed
- Physical address where meter is installed

The Bulk Meter Technician will ensure that the above data is captured and will provide a "Connection Number"

Bulk Metering Technician or a representative is to be present at the commissioning of the meter, where an opening meter reading will be taken and returned for capturing to the billing system.

Practical completion for the installation will only be granted when the Bulk Metering Technician (or representative) signs over acceptance of the meter and a "Connection Number" is provided for the meter and stencilled onto the chamber or kiosk.

For record drawing purposes, a GPS shape file is to be provided of all the installed meters with the above information included.

PS 21 PRACTICAL COMPLETION

Practical Completion of the works General Conditions of Contract, 2015, Clause 5.14.1

PS 21.1 PRACTICAL COMPLETION FOR ANY INDIVIDUAL INSTALLATION

Practical Completion for any individual installation will be certified when the meter assembly installation complies with the requirements of the specifications and scope of works, with the Employer able to take beneficial occupation of the meter installation and when the Bulk

Metering Technician (or representative) has accepted the installation and a “Connection Number” is provided for the meter installation, stencilled onto the chamber or kiosk. The meter installation shall be transmitting data to the eThekweni Water and Sanitation SCADA system located at their Control room, in terms of the requirements.

PS 21.2**PRACTICAL COMPLETION OF THE WHOLE OF THE WORKS**

Practical Completion of the whole of the Works means that all individual metering installations as defined in the Contract have reached a state of readiness and is beneficially used by the Employer, fit for intended use. No further work may be outstanding at any of the individual installations.

C3.3: STANDARD SPECIFICATIONS

C3.3.1 STANDARD PROJECT SPECIFICATIONS

The standard specifications on which this contract is based are the South African Bureau of Standards Standardized Specifications for Civil Engineering Construction SABS 1200, also now referred to as SANS 1200.

Although not bound in, nor issued with this document, the following sections of the Standardised Specifications of SANS 1200 shall form part of this Contract:

| | | | |
|-----------|----|------|----------------------------|
| SABS 1200 | AA | 1986 | General |
| SABS 1200 | AB | 1986 | Engineer's office |
| SABS 1200 | C | 1980 | Site clearance |
| SABS 1200 | DA | 1988 | Earthworks (Small Works) |
| SABS 1200 | L | 1983 | Medium pressure pipeline |
| SABS 1200 | LC | 1981 | Cable ducts |
| SABS 1200 | LB | 1983 | Bedding (pipes) |
| SABS 1200 | M | 1981 | Roads (general) |
| SABS 1200 | ME | 1981 | Sub-base |
| SABS 1200 | MF | 1981 | Base |
| SABS 1200 | MH | 1981 | Asphalt base and surfacing |
| SABS 1200 | MK | 1983 | Kerbing and Channelling |

The following SANS specifications are also referred to in this document and the Contractor is advised to obtain them from Standards South Africa (a division of SABS) in Pretoria.

| | |
|-------------------------|--|
| SANS 10396: 2003: | Implementing Preferential Construction Procurement Policies using Targeted Procurement Procedures |
| SANS 1914-1 to 6 (2002) | Targeted Construction Procurement |
| SANS 1921 – 1 (2004) | Construction and Management Requirements for Works Contracts Part 1: General Engineering and Construction Works and where accommodation of traffic is involved |
| SANS 1921-2 (2004): | Construction and Management Requirements for Works Contracts; and Part 2: Accommodation of Traffic on Public Roads Occupied by the Contractor. |

C3.3.2 AMENDMENTS TO THE STANDARD SPECIFICATIONS**TABLE OF CONTENTS****Page**

| | | |
|-------------|---|------------|
| PSAA | GENERAL (SMALL WORKS) (SABS 1200 AA – 1986) | 154 |
| PSAA 5 | CONSTRUCTION | 154 |
| PSAA 5.1 | Survey | 154 |
| PSAA 5.3 | Dealing with Water on Works | 154 |
| PSAA 5.4 | Safety | 154 |
| PSAA 5.5 | Ground and Access to Works | 154 |
| PSAA 5.6 | Watching, Barricading, Lighting and Traffic Crossings | 154 |
| PSAA 5.7 | Accommodation of Traffic | 155 |
| PSAA 6 | TOLERANCES | 155 |
| PSAA 6.2 | Degrees of Accuracy | 155 |
| PSAA 8 | MEASUREMENT AND PAYMENT | 155 |
| PSAB | EMPLOYER’S REPRESENTATIVES OFFICE (SABS 1200AB – 1986) | 158 |
| PSAB 3 | MATERIALS | 158 |
| PSAB 3.1 | Name Boards | 158 |
| PSAB 3.2 | Office Buildings | 158 |
| PSAB 5 | CONSTRUCTION | 158 |
| PSAB 5.4 | Telephones | 158 |
| PSAB 8 | MEASUREMENT AND PAYMENT | 159 |
| PSC | SITE CLEARANCE (SABS 1200C – 1998) | 160 |
| PSC 3 | MATERIALS | 160 |
| PSC 3.1 | Disposal of Materials | 160 |
| PSC 5.4 | Grubbing | 160 |
| PSC 5.6 | Conservation of Topsoil | 160 |
| PSC 8 | MEASUREMENT AND PAYMENT | 160 |
| PSDA | EARTHWORKS (SMALL WORK) (SABS 1200 DA-1988) | 163 |
| PSDA 2 | INTERPRETATIONS | 163 |
| PSDA 2.3 | Definitions | 163 |
| PSDA 3 | MATERIALS | 163 |
| PSDA 3.1 | Classification | 163 |
| PSDA 3.2 | Embankments and Backfill | 163 |
| PSDA 4 | PLANT | 164 |
| PSDA 4.3 | Compaction Plant | 164 |
| PSDA 5 | CONSTRUCTION | 165 |
| PSDA 5.1 | Precautions | 165 |
| PSDA 5.2 | Methods and Procedures | 166 |
| PSDA 6 | TOLERANCES | 169 |
| PSDA 6.1 | Degree of Accuracy | 169 |
| PSDA 6.2 | Permissible Deviations | 169 |
| PSDA 6.3 | Excavation by Mechanical Means | 169 |
| PSDA 7 | TESTING | 170 |

| | | |
|-------------|--|------------|
| PSDA 7.2 | Taking and Testing of Samples | 170 |
| PSDA 8 | MEASUREMENT AND PAYMENT | 170 |
| PSDA 8.2 | Computation of Quantities | 171 |
| PSDA 8.3 | Scheduled Items | 171 |
| PSL | MEDIUM PRESSURE PIPELINES (SABS 1200 L-1983)..... | 174 |
| PSL 3 | MATERIALS | 174 |
| PSL 3.4 | Steel Pipes, Fittings and Specials | 174 |
| PSL 3.9 | Corrosion Protection | 178 |
| PSL 3.10 | Valves | 191 |
| PSL 4 | PLANT | 191 |
| PSL 4.1 | Handling and Rigging | 191 |
| PSL 5 | CONSTRUCTION..... | 191 |
| PSL 5.1 | Laying | 192 |
| PSL 5.2 | Jointing Methods..... | 193 |
| PSL 5.3 | Setting of Valves, Specials And Fittings | 196 |
| PSL 5.5 | Anchor/Thrust Blocks and Pedestals..... | 198 |
| PSL 7 | TESTING | 198 |
| PSL 7.1 | General | 198 |
| PSL 7.2 | Initial Tests on Welded Steel Pipes | 198 |
| PSL 7.3 | Standard Hydraulic Pipe Test..... | 199 |
| PSL 7.4 | Tests on Epoxy Coatings..... | 199 |
| PSL 7.5 | Fittings and Specials | 199 |
| PSL 8 | MEASUREMENT AND PAYMENT | 200 |
| PSL 8.2 | Scheduled Items | 200 |
| PSLB | BEDDING (PIPES) (SABS 1200 LB-1983)..... | 204 |
| PSLB 3 | MATERIALS | 204 |
| PSLB 3.1 | Selected Granular Material | 204 |
| PSLB 3.2 | Selected Fill Material | 205 |
| PSLB 3.3 | Bedding..... | 205 |
| PSLB 3.4 | Selection | 205 |
| PSLB 5 | CONSTRUCTION..... | 205 |
| PSLB 5.2 | Placing and Compacting of Rigid Pipes | 206 |
| PSLB 8 | MEASUREMENT AND PAYMENT | 207 |
| PSLB 8.1 | Principles | 207 |
| PSLB 8.2 | Scheduled Items | 207 |
| PSMH | ASPHALT BASE AND SURFACING | 208 |
| PSMH 8 | Measurement and Payment | 208 |

PSAA GENERAL (SMALL WORKS) (SABS 1200 AA – 1986)**PSAA 5 CONSTRUCTION****PSAA 5.1 SURVEY**

Add the following:

Before commencing with the works per Reservoir site, the Contractor must note that no survey control has been provided. The Contractor will be required to prove existing services

PSAA 5.3 DEALING WITH WATER ON WORKS

Add to the Sub-Clause:

The Contractor shall accept all risks for any water affecting the works during the construction period, whatever the source or cause may be, and shall properly deal with and dispose of all water to ensure that the works are kept sufficiently dry at all times for their proper execution.

For this purpose the Contractor shall provide, operate and maintain in sufficient quantity such pumping equipment, well points, pipes and other equipment as may be necessary and he shall also provide any sumps, furrows, cross-embankments, coffer-dams and other temporary works as may be necessary to minimise damage, inconvenience, or interference.

PSAA 5.4 SAFETY

Add to the Sub-Clause:

All work and particularly work carried out in the proximity of buildings, bridges, tanks or other structures shall be carried out in conformance with the regulations framed under the Occupational Health and Safety Act, 1993 and the Minerals Act, Act 50 of 1991, including shoring where necessary, to ensure the safety of structures that are at risk.

The Contractor shall make available for the duration of the contract safety helmets, gumboots and any other necessary safety equipment for sole use by the Employer's Representative and his representative

The Contractor is to be aware that the sites are bordered by busy roads and streets which are subject to increase traffic volumes during peak hours. Interference with usual traffic flow is to be kept to a minimum for the duration of the contract.

If any such interference is unavoidable, for example, during the supply or installation of any materials, then the Contractor shall provide all necessary traffic control materials, equipment and personnel in compliance with the prevailing Council Legislation and Bylaws.

PSAA 5.5 GROUND AND ACCESS TO WORKS

Add to the Sub-Clause:

On completion of operations the Contractor shall restore the ground surface, wherever it may have been disturbed, to its original condition by filling in all ruts with material similar to the material within the rut and levelling the ground and, where necessary, planting grass and shrubs as may be required. Any boundary fences which have been removed or damaged by his operations and activities shall be repaired and/or reinstated at the Contractor's expense.

PSAA 5.6 WATCHING, BARRICADING, LIGHTING AND TRAFFIC CROSSINGS

Add new Sub-Clause:

Temporary Traffic Signs

The Contractor shall provide, erect and maintain on the site and at such positions on the approaches to the site all traffic signs necessary for the direction and control of traffic.

The details of all such signs, which shall conform to the current Road Traffic Ordinance and, and the departmental publication entitled "Safety in Road Construction", must be approved by the Employer's Representative before erection.

The signs shall be reflectorised or adequately illuminated at night in a manner approved by the Employer's Representative and kept clean and legible at all times. The Contractor shall reposition, cover or remove signs as required during the progress of the works.

PSAA 5.7 ACCOMMODATION OF TRAFFIC

Add new Sub-Clause:

The Contractor is to be aware that the sites are bordered by busy roads and streets which are subject to increase traffic volumes during peak hours. Interference with usual traffic flow is to be kept to a minimum for the duration of the contract.

If any such interference is unavoidable, for example, during the supply or installation of any materials, then the Contractor shall provide all necessary traffic control materials, equipment and personnel in compliance with the prevailing Council Legislation and Bylaws.

An allowance has been made in the Bill of Quantities.

PSAA 6 TOLERANCES

PSAA 6.2 DEGREES OF ACCURACY

Add to the Sub-Clause:

Degree of accuracy II shall be applicable to all work under this contract.

PSAA 8 MEASUREMENT AND PAYMENT

PSAA 8.2.1 FIXED CHARGE AND VALUE RELATED ITEMS

Add to the Sub-Clause:

The amount, if any, by which the sum of the fixed-charge and value-related items exceeds three percent of the net total tendered amount (excluding allowances for contingencies and price escalation), shall be regarded for payment purposes as time-related items and will be paid in accordance with Clause 8.2.2.

PSAA 8.2.2 TIME RELATED ITEMS

Add the following:

An extension of time granted will not necessarily or automatically entitle the Contractor to additional payments of time related items. Additional payments for specific time related items after the granting of an extension of time must be motivated and substantiated by the Contractor and shall be subject to approval by the Employer's Representative.

PSAA 8.3.2 PROVISION OF FACILITIES ON SITE

PSAA 8.3.2 (b) Facilities for the Contractor

Add to the Sub Clause:

The Tendered rate shall cover the cost of each establishment at each of the work fronts for all temporary facilities required to undertake the work, as per Clause PS 3 and PS 4. The cost of a single establishment for a central site camp by the Contractor will be deemed as inclusive in the rate and will not be measured separately.

PSAA 8.3.4 REMOVAL OF SITE ESTABLISHMENT

Add to the Sub Clause:

The Tendered rate shall cover the cost of each site removal at each of the work fronts of all temporary facilities required to undertake the work. The cost of a single site removal for a central site camp by the Contractor will be deemed as inclusive in the rates, and will not be measured separately.

PSAA 8.4.2 OPERATIONS AND MAINTENANCE OF FACILITIES ON SITE

PSAA 8.4.2 (b) Facilities for the Contractor

Add to Sub Clause 8.4.2 (b)

The Tendered rate shall cover the cost of the operations and maintenance of each site at each of the work fronts for all temporary facilities required to undertake the work, as per Clause PS 3.3. The cost of operation and maintenance of a single or a central site camp by the Contractor will be deemed as inclusive in the rate and will not be measured separately.

PSAA 8.4.3 GENERAL RESPONSIBILITIES AND OTHER TIME-RELATED OBLIGATIONS

Add to the Sub Clause:

The tendered sum shall cover the costs of on-site supervision and such local administration as the Contractor considers necessary for the proper completion of the Works, and shall cover the cost of the salaries, wages and allowances paid to the site agent/ construction manager, general foreman, section foremen (where applicable), site surveyors, timekeepers, assistants and other site supervisory staff, and of transport incurred in connection with such staff.

PSAA 8.4.5 ACCOMMODATION OF TRAFFIC

Add new Sub-Clause:

The tendered rate shall be fully inclusive of all material, equipment, personnel and legislative compliance cost necessary to accommodate any interference of traffic for the duration of the contract.

Temporary Traffic-Control Facilities:

- | | |
|--|----------------|
| a) Flagmen | Unit : man-day |
| b) Portable STOP and GO-RY signs. | Unit : No |
| c) Amber flicker lights | Unit : No |
| d) Road signs, R-and TR series (900mm) | Unit : No |
| e) Road signs, TW series | |
| (i) (1200mm sides) | Unit : No |
| (ii) (1800 x 300mm) | Unit : No |
| (iii) (2400 x 400mm) | Unit : No |
| f) Movable barriers (plastic barriers)..... | Unit : m |
| g) Delineators (DTG50J) (800 x 200mm reflector size) | |
| (i) Single | Unit: No. |
| (ii) Mounted back to back | Unit: No. |
| h) Traffic Cones (450) | Unit: No |

The unit of measurement for (a) shall be a day worked by a flagman. The tendered rate shall include full compensation for a flagman who is required to control traffic by way of flags or portable STOP and GO-RY signs and shall include the provision of flags and safety jackets.

The unit of measurement for (b), (c), (d), (e) and (g) shall be the number of each sign provided, and, as may be applicable, completely erected.

The tendered rates shall include full compensation for providing, and where applicable, erecting each sign complete. In the case of sub-item (b) it shall also include moving the sign as may be necessary.

The unit of measurement for (f) shall be the metre of each type of movable barriers provided and shall include the initial erection.

General:

The tendered rate for the respective traffic control facilities shall include full compensation for the supply of an initial erection complete with posts, stakes, portable stands and sandbags as may be required, for cleaning and maintenance, for covering with non-transparent material when temporarily not required and removal off the site when no longer required.

75% of the tariff will be payable when the items have been provided and erected for their first use on site and 25% when finally removed from site. Facilities which become unserviceable or are damaged by vehicles or stolen, in particular delineators, shall be replaced promptly at no additional cost.

The tendered rate shall include for the execution of all tasks and all temporary road signs required in relation to the accommodation of traffic in accordance with SANS 1921-2 (2004): Construction and Management Requirements for Works Contracts, Part 2 : Accommodation of Traffic on Public Roads occupied by the Contractor, SARTSM – Volume 2 Chapter 13.10 Signing Applications for Urban Streets.

PSAB 3 EMPLOYER'S REPRESENTATIVES OFFICE (SABS 1200AB – 1986)
PSAB 3 MATERIALS

PSAB 3.1 NAME BOARDS

Replace Clause 3.1 with:

A notice board as detailed in Section C4: Site Information is to be erected to the satisfaction of the Employer's Representative.

PSAB 3.2 OFFICE BUILDINGS

Add the following:

The Contractor shall provide one temporary, air-conditioned office for the exclusive use of the Engineer or his Representative in addition to those required for his own use.

A typical Engineer's office shall have a floor area of at least 40 m², with an internal partition that will subdivide the building into one office for sole use of the Engineer with a floor area of 12 m² and the remainder office to accommodate two site assistants.

Office furniture as per SANS 1200AB Clause 3.2 and must be located in a shady area or be protected from the sun by shade cloth suspended over its roof.

In addition the offices shall be fitted with:

- a correctly sized air conditioning unit complete with 3 desks and 3 office chairs
- refrigerator of at least 100 litre capacity;
- microwave of at least 20 litre capacity;
- A drawing table of size 2,0m x 1,0m x 0,95m high;
- an approved colour printer and scanner to print A3 documents;
- 27 Inch monitor with HDMI Cables,
- shade cloth protected parking area for 3 vehicles;
- 4 no. 15 Amp earthed power plug points reticulated within the offices for powering computer and other office equipment;
- In addition to the above comfortable, air-conditioned accommodation shall be made available for holding regular site meetings. This accommodation must comfortably cater for up to 10 persons seated around a table.

The offices must comply with the requirements of Clause 3.2 of SANS 1200AB and must be located in a shady area or be protected from the sun by shade cloth suspended over its roof.

PSAB 5 CONSTRUCTION

PSAB 5.4 TELEPHONES

The terms of sub-clause 8.2 of SABS 1200AA shall apply.

Add to the Sub Clause:

The Tender is to include, under the Time-Related Charges, a sum of R1500.00 per month for a period of time equal to the Time of Completion of the Contract to cover the cost of the Employer's Representative's and assistants telephone calls and other costs relating to the provision of a cellular telephone for the exclusive use by the Employer's Representative or Representative.

A wireless internet service is also required for the duration of the contract with a minimum data cap of 20 GB per month.

PSAB 8 MEASUREMENT AND PAYMENT

All measurement and payment for Employer's Representative's office to be effected under PSAA 8.3 and PSAA 8.4.

PSC SITE CLEARANCE (SABS 1200C – 1998)**PSC 3 MATERIALS****PSC 3.1 DISPOSAL OF MATERIALS**

Add the following:

The freehaul distance for this contract is unlimited. Contractors are to note that no overhaul will be paid. Material obtained from clearing must be disposed of offsite by the Contractor at his expense. The Contractor will be held responsible for observing the by-laws and regulations of the relevant local authority and for any injury to persons and damage to property caused by any fire starting on site, in his camp or a fire started for any reason by his employees, regardless of whether such injury or damage is the direct or indirect result of such fire. The Contractor shall indemnify the Employer against all claims or damages arising from this source. Burning of combustible material shall not be allowed.

PSC 5.4 GRUBBING

In the fourth line delete “200mm” and substitute 300mm.

PSC 5.6 CONSERVATION OF TOPSOIL

Add to the Sub-Clause:

All topsoil shall be conserved for later use by stockpiling clear of the working area.

PSC 8 MEASUREMENT AND PAYMENT**PSC 8.2.1 CLEAR AND GRUB**

Replace the first line with the following:

The area designated by the Employer’s Representative to be cleared and grubbed will be measured in square metre to the nearest square metre or,

The unit of measurement shall be square metre (m²).

PSC 8.2.5 TAKE DOWN EXISTING FENCES

Add to the Sub-Clause:

The tendered rate shall include for storing and reinstatement of the fence as directed by Employer’s Representative on site

The unit of measurement shall be metre (m).

PSC 8.2.10 REMOVE TOPSOIL TO STOCKPILE

Add to the Sub-Clause:

The tendered rate shall include full compensation for removing topsoil to a depth of 150mm and for loading and transporting the material to and from a stockpile in the vicinity of the site of works.

The contractor must only remove topsoil at the area where he will excavate for new meter installation unless otherwise agreed with the Employer’s Representative

The unit of measurement shall be cubic metre (m³).

PSC 8.2.11 SAW CUTTING OF EXISTING ASPHALT SURFACE

Add new Sub-Clause:

The unit of measurement shall be metre (m).

The unit of measure shall be the linear metre of the asphalt cut according to the plans or as instructed by the Employer's Representative. The rate shall include for the supply of an approved asphalt saw cutting machine and all other necessary equipment for saw cutting of asphalt, according to the specification which calls for a double cut on each side of the excavation if required.

PSC 8.2.12 SAW CUTTING OF EXISTING CONCRETE

Add new Sub-Clause:

The unit of measurement shall be metre (m).

The unit of measure shall be the linear metre of the concrete cut according to the plans or as instructed by the Employer's Representative. The rate shall include for the supply of an approved asphalt saw cutting machine and all other necessary equipment for saw cutting of concrete, according to the specification which calls for a single cut.

PSC 8.2.13 REMOVE EXISTING ROAD ASPHALT SURFACING TO SPOIL

Add new Sub-Clause:

The unit of measurement shall be square metre (m²).

The rate shall cover the cost of removing, loading, transporting and disposal to spoil of all asphalt surfacing as instructed by the Employer's Representative. The rate shall take into account that this work may have to be carried out in more than one operation depending on the Construction programme and traffic accommodation.

PSC 8.2.14 REMOVE EXISTING GRAVEL LAYERWORKS TO SPOIL

Add new Sub-Clause:

The unit of measurement shall be cubic metre (m³).

The rate shall include for the selective removal of existing gravel layerworks to the required depth as instructed by the Employer's Representative, loading and transporting to spoil as per Clause PSC 3.1: Disposal of Material. The rate shall take into account that this work will have to be carried out in more than one operation depending on the construction programme and traffic accommodation.

PSC 8.2.15 REMOVE EXISTING CONCRETE SURFACING TO SPOIL

Add new Sub-Clause:

The unit of measurement shall be square metre (m²).

The rate shall cover the cost of removing, loading, transporting and disposal to spoil of all concrete surfacing as instructed by Employer's Representative. The rate shall take into account that this work may have to be carried out in more than one operation depending on the Construction programme and traffic accommodation.

PSC 8.2.16 DISMANTLE, STORING AND RE-ERECTION OF ROAD SIGNS

Add new Sub-Clause:

The unit of measurement shall be number (No).

- Exceeding but not exceeding surface area of: 0 - 2,0m²

The unit of measure shall be the number of road signs dismantled, stored and re-erected as instructed by the Employer's Representative.

The rate shall include the cost of dismantling and re-erection of all components of the road sign, the transporting to and from storage, all costs associated with the storage of the road signs, all labour costs involved in the process of dismantling and re-erection and the backfilling, shaping and trimming of any sign post holes.

PSDA EARTHWORKS (SMALL WORK) (SABS 1200 DA-1988)**PSDA 2 INTERPRETATIONS****PSDA 2.3 DEFINITIONS**

Delete the sentence headed "Restricted excavation" and substitute:

Restricted excavation - An excavation so restricted in area or width as to preclude removal of material by excavating machinery used for bulk excavation measured in terms of Sub-Clause 8.3.1(b). Restricted excavation may be carried out by smaller machinery or by hand, as selected by the Contractor. The extent of restricted excavation shall be as scheduled and/or shown on the drawings; all other excavation shall be regarded as bulk excavation."

PSDA 3 MATERIALS**PSDA 3.1 CLASSIFICATION****PSDA 3.1.2 CLASSES OF EXCAVATION**

Delete the contents and replace with the following:

For this contract classes of excavation will be subdivided as follows:

- 1) Conventional methods (Mechanical)
- 2) All mass, restricted and trench excavations not designated as excavations to be done by labour-intensive methods, shall be classified as follows:
- 3) Soft excavation, according to SANS 1200.
- 4) No separate measurement will be made for Intermediate materials. Intermediate material will be measured as soft excavation.
- 5) Hard rock excavation, as specified in clause 3.1.2(c) excepting that boulders over 0,03 m3 in size will be measured individually and added to the quantity of hard rock excavation.

PSDA 3.1.3 GENERAL

Add new Sub-Clause:

The method of excavation shall be at the discretion of the Contractor provided that the work complies with the specification and the following requirements:

- Excavations shall be confined within the limits defined by the drawings or as instructed by the Employer's Representative.
- Surfaces in excavations shall be at all times be formed to shed stormwater and groundwater without ponding.

PSDA 3.2 EMBANKMENTS AND BACKFILL**PSDA 3.3.2 AREAS SUBJECT TO TRAFFIC LOADS**

Delete the Sub-Clause and substitute:

Backfill material shall be compacted to at least 98% Mod. AASHTO + 0.5 S (S = standard deviation). This compaction is only required where the trench is subject to vehicular traffic. Where the trench is not subject to vehicular traffic, compaction shall be to 95% Mod. AASHTO.

Backfill materials such as cohesionless sand (Umgeni sand or similar, which is easily eroded) is not permitted.

Bedding materials such as Umgeni sand or similar approved non-cohesive materials shall be compacted to 100% Mod. AASHTO by full saturation or similar methods approved by the Employer's Representative, it being noted that the Contractor shall take all necessary precautions, at his own cost, to prevent the pipes from floating. Compaction of bedding materials to 100 % Mod. AASHTO is required for the entire contract. All costs for providing the water required for the saturation of the material shall be included in the tendered rates.

Backfill materials for the road crossings shall be minimum G5 material which the Contractor will be required to obtain from a commercial source. Compaction of the material shall be to at least 96 % Mod. AASHTO + 0.5 S. In addition, the backfill material shall be 4% stabilised by weight with ordinary Portland Cement.

In areas where normal compaction is ineffective and/or subsoil seepage is evident, 300mm of the unsuitable material must be replaced with 300mm of approved granular material as directed by the Employer's Representative.

Add the following:

Should any subsidence take place in any trench after filling and should the Contractor fail to attend to such settlement within 4 hours of being instructed to do so by the Employer's Representative, then the Employer may take whatever steps are necessary such as erection of barricades, importing fill material, etc., at the Contractor's expense and without relieving him of any of his responsibilities under this contract.

PSDA 3.2.3 MATERIAL SUITABLE FOR REPLACING OVERBREAK IN EXCAVATIONS FOR FOUNDATIONS

Add new Sub-Clause:

Excavation carried out in excess of the specified depth, unless authorised by the Employer's Representative, shall be made up with concrete class 15/19 or other approved material, as directed by the Employer's Representative, at the Contractor's expense.

Where the sides of foundations are specified on the drawings as being cast against in-situ ground, the excavations shall be carried out to the neat dimensions of the base and any overbreak shall be backfilled with the same class of concrete as that in the base or with mass concrete fill as specified or directed by the Employer's Representative.

Where the bottoms or sides of excavations, against which concrete is to be cast, are softened due to rain or other causes the softened material shall be removed and replaced by concrete or other approved material as directed by the Employer's Representative at the Contractor's expense provided always that the material forming the sides of the excavation is initially capable of standing unsupported at the required slope.

PSDA 3.2.4 BACKFILLING AND EMBANKMENTS

Add new Sub-Clause:

Sufficient material arising from excavations for structures, foundations, footings and the like and which is suitable for forming embankments and backfilling against finished structures shall be temporarily stockpiled in the vicinity of the structures. All other material from the excavations shall be disposed of offsite."

PSDA 4 PLANT

PSDA 4.3 COMPACTION PLANT

The plant used for applying the dynamic load, controlling the moisture content and grading or mixing shall be capable of achieving the compaction specified using the materials available for the construction of the Works.

PSDA 5 CONSTRUCTION

PSDA 5.1 PRECAUTIONS

PSDA 5.1.1.1 BARRICADING AND LIGHTING

Delete the Sub-Clause and substitute:

Without limiting any obligation which the Contractor may have in terms of any Act, Ordinance or other legislation, the Contractor shall ensure that all excavations which are accessible to the public or which is adjacent to a public road or thoroughfare, or by which the safety of persons may be endangered are protected as set out in clause 13 of the General Safety Regulations of the Occupational Health and Safety Act, 1993 and that watchmen are employed to ensure that barricades, barriers and lights are effective at all times.

Trench excavations shall be protected by 1.2m high orange "Haznet" fencing approved by the Employer's Representative. The fencing shall be stretched tightly between supports along both sides and ends of the excavation. The supports shall consist of poles or iron standards securely planted in solid ground at not more than 5 m centres so as to enclose the spoil and the excavations.

Bridges for vehicles and/or pedestrians shall be provided along the route of the work as and where may be considered necessary by the Employer's Representative. They shall consist of a number of suitably sized steel plates laid across open excavated trenches. They shall be protected on each side by a stout two-rail timber fence, at least 1 m high, consisting of 150 mm x 75 mm timber verticals set firmly into the ground, with 75 mm x 50 mm rails securely fastened to them. At least 4 lamps or reflective markers must be provided at each crossing.

Where construction is in, or across, public roads the barricades or barriers and temporary road signs shall be erected. All such signs and positioning thereof shall comply with the requirements set out in Road Note 13 read in conjunction with the SA Road Traffic Signs Manual.

The Contractor shall include in his tendered rates for excavation and pipe trench excavation all costs associated with complying with barricading.

PSDA 5.1.1.2 SAFEGUARDING OF EXCAVATIONS

In sub clause a) delete the words "Machinery and Occupational Safety Act" in the third and fourth lines and substitute "regulations to the Occupational Health and Safety Act, 1993."

PSDA 5.1.1.3 EXPLOSIVES

Delete the contents of the Sub-Clause and replace with the following:

Explosives are not permitted.

PSDA 5.1.4 STORMWATER AND GROUNDWATER

Delete the third sentence and substitute:

Except where the use of tremies has been approved, foundation excavations for structures shall be kept free of water at all times until they have been inspected and approved and the concrete substructures, together with their related superstructures, have been completed.

Add to the Sub-Clause:

Any work destroyed or damaged due to inadequate precautions being taken against rain, flood, seepage or ingress of water of any kind, shall be repaired to the satisfaction of the Employer's Representative. The Contractor shall be responsible for the entire cost of any remedial works necessary.

Furthermore, whenever there exists, in the opinion of the Employer's Representative, any reasonable danger that backfilled trenches or other work may be damaged by flood waters, he may order whatever measure he considers necessary, inter alia:

- Earth or rock cross-walls in trenches.
- Temporary works to deviate existing water courses.
- Acceleration of the Contractor's programme to minimise risk.

PSDA 5.1.5 EXCESSIVE POLLUTION

Add the words "noise and", before the word "dust" in the first line.

PSDA 5.1.6 EXCAVATED MATERIAL NOT TO ENDANGER OR INTERFERE

Delete the last sentence and substitute:

All material that is unsuitable or not required for backfilling shall be disposed of at the nearest available solid waste site for spreading by others. No additional payment will be made for these activities.

PSDA 5.1.8 ROAD TRAFFIC CONTROL

Delete from the third and fourth lines and words "and such barricades and warning lights as are ordered" and add:

"and shall accommodate all traffic at any point on the site by providing by-passes, temporary bridges or the like"

An item has been included in the Schedule of Quantities to cover all costs required to accommodate any and all traffic on site.

PSDA 5.2 METHODS AND PROCEDURES

PSDA 5.2.2 EXCAVATION

Add to the Sub-Clause:

h) "Where outside shuttering is ordered by the Employer's Representative, the excavations shall be carried out for an extra width of not more than 600 mm all around the structure, measured from the base of the face to be shuttered, to allow for the shuttering to be fixed, this extra excavation and refilling where necessary is to be measured and paid for under quantities allowed for this purpose in the Schedule. Outside shuttering shall be used for the construction of all major structures unless ordered otherwise by the Employer's Representative.

i) Where permanent concrete is to be placed against an excavated face, the excavation shall be trimmed to ensure that there is no projection greater than 20 mm protruding into the excavation profile.

j) The Contractor shall not spoil, waste or stockpile excavated material without approval.

k) Should the contractor excavate to dimensions in excess of that stipulated or permitted by the Employer's Representative, then the excess will be at his own expense."

General

- 1) Excavation shall be undertaken in whatever material is encountered and to such levels and widths as are indicated on the drawings, in the specification and as instructed by the Employer's Representative. Trench excavation shall be undertaken in narrow trenching conditions with vertical sides necessitating the use of shoring and open battered trench excavation will not be permitted unless otherwise stated in the Project Specification.
- 2) Where site conditions permit, all materials excavated and required for backfilling shall be removed and neatly stacked where possible along the higher side of the trench, care being taken to restrict the area so occupied so as to cause the minimum of obstruction. Care shall be taken to protect existing structures such as walls, fences, gateways and also hedges, trees, gardens, etc., from damage by material so stacked.
- 3) All meter assembly excavation shall be deemed as restricted excavation.

PSDA 5.2.2.1 EXCAVATION TRENCH BOTTOM

Add new Sub-Clause:

Where the bottom of the trench has been excavated to a depth greater than that specified or ordered, the Contractor shall at his own expense replace the excess material so removed with suitable fill material compacted to 95% MAASHTO density or with 15 MPa concrete, as directed by the Employer's Representative.

For welded steel pipes or flange steel pipes, the trench shall be widened and deepened over a suitable length at the joints to provide a minimum clearance of 500mm on each side of and beneath the pipe to allow working space for the jointing and corrosion protection. This additional excavation is to be included in the tendered rates.

PSDA 5.2.2.2 EXCAVATION BY HAND

Add new Sub-Clause:

The Contractor must note that no excavation machinery may excavate within 600mm of existing water pipelines unless otherwise agreed by the Employer's Representative, all excavation to expose pipelines must be done by hand.

PSDA 5.2.3.1 EMBANKMENTS

In the thirteenth line of the Sub-Clause delete "600 mm" and substitute "300 mm".

In the sixteenth line of the Sub-Clause delete "300 mm" and substitute "150 mm".

Delete "Each layer shall be compacted at OMC to the specified density" and replace with

If the natural ground crossfall is greater than 5% the entire interface between the embankment and the natural ground shall be bonded by scarifying to a depth of 150mm. The thickness of any one layer of fill up to 1m below formation level shall not exceed 150mm after compaction using static rollers, or 300mm using vibrating rollers where no existing pipelines are encountered (refer to Clause PS 7.3).

The top 1m layer of fill below formation shall be carried out in layers not exceeding 150mm thickness.

The standard of compaction required shall be:

- up to 1m below formation level, 95% Mod. AASHTO. density;
- the top 1m layer below formation, 95% Mod. AASHTO density.

The moisture content during compaction of the top 1m layer below formation as determined by the Modified AASHTO compaction test shall be optimum +/-2%.

Item coverage shall include for: -

- compacting of natural ground before forming embankments to 95% Mod. AASHTO to a depth of at least 150mm; and
- Allowing for shrinkage and wastage of material.

PSDA 5.2.3.2 RESTRICTED BACKFILL AND COMPACTION AT STRUCTURES

Delete the eighth and ninth lines of the Sub-Clause and substitute:

“Not exceeding 150 mm and compacted by means of mechanical tampers to achieve a minimum 95% modified AASHTO density except where indicated otherwise on the Drawings.”

Add to the Sub-Clause:

Excavated material containing little or no organic matter, large clay lumps and excluding stones of average dimension exceeding 200mm may be used for backfill. Suitable material arising from excavations which is suitable for backfilling shall be stockpiled whilst all other materials from excavations shall be disposed of offsite.

Backfill to structures and that used in the formation of embankments shall be compacted to 95% modified AASHTO density.

Contractors are to note that no overhaul of backfill material will be measured. The Contractor shall be responsible for backfilling any working space and excavation slopes, overbreaking, battering etc., beyond the indicated pay lines.

The unit rate for excavation and backfilling in all materials shall include for compacting backfill to 95% modified AASHTO density.

No backfilling of meter assemblies will be allowed until the hydraulic test has been completed.

PSDA 5.2.3.3 DISPOSAL OF SOFT EXCAVATION MATERIAL

Add new Sub-Clause:

Material which the Employer's Representative considers to be unsuitable for the bottom of the trench shall be excavated to depths as instructed and disposed of as surplus material. The resultant space shall be refilled, as ordered, with approved material and compacted to a 95% Mod. AASHTO density.

PSDA 5.2.5.2 TOPSOILING

Delete the wording of Sub-Clause and replace with the following:

All topsoil suitable for re-use shall be transported directly to the stockpile area and placed separately from all other materials in order to avoid contamination. Where scheduled, topsoil shall be placed on all surfaces and on embankments and shall be lightly compacted by wheeled vehicles or by tamping, and trimmed neatly to the required lines, grades and levels. The final thickness of topsoil after compaction shall be at least 100 mm. Prior to topsoiling, the surfaces to be topsoiled shall be prepared by pulling horizontal ruts into the soil with the tines of a front-end loader or other suitable method to retard erosion of the topsoil.

PSDA 5.2.5.3 GRASS AND OTHER VEGETATION

Add to the Sub-Clause:

The surface of topsoiled embankments and terraces are to be planted with sods and other designated flat areas are to be seeded. The planted and seeded areas are to be fertilised and watered until the area is fully covered with grass. Grassed areas, once reinstated by the Contractor will be required to be maintained by the Contractor for a period of three months. This will include watering and weeding of the planted areas to the satisfaction of the Employer's Representative. The costs of complying with this requirement are to be included in the rates for grass planting.

PSDA 5.2.6 TRANSPORT FOR EARTHWORKS

PSDA 5.2.6.1 FREEHAUL

Delete the wording of Sub-Clause and replace with the following:

All haul will be regarded as freehaul. No overhaul will be paid under this Contract.

PSDA 5.2.6.2 OVERHAUL

Delete the Sub-Clause.

PSDA 6 TOLERANCES

PSDA 6.1 DEGREE OF ACCURACY

Delete the Sub-clause and substitute:

The work shall, subject to Sub-Clause 6.2, be finished off within the limits of Degree of Accuracy II as set out in Sub-Clause 6.1 of SABS 1200 D.

PSDA 6.2 PERMISSIBLE DEVIATIONS

Add the following permissible deviations for work to Degree of Accuracy II :

6.2(a)

| | |
|---|----------|
| 1 | ± 300 mm |
| 2 | ± 100 mm |
| 3 | ± 50 mm |
| 4 From direction of slope between 1/100 and 1/300, 10% 1/400 and flatter 5% | Nil |

6.2(b)

| | |
|---|---------|
| 1 | ± 35 mm |
| 2 | ± 50 mm |
| 3 | ± 50 mm |
| 4 | ± 15 mm |

6.2(c) 1 Read "-2% +1%" in place of "± 2%".

PSDA 6.3 EXCAVATION BY MECHANICAL MEANS

Add new Sub-Clause:

Where bulk excavation is carried out by earthmoving equipment, such excavation will only be allowed to within a level of 300 mm or less as ordered by the Employer's Representative, above the general level to which the ground has to be reduced, the balance of the bulk

excavation being carried out by hand or by other means approved by the Employer's Representative.

PSDA 7 TESTING

PSDA 7.2 TAKING AND TESTING OF SAMPLES

Add to the Sub-Clause:

Determination of the standard of compaction achieved shall be carried out in accordance with Standard methods of testing road construction materials published by the Department of Transport Division of National Roads, Publication TMH.1.

PSDA 8 MEASUREMENT AND PAYMENT

PSDA 8.1.1 BASIC PRINCIPLES

Items coverage shall include for-

- 4) Loosening or breaking up unexcavated material before or during excavation;
- 5) Allowing for bulking or shrinkage of material before or during excavation;
- 6) Keeping the earthworks free of water;
- 7) Depositing fill to slope away from vertical drainage layers and providing temporary drainage to prevent surface water from entering such drainage layers;
- 8) (Forming and trimming the slopes;
- 9) Restrictions on working at sides of structures;
- 10) Taking precautions to avoid damage to structure, existing sewers, drains and services, including providing temporary supports.
- 11) The drying of material which cannot be placed immediately in the fill embankments as its in-situ moisture content exceeds the limits specified.
- 12) Selecting suitable material of stated types and layering or depositing in locations indicated by the Employer's Representative or in stockpiles.

Delete the third line of the first sentence of the Sub-Clause and substitute:

"material in backfilling, forming embankments, etc., including any necessary additional offloading, stock-piling and reloading and the cost of disposal of any"

In the seventh line of the Sub-Clause delete "Drawing DA-2" and substitute "Fig DA-2".

PSDA 8.1.2 BASIC PRINCIPLES

Delete the first line of the Sub-Clause and substitute:

"Excavations which are required to be backfilled, or partially backfilled, will be measured as if taken out"

Delete the fifth and sixth lines of the Sub-Clause and substitute:

"other such structures, the volume will be measured from the finished outline of the concrete, or the blinding to the concrete (as the case may be), as shown on the Drawings".

PSDA 8.1.3 BASIC PRINCIPLES

Delete the third line of the Sub-Clause and substitute:

"will be measured as part of the bulk excavation or restricted excavation, as applicable.

PSDA 8.2 COMPUTATION OF QUANTITIES

Add the following:

No allowance will be made for bulking or shrinkage and excavation will be paid as being the volume in place before excavation commenced.

Separate items shall be scheduled for restricted excavation to accommodate various depth horizons starting with 0 to 2,0m depth and thereafter in 1,0m increments. The volume of restricted excavation will be based on the payline area of the meter assembly multiplied by the depth measured from the original ground level or a particular datum level agreed prior to commencing excavation.

Add the following to DA 8.2.3:

Prior to commencement of any excavation, the contractor shall notify the Employer's Representative in good time to ensure that measurements of the undisturbed ground, or any other relevant information are taken in order that the excavation quantities can be agreed upon between the Employer's Representative and the Contractor.

PSDA 8.2.4 SHORING

Add new Sub-Clause:

Except where shoring is specifically ordered, or approved by the Employer's Representative, the cost of shoring used, as well as the cost of any additional excavations required to install the shoring, will be deemed to be included in the rates tendered for the excavations.

All temporary works to be carried out in accordance to the Occupational Health & Safety Act, 1993 (Act 85 of 1993): Construction Regulations 2014 and applicable sections of SANS 1200. The design of any temporary works including shoring shall be carried out by a registered professional Engineer.

PSDA 8.3 SCHEDULED ITEMS

PSDA 8.3.2 RESTRICTED EXCAVATION

PSDA 8.3.2(A) RESTRICTED EXCAVATION

"Drawing DA-2" in the fourth line to read "Fig DA-2".

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

Trench Depths indicated on the Bill of Quantities and on the Tender Drawings are indicative only. The rates for restricted excavation will include for any required allowance for working space and shoring. The rate for restricted excavation is to be for the various depth horizons encountered.

PSDA 8.3.2(B) RESTRICTED EXCAVATION

Delete the last two lines and substitute:

(a) "above for any portion of the excavated material that is classified as soft, hard rock, boulder Class A or boulder Class B as applicable."

Add to the Sub-Clause:

(3) Hand Excavation Unit: m³

The unit of measurement shall be the cubic metre of material, measured in place according to the authorised dimensions, which was excavated by hand on the specific prior written instructions of the Employer's Representative.

The tendered rate shall include full compensation for the additional cost, effort and time resulting from excavating in the respective materials using hand methods only.

The Employer's Representative shall not be obliged to authorise payment under this item in respect of any hand excavation carried out (whether ordered in writing or otherwise), which hand excavation was in any case necessary to achieve compliance by the Contractor of his obligations under the Contract to :

- utilise construction appropriate to the nature of the specific parts of the Works and/or
- protect existing structures and/or services ; and/or
- comply with all prevailing legislation and regulations.

PSDA 8.3.4 IMPORTING OF MATERIALS

Add new Sub-Clause:

The measured volume of imported fill shall be the difference between the net volume of compacted fill and the net volume of suitable material excavated from the site and actually used as compacted fill. For this purpose it shall be assumed that one cubic metre of suitable material excavated from within the site forms one cubic metre of compacted fill.

PSDA 8.3.4.1 FROM STOCKPILE

The rate shall cover the cost of obtaining selected backfill or fill material from stockpile, loading, transporting, unloading, spreading in layers not exceeding 150 mm thick, watering, compacting to 95% Mod AASHTO density, and 98% Mod AASHTO in 150mm layers where the pipe is located under a paved road surface, trimming slopes of embankment to required outline all in accordance with the Specifications. The rate shall also include for carrying out density testing and the disposal of any surplus material"

PSDA 8.3.4.2 FROM COMMERCIAL SOURCES

The rate shall cover the cost of acquiring suitable material, loading, transporting, unloading, spreading in layers not exceeding 150mm thick, watering, compacting to 95% Mod AASHTO density, and 98% Mod AASHTO in 150mm layers where the pipe is located under a paved road surface, trimming slopes of embankment to required outline all in accordance with the Specifications. The rate shall also include for carrying out density testing and the disposal of any surplus material"

PSDA 8.3.7 GRASS AND OTHER VEGETATION

Add to the Sub-Clause:

The rate shall cover the cost planting sods on embankments and/ or terraces and seeding of other designated flat areas inclusive of fertilising, watering until the area is fully covered with grass and maintenance by the Contractor for a minimum period of three months. This will include watering and weeding of the planted areas to the satisfaction of the Employer's Representative and the costs of complying with this requirement are to be included in the rates for grass planting.

PSDA 8.3.9 CEMENT STABILISATION

Add new Sub-Clause:

The rate shall cover the cost of supply, mix and place (by weight) 4% Ordinary Portland Cement to stabilise granular material. The OPC will be measured net by weight.

Unit: kg

PSDA 8.3.10 TRIMMING OF EMBANKMENTS

Add new Sub-Clause:

The rate shall cover the cost of all works required to trim and shape embankments to a suitable level to the satisfaction of the Employer's Representative. Measurements shall be in square metres (m²) measured along the shape of the embankment.

Unit: m²

PSL MEDIUM PRESSURE PIPELINES (SABS 1200 L-1983)**PSL 3 MATERIALS****PSL 3.4 STEEL PIPES, FITTINGS AND SPECIALS****PSL 3.4.1 GENERAL**

Add the following to L 3.4.1:

The steel pipes specials to be laid under this contract are from DN80 up to DN600.

Steel fittings and specials to be grade X42 coated and lined to project specifications. Plate thickness shall not be less than 4.5mm, or the thickness that results in a working stress not exceeding 75% of the allowable maximum working stress for the steel grade.

For all branch connections the plate thickness of the barrel and branch shall be such that the maximum stress shall not be greater than that for an uncut pipe of the theoretical minimum thickness. Where it is more economical to provide external reinforcement in the form of collar type rings or crotch plates, these forms of reinforcement shall be used to achieve the same results.

PSL 3.4.2 PIPES OF NOMINAL BORE UP TO 150 MM

Delete the Sub-Clause.

PSL 3.4.3 PIPES OF NOMINAL BORE OVER 150 MM

Delete the Sub-Clause.

PSL 3.4.4 FITTINGS AND SPECIALS

Add the following to L 3.4.4:

The lining and wrapping of specials, which are to be butt-welded, is to be terminated 100 mm from the end of the pipe. The lining of specials which are to be sleeve welded shall be taken to the end of the pipe and the wrapping is to be terminated 100 mm from the end. On flanged specials the wrapping and lining is to be taken to the end of the pipe.

All specials shall be protected in accordance with clauses PSL 3.9. All electrodes used for welding of joints shall comply with SABS 455.

Tee pieces shall be fabricated in accordance with Table 9 of BS 534 (1990). All other specials shall be fabricated in accordance with the relevant clauses of BS 534 (1990).

All even curvature bends shall be long radius and fittings for diameters up to and including DN200 shall be in accordance with ASME/ANSI, B16.9. unless otherwise stated in the Bill of Quantities or drawings.

All reducers to be cast reducers and shall be in accordance with ASME/ANSI, B16.9. unless otherwise stated in the Bill of Quantities or drawings. Any fabricated reducers shall be fabricated based on the formula: Face to Face length = $(D-d)*4$ where "D" is pipeline diameter and "d" is the diameter of the water meter and shall not have more than two longitudinal weld seams.

The pipe manufacturer shall obtain and make available to the Employer's Representative a certificate or certificates from the steel manufacturer covering all steel used, showing by which process the steel was made and giving the chemical analysis of the steel and its physical

properties. A record shall be kept of pipe serial numbers and the cast numbers of the steel used.

The pipe manufacturer shall supply written confirmation that all hand welding was carried out by coded welders.

PSL 3.4.4.1 FLANGES

Use SANS 1123: 2007, Table 3 only. Where SANS 1123: 2007 (Table 3, for the different pressure classes) does not provide specifications for a particular diameter and class of flange, then specify BS EN 1092.

PSL 3.4.4.2 SEGMENTED BENDS

Add new Sub-Clause:

This clause applies to segmented bends equal to or greater than 300 mm in diameter. All segmented bends shall be fabricated in accordance with the criteria in Table 1.

Table 1:

| Total Deflection Angle | Number of Segments | Number of mitres |
|------------------------|--------------------|--|
| 0 to 15 | -- | < 5 degrees = single scarf, |
| | | >= 5 degrees = double scarf with 1 mitre joint |
| 16 to 30 | 3 | 2 |
| 31 to 45 | 4 | 3 |
| 46 to 60 | 5 | 4 |
| 61 to 75 | 6 | 5 |
| 76 to 90 | 7 | 6 |

Bends greater than 90 degrees shall be fabricated from combinations of the above. Shop drawings of these bends shall be submitted to the Employer's Representative for approval prior to manufacture.

The maximum angular deflection at any mitre shall be 15 degrees and where the first and last segment are to be half of the maximum angle. Unless otherwise indicated on the drawings, the minimum radius of the segmented bends shall be:

- DN 300 to 450: According to Table 8 of BS 534 (1990)
- DN 500 to 1600: 2.0 x pipe diameters

All segmental bends shall be fabricated with bevelled plain ends suitable for butt welding or with square, plain faced ends where slip-on flanges are to be welded to the special.

The tendered rate for the manufacture and supply of segmented bends, compound or simple, shall include for cutting, bevelling, welding, (welding of flanges if require will be an extra over item), NDT testing, surface preparation, lining and coating, laying and bedding and holiday detection tests.

PSL 3.4.5 TOLERANCES OF PIPES

Add new Sub-Clause:

The Contractor's attention is drawn to the required tolerance and method of measuring as described in Sections 5 and 6 of SANS 719.

PSL 3.4.6 PIPE SIZES AND LENGTHS**PSL 3.4.6.1 WALL THICKNESS**

The outside diameter, wall thickness of pipes to be supplied under this Contract are as follows:

| Nominal Diameter (mm) | Wall Thickness (mm) |
|-----------------------|---------------------|
| 200 | 4.5 |
| 250 | 4.5 |
| 300 | 4.5 |
| 350 | 4.5 |
| 400 | 4.5 |
| 450 | 4.5 |
| 500 | 4.5 |
| 600 | 6.0 |
| 700 | 6.0 |
| 800 | 8.0 |
| 900 | 10.0 |
| 1000 | 10.0 |
| 1200 | 12.0 |

PSL 3.8.2 FLEXIBLE COUPLINGS

Add the following as L 3.8.2:

Flexible couplings shall conform generally to Clause 15 of BS 534 for slip-on type couplings and shall be of approved manufacture, manufactured from rolled steel, and fitted with rubber rings suitable for jointing plain-ended pipes. They shall be capable of being tightened and released without damaging or improperly distorting the rubber seating rings and shall be designed to prevent the rubber rings being blown out under pressure or sucked in under vacuum.

The rubber jointing rings shall be manufactured from first grade natural rubber to B.S. 2494 Class D. All bolts and nuts shall comply with SABS 135 or SABS. 136. Each sleeve shall be fitted with a centre register unless stated otherwise in the Project Specification.

Each coupling shall permit a repeated movement of 10 mm to cater for thermal expansion and contraction of the pipe, and allow for the following angular deflections:

- 6° up to and including 600 mm diameter;
- 5° over 600 mm up to and including 750 mm diameter;
- 4° over 750 mm up to and including 900 mm diameter;
- 3° over 900 mm up to and including 1 200 mm diameter;
- 2° over 1200 mm diameter.

The steel used shall conform to the appropriate British Standard Specification and each coupling is to be capable of withstanding the test pressure applicable to the pipes with which they are to be used without exceeding a stress in the steel of 67% of the yield point.

Couplings shall be protected by an approved epoxy coating system such as "Cupon KSIR88". The plain end of the steel pipe shall be properly prepared before corrosion protection so as to accept the flexible coupling.

PSL 3.8.2.5 RESTRAINED FLEXIBLE COUPLINGS

Add new Sub-Clause:

Special restrained or anchoring flexible adaptor joints or flanged adaptor joints ("Viking Johnson" or similar) for connecting plain ended steel pipes to flanged joints are to be supplied complete with bolts, nuts, washers, gaskets, etc for connecting flanged joint to anchoring flange.

Anchoring or restraining flange to be welded approximately 300mm from plain end of pipe. Restraining flange adaptor to use minimum of 4 number grade 4.8 restraining bolts, equally spaced around circumference of flanges. Restraining flange to be to manufacturers specification and approved by the Employer's Representative.

PSL 3.8.3 FLANGES AND ACCESSORIES

Add the following to L 3.8.3:

Gaskets shall be manufactured from "Klinger 200" or other approved material which complies with the requirements for Grade B of B.S. 2815.

All gaskets shall be 3 mm thick.

All gaskets shall be purpose made. Hand cutting and trimming of gaskets on site will not be acceptable.

Care should be taken to ensure that all gaskets are packed properly and are not damaged by bending. For larger sizes the gaskets shall be suitably supported by wooden frames during transit and while in store.

PSL 3.8.3.6 INSULATING FLANGES

Add new Sub-Clause:

Bolts, nuts and washers used on insulated flanges shall be as for the steel flanges shown on the standard drawing. Bolts and nuts connecting mild steel flanges to stainless steel flanges, or stainless-steel flanges to stainless steel flanges shall be Grade 304 stainless steel. Bolts, nuts and washers used on insulated flanges shall conform to the Umgeni Water Particular Specification for Cathodic Protection.

PSL 3.8.8 BOLTED CONNECTIONS

Add new Sub-Clause:

PSL 3.8.8.1 BOLTED CONNECTIONS SHALL COMPLY WITH THE FOLLOWING

All pipes larger than 150mm diameter, connected to equipment or fittings, or where specifically indicated, shall be flanged to SANS 1123-2011 as amended, table 1600, 2500 or 4000 as scheduled. All flanges shall be truly at right angles to the axis of the pipe or fitting and shall be drilled with bolt holes off centre.

All plate flanges for welding shall be Type 3 and blank plate flanges shall be Type 8.

Puddle flanges shall be a minimum of the same diameter and thickness as the end flanges and shall be undrilled unless otherwise shown on the drawings.

All flanges, gaskets, bolts, nuts washers and other appurtenances required for the execution of the work under this Contract shall be supplied and installed by the Contractor under this Contract.

Any item of pipework that is found to have flanges that are incorrectly drilled shall be rejected. Reaming of bolt holes to oversize dimensions in order to make a particular piece fit shall not be permitted.

PSL 3.8.8.2 MATCHED FLANGES

Matched flanges shall correspond in construction and dimensions to flanges on equipment. Matched flanges shall be provided with the correct bolts, nuts and packing rings. All peening shall be clean before connections are made.

The faces of flanges that are in to be in contact with gaskets shall be masked and shall not be painted or coated. The mating flange shall then receive one coat of rust inhibitor (Plascon Rustix 84 or equal approved). Care shall be exercised to ensure that after the application of all coatings there are no runs or drips on the mating surfaces of the flanges and that the flange profiling is clearly visible over the entire face. Excessive coating build up in flange bolt holes that could snag bolts will not be permitted.

PSL 3.8.8.3 INSULATED FLANGES

Bolts, nuts and washers used on insulated flanges shall be as for the steel flanges shown on the standard drawing.

Bolts and nuts connecting mild steel flanges to stainless steel flanges, or stainless steel flanges to stainless steel flanges shall be Grade 304 stainless steel.

PSL 3.8.8.4 LENGTH OF BOLTS

The length of each bolt shall be such that, after the bolt has been tightened, the end of the bolt is flush with the outside of the nut, or projects above the nut by not more than two full threads. Tie-bolts on restrained/anchoring couplings shall be fitted with "backing nuts" and washers.

PSL 3.8.8.5 END-COVERS

Satisfactory temporary end-covers shall be provided by the Contractor for protection of flanges, prepared ends of open-ended pipes and fittings and screwed ends, to prevent damage to internal lining during transportation and during handling on site.

The end-cover on a pipe end or fitting shall remain in place during the entire installation process until the completion of a joint requires a cover to be removed.

PSL 3.8.8.6 BOLTS AND BOLT THREADS

Bolts and tie bolts to be grade 4.8. Bolts, nuts and washers shall be hot dipped galvanised to SANS 121:2000/ ISO 1461:2009.

All bolt torque sequences and torque values are to be agreed with the Employer's Representative. All bolts are to be tightened in a predetermined pattern with opposing bolts being tightened sequentially. When all bolts are tight, each bolt is to be torqued to the required/recommended torque in a predetermined pattern with opposing bolts being tightened sequentially.

All bolt threads shall be liberally coated with "Copper slip" or similar approved compound prior to assembly. Upon completion, bolt heads, washers and nuts shall be wrapped with the "Denso Mastic Blanket System" as described in elsewhere.

PSL 3.9 CORROSION PROTECTION

PSL 3.9.2 STEEL PIPES

PSL 3.9.2.1 STEEL PIPES OF NOMINAL BORE UP TO 150MM

Replace the clause with clause 3.9.2.2 unless otherwise specified on drawings or bill of quantities.

PSL 3.9.2.3 REPAIRS TO COATINGS AND LININGS

Replace the clause with the following:

FBMDPE, fusion-bonded epoxy coated and solvent free liquid epoxy lined or cement-mortar lined pipe shall be repaired as specified in this clause.

A. External Repairs**1. Detection of Defects in FBMDPE and Epoxy Coating by Holiday Tests**

Each pipe length shall first be placed on suitable dunnage adjacent to the trench. The Contractor shall then arrange for Holiday tests to be undertaken on the accessible portion of the pipe coating surface by the non-destructive testing firm appointed in terms of this contract document or the Employer's Representative's representative, whichever is applicable. It shall be a requirement of this contract that the Holiday testing device utilised by calibrated and approved by the Employer's Representative prior to the conducting of any Holiday tests.

2. Surface Preparation in accordance to specification PSL 3.9.7**a) Defects in epoxy coating detected by holiday testing**

At each pinhole detected by the Holiday test, the surrounding area shall be abraded to 25 mm beyond the defective area. It is noted that any cluster of pinholes within a radius of 25 mm shall be regarded as one defect. The abrasion shall be carried out with clean emery paper of 80 to 100 mesh so as to provide a suitably rough surface profile without causing the removal of excessive amounts of coating material.

b) Damage to FBMDPE and epoxy coating caused by welding, damage at joints and bends and damage at scour and air valve tees, crotch plates and buried valves to be surface prepared in accordance to specification PSL 3.9.7.**3. Cleaning of Area to be Repaired in accordance to specification PSL 3.9.7.****4. Methods of Repair to be Carried Out****a) Defects in epoxy coating detected by Holiday tests**

- i) The roughened area of coating and the defect shall be repaired by the application of a two part solventless epoxy repair kit (eg "Cupon Hycote 151", "Arc 982" or similar approved) to a minimum dry film thickness of 300, microns. The epoxy repair material shall be applied in accordance with the manufacturer's instructions and allowed to dry for 24 hours.
- ii) 24 Hours after the application of the epoxy repair material described above, the pipes may be placed in the trench and rotated so that the underside of the pipe, which was not Holiday tested at the side of the trench, may be tested.
- iii) The pipe coating any defects detected on the now uppermost surface of the pipe shall be prepared in accordance with the requirements of A.2(a) and A.3 above.

- iv) The prepared surface shall then be primed and patched in accordance to specification PSL 3.9.2.3.1 Making Good of Field Welded Joints, Repairs and Puddle Pipes.
- v) The dielectric resistance of the tape cover strip shall not be less than that of the FBMDPE (10 000 V) or fusion-bonded epoxy coating (3 500 V).
- b) Defects in FBMDPE and solvent free epoxy coating detected by Holiday tests

Where the repair area is less than 650 mm², the application of a hot spatula shall be used to repair the defect, provided there is a residual layer of polyethylene still adhering strongly to the steel surface.
- c) Defects in FBMDPE and solvent free epoxy coating other than those detected by Holiday tests

Any single repair area less than 0.1m² shall be carried out in accordance with A.4.b above. The number of repairs shall be limited to three per pipe or fitting. The length of such repair shall not exceed the nominal pipe diameter in the circumferential direction, nor twice the nominal pipe diameter in the longitudinal direction.
- d) Patch Repairs to Pipes Damaged by Welding

Patch repairs to pipes damaged by welding shall be carried out in accordance with the requirements of A.4.a(iv) and A.4.a(v) above.
- e) Patch Repairs to Pipes that will be Exposed to Ultra-Violet Light
 - i) Repairs shall be carried out in accordance with the requirements of A.4.a(i) above with due allowance being made for the 24-hour curing period.
 - ii) The pipe surface shall then be coated in accordance to specification PSL 3.9.8.5.
- f) Joint repairs (including bends) on pipes that are to be buried
 - i) Repairs shall be carried out in accordance with the requirements of A.4.a(iv) and A.4.a(v) above.
 - ii) No air-gap will be permitted between the tape and steel surface and tape width and application tension shall be such as to ensure that the tape “dresses down” over steel surface irregularities. This applies particularly on bell-end pipes.
 - iii) Gusseted bends requiring two or more welded joints shall be fully externally wrapped extending 150 mm outside the two outermost welded joints.
- g) Scour and air valve tees and crotch plates
 - i) Scour and air valve tees and crotch plates that are to be buried shall be protected in accordance with the requirements of A.4.a(i) above with due allowance being made for the 24-hour curing period.

B. Internal Repairs – Epoxy Lined Pipes

1. Detection of Defects in Epoxy Lining by Holiday tests

Each pipe length shall be first placed in position in the trench, welded to the preceding pipe and the lining at the joint reinstated (see B.2.b of this Clause). Once all work is complete in a particular length of pipe, the Contractor shall arrange for the testing of the pipe with a “wet sponge” detector set at 90 Volts in order to detect any electrical insulation defects.

2. Surface Preparation in accordance to specification PSL 3.9.7.

a) Defects in epoxy lining detected by holiday testing

At each pinhole detected by the Holiday test, the surrounding area shall be abraded to 25 mm beyond the defective area. It is to be noted that any cluster of pinholes within a radius of 25 mm shall be regarded as one defect. The abrasion shall be carried out with clean emery paper of 80 to 100 mesh so as to provide a suitably rough surface profile without causing the removal of excessive amounts of coating material.

b) Epoxy lining damaged by construction operations, joint repairs (including bends), lining to scour and air valve tees, access openings, stubs and valve bypasses

i) In order to avoid damage to the pipe lining occurring as a result of construction activities, all possible care shall be exercised during construction, the following procedures being required:

Wet sacking or rubber matting shall be placed on the pipe invert at areas where welding or flame cutting operations are in progress to prevent damage to coating from weld spatter or molten metal. This requirement shall be strictly enforced.

Foam shall be provided for the placing of tools etc on the internal pipe surface.

Soft-soled shoes shall be worn by all personnel working inside the pipe.

ii) All damaged and blistered epoxy lining shall be removed back to sound epoxy by mechanical grinding or other approved means.

3. Methods to Repair to be Carried Out

a) Defects in epoxy coating detected by Holiday tests

i) The roughened area of lining and the defect shall then be repaired by the application of a solvent free epoxy repair material (such as “Copon Hycote 151”, “Arc 982”, “Arc 855”, or similar approved) to a minimum dry thickness of 300 microns.

- A “halo” of 1 to 2 mm of the abraded material shall be left uncovered around the repair.
- The patch material shall be of a different colour to the pipe lining material.

ii) In the application of the epoxy the following shall be strictly in compliance with the manufacturer’s instructions:

- Method of application (type of brush or roller.)
 - Over coating time
 - Temperature range for application
 - Mix proportions of activator to base. This shall be strictly enforced, and splitting of manufacturer-supplied packs shall be allowed only if subsequent bending is carried out strictly by mass to the correct proportions.
 - Method of mixing base and activator.
 - Number of coats to achieve the specified thickness.
 - Safety aspects eg: eye and hand protection, ventilation, fire precautions, etc.
- iii) After the repair has been adequately cured, the repair and the surrounding 250 mm of epoxy lining shall be tested for electrical insulation defects. No defects will be permitted.
- b) Patch Repairs to Pipes Damaged by Construction Operations and Joint Repairs (including Bends)
- i) The roughened area of lining shall be repaired as described in B.3.a(i) above.
- ii) The requirements of Clauses B.3.a(ii) and (iii) above shall then be complied with.
- c) Lining to scour and air valve tees, access openings, stubs and valve bypasses
- i) The repair procedure shall be as described in B.3.a(i), (ii) and (iii) above.
- The epoxy repair material shall be applied to overlap the existing sound cement mortar lining by 25 mm at access openings, valve bypasses and scour tees.

The repair of EPOXY internal linings on manufactured pipe specials, welded joints where a flange has been welded to the pipe or where pipe specials have been welded to the pipe, the internal lining shall be repaired by means described above and with the relevant two part EPOXY repair kit, according to the manufacturer's specification, after suitable surface preparation of the steel surface in terms of Clause PSL 3.9.7.

C. Transition Zone Repair – Concrete Mortar Lining to Epoxy Lining

Add new Sub-Clause:

At transition zones, where for any specific reason the internal lining changes from cement mortar lining (CML) to an EPOXY lining at, for example, reducers, flanges, weld on flanges or fabricated specials which do not require cement mortar lining internally, the transition zone shall be specially prepared and reinstated with Epidermix 338 or similar approved.

The cement mortar lining shall be inspected for spalling, disbonding and or hair line cracks and any such portions of lining shall be removed in terms of this specification. Existing EPOXY in the transition zone shall be inspected for disbonding and should this be found the damaged EPOXY shall be ground down to bare metal.

The bare metal shall be degreased and grit blasted to specification (PSL 3.9.7).

Epidermix 338 shall be applied in the transition zone in such a manner that it starts as a thin layer of 1mm thick, over the EPOXY with an overlap of 10mm on to the Epoxy and feathered to the cement mortar lining in order to form a smooth transition.

PSL 3.9.2.3.1 Making Good of Field Welded Joints, Repairs and Puddle Pipes

Add new Sub-Clause:

This specification is based on “Denso” products. Alternative products may be accepted at the discretion of the Employer’s Representative. Once welding is complete and all weld splatter and burnt coatings have been removed, all welded pipe joints shall be prepared and wrapped in the following manner:

Surface Preparation

The bare metal shall be cleaned and wire brushed to St.2 standard and, if necessary, degreased with white spirit. The adjacent coating shall be cleaned to a minimum of 300mm either side of the joint.

Primer

The pipe barrel at the joint shall be degreased with white spirit and primed with “Denso Primer D” (or equal approved) extending 200mm onto sound coating. The primer shall cure for 30 minutes prior to the application of a tape system.

Profiling Tape

Apply 1,0mm x 75mm wide “Ultraflex sealing tape (yellow)” to the full circumference of the weld bead and steel interfaces. Care shall be taken to ensure a smooth profile and to avoid air bubbles being trapped beneath the tape. The tape shall not be stretched.

Tape System

Tape joint shall be wrapped with “Denso Ultraflex 1250/300 (Blue)” (or equal approved) (55% overlap) extending 150mm onto sound coating. Even tension shall be applied throughout the wrapping procedure and care shall be taken to prevent air bubbles from being trapped beneath the tape.

Repairs

Damaged pipe coating shall be repaired in the same manner with the repair extending at least 150mm either side beyond the edge of the damaged coating. “Spot” tape repairs will not be acceptable. Damage caused by the Contractor shall be repaired at the Contractor’s expense. Damage caused prior to the Contractor accepting responsibility for the pipes shall be repaired under this contract.

Puddle Pipes

All puddle pipes shall be primed and wrapped in accordance with the above procedure. The wrapping shall extend from (but shall not include) the puddle flange to 150mm beyond the concrete surface.

Hot- Dip Galvanizing

Hot-dipped galvanizing shall be done in accordance with the requirements of SANS 763 – 1977, as amended. On site fabrication processes such as welding, drilling, threading, etc. are to be avoided. All hot-dipped galvanized items shall be passivated immediately after hot dipping.

PSL 3.9.5 CORROSION PROTECTION TO BURIED JOINTS, COUPLINGS AND FLANGES

Delete the contents of the Sub-Clause and replace with the following:

All buried flanges and flexible joints shall, in addition to being epoxy/ thermoplastic powder/ Rilsan coated or fusion bonded epoxy coated, be protected as described below.

This specification is based on a "Denso" system. Alternative products will be subject to the approval of the Employer's Representative.

PSL 3.9.5.1 SURFACE PREPARATION

The entire joint area and at least 500mm of pipe either side of the joint shall be cleaned of mud and other deleterious matter.

PSL 3.9.5.2 PRIMER

The cleaned joint and pipe shall be primed with "Denso Priming Solution", or if moisture is present, "Denso S105 Paste". The priming shall extend to at least 400mm beyond either side of the joint.

PSL 3.9.5.3 MASTIC BLANKETS

Narrow strips cut from "Denso Mastic Blankets" shall be applied to the joint to achieve a smooth profile with a 50mm splayed fillet being formed at the joint/pipe interface. Care shall be taken, particularly at bolts, to avoid the formation of air pockets. Complete "Denso mastic Blankets" shall then be applied (mastic side down) to the joint until the joint is completely enveloped.

PSL 3.9.5.4 DENSO WRAPPING

The ends of the blanket shall be bound to the barrel of the pipe on each end with 100mm wide "Denso Petrolatum Tape". "Denso Petrolatum Tape" overlaps shall be 50mm and shall extend 100mm onto the blanket and 150mm onto the pipe barrel. All exposed bolts on flexible couplings and flanges adaptors to be wrapped.

PSL 3.9.5.5 POLYETHYLENE WRAPPING

The entire joint shall be wrapped with 350 micron polyethylene sheeting which shall end 400mm beyond the joint. The protective sheeting shall be secured to the pipe barrel and along the seam with 48mm wide "Denso Adhesive Tape" or similar approved.

PSL 3.9.7 PREPARATION AND CLEANING OF PIPE

Add new Sub-Clause:

PSL 3.9.7.1 PREPARATION OF PIPE

The following specifies the applicable method for preparation of all exposed steel surfaces for application of a repair for internal lining and/or external coating. This specification is applicable to all pipe steel surfaces which have been stripped of its corrosion protection layer, internally or externally, as a result of the manufacturing of specials, construction activities or pipe laying, welding and/or damages caused by handling or latent defects in application.

The surfaces of all pipes and specials to be lined and coated, irrespective of the lining and coating type used, shall be prepared in accordance with the following requirements:

- 1) All damaged and blistered lining and/ or coating caused by welding shall be removed back to sound lining or coating by mechanical grinding or other approved means.
- 2) The exposed steel surface shall be power or hand wire brushed to remove dirt, scale, rust and other foreign matter.
- 3) Weld splatter shall have been removed by chipping or grinding to a smooth surface flush with the surrounding steel.

- 4) Weld seams shall have a smooth contour, free from sharp edges, protrusions and undercuts.
- 5) Sharp edges and protrusions shall have been removed by grinding to a smooth radius of curvature of not less than 3mm.
- 6) The surrounding sound FBMDPE and epoxy surface shall be abraded beyond the defective area. The abrasion shall be carried out with clean emery paper of profile without causing the removal of excessive amounts of protective material.
- 7) All pipes for coating shall be in rust condition A to C of Swedish Standard SIS 05 5900. Pipes in rust condition D will be rejected.

PSL 3.9.7.2 CLEANING OF PIPE

PSL 3.9.7.2.1 Degreasing

Any bare metal surface shall be degreased in order to remove grease and oil from the pipe surface as a first step in the preparation process, before grit blasting and or power brushing starts. Degreasing shall be done with a non volatile solvent (e.g. "Aquasolve", "Chesterton Nr. 261 Safety Solvent Cleaner" or similar approved.) The surface shall then be cleaned with potable water and left to dry completely before the next step is taken.

PSL 3.9.7.2.2 Blast Cleaning

The surface of the pipe to be coated or lined shall be blast cleaned by centrifugal or air blast cleaning methods, then vacuum cleaned or blown off to achieve the following standards:

The profile produced by blast cleaning shall be angular and shall have an average peak to valley height of 60 to 100 microns, when tested in accordance with SANS method 772.

Hackles shall be removed with coarse abrasive paper. Residual dust and debris shall not exceed 0.2% when tested in accordance with SANS Method 769.

Any laminations revealed by blast cleaning shall be ground out and re-blast cleaned to meet the above requirements. If grinding penetrates the steel to a depth greater than 3.5% of the nominal wall thickness, the pipe shall be rejected.

The pipe surface shall not be contaminated by oil, grease or other harmful contaminant

PSL 3.9.7.2.3 Power Brush Cleaning – External Coating Repair

Power brushing of any bare metal surface shall take place after degreasing of the area as specified. The area that has been power brushed shall be free from rust, laitance, dust, oil or other deleterious matter before application of primer. Any areas in the region where power brushing took place shall be free from signs of disbonding of lining and or coating.

The surface finish, once power brushing has been completed shall conform to minimum St3 standard.

PSL 3.9.7.2.4 Handling of Cleaned Pipe

After cleaning, the pipe surface shall not be contaminated in any way. Operators shall wear clean gloves and all surfaces in contact with the pipe surface shall be clean and free from oil, grease, grit, dirt and other contamination.

PSL 3.9.7.2.5 Cut Back of Coated Pipe

The blast cleaned surface shall be stopped off or cut back by suitable masking which shall not contaminate the cleaned surface as follows:

- All pipes up to & including 200mm nominal diameter - 80mm from both ends of the pipe.

- All pipes from 250mm nominal diameter up to and including 500mm nominal diameter - 50mm from the belled end of the pipe and 50mm from the plain end of the pipe.
- All pipes 600mm nominal diameter and larger - 50mm from both ends of the pipe.
- The maximum cut-back shall be 100mm.

PSL 3.9.8 COATING AND LINING OF FABRICATED STEEL SPECIALS

Add new Sub-Clause:

All fabricated bends and specials supplied under this contract shall be coated and lined with an epoxy coating, thermoplastic powder coating or Rilsan coating for Steel Pipes and Specials.

The mating flange shall then receive one coat of rust inhibitor (Plascon Rustix 84 or equal approved). The flange profiling shall be clearly visible and no runs or drips will be permitted.

Following the coating and installation of the pipe, the coating is to be free from all electrical insulation defects.

PSL 3.9.8.1 THICKNESS OF COATING

The Target Thickness of lining and coating for pipes and pipe specials for solvent free epoxy lining and coatings shall be 600 microns (minimum 500 microns and maximum thickness 800 microns), and shall be free from sags and runs. Maximum dry film thickness per coat of 125 microns to 250 microns should be achieved.

The Target Thickness of lining and coating for pipes and pipe specials for fusion bonded lining and coatings shall be 400 microns (minimum 300 microns and maximum thickness 500 microns).

PSL 3.9.8.1.1 Corrosion Protection Coating and Linings for Steel Specials

The following table lists the materials and corrosion protection system to be applied to various components of the works:

| Environment | Material | Corrosion Protection System | Min DFT (µm) |
|--|-------------------------------|---|--------------|
| Pipe specials ≤ DN500 or ≤1500mm long | Mild Steel Grade X42 | Coating: Rilsan or Plascoat PPA 571 Aqua or similar approved Lining: Rilsan or Plascoat PPA 571 Aqua or similar approved | 300 |
| Pipe specials ≤ DN500 or >1500mm long | Mild Steel Grade X42 | Coating: Two Pack Epoxy Lining: Two Pack Epoxy | 500 |
| Pipe specials > DN500 or ≤1000 mm long | Mild Steel Grade X42 | Coating: Two Pack Epoxy Lining: Two Pack Epoxy | 500 |
| Pipe specials > DN500 or >1500mm long | Mild Steel Grade X42 | Coating: Two Pack Epoxy Lining: Two Pack Epoxy | 500 |
| Valves and Water Meters | To specific specifications | Fusion Bonded Epoxy (FBE) | 250 |

| Environment | Material | Corrosion Protection System | Min DFT (µm) |
|---|------------------|--|--------------|
| Flange adaptors and couplings | Low Carbon Steel | FBE or Two Pack Epoxy | 250 |
| Weld on flanges | Mild Steel | Two Pack Epoxy (excluding flange face) | 500 |
| Nuts, bolts and washers Anchor bolts | Mild Steel | Hot dipped galvanised carbon steel to SANS 1461 | 65 |
| Buried Bolted connections and couplings | | Petrolatum tape wrapping (Denso or similar approved) | N/A |

PSL 3.9.8.1.2 Solvent Free Epoxy and Lining

The requirements for a solvent free epoxy coating system are identical to the requirements for the solvent free epoxy lining system.

Pipes and fitting to be externally coated and internally lined with a two component cross linked epoxy that complies with the requirements of SABS 1217.

The cure rate of liquid epoxy coating is very dependent upon temperature, the rate of cure being very slow below 10°C and the reaction generally ceased below 5°C. Contractors tendering for this type of coating are therefore expected to have a heated shop or warm air blowers with suitable heat insulating tunnels to enable the temperature of the coating to be maintained at not less than 15°C from the time of application until full cure has taken place. Adverse weather conditions will not be accepted as a reason for delay in the programme or for solvent retention in multi-coat solvent borne systems.

The two components shall be thoroughly and completely mixed in the proportions specified by the manufacturer. Application shall be two component hot airless equipment or by single component airless equipment, as appropriate and as recommended by the material manufacturer. The coating shall be applied in a uniform manner and, when cured, shall comply with all the appropriate requirements of the specification.

When mixing two part epoxies, the base and activator shall be mixed in accordance with the manufacturer's specifications.

Mixing in the original container will only be permitted by means of methods that ensure full integration of different parts of the compound into a homogeneous compound with the characteristics as intended by the manufacturer.

The different parts of the compound shall not be diluted.

Mixing shall only be allowed with full batches and reduction of volumes from mixing packs by means of weight or volume measurement, which will result in smaller portions to be mixed, will not be allowed.

In the application of the epoxy the following shall be strictly in compliance with the manufacturer's instructions:

- Method of application (Type of Brush or roller.)
- Over coating time.
- Temperature range for application.
- Method of mixing base and activator.
- Number of coats to achieve the specified thickness.

- Safety aspects e.g. Eye and hand protection, ventilation, fire precautions, etc.
- Note that roller and brush applicators shall be replaced once the product application expiry time has been reached on any specific applicator tool.

Only solvent free Epoxy repair kits shall be utilized to repair the internal linings of the pipe line.

The specified thickness shall be achieved in one application for solvent free epoxies. In the event of the thickness being less than the minimum specified the coating shall be removed and the pipe length shall be re-blasted and re-coated to comply with the specification.

The Contractor's tendered rates for the laying of the pipe and fabrication of specials shall be deemed to include for all the Two Part Epoxy repairs that have to be applied in order to deliver a serviceable and acceptable pipe line.

PSL 3.9.8.3 THERMOPLASTIC POWDER COATING AND LINING

A thermoplastic powder coating and lining is to be used such as "Plascoat PPA 571 Aqua". The requirements for the "Plascoat PPA 571 Aqua" thermoplastic powder coating system are identical to the requirements for the thermoplastic powder lining system.

The preferred means of application of the coating and lining is by either Electrostatic Spray (ES) or Fluidised Bed Coating (FB) and Flame Spraying (FLS) to be used for field repairs.

Where pipe specials fitted with flanges are to be coated with "Plascoat PPA 571 Aqua" special methods shall be utilized to ensure that "Plascoat PPA 571 Aqua" is not applied to the flange face. Under no circumstances shall scraping or grinding of "Plascoat PPA 571 Aqua" on flange faces be allowed.

PSL 3.9.8.4 RILSAN COATING AND LINING

The requirements for the "Rilsan" or similar approved fusion bonded powder system are identical to the requirements for the "Rilsan" lining system. The surface preparation of the substrate, the application and curing of the product shall be in terms of the supplier's specifications and recommendations.

Where pipe specials fitted with flanges are to be coated with Rilsan, special methods shall be utilized to ensure that Rilsan is not applied to the flange face. Under no circumstances shall scraping or grinding of Rilsan on flange faces be allowed.

Repair work to Rilsan coated pipes and pipe specials shall be limited to the absolute minimum. Should Rilsan be affected by welding which in turn requires repairs to be effected, the Rilsan shall be removed by grinding up to a point where the Rilsan coating is sound and adheres to the pipe material without traces of disbonding, spalling or flaking.

The 25mm edge of Rilsan, onto which repair epoxy is to be applied, will be abraded with 80 or 100 grit emery paper to ensure adhesion of repair epoxy in the area. The bare metal, where repair epoxy has to be applied shall be grit blasted to render a surface finish of St2 before the application of the epoxy.

All steel pipes of nominal bore up to and including DN300, to be used for the manufacture of pipe specials and fittings, shall be coated and lined with Rilsan or similar approved.

PSL 3.9.8.5 PROTECTIVE UV COATING

All pipes and specials coated which are to be permanently exposed or above ground shall be over-coated with three or more coats of "Carboline, Carbothane 134 Clear Coat" or similar approved light coloured UV protection acrylic polyurethane resistant coating to a total minimum dry film thickness of 100 microns for UV protection. The pipe surface shall be prepared and the coating applied in strict accordance with the manufactures instructions or

shall be protected with the “Denso Acrylic Pipeline Tape (Steelcoat 500)” system or similar approved UV Resistant coating. The pipe surface shall be prepared and the coating applied in strict accordance with the manufacturer’s instructions.

PSL 3.9.9 REQUIREMENTS OF COATINGS AND LININGS

Add new Sub-Clause:

PSL 3.9.9.1 REQUIREMENTS OF SOLVENT FREE EPOXY LININGS AND COATINGS

PSL 3.9.9.1.1 PERFORMANCE CRITERIA

Applied coatings and linings shall comply with all the requirements given in Table 1 below:

Table 1: Requirements of Solvent Free Epoxy

| TEST | PROPERTY | REQUIREMENT | TEST METHOD |
|----------|---|--|--|
| 1 | Visual | Smooth glossy or semi glossy finish, free from excessive runs, sags, orange peel, occlusions or other visible defects. | Use an experienced observer. |
| 2 | Coating Thickness | Refer to PSL 3.9.8.1 | SANS Method 141. Take a minimum of 2 readings per m ² of surface up to 300mm nominal bore, or 1 per m ² over 300mm nominal bore. |
| 3 | Electrical Insulation Defects | <u>Solvent-free</u> : Nil defects at 90 Volts, 10 Mega-ohm. | SANS 1217, Section 8.12.1 |
| 4 | Impact Resistance | No defect at 1 Joules | SANS 1217, Section 8.7 but modified as given in Note 1. |
| 5a 5b | Degree of cure: Static Test Dynamic Test | No softening or discolouration when fully cured. No softening or discolouration when fully cured. | SANS 1217, Section 8.9. Cure time shall be in accordance with the manufacturer’s data. 50 Double rubs with cotton wool swab soaked in MEK. Cure time shall be in accordance with the manufacturer’s data. |
| 6 | Adhesion (Hot water soak) | Not more than 15mm disbonding from point of V. | Immerse in water at 75°C for 48 hrs. Make V cut at 30° angle. Test adhesion when panel has cooled to 25°C. |
| 7 | Cathodic Disbonding | Total disbonded area not to exceed 40mm diameter after 30 days. Current flow not to exceed 5mA. | ASTM G8 Method B - Magnesium Anode - 20°C - 7mm holiday. |
| 8 | Cathodic Disbonding (Accelerated) | Total disbonded area (including holiday) not to exceed 20mm diameter. | Impressed current - 3,5 volts potential at 75°C for 48 hrs. 3mm artificial holiday. |

NOTE 1: Impact resistance shall be carried out on a sample of production pipe firmly clamped and choked (to be rebound free) to a rigid base. No electrical insulation defects shall be detected at the point of impact when tested at 1 Joule.

PSL 3.9.9.2 REQUIREMENTS OF FUSION BONDED AND THERMOPLASTIC POWDER LININGS AND COATINGS

PSL 3.9.9.2.1 PERFORMANCE CRITERIA

Applied coatings and linings shall comply with all the requirements given in Table 2 below:

Table 2: Requirements of Fusion Bonded and Thermoplastic Powered

| TEST | PROPERTY | REQUIREMENT | TEST METHOD |
|----------|--|--|--|
| 1 | Visual | Smooth glossy or semi-glossy finish, free from excessive runs, sags, orange peel, occlusions or other visible defects | Use an experienced observer. |
| 2 | Coating Thickness | Refer to PSL 3.9.8.1 | SANS Method 141. Take a minimum of 2 readings per m ² of surface up to 300mm nominal bore, or 1 per m ² over 300mm nominal bore. |
| 3 | Electrical Insulation Defects | Nil defects at 3 500 volts. For conditions for repair see Clause 3.9.2.3 | SANS 1217, Section 8.12.2 |
| 4 | Impact Resistance | No defect at 2 Joules | SANS 1217, Section 8.7 but modified as given in Note 2. |
| 5a 5b | Degree of cure: a) Static Test b) Dynamic test c) Thermal characteristics | No softening or discolouration when fully cured. No softening or discolouration when fully cured. Chemical conversion shall be not less than 90% | SANS 1217, Section 8.9. Cure time shall be in accordance with the manufacturer's data. 50 Double rubs with cotton wool swab soaked in MEK. Cure time shall be in accordance with the manufacturer's data. |
| 6 | Adhesion (Hot water soak) | Not more than 5mm disbonding from point of V. | Immerse in water at 75°C for 48 hrs. Make V cut at 30° angle. Test adhesion when panel has cooled to 25°C. |
| 7 | Cathodic Disbonding | Total disbonded area not to exceed 40mm diameter after 30 days. Current flow not to exceed 5mA. | ASTM G8 Method B - Magnesium Anode - 20°C - 7mm holiday. |
| 8 | Cathodic Disbonding (Accelerated) | Total disbonded area (including holiday) not to exceed 10mm diameter. | Impressed current - 3,5 volts potential at 75°C for 48 hrs. 3mm artificial holiday. |

NOTE 2: Impact resistance shall be carried out on a production pipe. The inside of the pipe shall be supported by a wooden block fitted vertically across the internal pipe diameter and chocked so as to fit tightly and immediately beneath the point of impact. Damage to the coating shall be assessed by measuring electrical insulation defects at the point of impact. No defect is permitted after impact at 2 joules. Alternatively, the test may be carried out on a sample cut from the pipe and rigidly supported beneath the point of impact.

PSL 3.9.9.3 FREQUENCY OF TESTING

Tests 1 to 3 of TABLE 1 shall be applied to each and every pipe or pipe special.

Tests 4, 5(a) and 5(b) of TABLE 1 shall be applied to at least one pipe selected at random from the first day's production or from each batch of liquid epoxy, whichever is more frequent.

Tests 6, 7 and 8 of TABLE 1 shall be applied to at least one pipe or pipe special selected at random from the first day's production of each item.

Should the Contractor experience difficulties in achieving this specification, additional tests may be required by the Employer until the problem(s) has been identified and rectified.

Such additional tests shall be to the Contractor's account.

PSL 3.10 VALVES

Add the following to end of the Sub-Clause:

All valves DN600 and less shall be wedge gate or resilient seal valves constructed to SANS 664 and shall bear the SABS mark of type "AVK" / "VAG" or equal approved. All manufacturers must be in compliance and SANS 9001 / ISO 9001 accredited.

Valves of size DN350 and larger shall to be supplied complete with gearboxes. All Valves shall be non-rising spindle and anti-clockwise closing when the spindle is viewed from above and supplied with cap tops unless otherwise specified on the drawings or bill of quantities. All valves where the cap top is buried deeper than 0.5 m shall have a spindle extension installed with the valve unless otherwise directed by the Employer's Representative. All spindle extensions shall be hot dipped galvanised to SANS 121:2000/ ISO 1461:2009.

Dimensions of flanged valves shall be in accordance to SANS 664-1: 2011 edition 1.1, Table 1, column 2, short pattern only for face to face dimensions.

The minimum strength torque (MST) for valves of DN 50 up to DN 400 shall not be less than 180Nm.

Types of valves required in the works shall be as stated in the schedule of quantities and on the drawings. Where a particular make of valve is stated the contractor may offer an equivalent alternative, provided full details are submitted at the time of tender.

PSL 4 PLANT

PSL 4.1 HANDLING AND RIGGING

Add the following to L 4.1:

The Contractor shall supply, operate and maintain an adequate fleet of vehicles including cranes to be used for the safe conveyance of the pipes, specials and fittings. The pipes and specials shall be handled with care at all times to avoid damage to them or to the protective coatings. The equipment for the purpose of loading, transporting, unloading and moving and the manner in which they are handled shall be subject to the approval of the Employer's Representative.

During transport, the pipes and specials shall be supported on suitable pipe saddles such that all pipes and specials shall be separated so as not to bear against each other and shall be handled with care at all times to avoid damage to them or to the protective coatings. The equipment for the purpose of loading, transporting, unloading and moving and the manner in which they are handled shall be subject to the approval of the Employer's Representative.

The use of bare cables, chains, hooks or narrow skids will not be permitted and the Contractor shall supply canvas slings and padded skids and ramps of a sufficient width to prevent damage to the protective coating. The dragging or skidding of pipes and specials in contact with the ground shall not be permitted.

When handling 12m pipe lengths the pipes shall be lifted with band slings (minimum 300 mm wide) placed centrally around pipe at two points 6 metres apart.

PSL 5 CONSTRUCTION

PSL 5.1 LAYING**PSL 5.1.1 GENERAL**

Add the following to L 5.1.1:

The Contractor will be held fully responsible for the care and safety of all pipes and fittings, etc, on site, and shall bear the cost of all renewals, which may be necessary to make good losses, damages or breakages. Furthermore, he shall be fully responsible for handling and re-loading material at the storage areas and for transporting and offloading of all such materials to the Site of the Works."

Pipes and specials shall be lowered gently and carefully into the trench without jarring or bumping by crane, derrick or other approved lifting tackle and care shall be taken not to damage the pipe or its sheathing. Pipes and specials with soft sheathing shall be supported in stout wide canvas slings and no wooden blocks shall be used to support such pipes, either on the side or in the trench. Any supports required shall be formed with fine sand gravel.

The Contractor shall ensure that all pipe barrels are evenly supported over the whole of their length and that no weight is taken by the joints. The trench bottom, shall, where necessary, be accurately trimmed by hand and each pipe shall be firmly bedded down before backfilling is commenced.

The Contractor's special attention is drawn to the requirements for detailed fabrication drawings, working in confined spaces and for shoring of trenches.

PSL 5.1.1.1 Pipelaying Personnel

Add new Sub-Clause

The laying of all pipework items shall be performed only by qualified and experienced persons or who are registered as artisans in the plumbing, pipefitting or drain laying trades or who are qualified by reason of having attended and passed the course on pipelaying of the Civil Engineering Industry Training Board."

PSL 5.1.2 Damage

Add the following to L 5.1.2:

All pipes, specials, valves and fittings shall be carefully examined by the Contractor for internal and external damage at the following stages:

- 1) on arrival at laying site;
- 2) prior to laying;
- 3) after laying;
- 4) prior to backfilling; and
- 5) during backfilling.

All damage or defects of any kind shall be repaired by the Contractor and to the satisfaction of the Employer's Representative or an appointed third party inspection authority immediately after detection at any of the above inspections.

Where, in the opinion of the Employer's Representative, satisfactory repairs are not practicable, the damaged materials shall be replaced by the Contractor at his own cost.

PSL 5.1.3 Keeping Pipelines Clean

Add the following:

Stacking of Pipes and Specials

All pipes and specials shall be neatly and methodically arranged on the ground on delivery, as directed by the Employer's Representative. They shall be segregated according to meter assembly installation per reservoir site and separated in such a way that pipe specials can be located from the stacked position for transportation to its laying position without necessity of moving other pipes.

PSL 5.1.3.2 Cleaning of Valves and Fittings

Add new Sub-Clause:

All flanges, valves, fittings and equipment are to be installed in pipe work only after they have been thoroughly cleaned. Flange faces shall be checked for damage before being incorporated into the permanent works and any damage shall be reported to the Employer's Representative.

PSL 5.1.4 Depth and Cover

Add the following to L 5.1.4.2:

The minimum cover to finished surface over water mains shall be at least 1200 mm in trafficked areas and at least 800 mm elsewhere.

A minimum cover of 100mm over the valve cap. The cover to top of valve cap shall be a minimum of 300mm and shall not be increased above the minimum by more than 200mm without the approval of the Employers Agent.

PSL 5.1.6 Marker Posts

Add new Sub-Clause:

Pre-cast concrete marker posts shall be installed on either side of the meter assembly as well as above the buried meter and where otherwise indicated by the Employer's Representative.

The standard marker post rate shall include the supply and erection of painted, inscribed posts. The rate shall be inclusive of erection and shall include for all necessary excavation, mass concrete footing and formwork.

PSL 5.2 JOINTING METHODS

PSL 5.2.2 Flanges (Steel Pipelines)

Add the following to L 5.2.2:

Before being brought together, the ends of the pipes, fittings, couplings and all flanges are to be inspected and cleaned to ensure that all parts forming the joint are undamaged and clean.

Flanges to fittings or joints will generally be to SABS 1123. It is possible, however, that the Employer may supply valves with flanges which have not been drilled according to these standards. The Contractor shall be responsible for checking the flange drilling of all fittings supplied by the Employer and for supplying flanges drilled to match. Contractors are to note that generally matching flanges or jointing material to gate and butterfly valves are supplied by the Employer but not always. No additional payment is to be made for this work and the Contractor is to allow for such in his rates.

Contractors are to allow in the rates for the supply and installation of mild steel pressed washers (two per bolt) for all flanged fittings. The washers shall have an ID of 2 mm greater

than that of the bolt. Tenderers are to ensure that the length of the bolt includes allowance for the washers.

All bolts, nuts and washers to be in accordance to PSL 3.8.8.

Wherever loose or slip on flanges are welded onto pipelines, the Contractor shall ensure that the flange is lined and coated to project specifications and that all repairs to the lining and coating are in accordance to the project specification.

PSL 5.2.3 Welding (Steel Pipelines of Diameter 600 mm or greater)

Delete the title and replace with "Welding (Steel Pipelines)."

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

The only site welds that shall be permitted will be for welding of flanges to existing cut pipes as per the drawings.

The pipe ends are to be prepared in accordance with with the relevant requirements of the latest version of API 1104.

Site-welded butt joints are to tested by radiographic examination and/or other approved method (e.g. dye penetration) as ordered by the Employer's Representative who will also make the necessary arrangements for such tests to be carried out.

Site welded fillet joints (for sleeved or "bell-end" pipes) are to be tested by dye penetration tests as ordered by the Employer's Representative who will make the necessary arrangements for such tests to be carried out.

In the event of any welded joint proving unsatisfactory when the pipeline is subjected to the radiographic, dye penetration or hydraulic tests, the Contractor shall be held responsible for all costs involved in repairing the joint or cutting it out and welding in a new section of pipe, as may be ordered by the Employer's Representative, thereafter restoring the lining and wrapping, if these have become damaged, all to the satisfaction of the Employer's Representative.

After jointing and testing, the protective lining and wrappings are to be rendered continuous in the manner specified. Holiday detection tests shall be carried out in the field to ensure continuity of lining and wrapping.

PSL 5.2.3.1 Procedure Qualification Tests

Add new Sub-Clause:

The qualification tests for welding procedure shall be carried out generally in accordance with the requirements of API 1104: The detailed procedure to be adopted during manufacture shall be established. Prior to commencement of welding, the current qualification of each welder must be produced in accordance with the welding procedure. Should constant repairs be required on welds carried out by one particular welder, the Employer's Representative may request that the welder be re-tested or removed from the project.

The Contractor shall maintain a record of all welders employed on the works giving particulars of each individual welder's qualification tests carried out in terms of API 1104, the cost of which shall be borne by the Contractor. Qualification testing of welders shall be conducted in the presence of the Employer's Representative or his representative.

Before a welder is employed on tack or root welds, he shall carry out a test tack and root weld on a pipe of the same materials and under conditions as close as possible to those experienced on the actual pipeline.

The tests are to be carried out either before manufacture of the pipes to be supplied under this contract is commenced or before the manufacture of pipes in excess of a number previously agreed by the Employer's Representative is carried out.

The coupon plates shall be prepared either from plates of the same material as the pipe and welded in a similar manner to that to be used during production, or by cutting suitable specimens from a pipe selected at random by the Employer's Representative from the first production pipes. The coupon plate for the tensile weld test and those for the guided cold bend tests shall be prepared in accordance with the requirements of SABS 719.

The qualification tests shall be considered satisfactory if:

- 1) The weld has a joint efficiency greater than 95% of the minimum specified tensile strength of the parent metal and,
- 2) the bend test specimens are capable of being bent around a former with a diameter equal to six times the nominal thickness of the plate to an angle of 180 degrees without developing a crack, except at the arises of the specimen, of length or width greater than 3 mm.

Failure to pass the above qualification tests shall result in the rejection of any pipes welded with the procedure used and the preparation of a new qualification of procedure test.

Any changes in the electrode case type used or change of flux used shall require a qualification test before approval of the procedure is granted.

PSL 5.2.3.2 Welding Procedure

Add new Sub-Clause:

All welding shall conform to the approved welding procedures, which must be submitted to the Employer's representative for approval.

The minimum number of root bead welds, the minimum number of second bead welders and the type of clamp used (internal or external) shall be given in the description of the welding technique as specified above.

All welding procedures shall incorporate the power brushing of all welds after having deposited each and every layer. It is a condition of this specification that each and every weld run be power brushed before the next run is deposited.

Welding shall not be performed under conditions that could affect the quality of the welded joint (e.g. high moisture or windy conditions). Wind and rain shields may be used where practical.

PSL 5.2.3.3 Clearance

Add new Sub-Clause:

The minimum clearance around the pipe during welding shall be 600mm. When welding in the trench, "fox holes" will be required to provide adequate working space for the welders.

PSL 5.2.3.4 Visual Inspection

Add new Sub-Clause:

100% of each joint will be examined and the following criteria met:

All welds shall be substantially uniform in appearance with the inner and outer weld beads not exceeding 1 mm and 3 mm respectively in height above the pipe surface.

The weld, heat affected zone and surrounding parent metal shall be free from cracks, porosity and trapped slag.

All weld splatter must be removed prior to the application of corrosion protection.

PSL 5.2.3.5 Preparation of Joint

Where scarf cutting of the pipe ends is required in the field the pipe ends shall be prepared by machining or machine flame cutting. Hand flame cutting shall not be permitted except under the following circumstances;

PSL 5.2.3.5.1 Field Welding

Steel pipes may be cut by hand flame as follows:

- 1) In the case of cement lined steel pipe, the cement lining shall be chipped back 50 mm after the initial cut and the pipe then re-cut ± 10 mm from the original cut in order to remove any "blow-back".
- 2) In the case of epoxy lined steel pipe, all damaged lining shall be removed and reinstated in compliance with the Clause 3.9.2.3.
- 3) All flame cuts shall be made good by grinding to form the correct gap between steel sections prior to welding.
- 4) Bevels may be cut by flame provided they are made good by grinding.

When jointing pieces by butt-welding the number of tack welds applied shall be kept to a minimum to be effective in holding the pipe ends securely and to maintain the required root gap prior to welding, but shall in any case be not less than four.

PSL 5.2.3.6 Welded Attachments

Add new Sub-Clause:

Where it is necessary to weld attachments to pipe work (e.g. Cathodic Protection Lugs and Pipe Support Brackets and Trunnions) the material of the attachment is to be compatible with the pipe work and be welded on by an approved welder using approved welding procedures.

Welded attachments onto pipe work are to be subjected to the same level of NDT as the pipe work.

PSL 5.2.3.7 Quality Control

Add new Sub-Clause:

Records of which welds were carried out by each individual welder as well as the respective results of non-destructive testing shall be submitted to the Employer's Representative at each monthly site meeting. Should there be repetitive or serious welding defects, this information shall be forwarded to the Employer's Representative immediately.

Each weld and welder shall be given a unique number which shall be logged against each weld. This data will be used for reference on construction records, drawings, reports, radiographs and NDT records.

PSL 5.3 SETTING OF VALVES, SPECIALS AND FITTINGS

Add the following:

Valves and fittings shall be installed in accordance with the manufacturer's instructions. Where valves are supplied by the Employer at Municipal depots they shall be collected by the Contractor at such depots and transported to the laying site.

Valves are to be set correctly in the positions indicated and supported on concrete stools, except where not so required by the Employer's Representative and shall be installed with their operating spindles vertical. Valve spindle guide brackets and stays where provided shall be secured into position against concrete work and these must be set and carefully adjusted in order to give true vertical alignment of the spindle. The Contractor shall supply the insertions and bolts necessary for the installation of the valves.

PSL 5.3.1 The Storage, Commissioning and Installation of Butterfly Valves

Add new Sub-Clause:

Butterfly valves shall be stored, installed and commissioned so that the valve blade seal is protected at all times from oxidation, ozone attack and the ingress of dirt. All butterfly valves are to be installed such that the disc is installed horizontal to the flow direction with the hand wheel on the right hand side of the flow direction.

PSL 5.3.2 Storage

Add new Sub-Clause:

- The valve is to be stored in the vertical position.
- The valve should be stored in the cracked position (i.e. not shut).
- The valve should not be stored in the vicinity of electrical equipment.
- The valve should be stored under cover and protected from temperature extremes.

PSL 5.3.3 Installation and Commissioning

Add new Sub-Clause:

- Prior to the installation of the valve, all dust and dirt should be washed off the valve, particularly the seal, seat and any tapped holes in the valve body.
- The seals of all valves shall be checked for complete closure when the valve blade is in the fully closed position. (See seal adjustment below).
- The valve must not be lifted by the hand lever, valve actuator or the handwheel.
- The valve must not be used for lining up the pipework.
- The valve should be left in the fully open position after installation and prior to commissioning of the system.
- The valve is to be installed such that the disc opens in the direction of flow and is horizontal to flow.
- The valve is to be installed such that the hand wheel is on the right-hand side of the pipeline in the direction of flow.

PSL 5.3.4 Seal Adjustment

Add new Sub-Clause:

To adjust the seal, a 0,004" feeler gauge and an Allen key are required.

With the valve in the fully closed position, it should be possible only with difficulty to introduce the feeler gauge between the valve blade seal and the seat.

If, due to seal movement during storage the feeler gauge can easily pass between the seal and seat, then the clamp ring socket head cap screws in the vicinity of the gap should be finger tightened with the Allen key so as to push the seal out and close the gap.

PSL 5.3.1.4 Payment

All costs incurred for the seal adjustment as stipulated above shall be included in the respective rates for installation of the valves.

PSL 5.5 ANCHOR/THRUST BLOCKS AND PEDESTALS

In the fourth line of the Sub-Clause delete "15 MPa/37,5 mm" and replace with "20/19"

PSL 7 TESTING

PSL 7.1 GENERAL

Add the following to L 7.1:

Inspection

Facilities shall be provided to the Employer's Representative so that he may be able to inspect, during the process of welding, any layer of weld metal. He may require any defective welds either to be cut out and re-welded or repaired at his discretion. The Contractor shall clean thoroughly all welds prior to inspection. The Employer's Representative may require a number of completed joints, selected at random, to be cut for mechanical tests or to be selected for visual inspection, micro examination or examination by other means. When the Employer's Representative orders the Contractor in writing to cut out and test joints the Contractor shall be paid for such work at day work rates.

If as a result of inspection and testing, the work of any welder is found to be unsatisfactory, the welder shall not be permitted to continue welding under this contract.

Standards of Acceptability

The completed welds shall comply with the requirements of Clause 6.0 of API 1104. Work on which unauthorised repairs have been carried out may be rejected.

Repairs to Minor Faults

Faulty welds shall be rectified in accordance with clause 7.0 of API 1104.

All costs relative to the repair of faulty joints, including removal and replacement of the backfill and making good the wrapping and lining shall be borne by the Contractor.

PSL 7.2 INITIAL TESTS ON WELDED STEEL PIPES

PSL 7.2.1 DYE-PENETRANT TEST

Add the following to L 7.2.1:

100% of all fillet welds and other welds shall be dye penetrant tested. Any reduction in the percentage of welds to be tested shall be at the sole discretion of the Employer's Representative

PSL 7.2.2 RADIOGRAPHIC EXAMINATION

Add the following to L 7.2.2:

100% of all butt welds shall be radiographically tested. Any reduction in the percentage of welds to be tested shall be at the sole discretion of the Employer's Representative.

PSL 7.3 STANDARD HYDRAULIC PIPE TEST

PSL 7.3.1 TEST PRESSURE AND TIME OF TEST

Replace L 7.3.1.1, 7.3.1.2, 7.3.1.3 and 7.3.1.4 with the following:

Pressure Test

The Contractor shall include in his rates for the installation of pipes, fittings and specials, the cost of carrying out pressure tests.

On successful completion of the meter assembly installation, the Contractor is to recharge the pipeline to maximum static working pressure for gravity pipelines and working pressure for pumping pipelines. The duration of this test shall be for 24 hours with zero leakage. The Contractor is to advise the Employer's Representative in writing of all defects encountered or any visible leaks identified.

All tests shall be carried out in the presence of the Employer's Representative at such times and in such manner as he may direct.

The Contractor shall make all necessary temporary anchorage arrangements where structural concrete is required such as thrust anchor blocks etc to ensure that the associated structural concrete has cured for 28 days or until such concrete has attained the specified design strength.

PSL 7.4 TESTS ON EPOXY COATINGS

Add the following to L 7.4:

Wet sponge test of SFE lining.

The Employer on submission of the originals of the test results and respective invoices to the Employer's Representative will reimburse the Contractor for the cost of all successful tests.

Holiday testing of the tape wrapping and epoxy coating of the pipeline shall be carried out on site by the Contractor. However, at the Employer's Representative's discretion, quotations may be called for holiday testing of the epoxy coating of the pipeline for quality assurance purposes, from a reputable non-destructive testing firm.

- 1) Notwithstanding the requirements of any other specification contained in or referred to in this document, the holiday testing of the epoxy coating shall be performed with the apparatus set at 10 000V for FBMDPE coating and 3500V for FBE and SFE coating.
- 2) The holiday testing of the tape wrap system shall be performed with the apparatus set at 3 500V.

PSL 7.5 FITTINGS AND SPECIALS

Add new Sub-Clause:

PSL 7.5.1 RADIOGRAPHIC EXAMINATION OF SHOP WELDS

The Contractor shall include in his prices for the supply of pipes, fittings and specials, the cost of carrying out, under the supervision of the inspector appointed by the Employer, examination of shop welds on the following basis:

- ONE HUNDRED percent radiographic examination of all weld deposited manually or semi-automatically in fittings and specials which cannot be hydraulically tested prior to the fittings and specials being installed in the pipeline.

The Employer's Representative shall in all cases determine which welds are to be radiographed on the quantity basis specified above. All radiographs and records thereof made by the Contractor shall be made available to the Employer's Representative to enable him to determine whether the welds are acceptable or not and no lining or wrapping of pipes shall be permitted until the welds have been accepted by the Employer's Representative. To avoid unnecessary delay, at the option of the manufacturer, radiographs may be approved by the manufacturer's inspectors subject to them being subsequently approved by the Employer's Representative.

When a section of the weld is shown by radiography to be unacceptable and if the limits of the deficient weld are not defined by the radiograph, additional radiography shall be carried out at the Contractor's expense until the limits of the deficiency are determined.

Repairs shall be made to defective welds at the Contractor's expense. All repair welds shall be identified with a stamp marking, indicating which welder conducted the repair. Repaired welds shall be radiographed at the Contractor's expense but after any repair welder has had ten consecutive repairs approved, the extent of the radiography of the repairs conducted by the welder may be decreased by agreement between the Employer's Representative and the Contractor.

PSL 7.5.2 COATING AND LINING TESTS

Add new Sub-Clause:

Refer to Tables of PSL 3.9.9.

PSL 8 MEASUREMENT AND PAYMENT

PSL 8.2 SCHEDULED ITEMS

PSL 8.2.1 SUPPLY, LAY AND BED PIPES COMPLETE WITH COUPLINGS

Add to Sub-Clause:

The rates tendered shall cover the cost for supplying, manufacturing, off-loading, handling, installing, laying, bedding, supporting, non-destructive testing, jointing, cutting, welding of joints and all internal lining and external coatings, coating and lining repairs and field wrapping to specifications and all connectors, bolts, nuts, washers, gaskets etc.

PSL 8.2.2 EXTRA-OVER 8.2.1 FOR THE SUPPLYING, LAYING AND BEDDING OF IN-LINE SPECIALS

Add to Sub-Clause:

The rates tendered for the fabricating and installation of in-line pipe specials, shall cover the cost for supplying, manufacturing, off-loading, handling, installing, laying, bedding, supporting, non-destructive testing, jointing, cutting, welding of joints, welding specials into position where required and all internal lining and external coatings, coating and lining repairs and field wrapping to specifications where required for:

- 1) In-Line Tees
- 2) In-Line Reducers
- 3) In-Line Elbows and Bends
- 4) In-Line Flanges
- 5) Bull Noses

- 6) Segmented Bends
- 7) Slip on flanges
- 8) Other In-Line Specials such as spacers, spool pieces, etc. as specified.

The rate will also be inclusive of gaskets, fasteners, washers, bolts, nuts, painting and field wrapping of joints.

All fabricated pipe specials to be marked with item numbers which correspond to test certificates. All items to be supplied with quality control documentation.

PSL 8.2.5 SUPPLY AND INSTALLATION OF OTHER SPECIALS

PSL 8.2.5.1 SUPPLY OF OTHER SPECIALS

Delete the Sub-Clause and replace with the following:

The rate shall cover the cost of fabrication, supply, handling, uplifting and transporting to Contractor's store, storage, cutting and welding, gaskets, fasteners, washers, bolts, nuts, marking, NDT inspections, all internal lining and external coatings to specifications.

All fabricated pipe specials to be marked with item numbers which correspondent to test certificates. All items to be supplied with quality control documentation.

Unit: No

PSL 8.2.5.2 INSTALLATION OF OTHER SPECIALS

The rate shall cover the cost of installation, including handling, uplifting and transporting from Contractor's store to site, installing, laying, bedding, supporting, jointing, coating and lining repairs and field wrapping of joints to specifications.

Unit: No

PSL 8.2.11 ANCHOR BLOCKS/THRUST BLOCKS AND PEDESTALS

Add the following:

The tendered rates shall cover the cost of formwork, concrete, reinforcement (if any), and screeding to top surfaces.

The tendered rate shall also include the wrapping of uPVC pipes and fittings with Densopol 80 or a similar approved material where the pipes and fittings come into contact with concrete.

Unit: m³

PSL 8.2.16 PIPELINE MARKER POSTS

Add new Sub-Clause:

The rate shall cover the cost of transporting to site, handling, excavation, installation, 300mm x 300mm x 300mm concrete surround, backfilling and painting. Valve Markers to have letter "V" and Water Meters Markers to have letter "M" embossed 5mm deep.

Unit: No

PSL 8.2.17 CUTTING INTO EXISTING STEEL PIPELINE

Add new Sub-Clause:

The rate shall cover the cost of the cutting of the existing steel pipe, end preparation and making good of lining and coating.

The rate shall also cover preventing deformation of the ovality of the existing pipe once cut. All temporary or permanent supports are deemed to be inclusive in the rate for cutting of existing steel pipe.

The rate shall allow for everything necessary to carry out the removal of existing pipes and installation of new connections to following existing pipes. Rates are to include for: carefully exposing the existing pipelines, making arrangements with eThekwini's staff to temporarily shut of water on the existing pipelines to facilitate making the connection, cleaning pipelines, preparing the pipes for cutting, cutting pipes, dealing with all water (including that from leakages), preparing the pipe end for pipe jointing/welding and connecting the new pipework, making good internal lining and external coatings, recommissioning the pipeline and including all temporary supports, bedding and backfilling.

Loading and transporting removed sections to eThekwini water depot at Electron road, Springfield is covered elsewhere. The whole installation is to be completed within 8 hours. (All new pipes, valves and fittings required are measured elsewhere).

Unit: No

PSL 8.2.18 CUTTING AND CONNECTING TO EXISTING AC PIPELINE

Add new Sub-Clause:

The rate shall cover the cost of the cutting of the existing pipe and end preparation in accordance to Construction Regulations, 2014, Asbestos Regulations, 2001 and Environmental Management Plan, PEM 5.11 Hazardous Waste bound in the Document.

Allow for everything necessary to carry out the removal of existing pipes and installation of new connections to following existing pipes: Rates are to include for carefully exposing the existing pipelines, making arrangements with eThekwini's staff to temporarily shut of water on the existing pipelines to facilitate making the connection, cleaning pipelines, preparing the pipes for cutting, cutting pipes, dealing with all water (including that from leakages), preparing the pipe end for pipe jointing/welding and connecting the new pipework, making good internal lining and external coatings, recommissioning the pipeline and including all temporary supports, bedding and backfilling.

Loading and transporting removed sections to eThekwini water depot at Electron road, Springfield is covered elsewhere. The whole installation is to be completed within 8 hours. (All new pipes, valves and fittings required are measured elsewhere).

No cutting of existing pipelines will be allowed closer than 1 meter from an existing joint or coupling unless new meter assembly pipework replaces the joint completely.

Unit: No

PSL 8.2.19 CUTTING INTO EXISTING PVC OR GRP PIPELINE

Add new Sub-Clause:

The rate shall cover the cost of the cutting of the existing and end preparation.

The rate shall allow for everything necessary to carry out the removal of existing pipes and installation of new connections to following existing pipes. Rates are to include for: carefully exposing the existing pipelines, making arrangements with eThekwini's staff to temporarily shut of water on the existing pipelines to facilitate making the connection, cleaning pipelines, preparing the pipes for cutting, cutting pipes, dealing with all water (including that from

leakages), preparing the pipe end for pipe jointing/welding and connecting the new pipework, making good internal lining and external coatings, recommissioning the pipeline and including all temporary supports, bedding and backfilling.

Loading and transporting removed sections to eThekweni water depot at Electron road, Springfield is covered elsewhere. The whole installation is to be completed within 8 hours. (All new pipes, valves and fittings required are measured elsewhere).

No cutting of existing pipelines will be allowed closer than 1 meter from an existing joint or coupling unless new meter assembly pipework replaces the joint completely.

Unit: No

PSL 8.2.20 SIGNBOARDS

Add new Sub-Clause:

The tendered rates shall include for full compensation for:

- 1) Collection the sign boards in batches of 100;
- 2) Erecting the sign boards 72 hours prior to the shut;
- 3) Removal of sign boards no later than 24 hours after the shut;
- 4) Reusing sign boards where applicable.

Unit: No

PSL 8.2.21 METER PROTECTION SLEEVE

The tendered rates shall cover the cost of all works required for the supply and installation of meter protection sleeve as detailed on the drawings for meter protection sleeve and meter protection culvert, Type 1 and Type 2.

Unit: No

PSLB BEDDING (PIPES) (SABS 1200 LB-1983)**PSLB 3 MATERIALS****PSLB 3.1 SELECTED GRANULAR MATERIAL**

Add the following to LB 3.1:

The material to be used for the bedding cradle must meet the following requirements:

GRADING ANALYSIS RANGE

| SIEVE SIZE (mm) | PERCENTAGE PASSING |
|-----------------|--------------------|
| 9.500 | 100 |
| 6.700 | 90 to 100 |
| 4.750 | 80 to 90 |
| 2.360 | 65 to 80 |
| 1.180 | 50 to 65 |
| 0.600 | 35 to 50 |
| 0.425 | 25 to 35 |
| 0.300 | 15 to 25 |
| 0.150 | 5 to 15 |
| 0.075 | 0 to 5 |

Notwithstanding Clause LB.3.1. Only a clean sand containing no particles of diameter exceeding 10 mm, having a Plasticity Index (P.I.) not exceeding 10 and free from vegetation and lumps shall be used for the bedding cradle. The larger grains (4 to 10 mm in size) must be rounded and not sharp or angular.

Bedding materials (for cradle and blanket material), such as Umgeni River sand or similar approved non-cohesive materials shall be compacted to 100% Mod. A.A.S.H.T.O. either by full saturation or mechanical means or a combination of both, approved by the Employer's Representative.

The Contractor will be required to supply samples to the Employer's Representative of the bedding material to be used in the cradle as well as for blanket material, inclusive of the analysis of the characteristics of the material. Only after the Contractor has received written approval from the Employer's Representative, may he proceed with placing of selected granular material bedding.

The Contractor will carry out his own quality control testing of the bedding material to ensure that it meets specification. The results of these tests must be given to the Employer's Representative within 24 hours of completion of the test.

If any material used in the bedding of the new pipes is found to be outside the specification, the Contractor will remove and replace this material with approved sand at his own cost.

Should the Contractor change the source of the bedding material, samples of the proposed material shall be supplied to the Employer's Representative, inclusive of the analysis of the characteristics of the material. Only after the Contractor has received written approval from the Employer's Representative, may he proceed with placing of the new selected granular bedding material.

The costs for the grading analysis tests shall be included in the tendered rates for the supply, placement and compaction of the selected granular material.

It is anticipated that most of the bedding material will have to be provided from an off-site source.

PSLB 3.2 SELECTED FILL MATERIAL

Add the following to LB 3.2:

Only a clean sand containing no particles of diameter exceeding 20mm, having a Plasticity Index (P.I.) not exceeding 6 and free from vegetation and lumps shall be used for the selected fill blanket. It is anticipated that most of the fill material will have to be provided from an off-site source.

Pipeline to be constructed beneath existing road.

In this case the selected fill material shall be taken to the underside of the proposed new layerworks construction where the new road will match the existing road layers or will be constructed to a new design specification. In this case the selected fill material will be placed from the top of the pipe bedding to the bottom of road subgrade level and compacted to minimum 98% Mod AASHTO density. Thereafter the structural road layers will be constructed. This procedure is necessary to limit settlement beneath roads.

PSLB 3.3 BEDDING

Add the following to Sub-Clause:

Steel pipelines shall preferably be bedded as per Drawing LB-3 (d) of SANS 1200LB where the cradle material and the blanket material up to 300mm above the crown of the pipe, consists of selected granular material.

Joint holes (pockets) shall be provided in the bedding, as per Drawing LB-2, at each pipe joint or coupling. No sharp-edged stones shall be allowed to come into contact with either the pipes or the couplings (joints). No extra payment will be made for forming joint holes (pockets).

Portions of the pipeline may warrant the need for soilcrete and will be prepared, placed and compacted as per the relevant drawings.

PSLB 3.4 SELECTION

PSLB 3.4.1 SUITABLE MATERIAL AVAILABLE FROM TRENCH EXCAVATION

Add to Sub-Clause:

Notwithstanding the requirements of sub-clause 3.7 of SANS 1200 DB and sub-clause 3.4.1 of SANS 1200 LB regarding the use of selective methods of excavating, the Contractor shall use selective methods of excavating and shall provide and use plant that will enable him to avoid burying or contaminating material that is suitable and is required for bedding.

PSLB 3.4.1 SUITABLE MATERIAL AVAILABLE FROM TRENCH EXCAVATION

Replace the words “(but is not required)” in the fifth line with the words “at his own cost”.

PSLB 5 CONSTRUCTION

PSLB 5.1.2 DETAILS OF BEDDING

Delete and replace with:

The cradle thicknesses shall be as follows:

For DN600 and smaller

- Cradle thickness to be 200mm

For greater than DN600

- Cradle thickness to be 300mm

The blanket material thickness above the crown of the medium pressure pipe shall be 300mm for all diameters of pipe.

Cable ducts shall be regarded as flexible and shall be bedded in accordance with drawing no. LB-2 of SANS 1200LB.

PSLB 5.1.3 PLACING OF BEDDING

No loose rocks or stones shall be permitted to rest against the pipe barrel during the placement and compaction of the bedding cradle or blanket. In addition to the provisions of clause 5.1.3.3, hand equipment shall be used to compact the bedding material under the haunches and immediately next to the pipe. No vibratory mechanical equipment shall be allowed to make contact with any part of the pipe or be used on the bedding blanket directly above the pipe.

PSLB 5.1.4 COMPACTING

The bedding and fill material on each side of the pipe must be compacted to 100% MAASHTO over the full depth of the bedding layers, as indicated in drawing LB-3(d). The fill directly above the pipe must not be compacted until the depth of cover to pipe is at least 300 mm, unless otherwise specified by the Employer's Representative.

PSLB 5.2 PLACING AND COMPACTING OF RIGID PIPES

PSLB 5.2.2 CLASS 'C' BEDDING

Delete the third, fourth and portion of the fifth lines of the Sub-Clause and substitute the following:

"The pipes shall be bedded on a layer of compacted granular bedding material on which a 25mm thick layer of uncompacted granular bedding material has been placed and spread. Loose granular bedding material lying next to the pipe shall be placed into the haunch area and compacted with suitable hand tools, and additional selected granular material shall be added and compacted in layers until levels for the bedding cradle as shown on Dwg LB - 1 (c) are reached. The remainder of the bedding i.e. the selected fill blanket, shall be placed in layers up the sides of the pipe, each layer being compacted until levels are reached as shown on Dwg LB-1 (c)."

PSLB 5.2.5 STONE BEDDING

Add new Sub-Clause:

In areas where waterlogged conditions exist or where ordered by the Employer's Representative, special drains consisting of a 150mm thickness (See PSDB 5.5) of single sized stone with a geofabric filter surround ("Bidim" Grade A4 or similar approved) extending the full width of the trench shall be provided below the bedding to the pipes. The excavation for these drains will be measured in cubic metres at the contract rate applying to unsuitable excavation below the bottom of the trench. The stone filling will be paid for per cubic metre and the geofabric filter will be paid for per square metre. All measurements in this connection will be to a width equal to the base widths and depths ordered.

PSLB 5.3(B) SELECTED FILL BLANKET

Delete "200mm" from title of the Sub-Clause.

PSLB 8 MEASUREMENT AND PAYMENT**PSLB 8.1 PRINCIPLES****PSLB 8.1.1 SUPPLY OF BEDDING MATERIALS MEASURED SEPARATELY**

Add the following to LB 8.1.1:

The measurement for bedding shall be the total through length along the centre of the pipeline measured HORIZONTALLY with deductions made for line valve chambers or meter protection sleeves.

PSLB 8.2 SCHEDULED ITEMS**PSLB 8.2.1 PROVISION OF BEDDING FROM THE TRENCH EXCAVATION**

Delete the Sub-Clause and substitute the following:

Without the need for screening:

- | | |
|--|----------------------|
| 1) Selected granular material (Provisional Quantity) | Unit: m ³ |
| 2) Selected fill material (Provisional Quantity) | Unit: m ³ |

The rates shall cover the cost of acquiring, from any point along the trench excavation as may be selected by the Employer's Representative, bedding that complies with the relevant requirements of the specification, of delivering it to points alongside the trench spaced to suit the Contractor's methods of working, of making good any backfill deficiency from points where backfill has been acquired.

Extra Over for screening:

- | | |
|--|----------------------|
| 1) Selected granular material (Provisional Quantity) | Unit: m ³ |
| 2) Selected fill material (Provisional Quantity) | Unit: m ³ |

The rates shall cover the cost of screening or otherwise treating excavated material, at any point along the trench excavation as may be selected by the Employer's Representative, in order to produce bedding that complies with the relevant specification, delivering it to points alongside the trench, spaced to suit the Contractor's methods of working, of making good any backfill deficiency there may be from points where screened backfill material has been acquired.

The rate provided against the volumetric unit shall be applicable to the volume of material produced in terms of the required specification and not the volume of material screened in the first instance.

PSLB 8.2.2 SUPPLY ONLY OF BEDDING BY IMPORTATION**PSLB 8.2.2.3 From Commercial Sources (Provisional)**

Including for screening and/or other treatment:

- | | |
|-------------------------------|-----------------------|
| 1) Selected granular material | Unit : m ³ |
| 2) Selected fill material | Unit : m ³ |

The rates shall cover the cost of acquiring, loading, transporting, offloading, screening or otherwise treating excavated material in order to produce bedding that complies with the

relevant specification, delivering it to points alongside the trench spaced to suit the Contractor's methods of working and of disposing of displaced material.

NOTE: The rate for the supply and laying of pipelines covers the cost of handling the bedding material from alongside the trench, placing it under the pipeline, forming joint holes and completing the bedding around and over the pipeline.

PSMH ASPHALT BASE AND SURFACING

PSMH 8 MEASUREMENT AND PAYMENT

PSMH 8.5.4 ASPHALT

Change the unit of measurement from:

Unit: "t" to Unit: "m²"

Add to Sub-Clause:

The unit of measurement shall be the square metre and the quantity shall be calculated as the nett area of roadway surfaced in accordance with the drawings.

C3.4: PARTICULAR SPECIFICATIONS

The following Particular Specifications shall form Part of this Contract and are bound in the document:

TABLE OF CONTENTS

| | Page |
|---|-------------|
| PSX BRICKLAYER..... | 210 |
| PSX 1 SCOPE | 210 |
| PSX 2 MATERIALS | 210 |
| PSX 3 EQUIPMENT | 212 |
| PSX 4 CONSTRUCTION..... | 212 |
| PSX 5 TOLERANCES | 215 |
| PSX 6 TESTING | 216 |
| PSX 7 MEASUREMENT AND PAYMENT | 217 |
| PSEL PARTICULAR SPECIFICATION ELECTRICAL AND INSTRUMENTATION FOR FLOW METERS 218 | |
| PSEL 1 SCOPE OF WORKS | 218 |
| PSEL 2 PROJECT SPECIFICATION | 218 |
| PSEL 3 DESCRIPTION OF WORKS | 232 |
| PSEL 4 SCHEDULE OF DRAWINGS | 236 |
| PSEL 5 CABLE SCHEDULE | 236 |
| PSEL 6 EQUIPMENT SCHEDULE | 236 |
| PSMA METER SPECIFICATIONS | 237 |
| PSMA1 ULTRASONIC FLOW METER SPECIFICATION | 237 |
| PSMA2 MECHANICAL FLOW METER SPECIFICATION | 238 |
| PSCP CATHODIC PROTECTION | 241 |
| PSCP 1 DESCRIPTION | 241 |
| PSCP 2 CONTINUITY BONDING OF BURIED JOINTS | 241 |
| PSCP 3 CONTINUITY BONDING OF INLINE PIPEWORK ASSEMBLIES AND SPECIALS | 241 |
| PSCP 4 CABLE TO STEEL PIPE CONNECTION..... | 241 |

The following Particular Specifications shall form Part of this Contract and are included in Part C3.6 Annexures issued as a CD.

| | |
|--------|---|
| C3.6.1 | EWS OH&S: SITE SPECIFIC HEALTH AND SAFETY SPECIFICATION |
| C3.6.2 | EWS OH&S: BASELINE RISK ASSESSMENT |
| C3.6.3 | EWS OH&S: COVID 19 HEALTH AND SAFETY SPECIFICATION |
| C3.6.4 | PEM : ENVIRONMENTAL MANAGEMENT SPECIFICATION |
| C3.6.5 | PAA : PARTICULAR SPECIFICATION : DAYWORK SCHEDULE |
| C3.6.6 | PCL : COMMUNITY LIAISON OFFICER |
| C3.6.7 | EMC : CODE OF CONDUCT |

PSX BRICKLAYER**PSX 1 SCOPE**

This section of the Specification covers all aspects of brickwork including building in of various items, reinforcing of brickwork etc as well as the supply of all materials and labour.

PSX 2 MATERIALS**PSX 2.1 STANDARDS**

All materials used shall comply with the following standard specifications, the latest of which shall be held to apply:

| | |
|----------|--|
| SABS 28 | Metal ties for cavity walls |
| SABS 227 | Burnt clay masonry units |
| SABS 471 | Portland cement |
| SABS 626 | Portland blast-furnace cement |
| SABS 831 | Portland cement 15 and rapid-hardening Portland cement 15 |
| BS 1200 | Sand for plaster and mortar Concrete Masonry Assoc: The Masonry Manual |

PSX 2.2 MASONRY UNITS**PSX 2.2.1 GENERAL**

Bricks shall be free from cracks, chips or other defects and at least one end of 20% of the bricks shall have the same general colour and texture as the faces.

Special care shall be exercised in loading, stacking and handling face bricks as no damaged bricks shall be used and bats may only be used where required to obtain bond.

General-purpose stock bricks or common bricks shall have a minimum average compressive strength of 7 MPa unless otherwise specified. Where stock bricks are required for load bearing walls or foundations then the compressive strength shall be 28 MPa.

Facing bricks shall be of the type, origin and colour specified in the Schedule of Quantities or on the drawings and shall be selected for uniformity of dimension and colour.

Satisfactory proof of load bearing capacity of bricks offered shall be submitted before deliveries are made to the site.

For samples, 6 units of each type of brick shall be submitted to the Engineer for approval. All subsequent deliveries shall be to the standard of the approved samples.

All bricks which, in the opinion of the Engineer, do not comply with the abovementioned requirements, shall be removed from the site forthwith at the Contractor's cost.

PSX 2.2.2 BURNT CLAY BRICKS

Burnt clay bricks shall comply with SABS 227 and:

Engineering bricks shall be of high compressive strength and durability, with 49 MPa minimum average compressive strength and selected for their uniformity of dimension and shape. Bricks shall be clay, and pressed or wire cut. Water absorption after a 24-hour test shall not exceed 12% by mass.

Facing bricks shall have a minimum average compressive strength of 28 MPa. Bricks shall be clay and pressed to wire cut. Water absorption after a 24-hour test shall not exceed 12% by mass. Bricks shall have sharp, clean and well defined arises.

General purpose stock bricks or common bricks suitable for general building work shall be clay, pressed or wire cut, even in size, smooth in texture and with sharp well defined arises. Water absorption after a 24-hour test shall not exceed 14% by mass.

PSX 2.3 CEMENT

Cement used in masonry shall comply with the requirements of SABS 471, SABS 626 and SABS 831.

PSX 2.4 FINE AGGREGATE (SAND)

Fine aggregates used in mortar shall be naturally occurring sand or consist of crushed rock or gravel, or a combination thereof with naturally occurring sand being hard, clean and free from dust, shale, clay, loam roots and other impurities.

Fine mortar aggregates shall comply in all respect with SABS 1090.

PSX 2.5 WATER

Water shall be clean and free from injurious amounts of acids, alkalis, sugar and other organic substances. Water suitable for drinking purposes shall be acceptable. If so required by the Engineer, the suitability of water shall be proved by tests carried out by an approved laboratory.

PSX 2.6 MORTAR

Mortar shall unless otherwise specified, be Class II mortar and shall consist of 1-part Portland cement, one part hydrated lime and 5 parts of sand by volume for normal brickwork. Mortar for foundations, lintels and for all load bearing walls higher than 3000 mm shall be Class I mortar and shall consist of 1-part Portland cement, ¼ part hydrated lime and 4 parts sand. The ingredients shall be measured in proper gauge boxes on a timber or steel-mixing platform with water added and thoroughly mixed in to obtain a uniform consistency throughout. Alternatively, mixing may be by means of an approved mechanical batch mixer.

In the case of a cement-milled slag mortar, the sand and slag shall be mixed first and then the cement added.

Cement mortar shall be used within two hours of the first contact of the cement with water. No mortar which is older than two hours or has begun to set shall be used.

PSX 2.7 WALL TIES

Metal wall ties in brickwork and blockwork shall be galvanised crimped steel, single wire type, 4 mm diameter minimum, complying in all respects with SABS 28.

Ties cavity walls shall be PWD butterfly type formed of 4mm diameter steel wire galvanised class A for coastal conditions and to such lengths that no less than 75mm can be built in at each end.

PSX 2.8 REINFORCEMENT

Wall reinforcement shall consist of two 3.15 mm diameter longitudinal wires are appropriate centres for the thickness of the wall and with 2.80 mm diameter cross wires welded to the longitudinal wires at 300 mm centres. All wire used shall be of high tensile steel.

PSX 2.10 CONCRETE TO BRICKWORK TIES

End of junctions of brick walling to concrete are to be tied to the concrete by means of 1.6 x 32 x 500 mm galvanised hoop iron ties.

Brick linings to concrete are to be tied with 4 mm diameter crimped galvanised wire ties to SABS 28.

PSX 2.14 STORAGE OF MATERIALS

Cement and aggregates shall be stored in such a manner as to prevent deterioration or contamination by foreign matter, damp and chemicals spilled on the ground or which may settle out of the atmosphere.

Perishable materials likely to be damaged by exposure shall be stored under cover.

PSX 3 EQUIPMENT

The Contractor shall provide and maintain in good working order, adequate equipment for carrying out the required work in accordance with this specification in a safe efficient manner.

PSX 4 CONSTRUCTION**PSX 4.1 BRICKWORK GENERALLY**

All brickwork shall be laid in stretcher bond, plumb and true to line. Mortar beds shall be 10 mm thickness, unless otherwise described, and are not to exceed 12 mm in thickness, and no four successive joints shall rise more than 40 mm (for 10 mm joints). Clay bricks are to be well wetted (saturated in hot weather) with water before being laid and the course of bricks laid last shall be well wetted before fresh bricks are bedded upon it. Bricks shall be well buttered and laid on a full bed of mortar and joints shall be flushed up. Bricks in foundation walling are to be extra hard. Beam filling is to be built to walls 106 mm thick and the space between beam filling and roof covering shall be filled with a stiff mixture of 1 to 3-cement mortar tightly pressed in. The brickwork shall be carried up in a uniform manner, no one section being raised more than 1 200 mm above another section at one time and no brickwork is to be carried more than 4 courses above immediately adjoining or intersecting brickwork. Block bonding or toothed and keyed construction will only be allowed in alterations to existing work.

One-brick walls (230 mm) built stretcher bond in two skins shall be tied together with galvanised wall ties staggered not more than 1 m apart horizontally and every fourth course vertically with extra ties at reveals and openings etc. as may be necessary. Brick linings to concrete walls shall similarly be tied together, while galvanised hoop iron ties cast into concrete columns, shall be built into the joints of butting brick walls as specified. Where specifically required the outer face of the inner skin of all external one-brick walls above damp course level shall be waterproofed before the outer skin is built up. The face to be treated shall be bagged over until all crevices are filled. When thoroughly dry the face shall be twice coated with an approved liquid bituminous compound and worked around wire ties to produce an unbroken waterproof coating.

Where called for on the drawings wall and concrete ceiling surfaces shall be bagwashed with a wet sack dipped in liquid cement grout whilst the mortar in the brickwork joints is still soft until all joints and crevices are eventually filled. Projections of concrete shall be rubbed off and any defects shall be made good in cement mortar.

PSX 4.2 REINFORCED BRICKWORK

Brickwork over door and window openings shall be reinforced with welded wall reinforcement placed in each course of brickwork over openings for a minimum of 4 courses or as shown on the drawings. Reinforced brickwork shall continue at least one and a half bricks on either side of the opening. Where two or more openings are less than 675 mm apart, the reinforced brick lintels shall be continuous over all such openings and their dividing piers, plus 1½ brick bearing at both extreme ends.

Brick lintels in cavity walls, which are exposed to the weather, shall have a continuous damp-proof bourse built into the outer skin of the wall immediately above the lintel to cover the top of the lintel, raked up one course and carried through the inner skin.

Where called for on the drawings, brickwork shall be reinforced with wall reinforcement laid in every fourth course of all brick walling or as directed by the Engineer. The reinforcement shall be built in truly central to the wall and all longitudinal laps shall not be less than 450 mm. Reinforcement in half-brick walls shall be built 106 mm into main cross walls.

PSX 4.3 FACE BRICKWORK

All facings shall be kept clean during the progress of the work and face-brick surfaces with mortar spattering will not be accepted. Unless otherwise specified, the horizontal and vertical joints shall be pointed and finished with a round key joint and both rubbed smooth as the building work proceeds.

The various colours of the face bricks shall be selected and mixed at random to prevent portions of the face work showing a preponderance of one colour. Where sufficient storage is available on site the full quantity of face bricks required for the works (or such quantity as to keep supply well advanced of construction) shall be delivered to site.

PSX 4.4 FAIRFACE BRICKWORK

Where called for on the drawings and in the Schedule of Quantities, internal walls shall be of smooth stock-bricks, built fair and kept clean during construction and jointed as in Clause PSX 4.3.

PSX 4.5 PRECAST PRESTRESSED CONCRETE LINTELS

Approved precast prestressed concrete lintels of suitable size of the thickness of the wall and the width of the opening shall be used over openings in plastered and bagged walls.

Wherever possible, the minimum bearing for precast prestressed lintels, at their ends and over intermediate supports, shall be:

- a) for openings not exceeding 600 mm - ½ brick (115 mm)
- b) for openings exceeding 600 mm - 1 brick (230 mm)

Where this requirement necessitates a total lintel length exceeding 6.6 m, a joint may be introduced centrally over an intermediate pier in a position to be approved by the Engineer. Such joints shall be stiffened by the introduction of welded wall reinforcement as specified in PSX 4.2, and extending a minimum of 300 mm on either side of the joint, i.e. 600 mm minimum total length.

PSX 4.6 CONCRETE/BRICK TIES

At end on junction of brick walls with concrete columns or walls brickwork is to have galvanised hoop iron ties built into the joints of each ½ brick skin at maximum 8 course height intervals alternately to each skin or at 4 course height intervals if single skin only. Ties are to be cast into concrete at course heights by tacking L-shaped ties to inside face of shutters and bending down ends for building in after shutters are stripped, or shot fixed to concrete with approved nails and strength of shot top provide adequate fixing.

Galvanised crimped wire ties for fixing of brick linings to concrete are to be cast a minimum 75 mm deep into concrete at brick course eights (four per square metre staggered), bent down after shutters are stripped and built into brickwork.

PSX 4.7 DOORS

Timber for doors shall be selected, well-seasoned kiln dried Red Meranti and shall be treated with an approved oil soluble preservative. The following preservative is recommended : 5% Pentachlorophenol in a vessel consisting of 50% white spirits and 50% power paraffin or 100% white spirits. The Contractor shall obtain and submit to the Engineer a certificate from the merchant supplying the timber or doors to the effect that the timber has been treated as required.

After erection doors shall be well sanded and prepared and then coated with two coats of an approved penetrating sealer compatible with the treatment applied to the timber.

PSX 4.8 LOUVRES

Louvres and frames shall be manufactured from prepainted galvanised steel sheet coated on both sides. The coating shall comply with the manufacturers' specifications for 'Chromadek' with PVC Plastisol coating or 'Colomet' and 'Versacor' base and SMP weathering coat, or similar coating approved by the Engineer.

PSX 4.9 BRICK CLADDING TO EXPOSED FACE

The brick cladding to the outlet chamber and to the exposed faces of the reservoir wall shall consist of a single skin of face bricks as obtained from Independent Brick Supplies (or similar approved) and laid in bands as directed from the Engineer. This skin is to be fastened to the concrete as specified elsewhere.

The brickwork shall be in stretcher bond 4: 1 cement mortar. The brickwork shall be supported on suitably staggered concrete ledges with cross-sectional dimensions of 150 mm by 150 mm. R10 reinforcing starter bars will be used to tie the ledges into the reservoir wall and two Y10 bars shall be used in the longitudinal direction. The slope of the bank against the wall is to be indicated on the drawings.

Payment for the formwork for reinforced concrete ledges shall be per metre and shall include the following: -

- 1) the positioning and staggering of the brickwork support ledges to keep a minimum depth to the top of the ledges of 150 mm below finished ground level;

supply erection and stripping the necessary shuttering and temporary supports.

Payment of the brickwork shall be by the square metre and shall include for the supply and laying of all materials including the galvanised steel ties as specified and their installation.

PSX 4.10 SUNDRIES

- 1) Rough and fair cutting shall be performed as required and the brickwork fitted around structural steelwork. Face brickwork shall be carefully cut and fitted when next to the finishings.

Chases shall be left or formed in brickwork for edges of concrete floors, roofs, staircases, etc. Vertical chases shall be provided in brickwork and blockwork wherever required for pipes, conduits, switch boxes, distribution boards, etc.

Oversailing courses, corbels, etc, shall be built where required.

Ends of cills, thresholds, sep joints etc shall be built in, cut, or pinned in cement mortar where required.

Steel windows to be built into walls shall be set plumb and true with the cill bar resting on wedges to ensure that it is perfectly level. All lugs shall be bolted up tight and built in solid as walling proceeds, the channel frame of the window being caulked tight with Class B (1-¼-4) cement mortar, pointed up neatly all round and made watertight.

Passed steel doorframes shall be securely strutted when placed in position to prevent distortion of any kind during building. The frame shall be built solid into the walls and grouted solid at the back with 12:3 cement mortar as the work proceeds and properly pointed all round.

Timber doorframes and windows to be built into walls shall be primed before building in and set plumb and true. The underside of each vertical to the doorframes shall be provided with a 12 mm diameter steel peg projecting 75 mm from the bottom of the frame and these pegs shall be securely grouted into the floor threshold. 2 mm thick hoop iron cramps 40 mm wide, screwed to frames shall be built 450 mm into walls with ends turned up, four cramps to each jamb. At flush junctions of walls and frames a V-joint shall be ruled between frame and wall rendering. The junctions between timber frames or windows and face brickwork or unrendered concrete on external faces shall be sealed by pointing around the timber frames with an approved polysulphide based waterproofing compound finished off in a neat and workmanlike manner.

All necessary openings for ends of timber, gratings, cramps, holdfasts, dowels, wood plugs and slips for fixing joiner's work, hoop iron ties, etc, shall be formed built in with 1:3 cement mortar, and made good with properly performed rough and fair cuttings.

Damp proof courses shall be formed in the walls as described by building three consecutive bedding joints and all vertical joints between solid walls in 2:1 cement mortar with an approved waterproofing compound added in accordance with the manufacturer's instructions.

PSX 5 TOLERANCES

PSX 5.1 TOLERANCES

Tolerances for clay brick dimensions, strength, warpage and efflorescence shall be as SABS 227.

PSX 5.2 DEGREE OF ACCURACY

Permissible deviations in the final finished surfaces to the degree of accuracy required will be applied to linear dimensions, position, verticality, level, squareness and bow.

The degree of accuracy may be one of the following:

Degree of accuracy III for use where a high degree of accuracy is unnecessary eg mass storage warehouse walls and floors.

Degree of accuracy II for what is commonly called "good work".

Degree of accuracy I where the use of special, as opposed to normal, methods and/or materials is required.

PSX 5.3 TABLE OF PERMISSIBLE DEVIATIONS

| | Classification Item Finish | Permissible Deviation Degree of Accuracy | | | Corobrick Brick Guide |
|-----------|-------------------------------|---|----------|---------|---------------------------------|
| | | III mm | II mm | I mm | |
| PSX 5.3.1 | Stock brickwork | | | | |
| | - against earth | 20 | 15 | 10 | NFX |
| | - to receive | 17 | 10 | 7 | NFP |
| | plaster | | | | |
| PSX 5.3.2 | - to be bagged | 13 | 8 | 5 | NFP |
| | - fairface | 8 | 5 | 3 | FBS |
| | Faced brickwork with bricks | | | | |
| | - generally | | | | |
| PSX 5.3.3 | uniform in | | | | |
| | shape and | 8 | 5 | 3 | FBS |
| | size | | | | |
| | - high degree of | | | | |
| PSX 5.3.4 | uniformity in | 5 | 3 | 2 | FBX |
| | shape & size | | | | |
| | - non-uniform in | 13 | 8 | 5 | FBA |
| | shape | | | | |
| PSX 5.3.5 | Out of alignment with | | | | |
| | Adjoining finishes on | 4 | 3.0 | 15 | FBS |
| | projecting items | 3.5 | 2.5 | 1 | FBX |
| | (windows & door frames) | 5 | 3.5 | 2 | FBA |
| PSX 5.3.6 | Out of verticality of perps | | | | |
| | (dependent on bond) | 40 | 15 | 5 | |
| | Out of alignment | 2.5 | 2.0 | 1.5 | FBS |
| | horizontally top edge to | 2.0 | 1.5 | 1 | FBX |
| PSX 5.3.7 | top edge adjoining bricks | 3.0 | 2.5 | 2 | FBA |
| | Out of trueness vertically | 2.5 | 2 | 1.5 | FBS |
| | (top edge to lower edge | 2.0 | 1.5 | 1 | FBX |
| | Of next course) | 3.0 | 2.5 | 2 | FBA |
| PSX 5.3.8 | Squareness of rooms | | | | |
| | - measured on | | | | |
| | the diagonals* | 20 | 10 | 5 | |
| | Out of square or true of a | | | | |
| PSX 5.3.9 | corner or angle | | | | |
| | measured 300 mm from the | | | | |
| | angle* | 7 | 4 | 2 | |
| | | | | | |

*A similar degree of accuracy will be required to irregular shaped rooms. The governing factor shall be the general appearance and it may be necessary or acceptable to depart from the above guidelines if required.

PSX 6 TESTING

PSX 6.1 COMPRESSIVE STRENGTH

Determination of the minimum average compressive strength of clay bricks shall be in accordance with SABS 227 at frequencies required by the Engineer.

PSX 6.2 COSTS OF TESTS

Costs of Tests described above shall be borne by the Contractor who shall be deemed to have included these costs in the scheduled rates for brickwork.

PSX 7 MEASUREMENT AND PAYMENT**PSX 7.1 BRICKWORK**

The unit of measurement shall be square metre (m²).

The unit of measurement for all brickwork shall be the square metre of the specified type and thickness laid. The measurement of the work will be taken net, with door and window openings deducted, but will include for lintels, airbricks, etc.

The rates tendered for ordinary brickwork shall be inclusive of supply of bricks, brickforce, lintels, airbricks, wall ties, damp proof course, mortar and everything necessary to erect the brick work shown on the drawings, and for testing, all plumbing of corners and faces, linings, levelling, ruling of joints, forming reveals and openings, cutting where necessary but not specially scheduled, supply and building in wall plugs, wall ties, etc, hoisting to various levels, soaking all bricks in water before laying, any selecting of face-bricks on site to maintain an even texture when laid and for cleaning down with spirits of salts all facework on completion.

PSX 7.2 CILLS

The unit of measurement shall be square metre (m²).

The unit of measurement for internal and external cills be the linear metre of cill installed. The rate shall include for all materials and work required to construct cills complete in accordance with the drawings and the schedules.

PSX 7.3 DOORS

The unit of measurement shall be number (No).

The unit of measurement for doors shall be the number supplied and stalled complete with frames in accordance with the specifications and the drawings. The rate shall include for supply, delivery, storage, erection, installation complete with hinges and door furniture, preparation and sealing.

PSX 7.4 LOUVRES

The unit of measurement shall be number (No).

The unit of measurement for louvres shall be the number supplied, and installed complete in accordance with the specifications and the drawings. The rate shall include for supply, delivery, storage, erection and installation in accordance with the specifications and the drawings.

PSEL PARTICULAR SPECIFICATION ELECTRICAL AND INSTRUMENTATION FOR FLOW METERS

PSEL 1 SCOPE OF WORKS

This sub-contract is for the supply & installation of electronic infrastructure and installation of free-issue flow meters for the EThekwini Water & Sanitation Bulk Reservoir Inlet and Outlet Monitoring project located at various sites within Kwazulu-Natal province.

The scope of works includes:

Supply & install instrumentation cabling to flow meters

Supply & install kiosks to house flow meters for the measuring of flow at reservoir inlets / outlets at pre-determined reservoir sites.

Take possession and install flow meters and sensors at various EThekwini reservoir sites

The installation shall be to the following codes and standards:

SANS 10142-The wiring of premises Part 1: Low-voltage installations

EThekwini Water & Sanitation Department

The electrical & electronic work shall include inter alia:

At sites where a telemetry room is available:

Instrumentation cabling to flow meter comprising the supply & install of multi-core instrumentation cabling from existing telemetry panel to the metering kiosk.

Supply & install the metering kiosk and all associated equipment within it.

Take possession and install flow meters and sensors at various EThekwini reservoir sites

At sites where telemetry room is not available:

Supply & install the metering kiosk and all associated equipment within it.

Take possession and install flow meters, sensors and communication cabling at various EThekwini reservoir sites

Test & Commission the installation at the various sites.

Provide as-built drawings and documentation on the complete installation

Maintain the system for the duration of the defects & liability period.

These aspects should be seen only as a brief summary of the scope of the work and not as a complete record. Quantities and volume of work shall also be read or obtained from the drawings, bills of quantities and the rest of the specification.

PSEL 2 PROJECT SPECIFICATION

PSEL 2.1 REGULATIONS

The installation shall be erected and tested in accordance with the Acts and Regulations as indicated in the scope of works.

The supply and installation of the work shall be in agreement with the Conditions of the Contract with special attention to the following in particular:

- 1) The Occupational Health and Safety Act no. 85 of 1993, as revised,

SANS 10142-1, "The Wiring of Premises Part 1: Low Voltage Installations".

Government notices.

The local Municipal By-laws and any special requirements of the local supply authorities.

Any special conditions specified in this specification.

It must be clearly understood that, where differences in the General requirements occur as stated in (a), (b), (c), (d) and (e) or where additional requirements are required, the higher General requirements shall apply.

In the event of any contradiction between (a), (b), (c), and (d), then (e) shall be accepted above the rest.

Where any required by-law or regulation, which applies or becomes applicable during the execution of the electrical installation, is in conflict with the stipulation of the document, the former must have preference in all cases. The contractor must immediately notify the Engineer of such discrepancies.

The contractor may not make any alterations to the installation before written sanction to do so is received from the Engineer or its representative.

PSEL 2.2 SYSTEM AND SERVICE CONDITIONS

The equipment and installation shall be for outdoor use in Greater EThekweni Municipal area of supply and shall be suitable for:

| | |
|---|------------------------|
| (a) Climate: | Coastal |
| (b) Altitude: | from sea-level to 500m |
| (c) Ambient temperature: | from -5°C to 40°C |
| (d) Pollution level and type: | Coastal & Industrial |
| (e) Maximum relative humidity: | 60 % |
| (f) Mean annual value of solar radiation: | 1,0 kW/m ² |
| (g) Average total annual rainfall: | 1 000 mm |

PSEL 2.3 NOTICES AND FEES

The Contractor shall give all notices required by and pay all necessary fees, including any inspection fees, which may be due to the local Supply Authority.

On production of the official account, only the net amount of the fee charged by the Supply Authority for connection of the installation to the supply mains will be refunded to the Contractor by the Client.

The Contractor shall issue all notices and make the necessary arrangements with the Supply Authority, the local municipality, and any other authority as may be required with respect to the installation.

PSEL 2.4 CABLE INSTALLATION

- 1) All cable sleeves, manholes and cable markers are to be provided by the contractor unless otherwise specified. Others will provide cable ducts in the floors of buildings unless otherwise specified.

Cable run indoors shall be supported on cable trays or cable rack, secured thereto by heavy duty plastic strapping. The cables shall be fixed at intervals not greater than those stipulated in SANS 10142 and shall be spaced sufficiently to avoid de-rating in terms of SANS 10142 – 1. Cables shall be individually fixed so that any one may be removed from a group without disturbing the others.

Cables installed in trenches shall be installed at a depth of 1000mm below final ground level. All cable depth measurements shall be made to the top of the cable when laid directly in ground or to the top of the duct or sleeve where these are provided.

The contractor may only deviate from the above depth provided prior authority in writing has been obtained from the Engineer.

DC Cables shall be of the instrumentation cable type and have rating 300V/500V, stranded copper in ground or sleeves as directed by the Employer's Representative.

A yellow PVC cable warning tape with the wording "DANGER" shall be installed 200mm above all cables installed in cable trenches.

Every run of cable shall be a single length without joints. Say that where a run exceeds the general drum length of where the length of a run is increased after the cable is delivered on site, a through box will be permitted. Such through boxes shall be so placed as to afford easy access for maintenance and repair; when they are required in underground cable runs the contractor shall provide special cable markers to locate them.

All cable tails shall be provided with either cable lugs or ferrules as may be appropriate. At each sealing end straps-on cable markers shall be fixed, showing clearly and indelibly the number and size of cable cores and the destination of the cable.

PSEL 2.5 CABLE ROUTES

- 1) Cables shall follow the routes shown on the drawings; the routes shall only be varied with the written permission of the Engineer. Where no routes are defined on the drawings the contractor may select routes to his reasonable preference but shall obtain written approval of them before installing the cables.

The contractor shall, before trenching commences, familiarizes him with the routes and site conditions and the procedure and order of doing the work shall be planned in conjunction with the general construction program for other services and building requirements.

The contractor shall acquaint himself with the position of all the existing services such as storm water pipes, water mains, sewer mains, gas pipes, telephone cables, etc. before any excavations are commenced. For this purpose, he shall approach the Engineer's representative, the local municipal authority and any other authority which may be involved, in writing.

The Engineer reserves the right to alter any cable route or portion thereof in advance of cable laying. Payment in respect of any additional or wasted work involved shall be at the documented rates.

PSEL 2.6 TRENCHING

Trench excavations must comply with the requirements of SANS 1200 LC and SANS 1200 DA.

Every trench must be kept as straight as possible and must be dug to approved levels and measurements. The bottom must have an even contour.

Trenches dug close to railway lines, walls, roads, drains, pipes, cables, structures and on similar places where the danger of sagging exists, must be secured against such dangers and it must be done in such a way as to prevent possible injuries to construction personnel and the public. All these excavations must be done to the satisfaction of the Engineer and the public authorities concerned.

Bedding materials may not be laid until the trench has been approved by the Engineer. The Engineer might expect proof from the contractor that the minimum depth of bedding material is provided before giving authority for the cables to be laid.

- 1) Trenching shall be programmed in advance and the approved program shall not be departed from except with the consent of the Engineer.

The contractor will be held responsible for damage to any existing services brought to his attention by the relevant authorities and shall be responsible for the cost of repairs.

The contractor shall take all the necessary precautions and provide the necessary barriers, warning signs and/or lights to ensure that the public and/or employees on site are not endangered.

The contractor shall ensure that the excavations will not endanger existing structures, roads, railways, other site constructions or other property.

Trenches shall connect the points shown on the drawings in a straight line. The Engineer beforehand shall approve any deviations due to obstructions or existing services.

Trenches shall be as straight as possible and shall be excavated to a depth of 1000mm x 300mm wide.

The bottom of the trench shall be of smooth contour, and shall have no sharp dips or rises, which may cause tensile forces in the cable during back filling.

The excavated material shall be placed adjacent to each trench in such a manner as to prevent nuisance, interference or damage to adjacent drains, gateways, trenches, water furrows, other works, properties or traffic. Where this is not possible the excavated materials shall be removed from site and returned for back filling on completion of cable laying.

Trenches across roads, access ways or footpaths shall not be left open. If cables cannot be laid immediately the contractor shall install temporary "bridges" or cover plates of sufficient strength to accommodate the traffic concerned.

In the event of damage to other services or structures during trenching operations the contractor shall immediately notify the Engineer and institute repairs.

Prior to cable laying the trench shall be inspected thoroughly and all objects likely to cause damage to the cables either during or after laying shall be removed.

Where ground conditions are likely to reduce maximum current carrying capacities of cables or where the cables are likely to be subjected to chemical or other damage or electrolytic action, the Engineer shall be notified before installing the cables. The Engineer will advise on the course of action to be taken.

Extreme care shall be taken not to disturb surveyor's pegs. These pegs shall not be covered with excavated material. If the surveyor's pegs are disturbed, a person qualified to do so shall replace them.

PSEL 2.7 BLASTING

- 1) No guarantee is given or implied that blasting will not be required.

Should blasting be necessary and approved by the Engineer, the contractor shall obtain the necessary authority from the relevant Government Employers and Local Authorities. The contractor shall take full responsibility and observe all conditions and regulations set forth by the above authorities.

PSEL 2.8 SAFETY

The contractor must at all times provide proper and adequate precaution and safety arrangements on site. Should the contractor fail to comply with this requirement, the Engineer will take the necessary steps to ensure that this requirement is met and any costs incurred will be for the contractor's account. Complying with this requirement does not exonerate the contractor of his responsibilities and duties in accordance with the Occupational Health and Safety Act (Act 85: 1993) and mines and Industries Act of 1956, (Act 27: 1956). Symbolic safety signs must comply with the applicable requirements of SANS 1186.

PSEL 2.9 BACKFILLING

- 1) The contractor shall not commence with the backfilling of trenches without prior notification to the Engineer so that the cable installation may be inspected. Should the contractor fail to give a timeous notification, the trenches shall be re-opened at the contractor's cost. Such an inspection will not be unreasonably delayed.

For all cables, a coloured plastic-marking tape shall be installed 200mm above the cable. The tape shall be yellow, with red skull and crossbones with the words "ELECTRIC CABLE". These markings shall not be more than 1m apart from centre to centre.

Back filling shall be undertaken with soil suitable to ensure settling without voids. The maximum allowable diameter of stones present in the back fill material is 25mm.

The contractor shall have allowed in his tender for the importation of suitable backfill material if required.

In the trenches the cables shall be laid on a 50mm thick bed of suitable bedding material and be covered with a 150-mm layer of the same material before the trench is filled in.

The backfill shall be compacted in layers of 150mm and sufficient allowance shall be made for final settlement. The contractor shall maintain the refilled trench at his expense for the duration of the contract. Surplus material shall be removed from site and suitably disposed of.

On completion, the surface shall be made good to match the surrounding area.

In the case of roadways or paved areas the excavations shall be consolidated to the original density of the surrounding material and the surface finish reinstated.

PSEL 2.10 CABLES AT DIFFERENT DEPTHS

In situations where cables are laid at different depths in a common trench, the same procedure for placing and compaction of the approved fill material beneath and on top of the upper cable applies as for the lower cable.

In situations where cables have to be laid on top of each other the high voltage cables must be laid under the low voltage cables. (See drawing LC-1 in SANS 1200 LC).

PSEL 2.11 CONDUCT WITH RESPECT TO OBSTRUCTIONS

In cases where obstructions are encountered during excavation that demands changes to the trench or a special kind of trench, the contractor must have the Engineer's approval to implement such changes before laying the cable(s).

PSEL 2.12 STACKING OF EXCAVATED MATERIAL

The excavated material must be placed along the trench in such a way that it does not obstruct or damage adjacent fences, trees, drains, gate openings and other properties and must be heaped up in such a way that traffic is not obstructed. Should this not be possible, the material must be removed from site, with the Engineer's approval and brought back later to backfill the trench after the cable(s) has been laid.

Surplus material must be removed by the contractor and on the contractors own expense.

PSEL 2.13 COMPACTION

In areas which is specified in the project specifications the trenches must be refilled in layers of maximum 150mm depth (after compaction) and in case of soil sticking together (clay material) it must be compacted up to 93% of the modified AASHTO-density or in the case of non-sticky soil (sandy material) up to 98% of the modified AASHTO-density.

Machine compaction will not be permitted directly above the cable(s) or sleeve(s) before a layer of 300mm depth fill material has been placed on top of the cable(s) or sleeve(s). The machine compaction must be conducted in such a way that the forces superimposed on the cable(s) or sleeve(s) does not exceed that superimposed by ordinary pedestrians or light vehicle traffic when the cover is already 1 m deep. If road traffic is involved, the cable(s) must be protected by a cable-way or -sleeve of at least 100mm in diameter, through which the cable(s) can be drawn at any time. Cable-ways beneath subways must be cast in concrete in a suitable way, if it is required by the project specifications.

PSEL 2.14 TRANSPORT OF CABLE DRUMS

Cable drums must be carefully transported to prevent damage to the cables and to prevent disturbing the cables. Damaged cables will be rejected. Drums may not be off-loaded by simply allowing them to roll off the back of the truck onto the ground. Drums may only be rolled in the direction as indicated by the arrow painted on the drum by the manufacturer. (This will ensure that the correct tension is maintained and prevent the cable from damage later). Every drum may only have one cable length on it. Proper attention must be given to where the drums are to be off-loaded in order to prevent unnecessary moving thereof, eg. at joint locations.

PSEL 2.15 HANDLING OF DRUMS ON SITE

Note: It is recommended that a correctly designed spreader must be used to load and unload the drums with a crane.

Every drum must be mounted on jacks or on a cable-drum trailer with a horizontal supporting beam of suitable size and strength to handle the width and weight of the drum. The drum may not be allowed to rotate freely when the cable is rolled off. (Free rotation causes the cable to twist and loosen the windings, which can cause the inside armouring/insulation of the cable to be stretched). The cable must enter the trench from the top of the reel. All cables ends including that left on the drum or in a trench must be sealed to prevent the penetration of moisture into the cable. The free cable end on the drum must be fastened to the side of the drum.

PSEL 2.16 COMMUNICATION

The contractor must ensure good communication between the operators at the pulling end and at the reel end of the cable while laying the cable(s).

PSEL 2.17 PULLING OF CABLE

The cable may be pulled by hand or by a wrench, but the maximum tension in the cable as specified by the manufacturer, may not be exceeded. A cable grip must be used to pull the cable, but if specified by the project specification, a loop connected to the cable cores and sheathing must be used. A twist connection must be used between the loop and the rope used to pull the cable. In cases where cables have to be drawn around corners, well lubricated skid-plates or special corner rollers must be used. Skid-plates and rollers must be firmly secured and must be inspected regularly throughout the cable laying process to ensure that they work properly.

PSEL 2.18 CABLE BENDS

No cable bend may have a smaller radius than the minimum radius specified by the cable manufacturer. This radius shall never be less than the radius prescribed by the relevant SANS specification.

PSEL 2.19 CABLES LAID IN SLEEVES, CABLE WAYS, ETC

Cables laid under hardened areas must be laid through sleeves or cable-ways that are strong enough to withstand the expected shock loads applied by traffic. The laying of cable-ways and sleeves must comply with the applicable requirements of SANS 1200 LB and SANS 1200 LC. After the cable-ways and sleeves had been laid, they must be cleaned thoroughly to remove roughness and sharp edges that can damage the cable. The ends of spare sleeves and cable-ways must be properly sealed and if the project specification requires a pull wire, this must be installed. The position of these sleeves and cable-ways must be identified in the project specifications.

PSEL 2.20 CABLE SLEEVE PIPES

Where cables cross under roadways, other services and where cables enter buildings, the cables shall be installed in high-density polyethylene pipes or heavy duty class 34 uPVC sleeves with a wall thickness of not less than 1,5mm thick and a smooth finish inside.

The ends of all sleeves shall be sealed with a non-hardening watertight compound after the installation of cables. All sleeves intended for future use shall likewise be sealed with a draw wire inserted.

Cable sleeves shall be provided where shown on the drawings and wherever necessitated by installation conditions. Sleeves shall be of steel water pipe when traversing railways sidings, heavy duty tarmac, loading areas, etc.; they shall be of other approved materials where traffic loading is lighter. Cable sleeves shall not be less than 100mm internal diameter unless specifically noted otherwise in the Project Specification; they shall be of continuously smooth bore with no snags or hitches en route and shall encompass only easy sweeping bends permitting the easy passage of the heaviest cable involved. No cable sleeve shall exceed 50 meters without a manhole draw position, unless authorized in writing by the Engineer.

Cable sleeves entering a floor cable duct shall be swept gently to the level of the bottom of the trench so that cables do not kink at entry to the trench. Cable sleeves brought to switchboards or distribution boards having no associated floor cable ducts, or brought to rising cable ducts shall be swept up easily so that the cable emerges vertically from the floor. In cases where the emerging cable is exposed to view, wooden dams shall be fitted round the cable at the top of the sleeve, and the floor screeded completely round the cable. The outer ends of cable sleeves entering buildings shall, after drawing in the cables, be water proofed with cable compound of low melting point.

Sweeping bends shall be installed where sleeves enter distribution boards. Sharp sleeve bends are not acceptable.

Cables attached to external walls must be placed in a recessed galvanized pipe from 300mm below ground level into the meter box or into roof spaces complete with brass bushes at both ends.

The ends of all sleeves shall be sealed with a non-hardening watertight compound after the installation of cables. All sleeves intended for future use shall likewise be sealed.

PSEL 2.21 SPACING BETWEEN CABLES AND OTHER SERVICES

The minimum spacing between electrical cables and other services must be in accordance with the project specifications.

In case of trenches used for a number of electrical cables the minimum horizontal free space required to prevent de-rating of the cables, are as follows:

- 1) In the case of cables with a conductor size of not more than 70mm²: 75mm
- In the case of cables with a conductor size of at least 70mm²: 150mm

PSEL 2.22 INSTRUMENTATION CABLING

The multi-core instrumentation cabling supplying DC power and communication to the flow meter is to be of the following specification:

- Colour Coded Twisted Pair with individual and overall drain wires
- Insulation rated at 300V/500V,
- Individual & overall Mylar screened,
- Galvanized steel wire armoured
- Plain annealed class 4 bunched copper conductors
- Insulation to be crosslink polyethylene - Temperature rating 105°C
- Individual screening to be Aluminium tape with a 0.5mm² tinned copper drain wire. All individual screens are to be sealed
- Overall screening to be Aluminium tape with a 0.5mm² tinned copper drain wire
- Bedding sheath to be Flame retardant PVC - Temperature rating 90°C
- Outer sheath - Low Halogen. Black/Blue Stripe

Details of the instrumentation cable installation is shown in drawing ELE-2000-01/2.

PSEL 2.23 SURGE PROTECTION

The surge protection is to have minimum ratings as follows:

For 24VDC Supply to flow meter:

2-Pole Type 3 Surge arrester with remote signalling contact

| | |
|---|---------------------|
| Max. Continuous operating voltage (UC): | 30 VDC. |
| Nominal load current (IL): | 25 Amps |
| Voltage Protection Level: | 0-180V |
| Response time (L-N): | ≤25ns |
| Response time (L/N-PE): | ≤100ns |
| Operating Temperature: | -40 °C ... +80 °C |
| Remote Signalling: | Change-over Contact |

For Door Limit Switch:

2-Pole Type 1 Surge arrester with wireless condition monitoring

| | |
|---|-----------------------------|
| Max. Continuous operating voltage (UC): | 180 VDC. |
| Nominal load current (IL): | 100 milliAmp |
| Voltage Protection Level: | 0-550 V |
| Operating Temperature: | -40 °C ... +80 °C |
| Remote Signalling: | Contactlessly via RF 125kHz |

For RS485 to HART Converter:

4-Pole Type 1 Surge arrester with wireless condition monitoring

| | |
|---|-----------------------------|
| Max. Continuous operating voltage (UC): | 180 VDC. |
| Nominal load current (IL): | 100 milliAmp |
| Voltage Protection Level: | 0-550 V |
| Operating Temperature: | -40 °C ... +80 °C |
| Remote Signalling: | Contactlessly via RF 125kHz |

For SPD Monitoring:

Surge arrester condition monitoring module:

| | |
|--------------------------------------|-----------------------------|
| Input voltage range (UIN): | 18-48 V |
| Max. rated current consumption (IIN) | 100 milliAmp |
| Operating Temperature: | -40 °C ... +80 °C |
| Remote Signalling: | Contactlessly via RF 125kHz |

PSEL 2.24 EQUIPMENT KIOSK

Refer to electrical drawing ELE-2000-01 and equipment schedule.

All distribution kiosks and equipment shall comply with the requirements of the Specification with project specific requirements

General Requirements

Before the commencement of manufacture, detailed drawings of the proposed kiosk and boards are to be submitted to the Engineer or his representative/ agent for approval. Full schematic details of the layout and wiring of the boards are to be provided with these drawings.

At sites where a telemetry room is available, each Kiosk shall be fitted with, on it's mounting plate, the following equipment as per details on the drawings and schematic:

- 1 x Free-issue IP 67 Flow Transmitter (Endress and Hauser Prosonic 93C or similar
- 1 x Free-issue IP65 RS485-HART converter.
- IP65 Enclosure with the following components:
 - 60A Double Pole isolator
 - DIN Rail mounted Pre-fused Surge Arresters
- Earth Bar
- Spare Space

PSEL 2.24.1 CONSTRUCTION MATERIAL

| | |
|-----------------------------------|--|
| Enclosure Material (shell & roof) | 30mpa 10mm Re-enforced 42,5N Power Crete |
| Door | 5.0mm Hot dipped galvanised |
| Gland Plate | 1.6mm 3CR12 |
| Inner equipment mounting plate | 1.6mm 3CR12 |

Kiosks, constructed of 30mPa re-enforced concrete, shall be waterproof and spacious enough to accommodate all equipment as described in the schedules.

Any sheet metal shall be galvanized. Welding materials shall be of the same quality as the base metal.

The door shall be hot dipped galvanised to SANS 121/ ISO 1461 with thickness of 5.0mm with cross arm strategically placed to stiffen the inside of the door to prevent bending.

Doors shall open minimum 90° and shall be fitted with locking mechanisms. The door hinge shall be welded to the rebar with the female part of the locking mechanism housed in a 5.0mm steel plate hot dipped galvanised to SANS 121/ ISO 1461.

The locking mechanisms shall be a rotating spring loaded vault lock system and shall be tamper proof and shall be keyed alike or as per the client's requirements. The lock shall be mounted flush with the door and shall be protected with a curved pressed steel cover which is to be bolted to the door using oval head socket bolts.

The kiosk shell must be bolted / cast into the concrete plinth from the inside of the enclosure.

Nothing must obstruct the operator from operating the switchgear when doors are opened. The enclosure shall be weather proof and safe to operate in any weather condition

The enclosure shall be robust enough to prevent tampering.

The kiosk shall have on the roof, 4 x threaded slots to receive M16 lifting hooks,

The Enclosures shall be adequately protected against rust, dust and corrosion both from inside and outside.

The fabrication of material shall be done in such a way that there is a good finish of fabricated/moulded material. The material shall be fabricated/moulded accurately to adhere to dimensions as per the drawings

The enclosure shall be fabricated / welded such that the rain water does not enter the enclosure.

The Enclosure shall be constructed to allow adequate dissipation of heat. Ventilation of the enclosure shall not compromise the security of the enclosure and the equipment housed there-in. Ventilation shall be adequate to allow that all installed equipment inside the enclosure shall operate normally in temperatures between -10°C and 60°C.

The gland plate shall be manufactured of 3CR12 stainless steel of 1.6mm thickness. Sufficient holes shall be pre-punched for the number and sizes of cables specified.

PSEL 2.24.2 MOUNTING

The finish of all kiosks on the interior and exterior and on the panels on which switch gear is to be mounted shall be of a high quality and shall be suitable for exterior use. All Galvanising shall be applied to surfaces prepared in accordance with SANS 121/ ISO1461.

Mounting of the kiosk shall be on a concrete plinth of adequate size to provide a skirt of at least 100mm around the unit. The kiosk base shall be cast into the plinth. The plinth shall be of adequate thickness to protrude 100mm above ground while installed to a minimum depth of 250mm below ground level. The earth shall be properly compacted to prevent the unit from tilting or subsiding.

All equipment in the kiosk shall be surface mounted onto a 3CR12 stainless steel mounting plate of 1.6mm thickness. This mounting plate shall be fixed by means of fixings at the bottom and top of the plate.

A solid copper bus bar shall be provided for each phase and neutral and shall be mounted on appropriately coloured ceramic or similar insulators. The colours of insulators shall correspond with the phase colours that are red, yellow, blue and black for the neutral. Bus bars shall be easily reachable. Bus bars shall be suitably rated for the full load capacity as indicated on the single line diagrams.

PSEL 2.24.3 EARTHING

A solid copper earth bar shall be installed complete with spring washers, brass washers and nuts. The bus bar shall be provided with internal thread and the heads of the bolts shall be soldered in position at the back.

The gland plate shall be bonded to the earth bar through a stranded copper conductor.

Earthing to be carried out and tested in terms of SANS 10142. If earth resistivity is not achieved, further earth spikes and or earth wire to be installed to achieve the specified minimum readings

PSEL 2.24.4 WIRING

The LV cables shall rise into the unit from below through a plinth opening and shall be fitted to the gland plate with suitable glands. The individual cores of the cables shall be equipped with lugs and connected to the bus bars.

All internal cabling and wiring shall be neatly bundled with nylon ties, be housed within suitable PVC trunking and shall be arranged in horizontal and vertical directions only.

PSEL 2.24.5 LABELLING

All meters and circuit breakers shall be labelled with engraved plastic labels at least 1mm thick with 12mm letter size labels and shall be fitted to slide in frames.

All kiosks shall be clearly marked to indicate the name and/or number of the kiosk and from where the kiosk is fed and the size of the feeder cable.

Danger notices type WS7 to SANS 1186 manufactured from plate aluminium, measuring approximately 150mm x 150mm, shall be fitted to the door in a central easily visible position.

PSEL 2.24.6 FIXINGS

All set screws, nuts and spring washers for fitment of different parts or equipment inside the enclosure shall be stainless steel.

PSEL 2.24.7 DOCUMENTATION

Full particulars consisting of informal drawings, indicating size, construction and material used shall, however, be provided for approval to the Engineer before manufacture of the kiosk.

PSEL 2.24.8 INSTRUMENTATION & ASSOCIATED EQUIPMENT

The installation and mounting of instrumentation must conform to the manufacturer's requirements and shall be carried out by a competent instrumentation specialist.

All equipment to be supplied by the Contractor shall have the approval of the Employer's representative.

The instrumentation and equipment must be of the type listed in the Equipment Schedule.

PSEL 2.25 TESTS

After completion of the works and before first delivery is taken, a full test will be carried out on the installation, for a period of 30 days, to determine the satisfactory working thereof. During this period the installations will be inspected and the contractor shall make good, to the satisfaction of the Engineer, any defects which may arise.

The contractor shall provide all instruments and equipment required for testing and any water, power and fuel required for the commissioning and testing of the installations at completion.

Tests as stipulated in the "Occupational Health and Safety Act no. 85 of 1993, as amended, and in the "Code of Practice for the Wiring of Premises" SANS 10142-1 (as amended), must be done. These test report forms must be filled in fully and correctly in ink, signed by the installation electrician and handed to the Engineer or its representative.

Tests must be conducted on site after the whole installation is complete, unless written the Engineer to the contrary grants permission. The tests must include a full-load test for an

adequate period to ensure the satisfactory working of the installation. If negative test results are obtained, faults must be rectified and tests again done.

The contractor must supply all testing apparatus, correctly calibrated.

All tests shall be carried out in conjunction with and to the satisfaction of the Supply Authority and in the presence of the Engineer or his representative. The contractor shall make all arrangements for testing and inspection, the costs thereof being included in the Tender Price.

Each length of cable shall be tested for insulation and polarity by means of a 1000 Volt insulation tester designed for that purpose. In the case of underground cables this shall be done before back filling. In addition, the earth-loop impedance of each conductor earth electrode shall be measured. The earth resistance shall be tested by means of an approved instrument.

"Danger" notices shall be displayed at remote ends of cables under test.

The contractor shall ensure that the installation is completed in every respect and that there are no major defects prior to notifying the Engineer (in writing) for a first delivery inspection.

The Engineer will accept zero minor defects during the final inspection. Should the number of defects be exceeded at the final inspection then the Engineer will terminate that inspection and request that the contractor arrange an additional final inspection.

PSEL 2.26 CERTIFICATE OF COMPLIANCE

At each site, on completion of the service, a certificate of compliance must be issued to the Employer's Representative/Agent in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).

PSEL 2.27 MAINTENANCE OF INSTALLATIONS

With effect from Practical Completion for any individual installation, the contractor shall at his own expense undertake the regular servicing of the installation during the Defects Liability Period and guarantee period and shall make all adjustments necessary for the correct operation thereof.

If during the said period the installation is not in working order for any reason for which the contractor is responsible, or if the installation develops defects, the contractor shall immediately, upon being notified thereof, take steps to remedy the defects and make any necessary adjustments.

Should such stoppages however be so frequent as to become troublesome, or should the installation otherwise prove unsatisfactory during the said period the contractor shall, if called upon by the Engineer or the Employer, at his own expense replace the whole of the installation or such parts thereof as the Engineer or the Employer may deem necessary, with apparatus specified by the Engineer or the Employer.

PSEL 2.28 SCHEDULE OF FITTINGS

In all instances where schedule of light, socket outlet and power points are attached to or included on the drawings, these schedules are to be regarded as forming part of the specification.

PSEL 2.29 QUALITY OF MATERIALS

Materials and equipment used in this installation must be of the best quality of their respective types, must meet the relative SANS or BSS specifications and must be installed to the satisfaction of the electrical Engineer or his representative.

The contractor will be informed in writing if any material or workmanship is not of the required quality. In such a case, the contractor must replace the material concerned or repair the installation to the satisfaction of the Engineer or its representative.

If requested to do so, the contractor must provide samples of materials or equipment, for the approval by the electrical Engineer, before it may be installed. The samples will be kept for comparison with materials and equipment actually installed and will be returned after the contract has been satisfactorily completed.

Materials wherever possible, must be of South African manufacture.

PSEL 2.30 WORKMANSHIP AND STAFF

Except in the case of electrical installations supplied by a single-phase electricity supply at the point of supply, an accredited person shall exercise general control over all electrical installation work being carried out.

The workmanship shall be of the highest grade and to the satisfaction of the Employer.

All inferior work shall, on indication by the Employer's inspecting officers, immediately be removed and rectified by and at the expense of the Contractor.

Quality control to be implemented for open cable trenches prior to installation of cables.

PSEL 2.31 EARTHING AND BONDING

The Contractor will be responsible for all earthing and bonding of the electrical installation. The earthing and bonding is to be carried out strictly as described in this specification and to the satisfaction of the Employer's representative.

Quality control to be implemented for earthing installation during testing.

PSEL 2.32 MAINTENANCE OF ELECTRICAL SUPPLY

All interruptions of the electrical supply that may be necessary for the execution of the work will be subject to prior arrangement between the Contractor and the user Employer and the Employer's representative.

PSEL 2.33 LIAISON

The electrical contractor shall, in each case, provide the main contractor with all necessary information, dimensions, materials, etc., as called for in the specification, in good time.

It is essential that the electrical contractor work in close collaboration with the principal contractor to ensure that where his services run in proximity with other services, there are no clashes.

Failure to comply with the above may mean that corrective measures will have to be taken to correctly position the equipment. Any abortive work resulting will be entirely to the electrical contractor's account.

Where the electrical contractor is to provide electrical supplies to control panels forming part of other contract works, it is essential that the electrical contractor liaise fully with the particular contractor who must provide the electrical contractor with all information necessary so as to ensure that the supply cable terminates in the correct position and that the phase rotation complies with the equipment installed.

Failure to do so may result in the electrical contractor being held responsible for the cost of removing and replacing not only his own but also the equipment of the main contractor and other contractors.

PSEL 2.34 SUPERVISORY STAFF AND IDENTIFICATION

All work done on site shall at all times be under the direct and full-time supervision of a contract manager who shall be a qualified installation electrician who will sign the certificate of compliance.

Full particulars of the site organisation, complete with names of officials the Tenderer proposes to allocate to this project are to be submitted with this tender. For the duration of this contract the above detailed officials will be permanently assigned to this project and may only be relieved of their duties after prior agreement by the Engineer or his representative/agent.

Whilst on the site all staff and labourers employed by the electrical contractor shall wear distinctively marked clothing bearing the name of the electrical contractor or his identification logo.

PSEL 2.35 SETTING OUT OF WORKS

The electrical contractor shall be responsible for marking out and setting out of all equipment and plant.

The position of items of electrical equipment and plant indicated on the drawings are to be taken as approximate. The exact position for fixing shall be obtained by site measurements.

In case of doubt, decisions shall be obtained from the Engineer or his representative/agent.

PSEL 2.36 ERECTION OF EQUIPMENT

The contractor shall be responsible for the erection and installation of all equipment supplied by him under this contract.

In addition, the contractor shall be responsible for the care and maintenance of all electrical equipment after erection is completed until the first delivery of the specific section of the works. He shall ensure that the proper enclosure of all equipment is maintained at all times, that access doors and covers are opened only when necessary to work on the equipment and replaced afterwards, that the paint finish on all items is effectively protected and that all unused cable and conduit entries are effectively sealed.

PSEL 2.37 LEVELLING AND PLUMBING

All equipment shall be carefully levelled and plumbed, checked with a spirit level. Should any equipment be unsatisfactorily installed in this respect it shall be dismantled and reinstalled, the costs of making good to damaged structures, plaster and paint will be for the account of the contractor.

It must be noted that boxes for imported accessories must be levelled and plumbed when installed, since the inserts cannot be levelled independently of the boxes.

PSEL 2.38 DELIVERY AND COMPLETION

All contract materials shall be ordered timeously and delivered to site at dates suited to the agreed construction program.

The successful Tenderer for the installation will be required to commence work immediately following notification of tender acceptance, and shall thereafter at all times maintain the progress required by the agreed completion program.

PSEL 2.39 DRAWINGS

The drawings generally show the scope and extent of the proposed work and shall not be held as showing every minute detail of the work to be executed.

The position of power points, switches and equipment that may be influenced by built-in furniture must be established on site, prior to these items being built in.

On completion of the project update the drawings with any changes made during the course of the contract works and furnish the Engineer / client with the necessary as-built prints for record purposes.

PSEL 2.40 SHOP DRAWINGS

As soon as is possible after the contract has been awarded to him, the contractor must submit the following drawings to the Engineer for approval:
Design and construction drawings of all:

- Electrical equipment
- Electronic equipment
- Distribution Boards
- Distribution kiosks

The following information must appear on the drawings:

- 1) A full layout with the arrangement of the equipment and the distribution boards or kiosks, and on which all measurements of the equipment and the construction is indicated.

The position, fastening method and current rating of the bus bars.

The make, catalogue number and capacity of insulators, circuit breakers, fuses, contactors, etc.

Workshop drawings of the distribution board layout that is mounted on the inside of the kiosk.

The Engineer's approval of these drawings does not release the contractor from his responsibility to supply the correct equipment in terms of this contract.

PSEL 3 DESCRIPTION OF WORKS

PSEL 3.1 EXCAVATION & BACKFILL FOR MAIN SUPPLY CABLE

The rate shall include for the excavation in all materials for 300mm wide x 1050mm deep cable trench, and include backfill, compact and dispose of surplus/ unsuitable material for main supply cable from existing distribution board to flow transmitter kiosk

PSEL 3.2 EXCAVATION & BACKFILL FOR COMMUNICATION CABLE DUCT

Excavate in all materials for 300mm wide x 1050mm deep cable trench, backfill, compact and dispose of surplus/ unsuitable material for communication cable duct from flow transmitter kiosk to flow sensor

PSEL 3.3 CABLE WARNING TAPE

Supply and install SABS approved cable warning tape in trench 200mm above cable along the length of the trench.

PSEL 3.4 BEDDING

Import and place suitable bedding material to a depth of 50mm plus cover over cables / cable ducts to a depth of 150mm

PSEL 3.5 FLOW METER SUPPLY CABLING

Refer to Drawing ELE- 2000-01/02

At sites where telemetry room is available, a DC supply is to be provided to the metering kiosk for the flow meter and associated equipment.

The rate shall include for the supply and install of DC multi-core instrument cabling of size and type, 1.5mm², 16-core numbered, steel-wire armoured (SWA), 300/500V insulated twisted pair with individual and overall drain wires. The cable is to be bunched copper type and to be laid in ground in sleeves or without sleeves as directed by the Employer's Representative. All inclusive of works, labour, glands, shrouds, and lugs.

Installers to note that as per SANS 10142-1: Clause 6.2.7.1.2: When all conductors of a DC installation are carrying their maximum estimated load, the difference in voltage (the voltage drop) between any point of supply and any point of consumption shall not exceed 5 % of the circuit nominal voltage or shall comply with the requirements of the manufacturer of the equipment connected to the circuit.

Should clause 6.2.7.1.2 not be complied with or cannot be achieved, the installer must inform the clients representative or the engineer before commissioning.

PSEL 3.6 COMMUNICATION CABLE

The communication cable shall be installed by the instrumentation specialist.

At each site, take possession, install and connect free-issue 5m communication cable between transmitter/s in kiosk and flow meter sensors.

The rate shall include the pulling of cable in duct from kiosk to the sensor device.

PSEL 3.7 SURGE PROTECTION

Refer to ELE- 2000-01

Supply & Install DIN rail mounted pre-fused surge arresters into IP67 enclosure within kiosk.

Rate to include DIN rail surge protection devices and pre-fuses internal wiring and all other necessary accessories.

Combined lightning current and surge arrester modules to include life check feature where available for protecting one or two pair conductors.

PSEL 3.7.1 2-POLE TYPE 3 SURGE ARRESTER WITH REMOTE SIGNALLING CONTACT

The rate shall include the supply & install DIN rail mounted 2-Pole, 30VDC, Type 3 Surge Arrester for power systems with remote signalling contact

Shall include base part, protection module pre-fuses and all other necessary accessories

PSEL 3.7.2 2-POLE TYPE 1 SURGE ARRESTER WITH WIRELESS CONDITION MONITORING

The rate shall include the supply & install DIN rail mounted 2-Pole, 180VDC Surge Arrester with wireless status monitoring.

Shall include base part, protection module pre-fuses and all other necessary accessories

PSEL 3.7.3 4-POLE TYPE 1 SURGE ARRESTER WITH WIRELESS CONDITION MONITORING

The rate shall include the supply & install DIN rail mounted 4-Pole, 180VDC Surge Arrester with wireless status monitoring.

Shall include base part, protection module pre-fuses and all other necessary accessories

PSEL 3.7.4 SURGE ARRESTER CONDITION MONITORING MODULE

The rate shall include the supply & install, DIN rail mounted 18-48V SPD condition monitoring module for monitoring of adjacent surge protection devices equipped with life check.

Shall include RS485 interface, including visual state indication using three-coloured LEDs in conjunction with remote signalling contact.

PSEL 3.8 EQUIPMENT KIOSK

Refer to electrical drawing ELE-2000-01 and equipment schedule.

General Requirements

Before the commencement of manufacture, detailed drawings of the proposed kiosk and boards are to be submitted to the Engineer or his representative/ agent for approval. Full schematic details of the layout and wiring of the boards are to be provided with these drawings.

The rate to include for the supply and install of concrete bunker for the housing and protection of flow metering equipment.

Concrete bunker to be minimum 35mPA re-enforced concrete. To include 5mm 3CR12 stainless steel door with double throw locks. Master key system to be verified at each site and keys to be keyed alike as necessary, M16 Lifting Eyes, gland plate, 60A double pole isolator, and all necessary accessories as per specifications and drawings.

PSEL 3.9 CONCRETE FOUNDATION SLAB FOR CONCRETE EQUIPMENT KIOSK

The equipment kiosk to be cast in situ 25Mpa concrete foundation slab for concrete bunker, (1200 x 850 x 300mm with 2x110 entries to suit cable entry to the bunker). Rate to include for the foundation slab and fixing of bunker to slab and 2 x layers of Ref 888 mesh.

PSEL 3.10 FLOW METERS

The rate shall include for the taking possession of and install of free—issue IP67 flow meter transmitters into equipment kiosk including all fixings and mounting screws to maintain IP rating.

PSEL 3.11 ENCLOSURES

The rate shall include the supply and install of IP65, UV stabilized, polycarbonate box surface mounted onto mounting plate in equipment kiosk with clear lid and DIN rail and terminal blocks as shown on drawings.

PSEL 3.12 EARTHING**PSEL 3.12.1 EARTH BAR**

Supply & Install a solid copper earth bar with a minimum of five, 4mm bolts. The earth bar shall be copper and be pre-drilled with three holes to accept 10mm brass bolts. The earth bar shall be securely fixed to the wall so that there is a 50mm space between it and the wall.

The kiosk shall be earthed by means of an earth spike/s and 35mm² earth wire.

The rate shall include the supply & installation of 200mm x 50mm x6mm thick earth bar complete with all bolts washers and fixings

PSEL 3.12.2 EARTH SPIKE

Supply Install copper Earth spike in Crows Foot formation.

Rate to include the supply & installation of 1.8m long 16mm diameter earth rod, conductor clamps and all necessary accessories.

PSEL 3.12.3 EARTH SPIKE INSPECTION PIT

Supply Install a 200mm Dia x 500mm PVC earth spike inspection pit to access the earth spike connections.

Rate to include the supply & installation of the inspection pit complete with the 200mm x 500mm sleeve and PVC cover. The complete unit to be mounted in the ground with the cover 300mm below finished ground level.

PSEL 4 SCHEDULE OF DRAWINGS

The following drawings are part of the tender and should be priced accordingly.

| Drawing No. | Title |
|-------------|----------------------------------|
| ELE-2000-01 | Meter Kiosk |
| ELE-2000-02 | Meter Kiosk Installation Details |

PSEL 5 CABLE SCHEDULE

| From | To | Cable Size / Type | Cable Length | By who |
|--------------------------|-------------|---|---------------------------------|----------------------------|
| Existing Telemetry Panel | Flow Meter | 1.5mm ² , 16-Core, Numbered, Individual & Overall Mylar Screened, SWA Instrumentation Cabling in ground and duct. | Max = 290m | Instrumentation Specialist |
| Flow Meter | Flow Sensor | Flow Meter sensor cable in Duct in Ground | 5m (free issue) | Instrumentation Specialist |
| | | | 10m (procured through Contract) | |

PSEL 6 EQUIPMENT SCHEDULE

| Item | Supplied By | Make (To be Similar or Equivalent) | Model (To be Similar or Equivalent) |
|-----------------------------|------------------------|--|---|
| Ultrasonic Flow Transmitter | EWS (Free Issue) | Endress & Hauser | Proline Prosonic Flow 93C Transmitter |
| | | Siemens | SITRANS FUS380 |
| | Supplied by Contractor | Supplied by Contractor to Specification PSMA 1 | Supplied by Contractor to Specification PSMA 1 |
| Ultrasonic Flow Sensor | EWS (Free Issue) | Endress & Hauser | Proline Prosonic Flow 93C Sensors |
| | | Siemens | SITRANS FUS080 |
| | Supplied by Contractor | Supplied by Contractor to Specification PSMA 1 | Supplied by Contractor to Specification PSMA 1 |
| Cabling | | Alvern Cables | 8-Pair, numbered, individual and overall tinned copper drain wire, Individual & Overall Mylar Screened, SWA Instrumentation Cabling |

PSMA**METER SPECIFICATIONS****PSMA1****ULTRASONIC FLOW METER SPECIFICATION**

- 1) The flow meter shall be the in-line ultrasonic type comprising of a minimum of 2 pair of sensors and either remote or integral microprocessor based converter unit. The system shall be inherently bi-directional with separate isolated analogue (4-20mA) and pulse outputs (voltage free) for forward and reverse flow.

The flow meter shall have no moving parts to ensure that there is no damage from particulate matter e.g., stones etc.

The meter and transmitter shall be suitable for 24 volts D.C. without the need for link setting or voltage selection.

The system accuracy shall be equal to or better than $\pm 0.5\%$ of measured value under reference conditions irrespective of flow direction with a flow range of 0.01 m/s to 20 m/s full scale (i.e. 2000:1 turndown). Repeatability shall be equal to or better than $\pm 0.1\%$.

The meters shall be suitable for a maximum working temperature of 180°C at pressures up to 16 bars or as limited by the flange rating.

Tenderers must provide full details of the minimum lengths of straight pipe required upstream and downstream from each type of perturbation, so that the accuracy of the meters remains within the specified accuracies.

The specification is based off minimum installation of straight pipe requirement of 5 x meter diameter upstream from the flow meter and 3 x meter diameter downstream from the flow meter. An additional item has been allowed for in the Bill of Materials to increase the minimum straight pipe requirements for the supply of meters by the Contractor.

The meter performance shall have been verified using wetted calibration with potable water on a fully traceable test facility that is internationally accepted. Laboratory traceability packs shall be available on request.

The meter shall be designed and manufactured under the ISO 9000 series of quality standards. It shall also have a meter body length to current ISO standard for in-line ultrasonic flow meters to facilitate interchangeability of product.

The wetted materials shall be compatible with, and suitable for, use on potable water. The liner shall be certified by an internationally recognised body such as AWWA or equivalent.

The transmitter unit shall be protected to a minimum IP67 and must be of remote version type to be wall mounted.

Cabling between the signal transmitter shall be by one 6 core screened cable providing both power and measurement signal from the flowmeter sensor to the flow meter transmitter.

Cabling between the signal transmitter and meter shall be maximum length of 10 metres.

The signal transmitter must be fitted with built in communication interface with the integral MODBUS protocols. No converters will be accepted.

The signal transmitter display shall indicate user-defined flowrate, flow total and sonic velocity units. The device shall incorporate a menu selection allowing range, unit's etc to be made. Data shall be stored in a non-volatile memory.

There shall be independent totaliser displays to give forward total, reverse total, net totals, time and date.

The meter software shall incorporate multi password protection to prevent inadvertent or fraudulent programming or units of measurement changes.

The meter supplier must have a proven traceable track record of providing the backup service to the meters should the need arise to minimise down times as well as have the necessary repair facilities locally to have the meters repaired.

All inputs and outputs to be galvanically isolated from the power supply. All pulse/status outputs and Analogue 4-20 mA output to be fully galvanically separated.

The flow sensor shall be rated to IP68 and be suitable to indefinite submergence to a depth of up to 10m. The sensor shall also be suitable for installation in underground pipes without the need for a metering chamber, vault or pit (i.e., it shall be capable of direct burial). The Tenderer shall, on request, provide evidence of satisfactory operation of similar sensors for a minimum period of 5 years in buried installations.

The flow meter shall have an additional burial coating to the standard meter coating for protection of the meter for all buried/ sub soil installations.

Be suitable for use under a maximum pressure as stated in the Bill of Quantities and flanged to SANS 1123 or EN 1092-1;

PSMA2 MECHANICAL FLOW METER SPECIFICATION

Meters of a particular type and size shall comply with the flow requirements specified in Table PSMA 2.1 below. In this regard the following definitions shall apply:

1) Q_p – Permanent/ Continuous Flow Rate: the flow rate for which the meter is designed and at which the meter is required to give indication within the permissible tolerances which for this Contract is 2% and under normal conditions of use eg: Under steady or intermittent flow conditions.

Q_{min} – Minimum Flow Rate: the lowest flow rate at which the meter is required to give indications within the permissible tolerances which for this Contract is 5%. It is determined in terms of Q_p .

Q_t – Transitional Flow Rate: A flow rate that occurs between the overload flow rate and the minimum flow rate and at which the flow rate range is divided into two zones, the upper zone (which for this Contract is 2%) and lower zone (which for this Contract is 5%), each characterized by a specific permissible tolerance on flow rate indication.

Q_s – Overload Flow Rate: A flow rate that represents the highest flow rate at which the meter is required to operate in a satisfactory manner for a short period of time without sustaining any damage to an accuracy of 2%. (Q_{max})

Table PSMA 2.1: Meter Performance for Mechanical Meters

| METER SIZE (mm) | Q_p \geq (m ³ /hr) | Q_t \leq (m ³ /hr) | Q_{min} \leq (m ³ /hr) | Q_s \geq (m ³ /hr) |
|--------------------|--------------------------------------|--------------------------------------|--|--------------------------------------|
| 40 | 30 | 0.15 | 0.10 | 50 |
| 50 | 35 | 0.15 | 0.15 | 55 |
| 80 | 120 | 0.51 | 0.20 | 200 |
| 100 | 230 | 0.81 | 0.30 | 300 |
| 150 | 450 | 1.60 | 0.80 | 600 |
| 200 | 800 | 4.00 | 2.00 | 1200 |
| 250 | 1250 | 6.30 | 3.50 | 1600 |
| 300 | 1400 | 16.00 | 9.00 | 2000 |

Meters of all sizes shall:

1) Contain a minimum of wearing parts; be capable of correctly recording low rates of flow and withstanding flows in excess of the maximum rated capacity for short periods without damage to the mechanism;

- 2) Record through flow in cubic meters;
- 3) Be suitable for operation in water at all temperatures between 2°C and 40°C;
- 4) Have straight reading pattern cyclometer counters indicating completed m³, having a reading sequence from left to right, with one colouring system to indicate m³ and another colouring system or multi-pointer counters for sub multiples;
- 5) Have inlets and outlets to each meter supplied sealed against ingress of foreign matter with rigid metal or plastic blanking caps;
- 6) Have robust hinged covers of adequate strength to protect the meter counters;
- 7) Have a body free of blow holes and other flaws and be accurately machined;
- 8) Be suitable for use under a maximum pressure of 1600kPa;
- 9) Have underwater fittings manufactured from DZR brass (complying with SANS 6509) or other approved non-corrosive materials;
- 10) Have all threads other than inlets and outlets compatible with I.S.O. metric sizes; and
- 11) Have no screwed connecting pieces;
- 12) Be flanged in-line through-flow type, mechanical turbine bulk water meters and shall comply with the requirements of SANS 1529;
- 13) The meter bodies must be coated with a high quality sintered epoxy powder coating, both internally and externally, to provide maximum protection against corrosion. The coating dry film thickness is to be a minimum of 200 microns so to permit installation above ground without further protection. The cover bolts must be stainless steel to facilitate easy removal of mechanisms and must be installed with stainless steel washers;
- 14) Meters shall be fitted with hermetically sealed, copper can, dry dial, glass faced registers sealed to IP68 protection to prevent ingress of dirt or moisture. These meters must be equipped with registers, which comprise 6-digit cyclometer-type totalizers, registering in m³;
- 15) The meters shall have body lengths that comply with Table PSMA 2.2;
- 16) The meters shall have flanged inlets and outlets in accordance with SABS 1123 Table 1600 and capable of withstanding a nominal working pressure of at least 1600 kPa;
- 17) All internal plastic components to be constructed of virgin materials.
- 18) The meter shall be clearly and indelibly marked with the following information:
- 19) Name or trademark of the manufacturer
- 20) Meter serial number where first two digits indicate year of manufacture.
- 21) Direction of flow on both sides of the body
- 22) Unit of measurement
- 23) Meter type and size
- 24) Maximum admissible pressure
- 25) EWS Meter number stamped onto a plate and attached the body/ flange
- 26) The performance of the meters offered shall not be affected by outside electromagnetic influences;
- 27) The registers must have HRI pick-up as a standard feature as well as optical pulsers type OD so that the flow can be logged with the data loggers currently used by the Department;
- 28) Flanged meters are to be supplied complete with gasket sets;
- 29) Meters up to DN150 shall be able to be installed with 0 x DN unrestricted straight pipe upstream and downstream, Tenderers must provide full details of the minimum lengths of straight pipe required for greater than DN150 meter for

upstream and downstream from each type of perturbation, so that the accuracy of the meters remains within the specified accuracies;

30) Meters shall be able to be installed both in the horizontal and vertical position;

Table PSMA 2.2: Body Length of Mechanical Meters

| METER SIZE (mm) | Body Length (mm) |
|-----------------|------------------|
| 40 | 220 |
| 50 | 200 |
| 80 | 200 |
| 100 | 250 |
| 150 | 300 |

PSCP CATHODIC PROTECTION

PSCP 1 DESCRIPTION

All inline equipment (buried or in a chamber) along a steel pipeline such as joints, flanged joints, valves, meters, specials which have flanged connections with gaskets usually have an electrical resistance which encourages the electrical current to jump off the pipeline. All valves, meters, specials, flanged joints require an electrical cabling anti-corrosion by-pass to ensure the current remains on the pipeline.

PSCP 2 CONTINUITY BONDING OF BURIED JOINTS

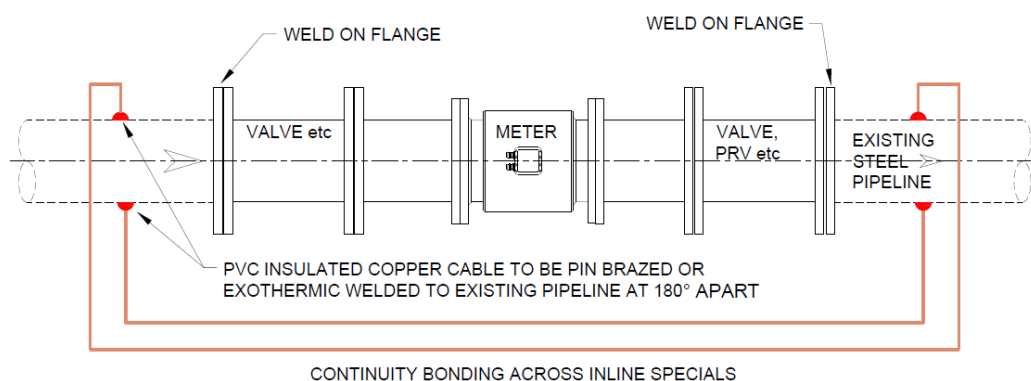
All pipe joints shall be continually bonded by means of 2 x 16mm² black PVC insulated copper cables pin brazed or exothermic welded to the steel pipeline either side of the joint.

All bonding of cables to the pipeline must be in accordance to PSCP 4.

PSCP 3 CONTINUITY BONDING OF INLINE PIPEWORK ASSEMBLIES AND SPECIALS

All inline equipment, specials and/ or pipework assemblies shall be continually bonded by means of 2 x 16mm² black PVC insulated copper cables pin brazed or exothermic welded to the steel pipeline either side of the inline equipment, specials and/ or pipework assemblies. The cables shall run in a 25mm diameter PVC conduit with a minimum offset of 350mm from the pipeline as illustrated below and shall have electrical warning tape placed 500mm above conduit during backfilling. Conduit ends shall be sealed with Polyurethane Foam.

All bonding of cables to the pipeline must be in accordance to PSCP 4.



PSCP 4 CABLE TO STEEL PIPE CONNECTION

Insulated PVC copper cable shall be pin brazed or exothermic welded to the steel pipeline. The technique used shall ensure that metallurgical contact is achieved between the cable and the pipeline while care is taken to (re)insulate the pipeline coating and the weld to prevent currents going to earth and to prevent corrosion. All wires to be crimped at ends with electrical type copper lugs or ferrules. Contractor shall submit details of the technique and equipment to be used.

The minimum amount of coating to bare pipe shall be removed. After connecting the cable, the entire exposed area shall be encapsulated in epoxy. The procedure for this is as follows:

- 1) Clean the pipeline coating to a minimum of 50mm beyond the final repair limits in accordance to PSL 3.9.7;
- 2) Construct a dam from a suitable material around the coating repair area;

- 3) Apply squish pack Copon Hycote 151 epoxy or similar approved non-conductive epoxy over the entire repair area, ensuring a minimum 5mm cover over the cable connection. A minimum overlap of 50mm shall be made over the existing coating.

All cable to pipe connections and coating repairs shall be witnessed by the Employers Representative.

C3.5: CONTRACT AND STANDARD DRAWINGS

C3.5.1 CONTRACT DRAWINGS / DETAILS

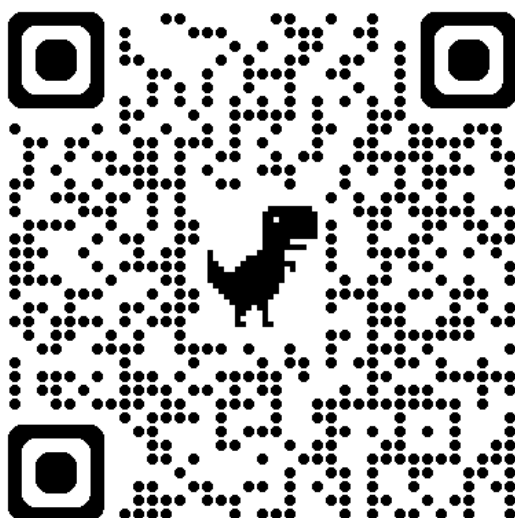
The drawings issued to tenders as part of the tender documents must be regarded as provisional and preliminary for the tender's benefit to generally assess the scope of work.

The PDF drawings are issued as a CD of drawings for Hard Copy Tender Documents purchased from The Cashier, eThekweni Water Services, Customer Services Building, 133 KE Masinga Road (formerly Old Fort Road), Durban.

The PDF drawings are accessible for Electronic Documents obtained from the eTenders website via the following link:

<https://drive.google.com/drive/folders/1BEFDmwj4kwNTyrPKmFcNU2J9yyUYoigU>

Alternatively, Scan the QR Code below:



The work shall be carried out in accordance with the latest available revision of the drawings approved for construction (AFC).

At commencement of the contract, the Engineer shall deliver to the Contractor copies of the AFC drawings and any instructions required for the commencement of the works. From time to time thereafter during the progress of the works, the Engineer may issue further drawings for construction purposes as may be necessary for adequate construction, completion and defects correction of the works.

All drawings and specifications and copies thereof remain the property of the Employer, and the Contractor shall return all drawings and copies thereof to the Employer at the completion of the contract.

Drawing Number Allocation

001 – 199 Reservoir Site Plans

200 – 299 Pipework and Standard Details

300 – 399 Electrical and Instrumentation Details

| RESERVOIR LAYOUT PLAN | | |
|-----------------------|-------------|---|
| NC DWG NO. | EWS DWG NO. | DRAWING NAME |
| D667-A-5000 | 59066/ 01 | Aloes Reservoir Site Plan Layout |
| D667-A-5001 | 59066/ 02 | Belvedere Reservoir Site Plan Layout |
| D667-A-5002 | 59066/ 03 | Canelands Reservoir Site Plan Layout |
| D667-A-5003 | 59066/ 04 | Durban North LI Reservoir Site Plan Layout |
| D667-A-5004 | 59066/ 05 | Effingham Reservoir Site Plan Layout |
| D667-A-5005 | 59066/ 06 | Etafuleni Reservoir Site Plan Layout |
| D667-A-5006 | 59066/ 07 | Everest Heights Reservoir Site Plan Layout |
| D667-A-5007 | 59066/ 08 | Grange Reservoir Site Plan Layout |
| D667-A-5008 | 59066/ 09 | Hambanathi Reservoir Site Plan Layout |
| D667-A-5009 | 59066/ 10 | Katzkop Reservoir Site Plan Layout |
| D667-A-5010 | 59066/ 11 | Kwamashu 1 Reservoir Site Plan Layout |
| D667-A-5011 | 59066/ 12 | Kwamashu 2 Reservoir Site Plan Layout |
| D667-A-5012 | 59066/ 13 | Kwamashu 3 Reservoir Site Plan Layout |
| D667-A-5013 | 59066/ 14 | Kwasilwane Reservoir Site Plan Layout |
| D667-A-5014 | 59066/ 15 | La Mercy Reservoir Site Plan Layout |
| D667-A-5015 | 59066/ 16 | Mamba Ridge Reservoir Site Plan Layout |
| D667-A-5016 | 59066/ 17 | Maphephethweni 2 Reservoir Site Plan Layout |
| D667-A-5017 | 59066/ 18 | Mount View Reservoir Site Plan Layout |
| D667-A-5018 | 59066/ 19 | Newlands 2 Reservoir Site Plan Layout |
| D667-A-5019 | 59066/ 20 | Newlands 3 Reservoir Site Plan Layout |
| D667-A-5020 | 59066/ 21 | Newlands 4 Reservoir Site Plan Layout |
| D667-A-5020 | 59066/ 22 | Ntuzuma 2 Reservoir Site Plan Layout |
| D667-A-5022 | 59066/ 23 | Ntuzuma 3 Reservoir Site Plan Layout |
| D667-A-5023 | 59066/ 24 | Ntuzuma 4 Reservoir Site Plan Layout |
| D667-A-5024 | 59066/ 25 | Ntuzuma 7 Reservoir Site Plan Layout |
| D667-A-5025 | 59066/ 26 | Nyaninga Reservoir Site Plan Layout |
| D667-A-5026 | 59066/ 27 | Ogunjini 2 Reservoir Site Plan Layout |
| D667-A-5027 | 59066/ 28 | Ogunjini 3 Reservoir Site Plan Layout |
| D667-A-5028 | 59066/ 29 | Ogunjini 4 Reservoir Site Plan Layout |
| D667-A-5029 | 59066/ 30 | Phoenix 1 Reservoir Site Plan Layout |
| D667-A-5030 | 59066/ 31 | Phoenix 2 Reservoir Site Plan Layout |
| D667-A-5031 | 59066/ 32 | Phoenix 3 Reservoir Site Plan Layout |
| D667-A-5032 | 59066/ 33 | Phoenix 4 Reservoir Site Plan Layout |
| D667-A-5033 | 59066/ 34 | Phoenix 5 Reservoir Site Plan Layout |
| D667-A-5034 | 59066/ 35 | Phoenix 6 Reservoir Site Plan Layout |
| D667-A-5035 | 59066/ 36 | Sea Cow Lake Reservoir Site Plan Layout |
| D667-A-5036 | 59066/ 37 | Senzokuhle Reservoir Site Plan Layout |
| D667-A-5037 | 59066/ 38 | Sunningdale Reservoir Site Plan Layout |
| D667-A-5038 | 59066/ 39 | Tongaath South Reservoir Site Plan Layout |
| D667-A-5039 | 59066/ 40 | Trenance 1 Reservoir Site Plan Layout |
| D667-A-5040 | 59066/ 41 | Trenance 3 Reservoir Site Plan Layout |
| D667-A-5041 | 59066/ 42 | Umdhloti Reservoir Site Plan Layout |
| D667-A-5042 | 59066/ 43 | Umhlanga 2 Reservoir Site Plan Layout |
| D667-A-5043 | 59066/ 44 | Umhlanga North Reservoir Site Plan Layout |
| D667-A-5044 | 59066/ 45 | Umhlanga South Reservoir Site Plan Layout |

| | | |
|-------------|-----------|---|
| D667-A-5045 | 59066/ 46 | Virginia 1 & 2 Reservoir Site Plan Layout |
| D667-A-5046 | 59066/ 47 | Waterloo Reservoir Site Plan Layout |
| D667-A-5047 | 59066/ 48 | Wesbrook Reservoir Site Plan Layout |

PIPEWORK AND STANDARD DRAWINGS

| NC DWG NO. | EWS DWG NO. | DRAWING NAME |
|-------------|-------------|--|
| D667-A-5280 | 59066/ 200 | Typical Ultrasonic Meter Assembly Installation on Steel Pipelines for Outlets and Gravity Supplied Inlets, Sheet 1 of 2 |
| D667-A-5280 | 59066/ 200 | Typical Ultrasonic Meter Assembly Installation on AC, PVC or GRP Pipelines for Outlets and Gravity Supplied Inlets, Sheet 2 of 2 |
| D667-A-5281 | 59066/ 201 | Typical Ultrasonic Meter Assembly Installation on Pumped Supplied Inlets, Sheet 1 of 2 |
| D667-A-5281 | 59066/ 201 | Typical Ultrasonic Meter Assembly Installation on Pumped Supplied Inlets, Sheet 2 of 2 |
| D667-A-5282 | 59066/ 202 | Typical Mechanical Meter Assembly Installation Details, Sheet 1 of 2 |
| D667-A-5282 | 59066/ 202 | Typical Mechanical Meter Assembly Installation Details, Sheet 2 of 2 |
| D667-A-5283 | 59066/ 203 | Meter Protection Sleeve Details for Meter Sizes up to and including DN300 |
| D667-A-5284 | 59066/ 204 | Meter Protection Culvert Details - Type 1 and Type 2 for Meters greater than DN300 and under Paved Surfaces |
| D667-A-5400 | 59066/ 205 | Standard Details, Sheet 1 of 2 |
| D667-A-5400 | 59066/ 205 | Standard Details, Sheet 2 of 2 |
| D667-A-5500 | 59066/ 300 | DC Power Supply to Flow Meter |
| D667-A-5501 | 59066/ 301 | DC Power Supply - Installation Details |

eTHEKWINI WATER AND SANITATION STANDARD DRAWINGS

| NC DWG NO. | EWS DWG NO. | DRAWING NAME |
|------------|-------------|--|
| | 006 | Precast Spacer Ring |
| | 009 | Notice Board |
| | 027 | Valve marker |
| | 028 | No 5B Valve cover |
| | 029 | No 5B Valve Cover Orientation |
| | 45005/ 01 | GRP Access Ladder: Plan, Section & Details |
| | 45005/ 02 | GRP Access Ladder & Safety Cage: Plan, Section & Details |
| | 45483 | DN50 - DN150 Dirt Box Revision 4 Fabrication Details |
| | 68308 | 1200 x 1200 GI Manhole Cover and Frame Rev D |

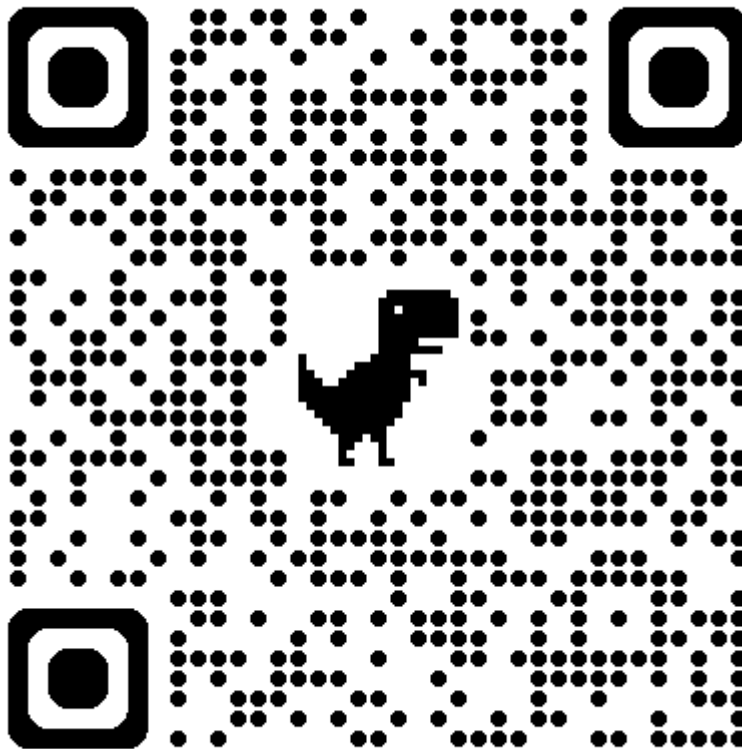
C3.6: ANNEXURES

The following documents shall form Part of this Contract and are included in Part C3.6 Annexures issued as a CD for Hard Copy Tender Documents purchased from The Cashier, eThekweni Water Services, Customer Services Building, 133 KE Masinga Road (formerly Old Fort Road), Durban.

The Part C3.6 Annexures are accessible for Electronic Documents obtained from the eTenders website via the following link:

<https://drive.google.com/drive/folders/1ZqMqlb8OdjkE1YJJClEzEuySpFm2KXMb>

Alternatively, Scan the QR Code below:



ETHEKWINI WATER AND SANITATION PARTICULAR SPECIFICATIONS

| | |
|--------|---|
| C3.6.1 | EWS OH&S: SITE SPECIFIC HEALTH AND SAFETY SPECIFICATION |
| C3.6.2 | EWS OH&S: BASELINE RISK ASSESSMENT |
| C3.6.3 | EWS OH&S: COVID 19 HEALTH AND SAFETY SPECIFICATION |
| C3.6.4 | PEM : ENVIRONMENTAL MANAGEMENT SPECIFICATION |
| C3.6.5 | PAA : PARTICULAR SPECIFICATION : DAYWORK SCHEDULE |
| C3.6.6 | PCL : COMMUNITY LIAISON OFFICER |
| C3.6.7 | EMC : CODE OF CONDUCT |

PART C4: SITE INFORMATION

C4.1 LOCALITY PLAN

C4.2 CONDITIONS ON SITE (Geotechnical Information)

C4.3 PROJECT NOTICE BOARD

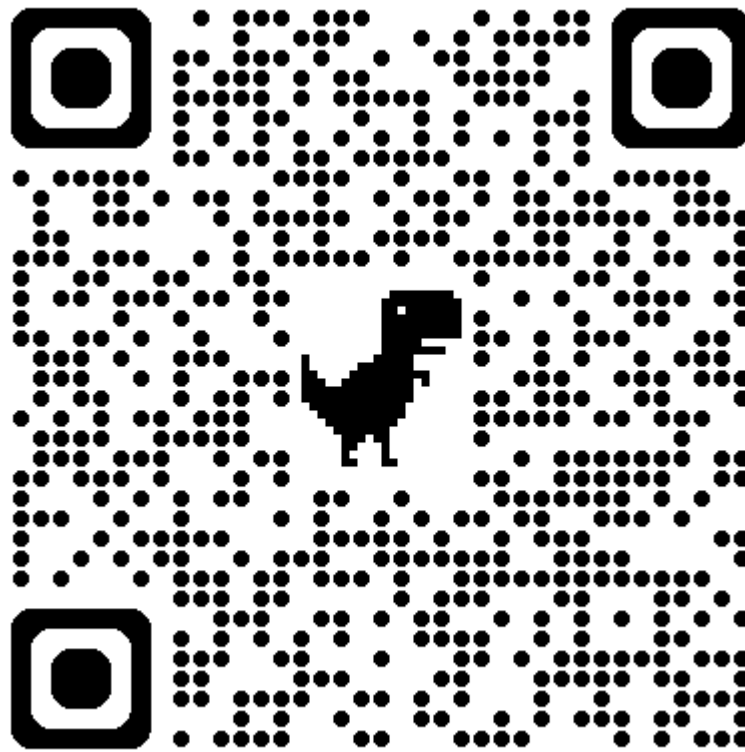
C4.1: LOCALITY PLAN

The Locality Plan is issued on the CD of drawings for Hard Copy Tender Documents purchased from The Cashier, eThekweni Water Services, Customer Services Building, 133 KE Masinga Road (formerly Old Fort Road), Durban.

The Locality Plan is accessible for Electronic Documents obtained from the eTenders website via the following link:

<https://drive.google.com/drive/folders/1t69lJKab0oI2eTu4gkM2Ru9Zkixni81u>

Alternatively, Scan the QR Code below:



C4.2: CONDITIONS ON SITE (GEOTECHNICAL INFORMATION)

There is no specific Geotechnical Information.

C4.3: PROJECT NOTICE BOARD

The Project Notice Board Details are issued on the CD of drawings for Hard Copy Tender Documents purchased from The Cashier, eThekweni Water Services, Customer Services Building, 133 KE Masinga Road (formerly Old Fort Road), Durban.

The Project Notice Board Details is accessible for Electronic Documents obtained from the eTenders website via the following link:

https://drive.google.com/drive/folders/1EyURQqHwJLYHTo15_8zY_ov00OOf3AwI

Alternatively, Scan the QR Code below:

