DEPARTMENT

TECHNICAL SERVICES

DIRECTORATE

Water Services

DIVISION

Water and Sanitation Engineering

PROCUREMENT DOCUMENT : Infrastructure (SAICE GCC)

Documents are to be obtained, free of charge, in electronic format, from
the National Treasury's eTenders website or the eThekwini Municipality website

Contract No: 32204-5W

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

Estimated CIDB: Grade: 7 Class: CE

CLARIFICATION MEETING AND QUERIES

Clarification Meeting: Compulsory Clarification Meeting

Meeting Location: Board Room 103, 3 Prior Road, eThekwini Water & Sanitation, Durban
Date, Time: On 23 January 2026 at 10h00

Queries can be addressed to:
The Employer's Agent's Representative:
Name: Neelesh Hira
Tel: 031-265-6007
eMail: Neelesh.Hira@naiduconsulting.com. All email queries must be submitted by 05 February 2026 and consolidated questions and answers to be uploaded on the website on 12 February 2026.

TENDER SUBMISSION

The Tender Offer (hard copy) shall be delivered to:

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

An **electronic submission** is also to be made via the eThekwini Municipality **JDE System (SSS Module)** (see Tender Data: C.2.13).

JDE Queries Contact: Lindo Dlamini: Tel: 031-322-7133 / 031-322-7153
Email: supplier.selfservice@durban.gov.za

Closing Date/ Time: **Friday, 20 February 2026** **at** **11h00**

Tender Offers submitted via any means other than that stated in the Tender Data will be deemed invalid

Issued by:

ETHEKWINI MUNICIPALITY

Deputy Director: Water and Sanitation Engineering

Date of Issue: 12/12/2025

Document Version 01/07/2025

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

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
Employer	The Employer is the eThekwini Municipality as represented by: Deputy Director: **Water and Sanitation Engineering**	C.1.1.1
Tender Documents	Documentation is to be downloaded from the **National Treasury's eTenders website** or the **eThekwini Municipality Website:** • https://www.etenders.gov.za/ • https://www.durban.gov.za/pages/business/procurement	C.1.2
CIDB Eligibility	It is estimated that Tenderers should have a CIDB contractor grading designation of 7 CE (or higher).	C.2.1.2
Clarification Meeting	**Board Room 103, 3 Prior Road, eThekwini Water & Sanitation, Durban** **On 23 January 2026 at 10h00**	C.2.7
Seek Clarification	Queries relating to these documents are to be addressed to the Employer's Agent's Representative whose contact details are: **Name: Neelesh Hira** **Tel: 031-265-6007** **eMail: Neelesh.Hira@naiduconsulting.com. All email queries must be submitted by 05 February 2026 and consolidated questions and answers to be uploaded on the website on 12 February 2026.**	C.1.4
Submitting a Tender Offer	The Tender Offer (hard copy) shall be delivered to: **The Tender Box in the foyer of the Municipal Building, 166 KE Masinga Road, Durban** An **electronic submission**, via the eThekwini Municipality **JDE System (SSS Module)**, is also to be made. Refer to Part T1.1.2 and Tender Data: C.2.13. Notwithstanding the **electronic submission**, a tender offer will only be deemed valid if the "hard copy" submission has been made.	C.2.13
Closing Time	The Tender Offer (hard copy) shall be delivered, and the electronic submission completed, both on or before **Friday, 20 February 2026**, at or before **11h00**.	C.2.15
Evaluation of Tender Offers	**The 80/20** Price Preference Point System, as specified in the **SCM Policy: Section 52: Preferential Procurement** will be applied in the evaluation of tenders. **Tender Data: C.3.11: Evaluation of Tender Offers** details the awarding of Preference Points, and other related evaluation requirements.	C.3.11

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

CIDB B.U.I.L.D. Programme Standards	
CIDB Standard for Indirect Targeting for Enterprise Development through Construction Works Contracts	**Applicable**
CIDB Standard for Developing Skills through Infrastructure Contracts	**Not Applicable**

T1.1.2: INFORMATION REGARDING THE ETHEKWINI JDE SYSTEM

This Part (T1.1.2) is for information purposes only. Compliance requirements are stated in **Part T1.2: Tender Data.**

1) General

eThekwini Municipality Bids, Tenders and Quotations (hereafter referred to as Tenders) are going to be submitted using the JDE System.

This JDE System will be used for:

- Viewing of available (open) Tenders,
- Downloading procurement documentation for Tenders,
- Uploading completed and signed Tender documentation,
- Completion and submission of Tenders electronically,
- Viewing the Tender opening schedule.

2) Registrations

To be granted access to the **JDE System** prospective service providers must be registered on the **National Treasury's Central Supplier Database (CSD)**, the **eThekwini Municipality Supplier Portal**, and the **eThekwini Municipality JDE System**.

National Treasury: Central Supplier Database

- Registration can be made on https://secure.csd.gov.za .
- Service Providers will be issued a **"MAAA"** number when registered.

eThekwini Municipality Supplier Portal

- Registration can be made on https://www.durban.gov.za by following these links:
  >Business **>**Supply Chain Management (SCM) **>**Accredited Supplier & Contractor Database.

eThekwini Municipality JDE System

- Service providers requiring access must send an email to supplier.selfservice@durban.gov.za
  A copy of the **Director's ID** is required:
- On receipt of this email, the Procurement and Supply Chain Management (P&SCM) Directorate will respond with the login credentials and a link to the **JDE System**.

3) Assistance with using the JDE System

The following P&SCM Official(s) can be contacted in connection with any queries regarding the use of the **JDE System**:

- Lindo Dlamini Tel: 031 322 7153 or 031 322 7133
  Email: supplier.selfservice@durban.gov.za

4) Viewing of available tenders

By following link https://rfq.durban.gov.za/jde/E1Menu.maf prospective Service Providers will be able to view available (open) Tender opportunities without signing into the system. However, Service Providers will not be able to respond to a Tender without being signed into the system using a JDE User ID and Password.

5) Tender documentation

By accessing the **JDE System** (using https://rfq.durban.gov.za/) and viewing any available Tenders, prospective Service Providers will be able to download the relevant Tender documentation.

The Tender documentation consists of the **TENDER** and **CONTRACT Parts**, as described in the INDEX, and will include any drawings and other information (if applicable). Referred to or included in the documentation are the **Standard Conditions of Tender (and associated Tender Data),** and the **Conditions of Contract (and associated Contract Data)** which will govern the tendering and contract processes respectively.

6) Submission of tender offers

Reference is to be made to the **Tender Data: C.2.13** that specifies compliance requirements.

Tender Offers are to be delivered, in "hard copy" format, to the Delivery Location as stated in the **Tender Data**.

In addition to the above, **Tender Offers are also to be SUBMITTED ELECTRONICALLY** (uploaded) on the eThekwini Municipality JDE System (Supplier Self Service (JDE-SSS) Module). Notwithstanding the **electronic submission**, a tender offer will only be deemed valid if the "hard copy" submission has been made. The "hard copy" submission will be deemed to be the ruling version.

Bidders are responsible for resolving all access rights and submission queries on the JDE System before the tender closing date/ time, as stated in the **Tender Data: C.2.15**.

7) Viewing the Tender opening schedule

Users on the **JDE System** will be able to view the **Tender Opening Schedule** for each closed Tender. The tender opening schedule will also be made available on the eThekwini Municipal website at URL:
https://www.durban.gov.za/pages/business/publication-of-received-bids

T1.1.3: NOTES TO TENDERERS

These "Notes to Tenderers" are intended to provide guidance to Tenderers regarding tendering obligations and requirements. Compliance requirements are stated in the relevant parts of the **Tender Data: T1.2.**

eThekwini Supply Chain Management Policy (SCMP)

The requirements as stated in the Employer's SCM Policy include, but are not limited to, the following:

1) Section 14(4): ETM Supplier Database

The eThekwini Supply Chain Management Policy requires suppliers/ service providers/ contractors to be registered on the eThekwini Municipality's Vendor Portal.

In the event of the Tenderer not being registered on the eThekwini Municipality's Supplier Portal, 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 is to be noted:

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

2) Section 20(1)(d)(i): Audited Financial Statements

Audited Financial Statements are required to be submitted if the value of the tender offer exceeds R10 million (incl. VAT). See **Returnable Form: MBD 5** and **Returnable Form: Contracts awarded by Organs of State** in the past 5 years.

3) Section 20(1)(d)(iii): Contracts Awarded during the past 5 Years

Tenderers are to include with their submission a listing of any contracts awarded to the Tenderer during the past 5 years, including particulars of any material non-compliance or dispute concerning the execution of the contracts. Tenderers are referred to **Returnable Form: MBD 5**

4) Section 13.1(b)(vii), 20(1)(d)(ii), 28.2(d), 29.6(a), 38.1(d), and 29.14: Municipal Rates and Taxes (Fees)

Tenderers are to refer to **Returnable Form: Declaration of Municipal Fees** to certify that they have no undisputed commitments for municipal services towards any municipality. Prior to an award, a Tenderer's municipal rates and taxes cannot be in arears. Should a Tenderer be in arrears with respect to municipal services and has formalised an agreement with the respective municipality to offset the arrears, the agreement must be in place at time of tender closing.

5) Section 21.2: Tender Validity

Tenders are to remain valid for twelve (12) months after the expiry of the original tender validity period unless the Municipality is notified, in writing, of anything to the contrary.

6) Section 28(2)(d), Section 28(2)(h) and Section use 29(12): Certifications and Registrations

CIDB Registration and Status, B-BBEE Certificates, and Tax Compliance Status PINs must be valid at tender closing, and before final award.

The Tenderer's Tax Compliance Status, CIDB Registration and Status (if required), and B-BBEE Level Status (if required), will be verified using the National Treasury Central Supplier Database (CSD). Tenderers are referred to **Returnable Form: Compulsory Enterprise Questionnaire**.

It is the Tenderer's responsibility to ensure that their data on the CSD is kept updated and correctly reflects the status of the tendering entity.

7) Section 28(2)(f), and 52.5.13: Joint Ventures (JV)

Each party of a JV must submit separate Tax Compliance Status PINs.

Also, and unless otherwise stated, the requirements for a single entity submission in terms of documentation requirements, will apply to each member of a JV making a submission.

As proof that a JV has been formalised, or that the parties to the JV agree to formalise the JV should they be successful in being recommended for the award of this tender, Tenderers are referred to **Returnable Form: Joint Venture Agreements**.

8) Section 49.1.2: Complaints and Objections (Appeals)

A non-refundable tariff, as per the approved Council tariffs, is payable by the Complainant to the Municipality. Proof of the payment of the Fee must be attached to the Complaint.

CIDB

Regulation 25(8)

9) 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.

Tenderers are referred to **CIDB Inform Practice Note #32**: "**Application of the Potentially Emerging (PE) Status**".

B.U.I.L.D. Programme

10) A programme to accelerate transformation in the construction industry, increase the capacity of the construction industry to deliver infrastructure and support the growth of emerging contractors, was launched on 14 March 2024 by the Deputy Minister of Public Works and Infrastructure and the Construction Industry Development Board.

Details of the B.U.I.L.D. Programme were published in a Government Gazette in 2020 (GG 43726) and B.U.I.L.D. has gradually been phased in at various levels of government and the private sector. The CIDB, a public entity with the mandate to promote improved performance in construction, oversees the programme and manages the B.U.I.L.D Fund.

The B.U.I.L.D programme determines that public sector entities which implement construction projects, that meet certain minimum requirements, must include developmental goals to the deliverables defined in the tenders. Contractors are required to include these goals in the plans and pricing when they submit their tender bids.

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 C** of the CIDB Standard for Uniformity in Construction Procurement as published in Government Gazette No 42622, Board Notice 423 of 8 August 2019, as duplicated below.

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.

Annex C

Standard Conditions of Tender

C.1 General

C.1.1 Actions

C.1.1.1 The employer and each tenderer submitting a tender offer shall comply with these conditions of tender. In their dealings with each other, they shall discharge their duties and obligations as set out in C.2 and C.3, timeously and with integrity, and behave equitably, honestly and transparently, comply with all legal obligations and not engage in anticompetitive practices.

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

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

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

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

C.1.2 Tender Documents

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

C.1.3 Interpretation

C.1.3.1 The ***Tender Data*** and additional requirements contained in the tender schedules that are included in the returnable documents are deemed to be part of these conditions of tender.

C.1.3.2 These conditions of tender, the ***Tender Data*** and tender schedules which are required for tender evaluation purposes, shall form part of any contract arising from the invitation to tender.

C.1.3.3 For the purposes of these conditions of tender, the following definitions apply:

a) **conflict of interest** means any situation in which:
   i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfil his or her duties impartially;
   ii) an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or
   iii) incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.
b) **comparative offer** means the price after the factors of a non-firm price and all unconditional ***discounts*** it can be utilised to have been taken into consideration;
c) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process;
d) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels;

C.1.4 Communication and employer's agent

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

C.1.5 Cancellation and Re-Invitation of Tenders

C.1.5.1 An employer may, prior to the award of the tender, cancel a tender if-

a) due to changed circumstances, there is no longer a need for the engineering and construction works specified in the invitation;
b) funds are no longer available to cover the total envisaged expenditure;
c) no acceptable tenders are received;
d) there is a material irregularity in the tender process.

C.1.5.2 The decision to cancel a tender invitation must be published in the same manner in which the *original* tender invitation was advertised.

C.1.5.3 An employer may only with the prior approval of the relevant treasury cancel a tender invitation for the second time.

C.1.6 Procurement procedures

C.1.6.1 General

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

C.1.6.2 Competitive negotiation procedure

C.1.6.2.1 Where the ***Tender Data*** require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of C.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of C.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

C.1.6.2.2 All responsive tenderers or at least a minimum of not less than three responsive tenderers that are highest ranked in terms of the evaluation criteria stated in the ***Tender Data*** shall be invited to enter into competitive negotiations based on the principle of equal treatment, keeping confidential the proposed solutions and associated information.

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

distort competition or have a discriminatory effect.

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

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

C.1.6.3 Proposal procedure using the two stage-system

C.1.6.3.1 Option 1

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

C.1.6.3.2 Option 2

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

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

C.2 Tenderer's obligations

C.2.1 Eligibility

C.2.1.1 Submit a tender offer only if the tenderer satisfies the criteria stated in the ***Tender Data*** and the tenderer, or any of his principals, is not under any restriction to do business with employer.

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

C.2.2 Cost of tendering

C.2.2.1 Accept that, unless otherwise stated in the ***Tender Data***, the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer complies with requirements.

C.2.2.2 The cost of the tender documents charged by the employer shall be limited to the actual cost incurred by the employer for printing the documents. Employers must attempt to make available the tender documents on its website so as not to incur any costs pertaining to the printing of the tender documents.

C.2.3 Check documents

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

C.2.4 Confidentiality and copyright of documents

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

C.2.5 Reference documents

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

C.2.6 Acknowledge addenda

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

C.2.7 Clarification meeting

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

C.2.8 Seek clarification

Request clarification of the tender documents, if necessary, by notifying the employer at least five (5) working days before the closing time stated in the ***Tender Data***.

C.2.9 Insurance

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

C.2.10 Pricing the tender offer

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

C.2.10.2 Show VAT payable by the employer separately as an addition to the tendered total of the prices.

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

C.2.10.4 State the rates and prices in Rand unless instructed otherwise in the ***Tender Data***. The conditions of contract identified in the ***Contract Data*** may provide for part payment in other currencies.

C.2.11 Alterations to documents

Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations.

C.2.12 Alternative tender offers

C.2.12.1 Unless otherwise stated in the ***Tender Data***, submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted as well as a schedule that compares the requirements of the tender documents with the alternative requirements that are proposed.

C.2.12.2 Accept that an alternative tender offer must be based only on the criteria stated in the ***Tender Data*** or criteria otherwise acceptable to the employer.

C.2.12.3 An alternative tender offer must only be considered if the main tender offer is the winning tender.

C.2.13 Submitting a tender offer

C.2.13.1 Submit one tender offer only, either as a single tendering entity or as a member in a joint venture to provide the whole of the works identified in the ***Contract Data*** and described in the scope of works, unless stated otherwise in the ***Tender Data***.

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

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

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

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

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

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

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

C.2.13.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the ***Tender Data***.

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

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

C.2.15 Closing time

C.2.15.1 Ensure that the employer receives the tender offer at the address specified in the ***Tender Data*** not later than the closing time stated in the ***Tender Data***. Accept that proof of posting shall not be accepted as proof of delivery.

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

C.2.16 Tender offer validity

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

C.2.16.2 If requested by the employer, consider extending the validity period stated in the ***Tender Data*** for an agreed additional period with or without any conditions attached to such extension.

C.2.16.3 Accept that a tender submission that has been submitted to the employer may only be withdrawn or substituted by giving the employer’s agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted. If the validity period stated in C.2.16 lapses before the employer evaluating tender, the contractor reserves the right to review the price based on Consumer Price Index (CPI).

C.2.16.4 Where a tender submission is to be substituted, a tenderer must submit a substitute tender in accordance with the requirements of C.2.13 with the packages clearly marked as “SUBSTITUTE”.

C.2.17 Clarification of tender offer after submission

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

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

C.2.18 Provide other material

C.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer,

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

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

C.2.19 Inspections, tests and analysis

Provide access during working hours to premises for inspections, tests and analysis as provided for in the ***Tender Data***.

C.2.20 Submit securities, bonds and policies

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

C.2.21 Check final draft

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

C.2.22 Return of other tender documents

If so instructed by the employer, return all retained tender documents within twenty-eight (28) days after the expiry of the validity period stated in the ***Tender Data***.

C.2.23 Certificates

Include in the tender submission or provide the employer with any certificates as stated in the ***Tender Data***.

C.3 The employer's undertakings

C.3.1 Respond to requests from the tenderer

C.3.1.1 Unless otherwise stated in the ***Tender Data***, respond to a request for clarification received up to five (5) working days before the tender closing time stated in the ***Tender Data*** and notify all tenderers who collected tender documents.

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

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

C.3.2 Issue Addenda

If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date that tender documents are available until three (3) working days before the tender closing time stated in the ***Tender Data***. If, as a result a tenderer applies for an extension to the closing time stated in the ***Tender Data***, the Employer may grant such extension and, shall then notify all tenderers who collected tender documents.

C.3.3 Return late tender offers

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

C.3.4 Opening of tender submissions

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

C.3.4.2 Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the ***Tender Data***, the name of each tenderer whose tender offer is opened and, where applicable, the total of his prices, number of points claimed for its BBBEE status level and time for completion for the main tender offer only.

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

C.3.5 Two-envelope system

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

C.3.5.2 Evaluate functionality of the technical proposals offered by tenderers, then advise tenderers who remain in contention for the award of the contract of the time and place when the financial proposals will be opened. Open only the financial proposals of tenderers, who score in the functionality evaluation more than the minimum number of points for functionality stated in the ***Tender Data***, and announce the score obtained for the technical proposals and the total price and any points claimed on BBBEE status level. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for functionality.

C.3.6 Non-disclosure

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

C.3.7 Grounds for rejection and disqualification

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

C.3.8 Test for responsiveness

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

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

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

a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,
b) significantly change the Employer's or the tenderer's risks and responsibilities under the contract, or
c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

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

C.3.9 Arithmetical errors, omissions and discrepancies

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

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

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

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

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

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

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

C.3.10 Clarification of a tender offer

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

C.3.11 Evaluation of tender offers

The Standard Conditions of Tender standardize the procurement processes, methods and procedures from the time that tenders are invited to the time that a contract is awarded. They are generic in nature and are made project specific through choices that are made in developing the ***Tender Data*** associated with a specific project.

Conditions of tender are by definition the document that establishes a tenderer's obligations in submitting a tender and the employer's undertakings in soliciting and evaluating tender offers. Such conditions establish the rules from the time a tender is advertised to the time that a contract is awarded and require employers to conduct the process of offer and acceptance in terms of a set of standard procedures.

The CIDB Standard Conditions of Tender are based on a procurement system that satisfies the following system requirements:	**Qualitative interpretation of goal**
Requirement	
Fair	The process of offer and acceptance is conducted impartially without bias, providing simultaneous and timely access to participating parties to the same information.
Equitable	Terms and conditions for performing the work do not unfairly prejudice the interests of the parties.
Transparent	The only grounds for not awarding a contract to a tenderer who satisfies all requirements are restrictions from doing business with the employer, lack of capability or capacity, legal impediments and conflicts of interest.
Competitive	The system provides for appropriate levels of competition to ensure cost effective and best value outcomes.
Cost effective	The processes, procedures and methods are standardized with sufficient flexibility to attain best value outcomes in respect of quality, timing and price, and least resources to effectively manage and control procurement processes.

The activities associated with evaluating tender offers are as follows:

a) Open and record tender offers received
b) Determine whether or not tender offers are complete
c) Determine whether or not tender offers are responsive
d) Evaluate tender offers
e) Determine if there are any grounds for disqualification
f) Determine acceptability of preferred tenderer
g) Prepare a tender evaluation report
h) Confirm the recommendation contained in the tender evaluation report .

C.3.11.1 General

The employer must appoint an evaluation panel of not less than three persons conversant with the proposed scope of works to evaluate each responsive tender offer using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the ***Tender Data***.

C.3.12 Insurance provided by the employer

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

C.3.13 Acceptance of tender offer

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

a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement;
b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract;
c) has the legal capacity to enter into the contract;
d) is not; insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act No. 2008, bankrupt or being wound up, has his/her affairs administered by a court or a judicial officer, has suspended his/her business activities or is subject to legal proceedings in respect of any of the foregoing;
e) complies with the legal requirements, if any, stated in the ***Tender Data***; and
f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

C.3.14 Prepare contract documents

C.3.14.1 If necessary, revise documents that shall form part of the contract and that were issued by the employer as part of the tender documents to take account of:

a) addenda issued during the tender period,
b) inclusion of some of the returnable documents and
c) other revisions agreed between the employer and the successful tenderer.

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

C.3.15 Complete adjudicator's contract

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

C.3.16 Registration of the award

An employer must, within twenty-one (21) working days from the date on which a contractor's offer to perform a construction works contract is accepted in writing by the employer, register and publish the award on the cidb Register of Projects.

C.3.17 Provide copies of the contracts

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

C.3.18 Provide written reasons for actions taken

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

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.

C.1: GENERAL

C.1.1 The employer:

The Employer for this Contract is the **eThekwini Municipality** as represented by:
Deputy Director: **Water and Sanitation Engineering**

C.1.2 Tender documents:

The Tender Documents issued by the Employer comprise:

1) This procurement document.
2) The **Conditions of Contract** and associated **Contract Data** are identified in **Section C1.2.1**. Tenderers/ Contractors are required to obtain their own copies.
3) The **Specifications** identified in **Section C3.3.1**. Tenderers/ Contractors are required to obtain their own copies.
4) **Drawings**, if applicable, issued separately from this document, or bound in **Section C3.4** (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 Supply Chain Management Policy (as at advertising date).
   - 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 1921:2004 – Construction and Management Requirements for Works Contract, Parts 1-3.
   - CIDB Standard for Developing Skills Through Infrastructure Contracts, published in Gazette Notice No. 48491 of 28 April 2023.
   - CIDB Standard for Indirect Targeting for Enterprise Development through Construction Works Contracts, published in Gazette Notice No. 36190 of 25 February 2013.
   - Any other eThekwini Policy documents referenced in the Tender Documents.

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

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

C.1.4 Communication and employer's agent:

The Employer's Agent is:

Name: Nadas Thumbaya
Tel: 031-265-6007
eMail: Terence.Thumbaya@naiduconsulting.com

The Employer's Agent's Representative is:

Name: Neelesh Hira
Tel: 031-265-6007
eMail: Neelesh.Hira@naiduconsulting.com. All email queries must be submitted by 05 February 2026 and

consolidated questions and answers to be uploaded on the website on 12 February 2026.

The Tenderer's contact details, as indicated on **Returnable Document T2.2.1: Compulsory Enterprise Questionnaire**, shall be deemed as the only valid contact details for the Tenderer for use in communications between the Employer's Agent and the Tenderer during tender evaluation.

C.2: TENDERER'S OBLIGATIONS

C.2.1 Eligibility:

Entities may only submit one (1) tender offer, either as a single tendering entity or as a partner of a joint venture. Should a tendering entity submit more than one (1) tender, **all** submissions by that tendering entity, including submissions where the entity is a partner of a joint venture, will be deemed not to be eligible.

C.2.1.1 Eligibility: General

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

(a) In the event of a Compulsory Clarification Meeting:
   i) the Tenderer fails to attend the Compulsory Clarification Meeting, or
   ii) the Tenderer fails to have **Returnable Document T2.2.2: Certificate of Attendance at Clarification Meeting / Site Inspection** signed by the Employer's Agent or their representative.

(b) At the time of tender closing, the Tenderer is not registered on the **National Treasury Central Supplier Database (CSD)** and the **eThekwini Municipality Supplier Portal**. In the case of a Joint Venture, this requirement will apply individually to each party in the Joint Venture. Tenderers are to reference **Returnable Document T2.2.1: Compulsory Enterprise Questionnaire** (section 1.5) and **Returnable Document T2.2.12: "CSD Registration Report"**.

(c) In the case of Joint Venture (JV) submissions, two or more JV entities have common directors/ shareholders or common entities tendering for the same works.

(d) The following documentation is to be completed in full, signed, and returned with the tender submission. Failure to comply will result in the tender offer being deemed non-responsive:
- T2.2.1: Compulsory Enterprise Questionnaire.
- T2.2.5: MBD 4: Declaration of Interest.
- T2.2.6: MBD 5: Declaration for Procurement Above R10 Million.
- T2.2.7: MBD 8: Declaration of Bidder's Past SCM Practices.
- T2.2.8: MBD 9: Certificate of Independent Bid Determination.
- T2.2.9: Declaration of Municipal Fees

(e) The certificates listed in the **Tender Data: C.2.23: Certificates** are to be included with the tender submission. Failure to comply will result in the tender offer being deemed non-responsive.
- T2.2.1: SARS Tax Compliance Status - PIN Issued (submitted with the Compulsory Enterprise Questionnaire).
- T2.2.12: Central Supplier Database (CSD) Report.
- T2.2.13: CIDB Registration and Status.

C.2.1.2 **Eligibility: CIDB**

Tenderers are to reference the provisions of **Tender Data: C.2.23: Certificates** and **Returnable Document: T2.2.13: Verification of CIDB Registration and Status** with respect to CIDB registration.

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.

C.2.2.2 **The cost of the tender documents:**

Replace this paragraph with the following:

"Documents are to be downloaded, free of charge, from the **National Treasury's eTenders website** or the **eThekwini Municipality's Website**."

C.2.6 **Acknowledge addenda:**

Add the following paragraphs:

"Addenda will be published on the **eThekwini Municipality website** as stated in **Tender Data: C.1.2**. Tenderers are to ensure that this 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 WILL result in the tender submission being made non-responsive."

C.2.7 Clarification meeting:

Board Room 103, 3 Prior Road, eThekwini Water & Sanitation, Durban
On 23 January 2026 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.

C.2.10.2 Pricing the tender offer:

The following is to be noted in terms of Tenderers being **VAT Registered,** or being a **Non-VAT Vendor** (ie. not VAT registered).

If the Tenderer is **VAT registered**, the Tenderer's Rates in the Bill of Quantities (BoQ) are to exclude VAT. VAT is to be shown separately on the BoQ summary page, and on the Form of Offer (Part C1.1.1).

If the Tenderer is a **Non-VAT Vendor**, the Tenderer's Rates in the Bill of Quantities are to include VAT. VAT is not to be shown separately on the BoQ summary page, or on the Form of Offer (Part C1.1.1). VAT will not be added to, or deducted from, rates or prices submitted from **Non-VAT Vendors**. The tendered priced will be deemed to include all VAT, taxes, and any applicable excise duties.

Tenderers are to refer to Part C2.1: PRICING ASSUMPTIONS / INSTRUCTIONS prior to pricing the tender offer.

C.2.12 Alternative tender offers:

No alternative tender offers will be considered.

C.2.13 Submitting a tender offer:

The signed Tender Offer ("hard copy") is to be sealed in an envelope, addressed to the City Manager, marked with the **identification details** and be delivered to the **delivery address**, both as stated below.

The **Tender Offer** (hard copy) is to be delivered to the following **delivery address**:
the Tender Box in the foyer of the Municipal Building, 166 KE Masinga Road, Durban

Identification details to be shown on the hard copy package are:
- Contract No. : **32204-5W**
- Contract Title : **The Installation of Water Meters and Ancillary Works on Existing Reservoir Inlets and Outlets within the Northern Operational Areas**

Tender Offers are also to be **SUBMITTED ELECTRONICALLY** (uploaded) on the eThekwini Municipality **JDE System** (Supplier Self Service (SSS Module)). For information pertaining to the JDE System, Tenderers are referred to **Section T1.1.2**.

Notwithstanding the **electronic submission**, a tender offer will only be deemed valid if the "hard copy" submission has been made. The "hard copy" submission will be the governing submission.

The Tender documentation, issued by the eThekwini Municipality (refer to **Tender Data: C.1.2**), is to be printed in its entirety. Printing should be done on white A4 paper, with printing on only one side of the paper. (It is suggested that the Tender documentation is not stapled, or punched for filing, prior to scanning, as this could affect the scanning process.)

After completion and signature (using **BLACK INK**), the entire Tender document is to be scanned to a single PDF (**P**ortable **D**ocument **F**ormat) document, at a resolution of 300 DPI (dots per inch). The PDF document is to be uploaded via the (Tender specific) upload option on the JDE System (SSS Module). Tenderers are responsible for resolving all access rights and submission queries on the JDE System before the tender closing date/ time (**Tender Data: C.2.15**).

Tender Offer delivery, and the electronic submission on the JDE System, are both to be completed on or before the closing date/ time stated in the **Tender Data: C.2.15**.

The submission of Tender Offers via any means other than that stated above will not be accepted, and those that are will be deemed invalid.

C.2.15 Closing date and time:

The closing time is:

- **Date : Friday, 20 February 2026**
- **Time : 11h00**

The **delivery of the hard copy AND** the completion of the requirements on the **JDE System (SSS Module)** are be completed prior to the Tender **closing date and time** as stated above. Any Tender Offer submitted thereafter will not be considered.

C.2.16 Tender offer validity:

The Tender Offer validity period is **120 Days** from the closing date for submission of tenders.

In terms of the SCM Policy (Cl.21.2) tenders must remain valid for acceptance for a period of twelve (12) months after the expiry of the original validity period, unless the Municipality is notified in writing of anything to the contrary by the tenderer.

C.2.23 Certificates:

Refer to **T2.1: "List of Returnable Documents"** 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 a printout of the required documents/ certificates at the back of their tender submission.

SARS Tax Compliance Status – PIN Issued

Reference is to be made to **Returnable Document T2.2.1: Compulsory Enterprise Questionnaire** which requires the "SARS Tax Compliance Status – PIN Issued" to be included with this returnable document.

Central Supplier Database (CSD)

Reference is to be made to **Returnable Document T2.2.12: CSD Registration Report**.

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

The date of the report, as indicated at the top right of each page, should be on or after the date of advertising of this tender.

Separate **CSD Registration Reports** are required for each party to a Joint Venture.

CIDB Registration (if applicable)

Reference is to be made to **Returnable Document T2.2.13: Verification of CIDB Registration and Status**.

Tenderers are to include with their submission a printout of their **CIDB Registration**, obtained from the CIDB website (https://portal.cidb.org.za/RegisterOfContractors/).

The date of obtaining the CIDB printout(s) is to be indicated on the printout, and the Tenderer's registration with the CIDB must be reflected as "Active" as at the date of tender closing.

Separate **CIDB Registration printouts** are required for each party to a Joint Venture.

The **Joint Venture Grading Designation Calculator** printout should be included when making a submission as a Joint Venture:
(https://registers.cidb.org.za/PublicContractors/JVGradingDesignationCalc)

B-BBEE Status Level of Contribution Certificate

Tenderers are referred to **Returnable Document T2.2.6: MBD 6.1: Preference Points Claim** for the B-BBEE Certificate requirements. Notwithstanding the completion of Returnable Document T2.2.6, should no B-BBEE Status Level of Contribution Certificate be returned no points for Preferential Procurement will be deemed to have been claimed.

The Amended Construction Sector Code (Government Gazette No.41287) is applicable to the B-BBEE compliance measurement of all entities that fall within the Construction Sector. The requirements for measurement and verification of entities are contained in the "Amended Code Series CSC000: Framework for Measuring Broad Based Black Economic Empowerment in the Construction Sector", as published in Notice 931 of 2017, Government Gazette No.41287 of 01/12/2017.

An EME Contractor with a Total Annual Revenue of less than R3 million may present an affidavit OR a certificate issued by the CIPC OR an authorised B-BBEE verification certificate by a SANAS accredited Verification Agency.

Any B-BBEE Certificate where the entity has been assessed using **Generic Codes** will not be accepted.

C.3: THE EMPLOYER'S UNDERTAKINGS

C.3.1.1 Respond to requests from the tenderer:

Replace the words "five working days" with "three working days".

C.3.2 Issue addenda:

Add the following paragraph:

"Addenda will be published on the **eThekwini Municipality Website** (refer to **Tender Data: C.1.2**).

C.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 P&SCM Boardroom, 6th Floor, (Municipal Building), 166 KE Masinga Road, Durban.

The tender opening schedule will also be made available on the eThekwini Municipal website at URL: https://www.durban.gov.za/pages/business/publication-of-received-bids

C.3.9 Arithmetical errors, omissions and discrepancies:

Add the following Clause:

"C.3.9.5 Reject a tender offer if the Tenderer does not accept the correction of the arithmetical error in the manner described in C.3.9.4."

C.3.11 Evaluation of Tender Offers:

Eligibility

Tenders will be checked for compliance with the ELIGIBILITY requirements, as specified in the **Tender Data: C.2.1**. Tenders not in compliance will be deemed non-responsive.

Functionality

FUNCTIONALITY will not be used in the evaluation of tenders.

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 **Part 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 **SCM Policy: Section 52: Preferential Procurement**.

The **80/20** preference points system, for requirements with a Rand value of up to R50,000,000 (all applicable taxes included), will be applied. The Formula used to calculate the **Price Points (max. 80)** will be according to that specified below.

Price Points

The financial offer will be reduced to a comparative basis using the **Tender Assessment Schedule**.

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

80/20 Procurement System

$$Ps = 80\left(1 - \frac{Pt - P\min}{P\min}\right)$$

Where: Ps = Points scored for comparative price of bid under consideration
Pt = Comparative price of bid under consideration
Pmin = Comparative price of lowest acceptable bid

Preference Points

Reference is to be made to **Returnable Form: MBD 6.1: Preference Points Claim**.

The Basket of Preference Goals (SCM Policy Section 52.7)

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

- **Ownership Goal**
  Goal Weighting: 70%

  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
Race: Black	Equals 0%	0
	Between 0% and 51%	5.6
	Greater or equal to 51% and less than 100%	11.2
	Equals 100%	14

Maximum Ownership Goal Points:	14

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.

- **RDP Goal: The promotion of enterprises located in a specific municipal area**
  Goal Weighting: **30%**

  The tendering entity's **Address** (as stated on the National Treasury Central Supplier Database (CSD) or on the eThekwini Municipality Vendor Portal) is to be used in the determination of the Tenderer's claim for **Preference Points** for this Specific Goal. The **regions** and **zones** (or wards) within the eThekwini Municipality are as specified on the Part C4: "Site Information" of this procurement document.

Municipal Area	80/20
Not within eThekwini Municipality	0
Within eThekwini Municipality	2.4
Within the specified region / Adjoining Wards	4.8
Within the specified zone / Project Ward(s)	6
Maximum Goal Points:	6

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

C.3.13 Acceptance of tender offer:

In addition to the requirements of **Tender Data: C.3.13** of the **Standard Conditions of Tender**, tender offers will only be accepted if:

(a) The Tenderer's municipal rates and taxes are not in arears, or they have made arrangements to meet outstanding municipal fee obligations.

(b) The Tenderer's tax compliance status has been verified, or they have made arrangements to meet outstanding tax obligations.

(c) If applicable, the Tenderer is **registered**, and **"Active"**, with the **Construction Industry Development Board** in an appropriate contractor grading designation.

(d) The Tenderer or any of its directors/ shareholders are n**ot 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.

(e) The Tenderer has not:
   i) Abused the Employer's Supply Chain Management System; or
   ii) Failed to perform on any previous contract and has been given a written notice to this effect.

(f) 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 the **Standard Conditions of Tender: C.1.1.3** of, the municipality reserves the right to award or not award the tender based on the municipalities available budget.

C.3.15 Complete adjudicator's contract:

Refer to the Conditions of Contract and the Contract Data.

C.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 referred to the requirements as stated in the **Tender Data: C.2.13**.

T1.2.3 ADDITIONAL CONDITIONS OF TENDER

T1.2.3.1 Complaints and Objections (Appeals)

Reference is to be made to Clause 49 of the eThekwini Supply Chain Management Policy.

In terms of Section 49 of the Ethekwini SCM Policy any person aggrieved by decisions taken in the implementation of the SCM System may lodge, within 14 days of notification thereof, a written objection against the decision. The objection with regard to the decision is to be directed to:

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

Any objection will only be processed upon receipt of a non-refundable administration fee of **R1,814.00** (including VAT), as stipulated in the Municipality's current SCM Policy. An objection will only be considered upon receipt of proof of payment of this fee which must be paid into the following bank account as a real-time payment:

EThekwini Metropolitan Municipality
Nedbank
Account Number: 110-782-1118
Reference Number: Use the Contract Number

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:

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

T1.2.3.4 Functionality Specification

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

Functionality Criteria / Sub Criteria		**Maximum Points Score**
Tenderer's Experience		40
Project Organogram and Experience of Key Staff	Contracts Manager	10
	Site agent	10
	Foremen	7
	Pipe Fitter / Plumber	7
	Welder	6
Preliminary Programme		5
Construction Methodology		10
Quality Control		5
	Maximum possible score for Functionality (M_s)	100

The minimum number of evaluation points for Functionality is **60**. Only those Tenderers who achieve the minimum number of Functionality evaluation points (or greater) will be eligible to have their tenders further evaluated.

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. Each evaluation criteria will be assessed in terms of six indicators and scores allocated according to the following table:

Level 0	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**
0	20	40	60	80	100

Evaluation criteria will be adjudicated according to submissions made in accordance with the following schedules, which are found in T2.2: Returnable Schedules:

Functionality criteria / Sub criteria	**Returnable Schedules**
Tenderer's Experience	• Experience of Tenderer
Project Organogram and Experience of Key Staff	• Proposed Organisation and Staffing • Key Personnel • Experience of Key Personnel
Preliminary Programme	• Preliminary Programme
Construction Methodology	• Construction Approach, Methodology, • Schedule of Proposed Subcontractors • Plant and Equipment
Quality Control	• Quality Control Statement

Unless otherwise stated, evaluation criteria will be adjudicated with respect to the contract specific Scope of Work, as specified in C.3. In this regard the following definitions apply to the evaluation criteria prompts for judgement:

- "**successfully completed**" implies a project has been completed on time and to specification;
- "**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;
- "**experience**" implies experience on projects of a similar nature;
- "**accredited degree / diploma**" implies a minimum 3 year qualification within the built environment, from a registered University or Institute of Technology.

Criterion: Tenderer's Experience	
Level 0	No information provided; OR submission of no substance / irrelevant information provided
Level 1	To have successfully completed 1 project of a similar nature within the past 10 years.
Level 2	To have successfully completed 2 to 3 projects of a similar nature within the past 10 years.
Level 3	To have successfully completed 4 to 6 projects of a similar nature within the past 10 years.
Level 4	To have successfully completed 7 to 9 projects of a similar nature within the past 10 years.
Level 5	To have successfully completed 10+ projects of a similar nature within the past 10 years.

Functionality Criterion: Tenderer's Experience with Similar Type Projects in The Past 10 Years			
Sub Criteria	**Prompts for Judgement-Key Expert Criteria**	**Max Points**	
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.	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 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.	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	
	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**

Criterion: Project Organogram and Experience of Key Staff

Note 1: "experience" implies experience on projects of a similar nature with respect to the Scope of works and with working on steel water mains.
Note 2: "Relevant accredited degree / diploma" implies a minimum 3-year qualification within the built environment, from a registered University or Institute of Technology.
Note 3: It is Compulsory for the Contract Manager to be registered with SACPCMP as a Professional Project and Construction Manager or ECSA as a Professional Engineer / Technologist / Technician.

	CONTRACTS MANAGER	SITE AGENT	FOREMAN	PIPE FITTER / PLUMBER	WELDER
Level 0	No information provided OR submission of no substance/irrelevant information provided	No information provided OR submission of no substance/irrelevant information provided	No information provided OR submission of no substance/irrelevant information provided	No information provided OR submission of no substance/irrelevant information provided	No information provided OR submission of no substance/irrelevant information provided
Level 1	Relevant accredited diploma / degree and minimum 1 year's experience post-qualification.	Relevant accredited diploma / degree and minimum 1 year's experience post-qualification.	Minimum 2 year's experience.	Minimum 2 year's experience.	Welder Trade Test Certificate and Minimum 2 year's experience.
Level 2	Relevant accredited diploma / degree and minimum 2 year's experience post-qualification.	Relevant accredited diploma / degree and minimum 2 year's experience post-qualification.	Minimum 3 year's experience.	Minimum 3 year's experience.	Welder Trade Test Certificate and Minimum 3 year's experience.
Level 3	Relevant accredited diploma / degree and minimum 4 year's experience post-qualification.	Relevant accredited diploma / degree and minimum 4 year's experience post-qualification.	Minimum 5 year's experience.	Minimum 5 year's experience.	Welder Trade Test Certificate and Minimum 5 year's experience.
Level 4	Relevant accredited diploma / degree and minimum 7 year's experience post-qualification.	Relevant accredited diploma / degree and minimum 7 year's experience post-qualification.	Minimum 8 year's experience.	Minimum 8 year's experience.	Welder Trade Test Certificate and Minimum 8 year's experience.
Level 5	Relevant accredited diploma / degree and minimum 10 year's experience post-qualification.	Relevant accredited diploma / degree and minimum 10 year's experience post-qualification.	Minimum 10 year's experience.	Minimum 10 year's experience.	Welder Trade Test Certificate and Minimum 10 year's experience.

Notes:

1. **The tenderer is to submit the CVs of the key personnel that are proposed for this project. The following documents must accompany the CVs of each key personnel:**
   - A signed declaration from the proposed individual stating that he/she is employed by the tenderer, or he/she will be available on a full-time employment, from the commencement of the project until the completion of the project, subject to their mandatory notice period.
   - All supporting documents (Declaration, identity document, qualifications, and professional registration certificates).
2. **If a tenderer fails to submit the CV or the supporting documents for any of the key personnel, then that key personnel will obtain a score of zero (0).**

Criterion: Preliminary Programme	
Level 0	No information provided OR submission of no substance / irrelevant information provided
Level 1	Programme does not cover 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).
Level 2	Programme covering 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).
Level 3	Programme covering 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
Level 4	Programme covering 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, and • Detailed activity and resources breakdown. • Cashflow included
Level 5	Programme covering 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, and • Detailed activity and resources breakdown. • Cashflow included • Detailed Plant and equipment resource breakdown

Criterion: Construction Methodology	
Level 0	No information provided OR submission of no substance / irrelevant information provided
Level 1	Brief overview of a generic methodology which encompasses all programmed activities in appropriate order.
Level 2	Brief overview of a site specific methodology which encompasses all programmed activities in appropriate and logical order.
Level 3	Brief overview of a site specific methodology which encompasses all programmed activities in appropriate order; **Plus**: • Including staff, plant and equipment resources • Including subcontractors if applicable
Level 4	Brief overview of site specific methodology which encompasses all programmed activities in appropriate order; **Plus:** • Including staff, plant and equipment resources, • Including subcontractors if applicable, • A brief description of preparatory work, construction processes including finishing works for each activity.
Level 5	Brief overview of site specific methodology which encompasses all programmed activities in appropriate order; **Plus:** • Including staff, plant and equipment resources, • Including subcontractors if applicable, • A brief description of preparatory work, construction processes including finishing works for each activity. • Demonstrates how the important issues are approached in an innovative and efficient way, indicating that the Tenderer has excellent knowledge of working in the projects environment and producing the required final product.

Criterion: Quality Control	
Level 0	No information provided OR submission of no substance / irrelevant information provided
Level 1	A generic statement covering required sampling and testing requirements for preparatory works, process monitoring and finishing works, for all programmed activities.
Level 2	Activity/Site specific statement covering required sampling and testing requirements for preparatory works, process monitoring and finishing works, for all programmed activities.
Level 3	Activity/Site specific statement covering required sampling and testing requirements for preparatory works, process monitoring and finishing works, for all programmed activities; **Plus:** • Including site specific quality control check-sheet for programmed activities.
Level 4	Activity/Site specific statement covering required sampling and testing requirements for preparatory works, process monitoring and finishing works, for all programmed activities; **Plus:** • 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; • Statement on remedial action to quality control.
Level 5	Activity/Site specific statement covering required sampling and testing requirements for preparatory works, process monitoring and finishing works, for all programmed activities; **Plus:** • 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; • Statement on remedial action to quality control. • ISO Accreditation

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 and signed as required.

The Tenderer is required to complete and sign 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

Technical or Functionality Evaluation

T2.2.1 COMPULSORY ENTERPRISE QUESTIONNAIRE

Ref	Description	Tenderer to Complete	
1.1	Name of enterprise		
1.2	Name of enterprise's representative		
1.3	Email address of representative		
1.4	Contact numbers of representative	**Tel:**	**Cell:**
1.5	National Treasury Central Supplier Database Registration number	**MAAA**	
1.6	VAT registration number, if any:		
1.7	CIDB registration number, if any:		
1.8	Department of Labour: Registration number		
1.9	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.	Personal income tax No. *
2.1			
2.2			
2.3			

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 **MBD 4, MBD 6, MBD 8, and MBD9** issued by National Treasury must be completed for each tender and be included as a tender requirement.

Tenderers are to include, at the back of their tender submission, a printout of their SARS "Tax Compliance Status – PIN Issued" certificate.

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 Tenderer's 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 the **Tender Data: C.2.1.1(a) and C.2.7**.

This is to certify that:

(entity name): .....

of (address): .....

.....

.....

was represented by the person(s) named below at the Clarification Meeting for Contract **32204-5W** held for all Tenderers, the details of which are stated in the **Tender Data: C.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 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.

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

If yes, furnish particulars: ……

……

3.9	Have you been in the service of the state for the past twelve months? If yes, furnish particulars:	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? If yes, furnish particulars:	YES / NO
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? If yes, furnish particulars:	YES / NO
3.12	Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state? If yes, furnish particulars:	YES / NO
3.13	Are any spouse, child or parent of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state? If yes, furnish particulars:	YES / NO
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 ? If yes, furnish particulars:	YES / NO

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:

T2.2.4 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	
1.0	Are you by law required to prepare annual financial statements for auditing?	YES	NO

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

2.0	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?	YES	NO

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

2.2 If YES, provide particulars.

……

……

3.0	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?	YES	NO

3.1 If YES, provide particulars.

SEE Returnable Document T2.2.5

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?	YES	NO

4.1 If YES, provide particulars.

……

……

If required by 1.1 above, Tenderers are to include, at the back of their tender submission, 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:

T2.2.5 CONTRACTS AWARDED BY ORGANS OF STATE IN THE PAST 5 YEARS

In terms of SCM Policy Section 20(1)(d)(iii), Tenderers are to provide details of Works undertaken for the Government or Public Sector entities/ Organs of State in the past 5 Years, including particulars of any material non-compliance or dispute concerning the execution of such contract.

Material non-compliance or dispute (Yes or No)													
Date Completed													
Value of Work													
Consulting Engineer/ Engineers representative													
Employer													
Contract Number													

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.

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.6 MBD 6.1: PREFERENCE POINTS CLAIM

(SCMP 52.7: Basket of Preference Goals)

This form serves as a claim form for preference points according to **The Basket of Preference Goals**. **Reference is to be made to the Tender Data: C.3.11.**

1.0 GENERAL CONDITIONS

1.1 The relevant **Preference Points System (80/20 or 90/10)** applicable to this bid is stated in the **Tender Data: C.3.11**.

1.2 Failure on the part of the Tenderer to submit the required proof or documentation, in terms of the requirements in the Tender Data for claiming specific goal preference points, will be interpreted that **Preference Points for Specific Goals** are not claimed.

1.3 The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

2.0 ADJUDICATION USING A POINT SYSTEM

2.1 The bidder obtaining the highest number of total points will be recommended for the award of the contract.

2.2 Preference points shall be calculated after prices have been brought to a comparative basis taking into account all factors of non-firm prices and all unconditional discounts.

2.3 Points scored will be rounded off to the nearest 2 decimal places.

2.4 In the event that two or more bids have scored equal total points, the successful bid must be the one scoring the highest number of preference points for B-BBEE.

2.5 However, when functionality is part of the evaluation process and two or more bids have scored equal points including equal preference points for B-BBEE, the successful bid must be the one scoring the highest score for functionality.

2.6 Should two or more bids be equal in all respects the award shall be decided by the drawing of lots.

3.0 POINTS AWARDED FOR PRICE

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

80/20 Procurement System

$$Ps = 80\left(1 - \frac{Pt - P\min}{P\min}\right)$$

Where:
Ps = Points scored for comparative price of bid under consideration
Pt = Comparative price of bid under consideration
Pmin = Comparative price of lowest acceptable bid

4.0 POINTS ALLOCATED FOR THE BASKET OF PREFERENCE GOALS

4.1 Preference points may be claimed for the **Specific Goals** stated in the **Tender Data: C.3.11**.

For the purposes of this tender, the Tenderer may claim points based on the goal(s) stated in the table below, as supported by proof/ documentation specified in the Tender Data.

80/20 Preference Points System The Specific Goals to be allocated points in terms of this tender:	**Maximum Number of points ALLOCATED**	**Tenderer's Number of points CLAIMED**
Ownership Goal: Race (black)	14	
RDP Goal: The promotion of enterprises located in a specific municipal area.	6	
Total CLAIMED Points (maximum 20)	**20**	

5.0 REMIDIES FOR THE SUBMISSION OF FALSE INFORMATION

5.1 The remedies for the submission of false information regarding claims for specific goals are stated in the **SCM Policy: Section 52.9**.

Tenderers are to include, at the back of their tender submission, the required proof/ documentation in support of their Preference Goal claims.

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 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.

	Circle Applicable	
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.	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:

T2.2.8 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 below **Certificate of Independent Bid Determination** must be completed and submitted with the bid.

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid for: Contract **32204-5W**
The Installation of Water Meters and Ancillary Works on Existing Reservoir Inlets and Outlets within the Northern Operational Areas

in response to the invitation for the bid made by: ETHEKWINI MUNICIPALITY

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

I certify, on behalf of: ……

that:

(continued on next page)

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 consortium[3] will not be construed as collusive bidding.

7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
   (a) prices.
   (b) geographical area where product or service will be rendered (market allocation).
   (c) methods, factors or formulas used to calculate prices.
   (d) the intention or decision to submit or not to submit, a bid.
   (e) the submission of a bid which does not meet the specifications and conditions of the bid.
   (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.

NAME (Block Capitals): ---------- **Date**

SIGNATURE: _____ ----------

T2.2.9 DECLARATION OF MUNICIPAL FEES

Reference is to be made to the **Tender Data: C.2.23 and C.3.13(a)**.

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:

Account	**Account Number: to be completed by Tenderer**											
Consolidated Account												
Electricity												
Water												
Rates												
JSB Levies												
Other												

- If applicable, a copy of a recent (within the past 3 months) Metro Bill is to be provided.

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 eThekwini 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.

- Where a Tenderer's place of business or business interests are carried out from premises as part of any other 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, copies of the above-mentioned account's, agreements signed with the municipality, lease agreements, or official letters.

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:

T2.2.10 CONTRACTOR'S HEALTH AND SAFETY DECLARATION

Reference is to be made to Clauses C.2.1(e) and C.2.23 of the Tender Data.

In terms of Clause 5(1)(h) of the OHSA 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 OHSA 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 OHSA 1993 Construction Regulations 2014.

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

3 I propose to achieve compliance with the Regulations by one of the following **(Tenderers are to Circle Applicable - Yes or No)**:

	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) 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:

T2.2.11 CSD REGISTRATION REPORT

Reference is to be made to **Tender Data: C.2.1.1(b) and C.2.23**.

The **Tender Data: C.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.

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

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

The following is an example of the printout obtained from the above website.
Note: the printout will contain more than one page.

CENTRAL SUPPLIER DATABASE FOR GOVERNMENT

Report Date:

Report Ran By:

CSD REGISTRATION REPORT

SUPPLIER IDENTIFICATION

Supplier number		Have Bank Account	
Is supplier active?		Total annual turnover	
Supplier type		Financial year start date	
Supplier sub-type		Registration date	
Legal name		Created by	
Trading name		Created date	
Identification type		Edit by	
Government breakdown		Edit date	
Business status		Restricted Supplier	
Country of origin		Restriction Last Verification Date	
South African company/CC registration number			

Tenderers are to include, at the back of their tender submission, a printout of their 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:

T2.2.12 CIDB REGISTRATION AND STATUS

Reference is to be made to the **Tender Data: C.2.1.2, C.2.23, and C.3.13(c).**

The **Tender Data: C.2.1.1: 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.

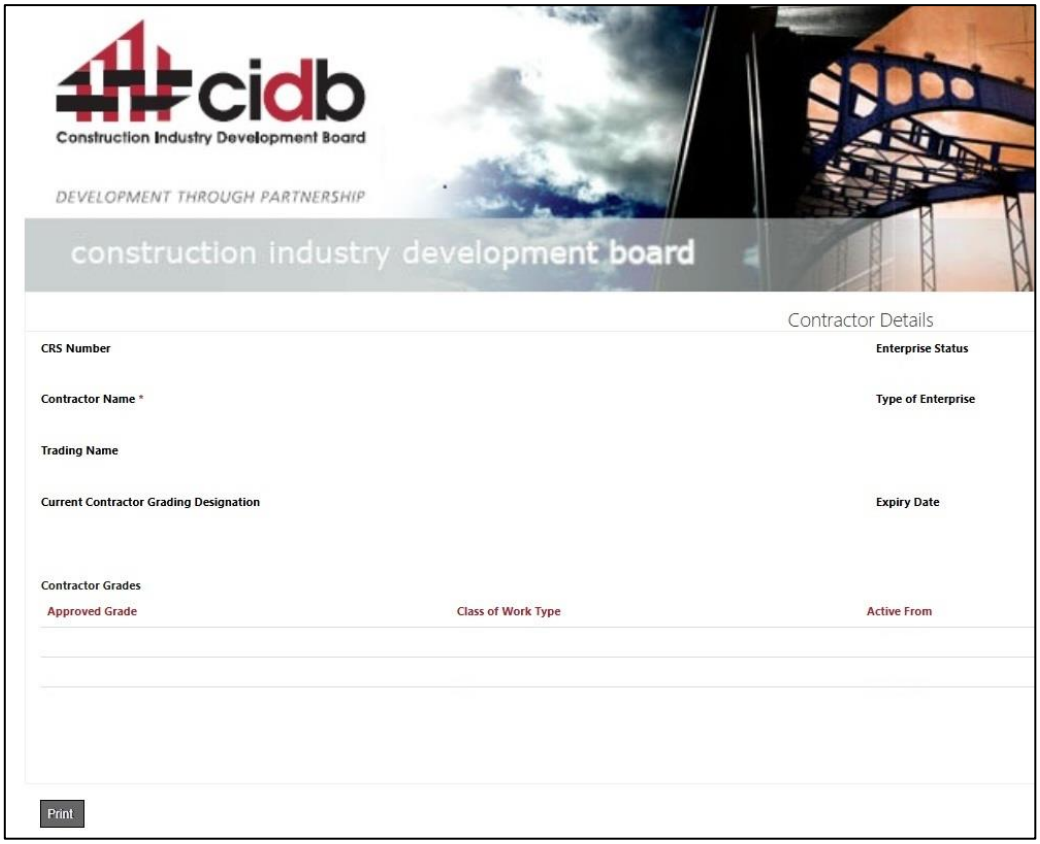
The required class of construction work is specified in the **Tender Data: C.2.1.2**.

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

CIDB Registrations can be obtained from the CIDB website at:

https://portal.cidb.org.za/RegisterOfContractors/

The following is an example of the printout obtained from the above website using the provided "Print" button. Note: the printout may contain more than one page.



Tenderers are to include, at the back of their tender submission, a printout of their CIDB Registration and Status.

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 JOINT VENTURES AGREEMENTS

If this tender submission is to be made by an established Joint Venture, the Joint Venture Agreements and Power of Attorney Agreements are to be attached here.

Should the Joint Venture, at the time of submission, not yet be formalised, this form is to be completed in full and signed by all parties to the proposed Joint Venture.

The Lead Partner of the Joint Venture is to sign the **Form of Offer** in Section **C1.1.1**.

INTENT TO FORM A JOINT VENTURE

Should our submission for CONTRACT: **32204-5W** be successful, a Joint Venture will be established by the parties as listed below, as an unincorporated association, with the purposes of securing and executing the Contract, for the benefit of the Members.

Proposed Joint Venture			
Joint Venture Title (name):			
Represented by (name):		Tel:	

Lead Partner/ Member 1			
Entity Name:			
Ownership Interest in JV %:		CSD Registration:	MAAA
CIDB #:			
Represented by (name):		Signature:	

Partner/ Member 2			
Entity Name:			
Ownership Interest in JV %:		CSD Registration:	MAAA
CIDB #:			
Represented by (name):		Signature:	

Partner/ Member 3			
Entity Name:			
Ownership Interest in JV %:		CSD Registration:	MAAA
CIDB #:			
Represented by (name):		Signature:	

Note: All requirements for Joint Ventures, as stated elsewhere in this procurement document, must be complied with in full.

T2.2.14 RECORD OF ADDENDA TO TENDER DOCUMENTS

Reference is to be made to the **Tender Data: C.2.6**.

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: _____ _____

T2.2.15 EXPERIENCE OF TENDERER

Refer to Additional Conditions of Tender: T1.2.3.4 for Functionality Points evaluation prompts (if applicable).

The following is a statement of works of similar nature (in relation to the scope of works) recently (within the past 10 years) executed by myself / ourselves.

Tenderers are to submit the following documents / information:
1.) Copies of signed appointment letters,
2.) Completion certificates or final payment certificates for all projects submitted (whichever is available) and
3.) Signed Independent Reference of Tenderers Experience T2.2.15.
Failure to submit all documents / information as per 1.), 2.) and 3.) above will result in a score of zero (0) for this criterion.

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

Attach additional pages if more space is required

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: _____ _____

TO BE COMPLETED FOR EACH PROJECT THAT IS LISTED IN T2.2.15

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): .....

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

T2.2.16 PROPOSED ORGANISATION and STAFFING

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 their 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.

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 KEY PERSONNEL

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 **		
Site Agent **		
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: ..... _____

T2.2.18 EXPERIENCE OF KEY PERSONNEL

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.

A CV of each key personnel of not more than 4 pages should be attached to this schedule:

Each CV should be structured under the following headings:

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***

Declaration

I ,_____ (Name and Surname), ID Number _____ , confirm that I would be involved in the execution of the work as per the nominated position and carry out the duties throughout the project. If circumstances change the company would notify the Employer and a suitable Employer approved replacement will be made available.

The undersigned, which warrants that he / she confirms that the contents of information within the CV are both true and correct.

Sign _____ Date_____

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 PRELIMINARY PROGRAMME

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

Note: The programme must be based on the completion time as specified in the Contract Data.

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 CONSTRUCTION APPROACH, METHODOLOGY, AND QUALITY CONTROL

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.

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 Construction Methodology and Quality Control information to this page.

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 SCHEDULE OF PROPOSED SUBCONTRACTORS

The following firms have been identified as possible subcontractors for work in this contract.

NAMES AND ADDRESSES OF PROPOSED SUBCONTRACTORS	NATURE AND EXTENT OF WORK TO BE SUBCONTRACTED	PREVIOUS EXPERIENCE WITH SUBCONTRACTOR

Attach additional pages if more space is required

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 PLANT and EQUIPMENT

The following are lists of major items of relevant equipment that I / we presently own or lease and will have available for this contract 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:

T2.2.23 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 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: _____ _____

T2.2.24 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 BBBEE 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.
- eThekwini 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 the Contract	Penalty Factor	Application	Objective
1	0 – 7.5%	0.25	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 Service Provider's fees.	The Service Provider 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.
2	7.6 – 15%	0.50		
3	15.1 – 22.5%	0.75		
4	22.6 – 30%	1.00		

DECLARATION OF WORK POTENTIALLY EARMARKED FOR TARGETED ENTERPRISES FOR:

Contract Participation for Targeted Enterprises

Total value of contract earmarked for targeted enterprises: ______________________________

Percentage (%) contract participation by targeted enterprises: ______________________________

Itemised tasks/work to be potentially performed by the targeted enterprise:

Task / Work Description	Value (as per BOQ)
TOTAL	

Attach additional pages if more space is required

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: -- ------------------------------

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: **32204-5W**

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 fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this Agreement.

Notwithstanding anything contained herein, this Agreement comes into effect on the date when the Tenderer receives one fully completed original copy of this document, including the Schedule of Deviations (if any). Unless the Tenderer (now 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.

FOR THE TENDERER		**FOR THE EMPLOYER**
……..……..	Signature	……..……..
……..……..	Name *(in capitals)*	……..……..
……..……..	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 **600 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 non-working days as stated in 5.8.1 and special non-working days as stated 5.1.1(a) & (b) are included in the above time for achieving Practical Completion.

1.1.1.15 The Employer is the eThekwini Municipality as represented by:
Deputy Head: **Water and Sanitation Engineering**

1.2.1.2 The address of the Employer is:
Physical: No. 3 Prior Road, Durban, 4001
Postal: P.O. Box 1038, Durban, 4000
Telephone: 031 311 8602 (t)
Fax: 031 311 8747 (t)
E-Mail: Bhavna.Soni@durban.gov.za

1.1.1.16 The **name of the Employer's Agent** is Nadas Thumbaya
1.2.1.2 The address of the Employer' Agent 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: Terence.Thumbaya@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 **15%** 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 Division (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)
- CV(s) of Key Site Staff (refer to Clause 4.11.1)
- CPG Implementation Plan (if applicable)

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.

The Employer is responsible for:

a) Ensuring that reasonable access is provided to the Contractor for the execution of the works, in accordance with the agreed schedule.
b) Communicating any operational constraints or specific requirements that may impact the Contractor's activities.
c) Communicating with the Contractor to address potential conflicts between operational activities and construction works.

The Contractor is responsible for:

i) Adhering to the Employer's access protocols, operational constraints, and safety requirements while on-site.
ii) Scheduling and executing work to minimize interference with the Employer's ongoing operations.
iii) Maintaining open communication with the Employer to ensure the smooth coordination of shared access.
iv) Any conflicts or delays arising from shared access arrangements shall be resolved through mutual consultation to ensure progress while maintaining the treatment works' operational functionality.

v) Coordinating with the Employer to address potential conflicts between operational activities and construction works.
vi) Holding ongoing coordination meetings at an interval agreed with the Employer

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

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

(a) All public holidays as declared in terms of Section 2A of the Public Holidays Act, 1994 (Act No. 36 of 1994); and
(b) The year-end break commencing with the close of business on the last working day prior to 16 December and ending with the start of business on the 1st working day in 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.

Month	**Days Lost**	**Average Rainfall**	**Month**	**Days Lost**	**Average Rainfall**
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 0000** (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 **2023 = 100**.
- The Index for **Labour** shall be based on **2024 = 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**

6.8.3 Price adjustments for **variation in the cost of the special material(s)** listed below, will be allowed.

Bitumen - escalation will be calculated using the "Rise and Fall" method as determined by the Employer. The base price for bitumen on this contract shall be the ruling price of 50/70 grade bitumen based on the **RUBIS Asphalt South Africa List Selling Price** for Penetration Grade Bitumen, seven (7) days prior to the closing date of tenders.

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 will be determined by the Employer.

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 eThekwini 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)

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 BBBEE 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.
- eThekwini 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 the Contract	Penalty Factor	Application	Objective
1	0 – 7.5%	0.25	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 Service Provider's fees.	The Service Provider 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.
2	7.6 – 15%	0.50		
3	15.1 – 22.5%	0.75		
4	22.6 – 30%	1.00		

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

[For contract awards over R10m] 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 CIDB B.U.I.L.D. PROGRAMME

a) CIDB Skills Standard

It will be a condition of contract that the Contractor shall, in the performance of the contract, achieve the **Contract Skills Development Goal** (CSDG) established in the below referenced standard:

- CIDB Standard for Developing Skills Through Infrastructure Contracts, published in Gazette Notice No. 48491 of 28 April 2023.

b) CIDB Indirect Targeting Standard

It will be a condition of contract that the Contractor shall, in the performance of the contract, achieve the **Contract Participation Goal** (CPG) relating to the engagement of targeted enterprises as established in the below referenced standard:

- CIDB Standard for Indirect Targeting for Enterprise Development through Construction Works Contracts, published in Gazette Notice No. 36190 of 25 February 2013.

C1.2.3.8 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 000.00.

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 C.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 42 pages. The pages are numbered 82 to 124

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	Month	20.00		
	8.4.2 (a)	Operations and Maintenance of Facilities on Site for the Engineer (SABS 1200 AB):	Month	20.00		
1.2.2	PSAB 3.2	Furnished offices	Month	20.00		
1.2.3	PSAB 5.4	Telephone for Engineer	Month	20.00		
1.2.4	PSAB 3.2	Meeting room facilities	Month	20.00		
1.2.5	PSAB 3.1	Project name board	Month	20.00		
	PSAA 8.3.2 (b)	Operations and Maintenance of Facilities on Site for the Contractor:	Month	20.00		
1.2.6		Offices, storage sheds, workshops, ablution & latrine facilities, tools & equipment, water supplies, electric power and communications, access and plant.	Month	20.00		
1.2.7	PSAA 5.3	Dealing with water	Month	20.00		
1.2.8	PSAA 5.5	Access	Month	20.00		
1.2.9	8.4.3 PS 6.5	General Responsibilities and Other time-related obligations	Month	20.00		
1.2.10	PS 16	Communication, Community Liaison and Public Relations	Month	20.00		
1.2.11	PS 18	Storage of Free Issue Items	Month	20.00		
	AH	Occupational Health and Safety	Month	20.00		
1.2.12		Compliance with the Occupational Health and Safety requirements	Month	20.00		
1.2.13	AH 10.2	Deployment of Health and Safety Officer for the duration of the Contract	Month	20.00		
		Allow for additional items which the tenderer requires to be priced separately	Month	20.00		
1.2.14		a)	Month	20.00		
1.2.15		b)	Month	20.00		
1.2.16		c)	Month	20.00		
1.2.17	PS 4.4	Site security for the duration of the contract	Month	20.00		
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		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	PS 17.5	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 Cl 6.5.1.2.3**	**DAYWORKS**				
		Labour:				
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		
		Plant and Equipment:				
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		
		Materials:				
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 Machince	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.	m²	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	m³	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	m²	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	m³	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	m²	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 - 2.0m²	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 faciliate meter assembly installation where slopes are greater than 1:3	m³	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.	m³	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	m³	670.00		
3.2.3		From 2.0m to 3.0m	m³	800.00		
3.2.4		From 3.0m to 4.0m	m³	500.00		
3.2.5		From 4.0m to 5.0m	m³	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	m³	80.00		
3.2.7		2) Hard rock excavation	m³	80.00		
3.2.8	PSDA 8.3.2(b) (3) PSDA 5.2.2.2	3) Hand excavation	m³	590.00		
3.2.9	8.3.5 PS 6.9	Hand excavation to locate existing water pipelines for meter assembly installations	m³	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	m³	50.00		
3.3.2		Backfilling around structures	m³	20.00		
Total Carried Forward						

SECTION 3: EARTHWORKS

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (RAND)
Brought Forward						
3.3.3		Backfilling of demolished structures	m³	40.00		
		From commercial Sources				
	PSDA 8.3.4.2	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		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	**PSL 3.10**	**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		**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	**PS 17**	**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		DN400	No.	12.00		
5.4.6		DN500	No.	2.00		
5.5	**PSMA 1**	**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		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:**				
	PSL 8.2.5.1	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		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**				
	PSMA1 (g)	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 ASSEMLY 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 ASSEMLY 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 ASSEMLY 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		**BY-PASS MECHANICAL METER ASSEMBLY PIPEWORK (INSTALLATION)**				
	PSL 8.2.5.2	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		DN200	No.	7.00		
8.4	**PSL 3.10**	**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		DN150	No.	9.00		
8.4.5		DN200	No.	7.00		
8.5	**PSL 3.10**	**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		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		**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		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		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**				
		EXISTING STEEL PIPELINES				
	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						
		EXISTING ASBESTOS CEMENT PIPELINES				
	PSL 8.2.18	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		
		EXISTING uPVC/ mPVC OR GRP PIPELINES				
	PSL 8.2.19	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:				
		0 to 15 deg, for:				
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		
		15 to 30 deg, for:				
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		
		31 to 45 deg, for:				
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		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		
	PSL 8.2.2	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 16mm² 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	FORMWORK				
	8.2.2	Smooth Horizontal, for:				
11.1.1		Soffit of Roof slab of meter chambers	m²	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	REINFORCEMENT				
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	m²	130.00		
	8.4	CONCRETE				
	8.4.2	Grade Concrete (15 Mpa/19mm)				
11.1.8		Blinding layer minimum 50mm thick	m³	6.00		
	8.4.3	Grade Concrete (25 Mpa/19mm)				
11.1.9		Chamber floors	m³	30.00		
11.1.10		Chambers roof slabs	m³	24.00		
	8.4.4	UNFORMED SURFACE FINISHES				
	8.4.4 (a)	Wood-floated finish to:				
11.1.11		Chamber floors.	m²	120.00		
	8.4.4 (b)	Steel-floated finish to:				
11.1.12		Chambers roof slabs	m²	65.00		
11.2	**PSX**	**BRICKWORK CHAMBERS**				
		(Refer to DWG 59066/ 202 and 59066/ 205 for details for Brickwork Chamber walls)				
		BRICKWORK BELOW GROUND				
Total Carried Forward						

SECTION 11: CHAMBERS AND CONCRETE WORKS

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (RAND)
Brought Forward						
		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).				
11.2.1		110mm chamber external face including brick force every course up to 2 courses below NGL	m²	400.00		
		Brickwork in stretcher bond. "Roan Satin" face brick. (All inclusive of cleaning brickwork and making good on completion).				
11.2.2		110mm chamber internal face including brick force every course up to 2 courses below NGL	m²	320.00		
		<u>BRICKWORK ABOVE GROUND</u>				
11.2.3		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		
		<u>WATERPROOFING</u>				
11.2.4		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		
		<u>BOX OUT HOLES</u>				
11.2.6		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	m²	100.00		
11.3.7		Bagging of 1:3 cement and sand mixture on external facing face	m²	100.00		
11.3.8		Two coats "Brickseal" or approved bitumen emulsion waterproof coating on bagged brick walls	m²	100.00		
11.4		**MISCELLANEOUS AND CHAMBER EXTRAS**				
11.4.1		Supply and place 19mm stone	m³	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	m²	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 saftey 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	m³	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	m³	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/m²				
12.3.1		Carriageway	m²	725.00		
	8.5.3	Tack Coat:				
12.3.2		Spray surface using 30% stable grade emulsion at 0.3 litres/m²	m²	725.00		
	PSMH 8.5.4	Asphalt:				
12.3.3		Continuously medium graded asphalt using 35/50 Pen. Grade bitumen, thichness 30-50mm to roads	m²	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	m²	36.00		
12.4.2		Reinstate concrete driveways, footways and kerbs with 25Mpa concrete	m³	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/m² (including glass beads, setting out and pre-marking for characters, symbols & traffic islands)	m²	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						
		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.				
13.3.1		Supply 110mm diameter	m	5,500.00		
13.3.2		Install 110mm diameter	m	5,500.00		
13.3.3		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		
13.4	**PSEL 3.5**	**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 1.5mm² 16-core	m	5,500.00		
13.4.2		Install 1.5mm² 16-core	m	5,500.00		
13.4.3		Terminate 1.5mm² 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 x6mm 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 35mm² Bare Copper Earth Wire	m	275.00		
13.11.2		Install 35mm² Bare Copper Earth Wire	m	275.00		
13.11.3		Terminate Bare Copper Earth Wire	No.	330.00		
13.11.4		Supply 35mm² PVC Insulated Copper Earth Wire	m	275.00		
13.11.5		Install 35mm² 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 ASSEMLY 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

C3.1: PROJECT DESCRIPTION AND SCOPE OF CONTRACT

C3.1.1 DESCRIPTION OF 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 EXTENT OF THE WORKS

C3.1.2.1 GENERAL 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
32204-5W: Northern Operational Areas	**48**	**52**	**20**

C3.1.2.2 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 supplied by the Contractor);
- 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.

C3.1.3 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 the proposed works 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.

C3.1.4 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 eThekwini Municipality Supply Region. The Employer will provide access to all the sites.

C3.1.5 NATURE OF GROUND AND SUBSOIL CONDITIONS

The Refer to Section C4.2: Site Information.

C3.2: PROJECT SPECIFICATION

PREAMBLE

The Project Specifications (PS) form an integral part of the contract and supplements the Standard Specifications. They contain a general description of the works, the site and the requirements to be met.

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 clause or item.

Any reference to "the Engineer" in this document is to be read as "the Employer's Agent" in terms of the definition 1.1.1.16 of the General Conditions of Contract for Construction Works as issued by SAICE – Third edition (2015)

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 eThekwini 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 eThekwini 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 crossed 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 eThekwini 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 eThekwini 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 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

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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 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 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 (m^2).

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 (m^3).

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 (m^2).

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 (m^3).

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 (m^2).

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: m^3

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 form 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 (m^2) measured along the shape of the embankment.

Unit: m^2

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 9000 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 “Copon 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 "Copon 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

Environment	Material	Corrosion Protection System	Min DFT (µm)
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
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 10ºC and the reaction generally ceased below 5ºC. 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 15ºC 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	Solvent-free: 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 75ºC for 48 hrs. Make V cut at 30º angle. Test adhesion when panel has cooled to 25ºC.
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 - 20ºC - 7mm holiday.
8	Cathodic Disbonding (Accelerated)	Total disbonded area (including holiday) not to exceed 20mm diameter.	Impressed current - 3,5 volts potential at 75ºC 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 75ºC for 48 hrs. Make V cut at 30º angle. Test adhesion when panel has cooled to 25ºC.
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 - 20ºC - 7mm holiday.
8	Cathodic Disbonding (Accelerated)	Total disbonded area (including holiday) not to exceed 10mm diameter.	Impressed current - 3,5 volts potential at 75ºC 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 Contractors 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: m^3

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 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 8.2.20 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 on 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: m³
2) Selected fill material (Provisional Quantity) Unit: m³

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: m³
2) Selected fill material (Provisional Quantity) Unit: m³

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 : m³
2) Selected fill material Unit : m³

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:

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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 sage 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 waves 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 of 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 sued 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 jointer'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 consecutivebedding 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 III mm	II mm	I mm	Corobrick Brick Guide
PSX 5.3.1	Stock brickwork				
	- against earth	20	15	10	NFX
	- to receive plaster	17	10	7	NFP
	- to be bagged	13	8	5	NFP
	- fairface	8	5	3	FBS
PSX 5.3.2	Faced brickwork with bricks				
	- generally uniform in shape and size	8	5	3	FBS
	- high degree of uniformity in shape & size	5	3	2	FBX
	- non-uniform in shape	13	8	5	FBA
PSX 5.3.3	Out of alignment with Adjoining finishes on projecting items (windows & door frames)	4 3.5 5	3.0 2.5 3.5	15 1 2	FBS FBX FBA
PSX 5.3.4	Out of verticality of perps (dependent on bond)	40	15	5	
PSX 5.3.5	Out of alignment horizontally top edge to top edge adjoining bricks	2.5 2.0 3.0	2.0 1.5 2.5	1.5 1 2	FBS FBX FBA
PSX 5.3.6	Out of trueness vertically (top edge to lower edge Of next course)	2.5 2.0 3.0	2 1.5 2.5	1.5 1 2	FBS FBX FBA
PSX 5.3.7	Squareness of rooms				
	- measured on the diagonals*	20	10	5	
PSX 5.3.8	Out of square or true of a 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 (m^2).

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 (m^2).

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 EThekwini 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/m2
(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 lying.

   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 lying 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 -10ºC and 60ºC.

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 tiling 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	1.5mm², 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) 10m (procured through Contract)	Instrumentation Specialist

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 (volt 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 +/- 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 +/-0.1%.

   The meters shall be suitable for a maximum working temperature of 1800C 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 perturbance, 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 Quantities 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 it 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, nett 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 additioanl 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)	Qp >= (m^3/hr)	Qt <= (m^3/hr)	Qmin <= (m^3/hr)	Qs >= (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 2ºC and 40ºC;

4) Have straight reading pattern cyclometer counters indicating completed m^3, having a reading sequence from left to right, with one colouring system to indicate m^3 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 m^3;
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 perturbance, 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

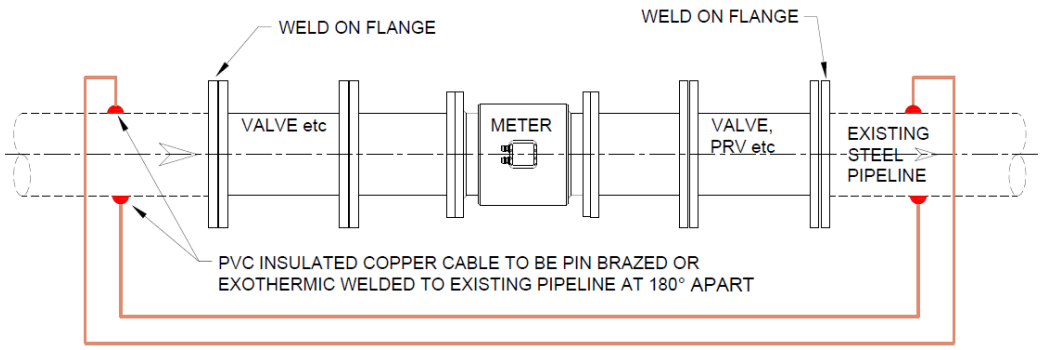
All pipe joints shall be continually bonded by means of 2 x 16mm² black PVC insulated copper cables pin brazed or exothermic welded to the steel pipeline either side of the joint.

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.



CONTINUITY BONDING ACROSS INLINE SPECIALS

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.

C3.4: PARTICULAR SPECIFICATIONS

In addition to the Standardized and Project Specifications the following Particular Specifications / Policies shall apply to this contract:

C3.4.1 Part AH - OHSA 1993 Safety Specification
(26 Pages)

C3.4.2 Standard Environmental Management Plan for Civil Engineering Construction Works
(24 Pages)

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, eThekwini 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	Tongaat 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

C3.5.2 STANDARD DRAWINGS

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 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.

C3.6: ANNEXURES

The Part C3.6 Annexures The following documents shall form Part of this Contract and 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

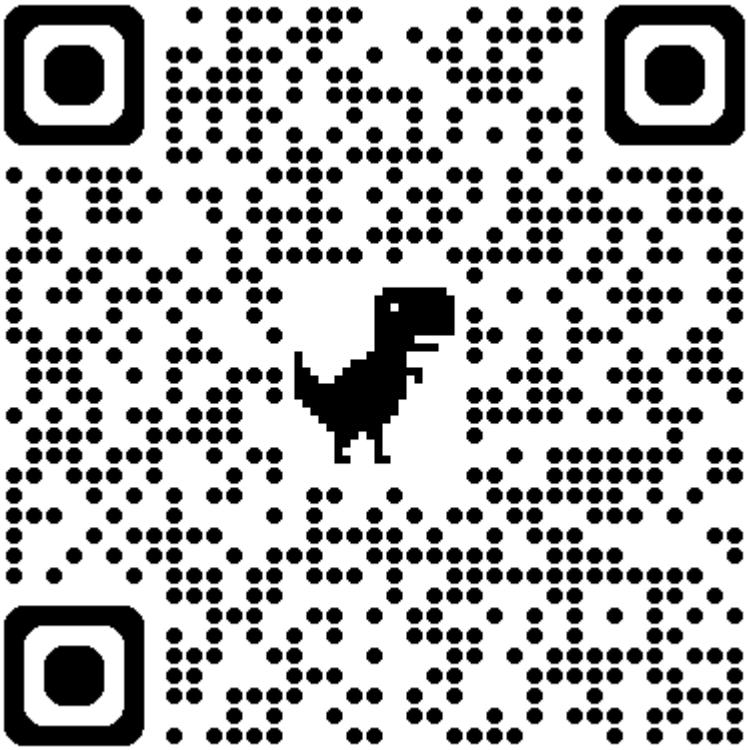
PART C4: SITE INFORMATION

C4.1 LOCALITY PLAN

The Locality Plan is accessible for Electronic Documents obtained from the eTenders website via the following link:

https://drive.google.com/drive/folders/1t69lJKab0oI2eTu4qkM2Ru9Zkixni81u

Alternatively, Scan the QR Code below:



C4.2 CONDITIONS ON SITE (GEOTECHNICAL INFORMATION)

There is no specific geotechnical information

C4.3 TEST RESULTS

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_ov00OOf3Awl

Alternatively, Scan the QR Code below: