CLUSTER

Trading Services

UNIT

eThekwini Water and Sanitation

DEPARTMENT

Water and Sanitation Engineering

PROCUREMENT DOCUMENT

INFRASTRUCTURE

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

Contract No: **30583-5W**

Contract Title: **Blackburn to Phoenix 1: Construction of a 6.6km, 4.5mm Thick, Grade X42, Continuously Welded Steel Gravity Main Load Shift Pipeline: Ward 102, 35 & 48.**

Est. CIDB Grade/ Class: **8 CE**

CLARIFICATION MEETING AND QUERIES

Clarification Meeting: **Compulsory Clarification Meeting**

Meeting Location, Date, Time: **Blackburn Reservoir**
(29°50'30.5"S 30°47'44.6"E) (-29.691538, 31.050099)
On 26 May 2025 at 10h00

Queries can be addressed to:
The Employer's Agent's Representative:
Dhiveshni Naidu Pr. Eng
Tel: 031 311 8664
e-Mail: Dhiveshni.Naidu@durban.gov.za
Email queries to be sent by 5 June 2025
Response to Queries will be uploaded by 12 June 2025

TENDER SUBMISSION

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

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

Closing Date/ Time: **Friday, 20 June 2025** **at** **11h00**

FOR OFFICIAL USE ONLY

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

FACSIMILE, eMAIL, or POSTED TENDERS WILL NOT BE ACCEPTED

Issued by:

ETHEKWINI MUNICIPALITY

Deputy Head: Water and Sanitation Engineering

Date of Issue: 16/05/2025

Document Version 01/03/2024

FOR OFFICIAL USE ONLY

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

INDEX to PROCUREMENT DOCUMENT

PART T1: TENDERING PROCEDURES

T1.1.1: TENDER NOTICE AND INVITATION TO TENDER

Invitations for tenders are being issued for the following construction project: the construction of a Grade X42 DN500 x 4.5mm x 3.8km, DN 400 x 4.5mm x 0.4km, and DN300 x 4.5mm x 2.4km steel watermain from Blackburn reservoir to Phoenix 1 Low level in Ward 102, 35, and 48. This pipeline will run along municipal roads and the proposed Go Durban C9 corridor, and intersect two Department of Transport roads through an 1117mm Diameter Pipe Jack Concrete Sleeve and associated works.

Subject	Description	Tender Data Ref.
Employer	The Employer is the eThekwini Municipality as represented by: Deputy Head: **Water and Sanitation Engineering**	F.1.1.1
Tender Documents	Documents can only be obtained in electronic format and issued by the eThekwini Municipality. Documentation can be downloaded from the **National Treasury's eTenders website** or the **eThekwini Municipality's Website**. The entire document should be printed (on A4 paper) and suitably bound by the tenderer.	F.1.2
Eligibility	It is estimated that tenderers should have a CIDB contractor grading designation of **8 CE** (or higher). The CIDB provisions in relation to a Contractor's Potentially Emerging (PE) status do not apply.	F.2.1.1
Clarification Meeting	**Blackburn Reservoir** **(29°50'30.5"S 30°47'44.6"E) (-29.691538, 31.050099)** **On 26 May 2025 at 10h00**	F.2.7
Seek Clarification	Queries relating to these documents are to be addressed to the Employer's Agent's Representative whose contact details are: **Dhiveshni Naidu Pr. Eng** **Tel: 031 311 8664** **e-Mail: Dhiveshni.Naidu@durban.gov.za** **Email queries to be sent by 5 June 2025** **Response to Queries will be uploaded by 12 June 2025**	F.2.8
Submitting a Tender Offer	Tender offers shall be delivered to: **The Tender Box in the foyer of the Municipal Building** **166 KE Masinga Road, Durban** **Bidders are required to also make an** electronic submission via SSS. Bidders must ensure that the hard copy and electronic submission are the same, failing which the submission will be deemed invalid. Bidders are responsible for resolving all access rights and submission queries before the tender closing date. **SSS Queries Contact: Lindo Dlamini**: Tel: 031-3227133/031-3227153 email: supplier.selfservice@durban.gov.za	F.2.13
Closing Time	Tender offers shall be delivered on or before **Friday, 20 June 2025** at or before **11h00**.	F.2.15

Evaluation of Tender Offers	**The 90/10** Price Preference Point System, as specified in the PPPFA Regulations 2022 will be applied in the evaluation of tenders. Refer to Clause F.3.11 of the Tender Data for the **Specific Goal(S)** for the awarding of Preference Points, and other related evaluation requirements.	F.3.11

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

PART T1: TENDERING PROCEDURES

T1.2: TENDER DATA

T1.2.1 STANDARD CONDITIONS OF TENDER

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

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

T1.2.2 TENDER DATA

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

F.1: GENERAL

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

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

1) This procurement document.

2) "General Conditions of Contract for Construction Works – 3rd Edition 2015" issued by the South African Institution of Civil Engineering (GCC 2015). This document is obtainable separately, and Tenderers shall obtain their own copies.

3) "City of Durban Technical Specifications" hereinafter referred to as the Standard Engineering Specifications. This document is obtainable separately, and Tenderers shall obtain their own copies of the applicable Sections.

4) Drawings, issued separately from this document, or bound in Section C3.4 (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 current (as at advertising date) Supply Chain Management Policy.
   - The Preferential Procurement Policy Framework Act No 5 of 2000, and the Preferential Procurement Policy Framework Act Regulations (2022).
   - The Occupational Health and Safety Act No 85 and Amendment Act No 181 of 1993, and the Construction Regulations (2014).
   - The Construction Industry Development Board Act No 38 of 2000 and the Regulations issued in terms of the Act (July 2013).
   - SANS 1921:2004 – Construction and Management Requirements for Works Contract, Parts 1-3.
   - 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's Website** at URLs:

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

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

F.1.4 Communication and employer's agent:

The Employer's Agent is:
Roxanne Canny Pr. Eng.
Tel: 031 311 8745
e-Mail: Roxanne.Canny@durban.gov.za

The Employer's Agent's Representative is:
Dhiveshni Naidu Pr. Eng
Tel: 031 311 8664
e-Mail: Dhiveshni.Naidu@durban.gov.za
Email queries to be sent by 5 June 2025
Response to Queries will be uploaded by 12 June 2025

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

F.2: TENDERER'S OBLIGATIONS

F.2.1.1 Eligibility: General

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

(a) the Tenderer does not comply with the legal requirements as stated in the Employer's current SCM Policy.

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

(c) In the event of a Compulsory Clarification Meeting:
  i) the Tenderer fails to attend the Compulsory Clarification Meeting.
  ii) the Tenderer fails to have the form "Certificate of Attendance at Clarification Meeting / Site Inspection" (in T2.2) signed by the Employer's Agent or his representative.

(d) in the case of JV submissions, two or more JV entities have common directors/shareholders or common entities tendering for the same works.

(e) at the time of closing of tenders, the Tenderer is not registered on the National Treasury Central Supplier Database (CSD) as a service provider. In the case of a Joint Venture, this requirement will apply individually to each party in the Joint Venture.

(f) The tenderer has not submitted, with this tender, a valid Letter of Good Standing from the Compensation Commissioner as proof of being registered and in good standing with the compensation fund. Reference is to be made to Returnable Document T2.2.13.

(g) The tender fails to complete and sign the Declaration of Municipal Fees in T2.2: "Returnable Documents" and submits the required documentation. Reference is to be made to Returnable Document T2.2.12.

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

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

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

The following are to be noted:

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

F.2.1.2 **Eligibility: CIDB**

Only those tenderers who are registered (as "Active") with the CIDB (at the 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 an 8 **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 the time of tender closing),
(b) The lead partner has a contractor grading designation in the 8 **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 an 8 **CE** class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations. It is compulsory that the combined contractor grading designation be submitted, failure to do so will deem the tenderer ineligible.

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

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

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

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

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

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

F.2.7 **Clarification meeting:**
Blackburn Reservoir
(29°50'30.5"S 30°47'44.6"E) (-29.691538, 31.050099)
On 26 May 2025 at 10h00

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

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

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

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

- Contract No. : **30583-5W**
- Contract Title : **Blackburn to Phoenix 1: Construction of a 6.6km, 4.5mm Thick, Grade X42, Continuously Welded Steel Gravity Main Load Shift Pipeline: Ward 102, 35 & 48.**

The Employer's address for delivery of tender offers is:
The Tender Box in the foyer of the Municipal Building
166 KE Masinga Road, Durban

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

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

SSS Queries Contact: Lindo Dlamini: Tel: 031-3227133/031-3227153 email:
supplier.selfservice@durban.gov.za
Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted.

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

- Date : **Friday, 20 June 2025**
- Time : **11h00**

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

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

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

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

Tax Clearance

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

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

Failure to comply will make the tender non-responsive.

Compensation Commissioner

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

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

Failure to comply will make the tender non-responsive.

Central Supplier Database (CSD)

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

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

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

CIDB Registration

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

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

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

The Joint Venture Grading Designation Calculator should be used when submitting as a Joint Venture (https://registers.cidb.org.za/PublicContractors/JVGradingDesignationCalc). Failure to submit the joint venture grading designation will render the tenderer ineligible.

The date of obtaining the CIDB printout(s) is to be indicated on the printout.

F.3: THE EMPLOYER'S UNDERTAKINGS

F.3.1.1 **Respond to requests from the tenderer:** Replace the words "five working days" with "three working days".

F.3.2 **Issue addenda:** Add the following paragraph: "Addenda will be published, in electronic format, on the same platform(s) as the Tender Notification (refer to F.1.2).

F.3.4 **Opening of Tender Submissions:** Tenders will be opened immediately after the closing time for tenders. The public reading of tenders will take place in the SCM Boardroom, 6th Floor, Engineering Unit Building, 166 KE Masinga Road, Durban.

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

Eligibility

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

Functionality

FUNCTIONALITY will be evaluated to determine the responsiveness of tenders received. The minimum score for FUNCTIONALITY is 60 points. Those tenders not achieving the minimum score will be deemed non-responsive.

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

Preference Point System

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

Price Points

The **90/10** preference points system will be applied. The Formula used to calculate the **Price Points (max. 90)** will be according to that specified in Regulation 5.1.

Preference Points

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

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

- **Ownership Goal**
  Goal Weighting: 50%

  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	90/10
Race: Black (w1)	Equals 0%	0
	Between 0% and 51%	2
	Greater or equal to 51% and less than 100%	3
	Equals 100%	5
	Maximum Goal Points:	5

The **Weightings** of the **Ownership Categories** will be:
- w1 = 100%,

Proof of claim as declared on MBD 6.1 (1 or more of the following will be used in verifying the tenderer's status)
- Companies and Intellectual Property Commission registration document (CIPC)
- CSD report.
- B-BBEE Certificate of the tendering entity.
- Consolidated BBBEE Certificate if the tendering entity is a Consortium, Joint Venture, or Trust (Issued by a verification agency accredited by the South African Accreditation System).
- Agreement for a Consortium, Joint Venture, or Trust.

- **RDP Goal: The promotion of South African owned enterprises**
  Goal Weighting: 50%

  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.

Location	90/10
Not in South Africa	0
South Africa	1
Kwa Zulu Natal	3.5
eThekwini Municipality	5
Maximum Goal Points:	5

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

F.3.11.9 Scoring quality

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

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

$N_Q = W_2 \times S_O / M_S$

where:

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

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

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

(e) The tenderer has completed the **Compulsory Enterprise Questionnaire** and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the Employer or potentially compromise the tender process.
(f) The tenderer is **registered and in good standing with the compensation fund or** with a **licensed compensation insurer**.
(g) The Employer is reasonably satisfied that the tenderer has in terms of the Construction Regulations, 2014, issued in terms of the Occupational Health and Safety Act, 1993, the **necessary competencies and resources to carry out the work safely**.

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

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

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

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

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

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

T1.2.3 ADDITIONAL CONDITIONS OF TENDER

T1.2.3.1 Appeals

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

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

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

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

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

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

T1.2.3.3 Code of Conduct and Local Labour

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

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

T1.2.3.5 Functionality Specification

The value of W_2 is 100. The Functionality criteria (and sub criteria if applicable) and maximum score in respect of each of the criteria are as follows:

Functionality Criteria / Sub Criteria		**Maximum Points Score**
Tenderer's Experience		35
Project Organogram and Experience of Key Staff	Contracts Manager	15
	Site agent	15
	Continuously welded steel pipe lead Foreman	15
	Civil Work Lead Foreman	10
Preliminary Programme		5
Quality Control		5
	The 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	**Returnable Schedules**
Tenderer's Experience	Experience of Tenderer: • Including a description of works undertaken. The tenderer's experience must be in the construction of a c**ontinuously welded steel pipeline**. • The minimum size (capacity) of the continuously welded steel pipe **DN ≥ 300mm, and ≥ 1km long.**
Project Organogram and Experience of Key Staff	• Proposed Organisation and Staffing • Key Personnel • CVs with Experience of Key Personnel
Preliminary Programme	• Preliminary Programme
Quality Control	• Quality Control Certification

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 judgment:

- "**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 60% of this tender's value, and had a comparable Scope of Work in terms of technical requirements and operations where the projects involved continuously welded steel pipelines of no less than 300 mm diameter and not less than 1000m in length.
- "**Experience**" implies experience on projects of a similar nature (continuously welded steel pipeline);
- "A**ccredited degree/diploma**" implies a minimum 3-year qualification within the built environment, from a registered national University or Institute of Technology.

Criterion: Tenderer's Experience (Construction of continuously welded steel pipeline, ≥ DN300 and ≥ 1km Long) (35 Points) Note: "successfully completed" implies a project has been completed on time and to specification	
Level 0	No information provided; OR submission of no substance / irrelevant information provided / less than 2 projects
Level 1 (20)	To have successfully completed 2 projects continuously welded steel pipeline within the past 10 years with a scope of works similar to the scope of works for this contract.
Level 2 (40)	To have successfully completed 3 projects of a continuously welded steel pipeline within the past 10 years with a scope of works similar to the scope of works for this contract.
Level 3 (60)	To have successfully completed 4-5 projects of a continuously welded steel pipeline within the past 10 years with a scope of works similar to the scope of works for this contract.
Level 4 (80)	To have successfully completed 6-7 projects of a continuously welded steel pipeline within the past 10 years with a scope of works similar to the scope of works for this contract.
Level 5 (100)	To have successfully completed 8+ projects of a continuously welded steel pipeline within the past 10 years with a scope of works similar to the scope of works for this contract.

Criterion: Project Organogram and Experience of Key Staff (55 Points)	
Note:	Projects of a similar nature that will be considered shall be continuously welded steel pipelines.
CONTRACT MANAGER 15 Points	
Level 0	No information provided OR submission of no substance / irrelevant information provided OR less than 3 years experience OR Relevant accredited diploma / degree and less than 3 years' experience.
Level 1 (20)	Relevant accredited diploma/degree and minimum 3 year's experience.
Level 2 (40)	Relevant accredited diploma/degree and minimum 6 years experience.
Level 3 (60)	Relevant accredited diploma/degree and minimum 9 years experience.
Level 4 (80)	Relevant accredited diploma/degree and minimum 12 years experience.
Level 5 (100)	Relevant accredited diploma/degree and minimum 15 years experience.

SITE AGENT 15 Points	
Level 0	No information provided OR submission of no substance / irrelevant information provided OR less than 4 years experience OR Relevant accredited diploma / degree and less than 3 years' experience.
Level 1 (20)	Minimum 4 years' experience as a site agent OR Relevant accredited diploma/degree and minimum 3 year's experience.
Level 2 (40)	Minimum 7 years' experience as a site agent OR Relevant accredited diploma/degree and minimum 6 years experience.
Level 3 (60)	Minimum 10 years' experience as a site agent OR Relevant accredited diploma/degree and minimum 9 years experience.
Level 4 (80)	Minimum 13 years' experience as a site agent OR Relevant accredited diploma/degree and minimum 12 years experience.
Level 5 (100)	Minimum 16 years' experience as a site agent OR Relevant accredited diploma/degree and minimum 15 years experience.

PIPELINE LEAD FOREMAN 15 Points	
Level 0	No information provided OR submission of no substance / irrelevant information OR Less than 3 year's experience.
Level 1 (20)	Minimum 3 year's experience as a Lead Foreman on continuously welded steel pipeline projects
Level 2 (40)	Minimum 6 year's experience as a Lead Foreman on continuously welded steel pipeline projects
Level 3 (60)	Minimum 9 year's experience as a Lead Foreman on continuously welded steel pipeline projects
Level 4 (80)	Minimum 12 year's experience as a Lead Foreman on continuously welded steel pipeline projects
Level 5 (100)	Minimum 15 year's experience as a Lead Foreman on continuously welded steel pipeline projects

CIVIL LEAD FOREMAN 10 Points	
Level 0	No information provided OR submission of no substance / irrelevant information OR Less than 3 year's experience.
Level 1 (20)	Minimum 3 year's experience relevant experience as a Lead Foreman (Civils)
Level 2 (40)	Minimum 6 year's experience relevant experience as a Lead Foreman (Civils)
Level 3 (60)	Minimum 9 year's experience relevant experience as a Lead Foreman (Civils)
Level 4 (80)	Minimum 12 year's experience relevant experience as a Lead Foreman (Civils)
Level 5 (100)	Minimum 15 year's experience relevant experience as a Lead Foreman (Civils)

'Criterion: Preliminary Programme (5 Points)	
Level 0	No information provided OR submission of no substance / irrelevant information provided
Level 1 (20)	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 (40)	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 (60)	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 (80)	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 (100)	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: Quality Control (5 Points)	
Level 0	No information provided OR submission of no substance / irrelevant information provided
Level 1 (20)	A generic statement covering required sampling and testing requirements for preparatory works, process monitoring and finishing works, for all programmed activities.
Level 2 (40)	Activity/Site specific statement covering required sampling and testing requirements for preparatory works, process monitoring and finishing works, for all programmed activities.
Level 3 (60)	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 (80)	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, and • Resources to be assigned to quality control, and • List of subcontractor /service providers to be assigned for quality control, and • Statement on remedial action to quality control.
Level 5 (100)	Activity/Site specific statement covering required sampling and testing requirements for preparatory works, process monitoring and finishing works, for all programmed activities; **Plus:** • ISO Accreditation • Including site specific quality control check-sheet for programmed activities, and • Resources to be assigned to quality control, and • List of subcontractor /service providers to be assigned for quality control, and • Statement on remedial action to quality control.

PART T2: RETURNABLE DOCUMENTS

T2.1 LIST OF RETURNABLE DOCUMENTS

T2.1.1 General

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

The Tenderer is required to complete each and every Schedule and Form listed below to the best of their ability as the evaluation of tenders and the eventual contract will be based on the information provided by the Tenderer. Failure of a Tenderer to complete the Schedules and Forms to the satisfaction of the Employer will inevitably prejudice the tender and may lead to rejection on the grounds that the tender is non-responsive.

T2.1.2 Returnable Schedules, Forms and Certificates

Entity Specific

Eligibility

Technical or Functionality Evaluation

T2.2 RETURNABLE SCHEDULES, FORMS, AND CERTIFICATES

The returnable schedules, forms, and certificates, as listed in T2.1.2, can be found on pages **18** to **57**.

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

T2.2.1 COMPULSORY ENTERPRISE QUESTIONNAIRE

Ref	Description	Complete or Circle Applicable
1.1	Name of enterprise	
1.2	Name of enterprise's representative	
1.3	ID Number of enterprise's representative	
1.4	Position enterprise's representative occupies in the enterprise	
1.5	National Treasury Central Supplier Database Registration number	**MAAA**
1.6	eThekwini Supplier Database: Reference number (PR), if any:	**PR**
1.7	VAT registration number, if any:	
1.8	CIDB registration number, if any:	
1.9	Department of Labour: Registration number	
1.10	Department of Labour: Letter of Good Standing Certificate number	

2.0 **Particulars of sole proprietors and partners in partnerships (attach separate pages if more than 4 partners)**

	Full Name	Identity No.	Personal income tax No. *
2.1			
2.2			
2.3			
2.4			

3.0 **Particulars of companies and close corporations**

3.1	Company registration number, if applicable:	
3.2	Close corporation number, if applicable:	
3.3	Tax Reference number, if any:	
3.4	South African Revenue Service: Tax Compliance Status PIN:	

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

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

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

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

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

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

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

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

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

i) authorizes the Employer to verify the tenderers tax clearance status from the South African Revenue Services that it is in order.

ii) confirms that the neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004.

iii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption.

iv) confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest.

v) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

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

SIGNATURE: ---------- ----------

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

Reference is to be made to Clauses F.2.1(c) and F.2.7 of the Tender Data.

This is to certify that:

(entity name): .....

of (address): .....

.....

.....

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

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

Particulars of person(s) attending the meeting:

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

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

Name: ……

Signature: ……

Date: ……..….

T2.2.3 TAX COMPLIANCE STATUS PIN

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

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

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

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

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

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

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

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

SIGNATURE: ---------- ----------

T2.2.4 CONTRACTOR'S HEALTH AND SAFETY DECLARATION

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

Reference is to be made to Clauses F.2.1(e) and F.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:

T2.2.5 MBD 4: DECLARATION OF INTEREST

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

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

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

1 No bid will be accepted from persons **in the service of the state**[1]**.**

2 Any person, having a kinship with persons **in the service of the state**, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to **persons in service of the state**, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority and/or take an oath declaring his/her interest.

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

3.1	Name of enterprise	Complete T2.1.2.1 Item 1.1
	Name of enterprise's representative	Complete T2.1.2.1 Item 1.2
3.2	ID Number of enterprise's representative	Complete T2.1.2.1 Item 1.3
3.3	Position enterprise's representative occupies in the enterprise	Complete T2.1.2.1 Item 1.4
3.4	Company Registration number	Complete T2.1.2.1 Item 3.1 or 3.2
3.5	Tax Reference number	Complete T2.1.2.1 Item 3.3
3.6	VAT registration number	Complete T2.1.2.1 Item 1.7

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

If yes, furnish particulars: ……

……

If yes, furnish particulars: ……

……

3.10 Do you have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and or adjudication of this bid?	YES	NO
If yes, furnish particulars:		
3.11 Are you, aware of any relationship (family, friend, other) between any other bidder and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid?	YES	NO
If yes, furnish particulars:		
3.12 Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state?	YES	NO
If yes, furnish particulars:		
3.13 Are any spouse, child or parent of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state?	YES	NO
If yes, furnish particulars:		
3.14 Do you or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract ?	YES	NO
If yes, furnish particulars:		

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

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

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

NAME (Block Capitals): **Date**

.....

SIGNATURE:

.....

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

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

		Circle Applicable	
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.

……

……

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 document, a printout of their audited annual financial statements.

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

NAME (Block Capitals): **Date**

SIGNATURE:

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

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

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

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

1.0 GENERAL CONDITIONS

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

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

1.2 The applicable preference point system for this tender is the 90/10 preference point system.

1.3 Preference Points for this tender shall be awarded for:

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

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

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

2.0 DEFINITIONS

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

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

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

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

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

3.0 FORMULA FOR CALCULATION OF PREFERENCE PRICE POINTS

3.1 PROCUREMENT OF GOODS AND SERVICES

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

90 / 10 Points System

$$Ps = 90\left(1 - \frac{Pt - Pmin}{Pmin}\right)$$

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

4.0 POINTS AWARDED FOR SPECIFIC GOALS

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

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

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

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

TABLE 1: Specific Goals for the tender and maximum points for each goal are indicated per the table below.

Tenderers are to indicate their points claim for each of the Specific Goals in the shaded blocks.

The Specific Goals to be allocated points in terms of this tender	Maximum Number of points ALLOCATED (90/10 system)	Number of points CLAIMED (90/10 system)
Ownership Goal: Race (black)	5	
RDP Goal: The promotion of South African owned enterprises.	5	
Total CLAIMED Points (10 Maximum)		

Should the municipality apply a combination of Specific Goals, the **points for the individual goals** will be weighted according to the **Goal Weightings** specified in the Tender Data (Clause F.3.11) to arrive at the final points for **Preferential Points for Specific Goals**.

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

I acknowledge that:

1) The information furnished is true and correct.

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

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

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

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

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

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

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

1.0 This Municipal Bidding Document must form part of all bids invited.

2.0 It serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.

3.0 The bid of any bidder may be rejected if that bidder, or any of its directors have:

a) abused the municipal entity's supply chain management system or committed any improper conduct in relation to such system.
b) been convicted for fraud or corruption during the past five years.
c) wilfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years.
d) been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).

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

		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.

……

……

		YES	NO
4.4	Does the bidder or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?		

4.4.1 If YES, provide particulars.

……

……

		YES	NO
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?		

4.5.1 If YES, provide particulars.

……

……

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

I accept that, in addition to cancellation of a contract, action may be taken against me should this declaration prove to be false.

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.9 MBD 9: CERTIFICATE OF INDEPENDENT BID DETERMINATION

NOTES

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

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

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

1.0 This Municipal Bidding Document (MBD) must form part of all **bids**[1] invited.

2.0 Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or **bid rigging**).[2] Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.

3.0 Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:

a. take all reasonable steps to prevent such abuse;
b. reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and
c. cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.

4.0 This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of **bid rigging**.

5.0 In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid.

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

(Bid Number and Description)

in response to the invitation for the bid made by:

(Name of Municipality / Municipal Entity)

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

I certify, on behalf of:

(Name of Bidder)

that:

1. I have read and I understand the contents of this Certificate.

2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect.

3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;

4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;

5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
   (a) has been requested to submit a bid in response to this bid invitation.
   (b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience.
   (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder.

6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement, or arrangement with any competitor. However, communication between partners in a joint venture or 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: _____ ----------

T2.2.10 JOINT VENTURES AGREEMENTS

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

As per Clause F.2.1.2 (c), it is compulsory that the combined contractor grading designation be submitted, failure to do so will deem the tenderer ineligible.

T2.2.11 RECORD OF ADDENDA TO TENDER DOCUMENTS

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

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

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

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

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

SIGNATURE: ..... _____

T2.2.12 ELIGIBILITY: DECLARATION OF MUNICIPAL FEES

Reference is to be made to Clause F.2.1(f)(ii) of the Tender Data.

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

.....

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

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

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

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

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

- Where the tenderer's place of business or business interests are outside the jurisdiction of 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.

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

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

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

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

SIGNATURE: ....

T2.2.13 ELIGIBILITY: REGISTRATION WITH COMPENSATION COMMISSIONER

Reference is to be made to Clause F.2.1(f)(i) of the Tender Data.

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

Clause 80: Employer to register with commissioner and furnish him with particulars
The Act requires that an Employer carrying out business in the Republic to register with the Compensation Commissioner. Any person who fails to comply with the provisions of the this clause is guilty of an offence.

Clause 82: Employer to furnish returns of earnings
The Act requires an Employer to furnish the commissioner with a return showing:

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

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

Clause 86: Assessment to be paid by an employer to commissioner
The Act states that an Employer will receive notices of assessment from the commissioner. The Employer must pay the commissioner the assessment amount on the notices.

Clause 89: Mandators and contractors
The Act requires a contractor (a person with a contract with a mandator) to register as an Employer in accordance with the provisions of the Act and pay the necessary assessments. Failing registration or payment of assessments, the mandator is required to pay the assessments in respect of the employees of the contractor. The mandator is allowed to recover the assessment amounts paid from the contractor.

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

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

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

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

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

SIGNATURE: _____ _____

T2.2.14 ELIGIBILITY: CSD REGISTRATION REPORT

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

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

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

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

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

CENTRAL SUPPLIER DATABASE FOR GOVERNMENT

Report Date:

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 document, a printout of their (full) CSD Registration Report.

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

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

SIGNATURE: _____ _____

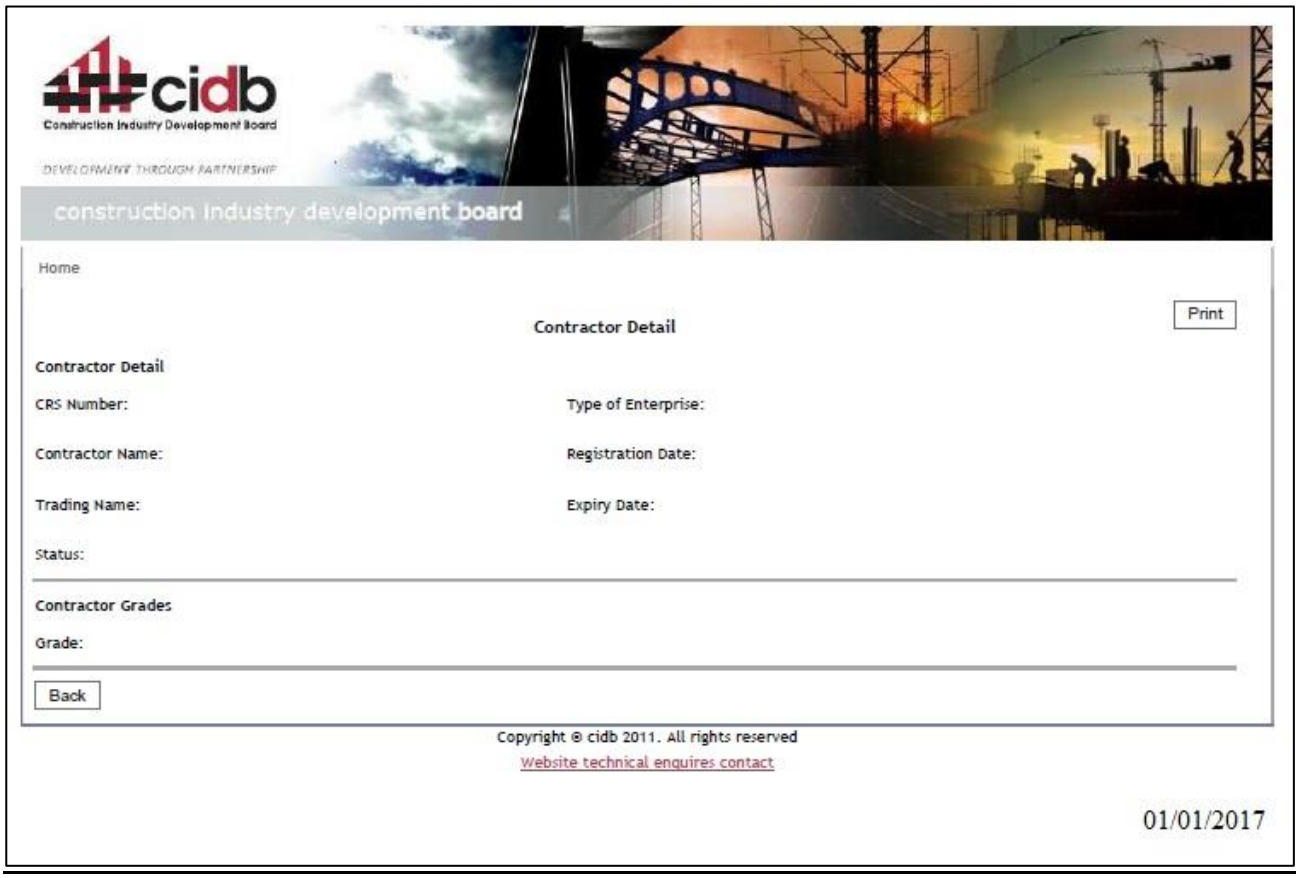
T2.2.15 ELIGIBILITY: VERIFICATION OF CIDB REGISTRATION AND STATUS

Reference is to be made to Clause F.2.1.1 and F.2.23 of the Tender Data**.**

The Conditions of Tender, **Clause F.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 Clause F.2.1.1.

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

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



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

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

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

SIGNATURE: _____ _____

T2.2.16 EXPERIENCE OF TENDERER

Refer to Clause F3.11.9 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.

“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 60% of this tender’s value, and had a comparable Scope of Work in terms of technical requirements and operations where the projects involved continuously welded steel pipelines of no less than 300 mm diameter and not less than 1000m in length;

Tenderers are to submit copies of signed completion certificates for all projects submitted.

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

T2.2.17 PROPOSED ORGANISATION and STAFFING

Refer to Clause F3.11.9 for Functionality Points evaluation prompts (if applicable).

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

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

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

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

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

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

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

SIGNATURE: _____ _____

T2.2.18 KEY PERSONNEL

Refer to Clause F3.11.9 for Functionality Points evaluation prompts (if applicable).

The Tenderer shall list below the personnel which he intends to utilize on the Works, including key personnel (Contract Manager, Site Agent, pipeline lead Foremen, and Civil Foreman) who 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		
Pipe Lead Foremen		
Civil Work Lead Foremen		
Others:		

Note: CVs of key personnel may be requested during the 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: ..... _____

T2.2.19 EXPERIENCE OF KEY PERSONNEL

Refer to Clause F3.11.9 for Functionality Points evaluation prompts (if applicable).

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

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 the contract manager, site agent(s) and general foreman of not more than 2 pages should be attached to this schedule:

Each CV should be structured under the following headings:

a) Personal particulars
- name
- date and place of birth
- place (s) of tertiary education and dates associated therewith
- professional awards

b) Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations)

c) Skills

d) Name of current employer and position in enterprise

e) Overview of post-graduate / diploma experience (year, organization and position)

f) Outline of recent assignments/experience that has a bearing on the scope of work

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: _____ _____

QUALIFICATIONS AND EXPERIENCE AS CONTRACTS MANAGER ON CONTRACTS FOR THE CONSTRUCTION OF CONTINUOUSLY WELDED STEEL PIPELINE WITH A NOMINAL DIAMETER GREATER THAN OR EQUAL TO 300mm FOR A MINIMUM LENGTH OF 1000 METRES.

The relevant person listed under key staff above shall complete all the required information below and sign the declaration at the end of this form.

Full Name & Surname:			
ID/ Passport No.:		**Age:**	
Name of Tertiary Institution Attended:			
Relevant Qualification/s Obtained (and year):			
Name of Professional Institution Registered With:		**Registration No.:**	

EMPLOYMENT HISTORY (To be listed in chronological order with reference to relevant experience only)

Period of Employment (MM/YY to MM/YY)	**Name of Employer**	**Designation**	**Years of Relevant Experience**
Total number of years of relevant experience:			

Note:

1. The tenderer must submit a brief CV (of not more than 4 pages) containing relevant work experience only with contactable references. Ambiguous, vague, or unclear statements submitted in the CV will not be considered.

Declaration by Key Staff

I the undersigned, declare that all the information provided above and contained in my CV is a true reflection of myself, my qualifications and my experience.

NAME : ..... (Block Capitals)

SIGNATURE : …….……..…… DATE: .....

The undersigned, who warrants that he/she is duly authorised to do so on behalf of the enterprise, confirms that the contents attached hereto relative to the above are within his/her personal knowledge and are to the best of his/her belief both true and correct.

NAME : ..... (Block Capitals)

SIGNATURE : …….……..…… DATE: .....

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

QUALIFICATIONS AND EXPERIENCE OF SITE AGENT ON CONTRACTS FOR THE CONSTRUCTION OF CONTINUOUSLY WELDED STEEL PIPELINE WITH A NOMINAL DIAMETER GREATER THAN OR EQUAL TO 300mm FOR A MINIMUM LENGTH OF 1000 METRES.

The relevant person listed under key staff above shall complete all the required information below and sign the declaration at the end of this form.

Full Name & Surname:			
ID/ Passport No.:		**Age:**	
Name of Tertiary Institution Attended:			
Relevant Qualification/s Obtained (and year):			
Name of Professional Institution Registered With:		**Registration No.:**	

EMPLOYMENT HISTORY (To be listed in chronological order with reference to relevant experience only)

Period of Employment (MM/YY to MM/YY)	**Name of Employer**	**Designation**	**Years of Relevant Experience**
Total number of years of relevant experience:			

Note:

1. The tenderer must submit a brief CV (of not more than 4 pages) containing relevant work experience only with contactable references. Ambiguous, vague, or unclear statements submitted in the CV will not be considered.

Declaration by Key Staff

I the undersigned, declare that all the information provided above and contained in my CV is a true reflection of myself, my qualifications and my experience.

NAME : ..... (Block Capitals)

SIGNATURE : …… DATE: .....

The undersigned, who warrants that he/she is duly authorised to do so on behalf of the enterprise, confirms that the contents attached hereto relative to the above are within his/her personal knowledge and are to the best of his/her belief both true and correct.

NAME : ..... (Block Capitals)

SIGNATURE : …… DATE: .....

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

QUALIFICATIONS AND EXPERIENCE OF STEEL PIPE LEAD FOREMAN ON CONTRACTS FOR THE CONSTRUCTION OF CONTINUOUSLY WELDED STEEL PIPELINE WITH A NOMINAL DIAMETER GREATER THAN OR EQUAL TO 300mm FOR A MINIMUM LENGTH OF 1000 METRES.

The relevant person listed under key staff above shall complete all the required information below and sign the declaration at the end of this form.

Full Name & Surname:			
ID/ Passport No.:		**Age:**	
Name of Tertiary Institution Attended:			
Relevant Qualification/s Obtained (and year):			
Name of Professional Institution Registered With:		**Registration No.:**	

EMPLOYMENT HISTORY (To be listed in chronological order with reference to relevant experience only)

Period of Employment (MM/YY to MM/YY)	**Name of Employer**	**Designation**	**Years of Relevant Experience**
Total number of years of relevant experience:			

Note:

1. The tenderer must submit a brief CV (of not more than 4 pages) containing relevant work experience only with contactable references. Ambiguous, vague, or unclear statements submitted in the CV will not be considered.

Declaration by Key Staff

I the undersigned, declare that all the information provided above and contained in my CV is a true reflection of myself, my qualifications and my experience.

NAME : ..... (Block Capitals)

SIGNATURE : …… DATE: .....

The undersigned, who warrants that he/she is duly authorised to do so on behalf of the enterprise, confirms that the contents attached hereto relative to the above are within his/her personal knowledge and are to the best of his/her belief both true and correct.

NAME : ..... (Block Capitals)

SIGNATURE : …… DATE: .....

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

QUALIFICATIONS AND EXPERIENCE OF CIVILS LEAD FOREMAN ON CONTRACTS FOR THE CONSTRUCTION OF REINFORCED CONCRETE STRUCTURES.

The relevant person listed under key staff above shall complete all the required information below and sign the declaration at the end of this form.

Full Name & Surname:			
ID/ Passport No.:		**Age:**	
Name of Tertiary Institution Attended:			
Relevant Qualification/s Obtained (and year):			
Name of Professional Institution Registered With:		**Registration No.:**	

EMPLOYMENT HISTORY (To be listed in chronological order with reference to relevant experience only)

Period of Employment (MM/YY to MM/YY)	**Name of Employer**	**Designation**	**Years of Relevant Experience**
Total number of years of relevant experience:			

Note:

1. The tenderer must submit a brief CV (of not more than 4 pages) containing relevant work experience only with contactable references. Ambiguous, vague, or unclear statements submitted in the CV will not be considered.

Declaration by Key Staff

I the undersigned, declare that all the information provided above and contained in my CV is a true reflection of myself, my qualifications and my experience.

NAME : ..... (Block Capitals)

SIGNATURE : ……..……..…… DATE: .....

The undersigned, who warrants that he/she is duly authorised to do so on behalf of the enterprise, confirms that the contents attached hereto relative to the above are within his/her personal knowledge and are to the best of his/her belief both true and correct.

NAME : ..... (Block Capitals)

SIGNATURE : ……..……..…… DATE: .....

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

T2.2.20 PRELIMINARY PROGRAMME

Refer to Clause F3.11.9 for Functionality Points evaluation prompts (if applicable).

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:

T2.2.21 QUALITY CONTROL

Refer to Clause F3.11.9 for Functionality Points evaluation prompts (if applicable).

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 his / her 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: _____ _____

T2.2.22 TECHNICAL DATA SHEETS

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

Technical Data Sheet 1: Valves and Mechanical Fittings

Note:

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

T2.2.22.1 TECHNICAL DATA SHEETS

TECHNICAL DATA SHEET 1: VALVES AND MECHANICAL FITTINGS

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

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

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

NAME : ..... (Block Capitals)

SIGNATURE : ..... DATE: .....

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

T2.2.23 CONTRACTOR'S HEALTH AND SAFETY PLAN

At tender stage only a brief overview (to be attached to this page) of the tenderer's 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 Part C.3: Project Specification. A generic plan will not be acceptable.

NAME : ..... (Block Capitals)

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

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:	**30583-5W**
Contract Title:	**Blackburn to Phoenix 1: Construction of a 6.6km, 4.5mm Thick, Grade X42, Continuously Welded Steel Gravity Main Load Shift Pipeline: Ward 102, 35 & 48.**

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

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

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

R..... (*In words* .....

.....)

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document to the Tenderer before the end of the period of validity stated in the Tender Data, whereupon the Tenderer becomes the party named as the Contractor in the Conditions of Contract identified in the Contract Data.

For the Tenderer:

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

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

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

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

Address : .....

: .....

Telephone : .....

Witness:

Signature : ..... **Date** : .....

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

Notes:
*** Indicates what information is mandatory.**
Failure to complete the mandatory information and sign this form will invalidate the tender.

C1.1: FORM OF OFFER AND ACCEPTANCE

C1.1.2: FORM OF ACCEPTANCE

This Form will be completed by the Employer

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

The terms of the contract are contained in:

- Part C1 : Agreement and Contract Data, (which includes this Agreement)
- Part C2 : Pricing Data, including the Bill of Quantities
- Part C3 : Scope of Work
- Part C4 : Site Information

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

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

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

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

Signature *(person authorized to sign the acceptance)* **:** .....

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

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

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

Address : .....

: .....

Witness:

Signature : ..... **Date** : .....

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

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

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

1. **Subject** : ……..

Details : ……..

: ……..

2. **Subject** : ……..

Details : ……..

: ……..

3. **Subject** : ……..

Details : ……..

: ……..

By the duly authorised representatives signing this Schedule of Deviations, the Employer and the Tenderer agree to and accept the foregoing Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and addenda thereto as listed in the Tender Schedules, as well as any confirmation, clarification or change to the terms of the offer agreed by the Tenderer and the Employer during this process of offer and acceptance.

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.**

1.1.1.14 The **time for achieving Practical Completion**, from the Commencement Date is **795 Days**. The period as stated in 5.3.2, and the 37 days referred to in 5.3.3, are included in the above time for achieving Practical Completion. The special non-working days as stated in 5.8.1, sub clause 5.1.1.1, are excluded from the above time for achieving Practical Completion.

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

1.2.1.2 The address of the Employer is:

Physical:	3 Prior Road, Durban Central, 4001
Postal:	P.O. Box 1038, Durban, 4000
Telephone:	031-311-8656 (t)
Fax:	031-311-8549 (f)
E-Mail:	Bhavna.Soni@durban.gov.za

1.1.1.16 The **name of the Employer's Agent** is Roxanne Canny Pr. Eng.

1.2.1.2 The address of the Employer's Agent is:

Physical:	3 Prior Road, Durban Central, 4001
Postal:	P.O. Box 1038, Durban, 4000
Telephone:	031-311-8745 (t)
Fax:	031-311-8549 (f)
E-Mail:	Roxanne.Canny@durban.gov.za

1.1.1.26 The **Pricing Strategy** is by **Re-measurement Contract**.

3.2.3 The Employer's Agent shall obtain the **specific approval of the Employer** before executing any of his functions or duties according to the following Clauses of the General Conditions of Contract:

- 6.3: Council approval in order to authorise any expenditure in excess of the Tender Sum plus **10%** contingencies.

4.11.1 To carry out and complete the works, the Contractor shall employ a competent Contracts manager, Site Agent, and Foremen 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 CVs of the Site Agent and the Foreman should be submitted to the Employer's Agent's Representative for acceptance by the Department (reference is made to Cl.5.3.1 of the Contract Data).

Note:

"Similar nature" implies projects that were of a value of at least 60% of this tender's value, and had a comparable Scope of Work in terms of technical requirements and operations where the projects involved continuously welded steel pipelines of no less than 300 mm diameter and not less than 1000m in length;

"Experience" implies experience on projects of a similar nature (continuously welded steel pipeline);

"Accredited degree/diploma" implies a minimum 3-year qualification within the built environment, from a registered national 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

5.3.2 The **time to submit the documentation** required before the 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."

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

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

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

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

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

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

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 30,000** (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 **2021 = 100**.

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

6.8.3 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 "Shell Wholesale 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%**.

The **percentage advance** on Plant not yet supplied to Site: **Not Required**

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 5,000,000.00**.

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 10,000,000.00**.

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 10,000,000.00**.
- 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 3 000 000.00**.
- Minimum amount for temporary storage of materials off site, excluding Contractor's own premises: **R 10 000 000.00**.
- Minimum amount for transit of materials to site: **R 5 000 000.00**.

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 ad-hoc adjudication.

10.5.3 The **number of members** of the Adjudication Board to be appointed: **Minimum of 3.**

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 the 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 unskilled 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) 35, 48, and 102.** The contractor will be required to provide proof of the authenticity of local labour. Signed confirmation by the appointed CLO will suffice for this.

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

C1.2.3.3 CONTRACTOR PARTICIPATION GOAL (CPG)

It is a condition of the contract that the contractor must allow for a minimum of **30%** of the contract value (excluding Provisional Sums, Time-Related and Fixed Costs, and Value Added Tax (VAT) to be subcontracted to contractors who are **>51% BLACK** owned. Proof of payment to the subcontractors will be required to verify that the minimum has been achieved.

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

C1.2.3.4 FTE (Full Time Equivalent) EMPLOYMENT INFORMATION

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

- Initials (per ID doc)
- Last Name (per ID doc)

- ID Number
- Disability (y / n)
- Education Level

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

- Category of Employment

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

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

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

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

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

C1.2.3.5 PERFORMANCE MONITORING OF SERVICE PROVIDERS

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

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

C1.2.3.6 EXCEPTED RISKS (Clause 8.3)

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

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

C1.2.3.7 CPG MANAGEMENT, FORMULATION OF PROJECT STEERING COMMITTEE, APPOINTMENT OF ISD CONSULTANT

The Contractor will be required to submit the detailed CPG implementation plan within 7 days of the commencement of the contract. In addition, the contractor is required to appoint the ISD consultant and establish the labor desk and project steering committee prior to the commencement of works. Should this requirement not be fulfilled, then claims resulting in community disruption and delays will not be accepted by the employer.

C2.1: PRICING ASSUMPTIONS / INSTRUCTIONS

C2.1.1 GENERAL

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

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

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

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

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

C2.1.3 QUANTITIES REFLECTED IN THE SCHEDULE

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

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

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

C2.1.5 MONTHLY PAYMENTS

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

C2.1.4 PROVISIONAL SUMS / PRIME COST SUMS

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

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

C2.1.6 PRICING OF THE BILL OF QUANTITIES

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

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

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

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

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

C2.1.7 "RATE ONLY" ITEMS

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

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

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

C2.1.8 PRELIMINARY AND GENERAL

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

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

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

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

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

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

C2.2: BILL OF QUANTITIES

The Bill of Quantities follows and comprises of 24 pages. The pages are numbered 71 to 94.

PART C3: SCOPE OF WORK

C3.1: PROJECT DESCRIPTION AND SCOPE OF CONTRACT

C3.1 Description of Works

eThekwini Municipality's Water and Sanitation (EWS) Unit has identified within its bulk reservoir supply network, the need to construct a continuously welded steel load shift pipeline from Blackburn Reservoir to supply the Phoenix 1 lower-level area. The load shift pipeline is Grade X42 and 4.5mm thick with diameters and lengths as follows: DN500 3.8 km, DN400 0.4 km, and DN300 2.4 km. The pipeline traverses through Municipal Wards 35, 48, and 102, and through the proposed Go Durban C9 corridor (Refer to Section C.4.1). This is to provide a long-term solution to water supply challenges experienced in the Phoenix 1 supply area.

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

The scope of works to be carried out 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:

- General clearing along the pipeline route.
- Conventional open trench excavation along the greenfield, gravel, and tarred roads, allowing for shoring and bracing if necessary, bedding, pipe laying, welding, wrapping, and backfilling;
- Collection from Hammarsdale Reservoir pipe yard ± 45km from the site or purchase of grade X42 x 4.5mm thick plate x 9.144m long steel pipes, should they not be available from the pipe yard. Purchase of 4.5mm thick plates x 500mm, 400mm, and 300mm Ø grade X42 steel pipes, protection, transporting, and off-loading to site.
- Two pipe jacks along Department of Transport roads, 1117mm Ø concrete sleeves.
- Construction of 10 No. scour valves
- Construction of 11 No. air valves
- Construction of isolation valves
- Testing of water main.
- Tie-in of the existing DN500 Steel outlet from Blackburn Reservoir and pipeline reconfiguration along the route for supply rezoning purposes.
- Reinstatement along pipeline route.
- Such other works as may be deemed necessary by the Engineer for the completion of the project.
- Installation of Cathodic Protection.

C3.1.1 Main Components of the Works:

a) Open excavation for the continuously welded steel pipe

Clearing, excavation, bedding, pipe laying, welding, backfilling, testing and reinstatement for the construction of approximately 6600m of the 500, 400, and 300 mm diameter 4.5mm thick steel pipes as detailed on the drawings, including all specials, chambers, and tie-ins, taking into consideration the protection of existing services and the maintenance of live water mains, sewers, Telkom, Neotel, stormwater, electricity, etc. during the construction.

b) Pipe jacking of 1117mm Ø concrete sleeves.

Two pipe jacks along the Department of Transport Roads, M41 Highway and Old North Coast Road, by means of an 1117mm Ø concrete sleeves.

c) Tie into existing pipelines as required.

The contractor will be required to tie into specified pipelines and a reservoir outlet as indicated on drawings and by the engineer.

d) Reinstatement

The contractor will be required to reinstate all road surfaces, paved areas, fences and other items as indicated and as required on site.

e) Other works

Such other works as may be deemed necessary by the engineer for the completion of the project.

C3.1.2 Cathodic Protection

C3.1.2.1 Scope of Work

The provision of consulting services for cathodic protection construction supervision is required for the implementation of the Cathodic protection system for the proposed load shift pipeline.

Based on the design report prepared by UDI Engineering Services Pty LTD, Report Number PR0362, dated 15 November 2021, the soils found along the pipeline route may be classified as corrosive based on soil resistivity criteria. A cathodic protection system is therefore recommended for the proposed pipeline.

The results indicated DC stray current activity in close proximity to the proposed pipeline. Therefore, an impressed current type of cathodic protection system is recommended.

A temporary cathodic protection system is also recommended during the construction phase of the pipeline. A full report will be made available for the tenderers at the time of tender.

C3.1.3 Temporary Works

The contractor shall carry out such temporary work, including the necessary access and construction of 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, and related temporary works required during excavation of trenches and excavations as required to enable the permanent works to be constructed. The design of the lateral support is to be undertaken by the contractor's appointed professional engineer and included in the tendered rates. The design of the lateral support solution will be dependent on the technique used by the contractor to perform the excavation, as well as programmed to fit into the contractor's construction programme. The contractor is to submit the detailed design for the approval and acceptance by the employer;
- Any temporary support structures required to protect and maintain services;
- Any temporary pipe specials and fittings.

C3.1.4 Construction Causeways / Routes

Access over private property requires the permission of the owners, and the contractor is required to make contact with relevant parties to ensure that the necessary permission is obtained prior to any work commencing on the property.

Where the contractor has gained permission to construct temporary access routes etc. from the relevant parties, the contractor shall maintain such throughout the contract period by filling, de-watering, compacting and grading suitably imported gravel fill material, inclusive of forming drainage channels as necessary giving vehicular passable access to the property owners and tenants, construction teams, etc. at all times, all to the satisfaction of the Engineer or his representative. Where necessary, the contractor shall make allowance in the rates for completing the work required to the accesses out of normal hours.

C3.1.5 Description of Site and Access

The proposed pipeline traverses along wards 35, 102, and 48 within the North Operational Region of EWS as depicted on the locality plan under Section C4.1.

The load shift pipeline route starts at the existing Blackburn Reservoir outlet chamber, and traverses along the proposed Go Durban C9 corridor towards the M41 Highway where it crosses through means of a pipe jack toward Flanders Drive. The proposed pipeline traverses along Siphosethu Drive towards the Phoenix highway along the centre of the left-hand line due to numerous electricity cables on the verge of the road.

The natural topography of the project area is generally characterized by undulating terrain, with slopes ranging from flattish and gentle slopes to moderately steep slopes. The site is located within a dense urban area. The dense urban area increases the difficulty of laying large diameter pipelines considering limited space, surrounding residential property and services. Land-use in the area varies from middle to high-income residential property and light commercial industries and office buildings.

It is important to note that the project area has a number of critical services that the awarded Contractor will encounter during the construction of the new gravity pipeline. These critical services amongst other services include:

- High Voltage/ Medium Voltage eThekwini powerlines below and above ground; and
- Optic fibre lines by telecommunication service providers.

A Locality Plan of the proposed pipeline route is provided under C4.1 in the Tender Document.

The Contractor shall be responsible for the maintenance and reinstatement of damage caused by him or his agents/deliveries to vehicular access tracks and rights of way. The Council and the property owners shall be indemnified against any damages or claims arising from the use of any tracks and rights of way by the Contractor or his agents/deliveries.

C3.1.6 Nature of Ground and Subsoil Conditions

Trial holes may be excavated by Tenderers, (with the prior written consent of the Engineer's representative to assist in the pricing of their excavation rates. Any trial hole shall be barricaded and shall be backfilled immediately after inspection of the soil conditions.

The tenderer shall be fully liable for any claims for losses, damage or injuries arising or as a consequence of carrying out trial holes excavations for the purpose of this tender. Furthermore, the Engineer's authority for the carrying out of any exploratory excavations is subject to the Tenderer indemnifying the Employer and the Engineer against any such claims.

The results of tests on ground and subsoil conditions are included in Section C.4.2 of these documents.

C3.2: PROJECT SPECIFICATION

PREAMBLE

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

C3.2.1 GENERAL

PS.1 PROGRAMME, METHOD OF WORK, AND ACCOMMODATION OF TRAFFIC

This Clause is to be read in conjunction with the provisions and obligations as contained in SANS 1921-1 and SANS 1921-2.

PS.1.1 Preliminary Programme

The Contractor shall include with his tender a preliminary programme on the prescribed form (see Part T2.2: Preliminary Programme) to be completed by all Tenderers. The programme shall be in the form of a simplified bar chart with sufficient details to show clearly how the works will be performed within the time for completion as stated in the Contract Data.

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 (refer to Clause 5.12.2.2) and special non-working days (refer to Clause 5.1.1.1) as specified in the in the Contract Data.

PS.1.2 Programme in Terms of Clause 5.6 of the General Conditions of Contract

It is essential that the construction programme, which shall conform in all respects to Clause 5.6 of the General Conditions of Contract, be furnished within the time stated in the Contract Data (refer to Clause 5.3.1/2).

The preliminary programme to be submitted with the tender shall be used as basis for this programme. The Tenderer's attention is drawn to the fact that a number of factors will affect the programming of and method of carrying out the works. The more important of these are:

(1) Construction and commissioning of the new pipeline may possibly be co-ordinated with the construction of the intersecting Go Durban C9 route. The contractor is to set up the programme such that the commencement of the workfront is to start on the developed area from Phoenix to Blackburn reservoir. Since the two projects intersect, the contractor is to programme the works to construct along the C9 Route last.
(2) Time required for service relocations.
(3) Time allowances to be made for the ordering of special items.
(4) Notification required by service organisations.
(5) Any special sequence in which work must be carried out. Must certain areas of work be finished before work commences on others?
(6) If delays are anticipated with service relocations the Contractor should be asked to allow time.
(7) Is work required out of normal hours? (e.g. to accesses).
(8) Vehicular access to private property is to be maintained.
(9) Traffic restrictions.
(10) The availability of components supplied by the Employer;

(11) The constructional plant which he intends to supply and use for the purpose of the Contract;
(12) Searching for, dealing with and carrying out alterations to existing services;
(13) The quantities that will be carried out and the cash-flow resulting from this on a monthly basis;
(14) Known physical conditions or artificial obstructions;
(15) The accommodation and safeguarding of public access and traffic;
(16) The design, testing and approval of concrete mixes and other imported material;
(17) Proving of services by hand.
(18) Time allowance for EPWP implementation plan.
(19) Time allowance to select CPG sub-contractors, train and appoint to meet minimum CPG target.
(20) Formulation of Project Steering Committee and Business Desk.

Those known, existing services in the area of the works have been depicted on the contract drawings. It is evident, however, that the status of existing service records as far as can be ascertained might not reflect the actual situation in the field. As such, due allowance has been made in the Bill of Quantities for the proving of services where directed by the Engineer.

PS.1.3 Requirements for Accommodation of Traffic

PS.1.3.1 General

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

Clause 4.10.4 of SANS 1921-2: 2004 shall be replaced with the following:
"Road signs and markings shall comply with the requirements of "The South African Road Traffic Signs Manual - Volume 2: Roadworks Signing".

The contractor will be required to provide a detailed construction method statement for traffic accommodation when the proposed pipeline crosses and traverses on road 14 days before commencing with works. These method statements are to be approved by the Engineer within 7 days of submission.

PS.1.3.2 Basic Requirements

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

The Contractor shall ensure that all road signs, barricades, delineators, flagmen and speed controls are effective, and that courtesy is extended to the public at all times. Failure to maintain road signs, warning signs or flicker lights, etc., in a good condition shall constitute ample reason for the Employer's Agent to suspend the work until the road signs, etc., have been repaired to his satisfaction.

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

The Contractor shall construct and maintain all temporary drainage works necessary for temporary deviations. The Contractor shall ensure that the existing property accesses are maintained at all times. Where necessary, the Contractor shall make allowance in the rates for completing the work required to the accesses out of normal hours.

PS.1.3.3 Traffic Safety Officer

Where warranted by traffic conditions on or near the site, the Contractor shall nominate a suitable member of his staff as traffic safety officer to be responsible for the arrangement and maintenance of all the measures for the accommodation of traffic for the duration of the project. Duties of the traffic safety officer shall be in compliance with the Occupational Health and Safety Act 1993 and the Construction Regulations 2014.

PS.1.3.4 Payment

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

PS.1.3.5 Pedestrian movement

The Contractor shall make provision for accommodating all pedestrian movements in the area of the works. Allowance shall be made in the relevant rates for any barricades and signs required.

PS.1.3.6 Temporary Reinstatement

Provided always that if in the course or for the purpose of the execution of the works or any part thereof any road or way shall have been broken up, then notwithstanding anything herein contained:

a) if the permanent reinstatement of such road or way is to be carried out by the appropriate authority or by some person other than the Contractor (or any subcontractor to him), the Contractor shall at his own cost and independently of any requirement of or notice from the Engineer be responsible for the making good of any subsidence or shrinkage or other defect, imperfection or fault in the temporary reinstatement of such road or way, and for the execution of any necessary repair or amendment thereof from whatever cause the necessity arises, until the end of the period of maintenance in respect of works beneath such road or way until the authority or other person as aforesaid shall have taken possession of the site for the purpose of carrying out permanent reinstatement (whichever is the earlier), and shall indemnify and save harmless that Council against and from any damage or injury to the Council or to third parties arising out of or in consequence of any neglect or failure of the Contractor to comply with the foregoing obligations or any of them and against and from all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto.

b) where the authority or person as aforesaid shall take possession of the site as aforesaid in sections or lengths, the responsibility of the Contractor under paragraph (a) of this sub-clause shall cease in regard to any such section or length at the time possession thereof is so taken, but shall during the continuance of the said period of maintenance continue in regard to any length of which possession has not been taken and the indemnity given by the Contractor under the said paragraph shall be construed and have effect accordingly.

PS.2 SERVICES

This Clause is to be read in conjunction with the provisions and obligations as contained in SANS 1921-1 and SANS 1921-2.

PS.2.1 Existing Services

The Tenderer's attention is drawn to the numerous 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.2.2 Proving Underground Services

All services in a particular area must be proven before commencing work in that area. Insofar as bulk earthworks are concerned, where services are indicated on the drawings or where from site observations can reasonably be expected that such services are likely to exist where excavations are to take place, the Contractor shall without instructions from the Employer's Agent carefully excavate by hand to expose and prove their positions.

When a service is not located in its expected position the Contractor shall immediately report such circumstances to the Employer's Agent who will decide what further searching or other necessary action is to be carried out and shall instruct the Contractor accordingly.
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.

When electrical cables are not in the positions shown on drawings of eThekwini Electricity and cannot be found after proving trenches have been put down, assistance may be obtained by calling an official of the Works Branch on Telephone No. 311-1111 during office hours, or by contacting Control on Telephone No. 305-7171 after hours. 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.

Proving of services shall be completed at least two weeks in advance of the actual programmed date for commencing work in the area. 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.

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.

PS.2.3 New Services and Relocation of Existing

This clause shall be read in conjunction with Clause PS.1. New services are either to be installed by the Contractor as part of the contract or by others during the contract period. In the latter case excavation and subsequent backfilling of the trench from the top of the bedding layer shall generally be carried out by the Contractor.

Relocation of services shall generally be carried out by the relevant services organisation. Generally, their work shall include the excavating and bedding the service which will include backfilling to a depth of approximately 300 mm above the service.

The remainder of the backfilling shall be carried out by the Contractor. Generally, work shall only commence on the installation of new services once the bulk earthworks have been completed and roughly trimmed to level along a substantial portion of the services route. In addition, no sidewalk, verge, median or island shall be surfaced or top soiled until all work on the services has been completed.

Services affected by the contract are described as follows:

- PS.3: Watermains;
- PS.4: Sewers;
- PS.5: Stormwater;
- PS.6: Electrical Plant
- PS.7: Telkom / Neotel;
- PS.8: Department of Transport Roads

Further to the above, Tenderers are referred to the services drawing and are to note that several minor cables/pipes may be encountered during excavation works which may require to be relocated to some extent. It is anticipated that the two-week period required under PS.2.2 will allow sufficient time for these relocations.

PS.2.4 Accommodation of Services

Further to Clauses PS.1 and PS.2 of this specification, Tenderers are to note that allowance must be made under this item and/or the appropriate rates, for all costs incurred as a result of complying with these clauses. It shall also cover liaison with the services organisations and accommodation of their work gangs/contractors on site.

PS.3 WATERMAINS

PS.3.1 General

The contractor's attention is drawn to the fact that the proposed pipeline runs parallel to and crosses various eThekwini water mains and reticulation pipelines. The contractor is to ensure that the service provider is contacted timeously for the services to be relocated or temporarily relocated before the proposed pipeline is installed.

PS.3.2 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.3.3 Restriction on Compaction Equipment

The Contractor is to note that existing water mains 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 water

mains.
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 is 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 water main or electrical cables be damaged during the construction of the road.

PS.4 SEWERS

The Contractor shall be responsible for ensuring that cementitious sludge, sand and rubble from the works do not enter the foul water reticulation system. The Contractor shall be liable for any costs incurred by the Council or others as a result of blockages in the reticulation system attributed to failure to comply with the above requirement.

PS.4.1 Blockage of Foul Water Sewers

The Contractor shall be responsible for ensuring that cementitious sludge, sand and rubble from the works do not enter the foul water reticulation system. The Contractor shall be liable for any costs incurred by the Council or others as a result of blockages in the reticulation system attributed to failure to comply with the above requirement.

PS.5 STORMWATER

The Contractor shall be responsible for ensuring that cementitious sludge, sand and rubble from the works do not enter the storm water reticulation system. The Contractor shall be liable for any costs incurred by the Council or others as a result of blockages in the reticulation system attributed to failure to comply with the above requirement.

PS.5.1 Blockage Storm Water Sewers

Table 1: Storm water Management Interventions

No.	Details	Action	Timing
1	Open Pipe Trenches	Open Excavations limited to mitigate storm damage	During Pipe Laying
2	Drainage of Open Trenches	Outlets to be installed at bottom of open trench	During Pipe Laying
3	Run-off	Berms to be created between open trench and removed fill	After Excavation
4	Erodible material on site	These materials will be reinforced with sand bags	After Excavation
5	Sand bag barricading	The contractor will ensure that there is an opening in the barricading to prevent storm water build up	After sand bags are installed

6	Areas with high water table	In these areas adequate battering and shoring will used to prevent trench collapse	Pipe laying in wetland
7	Dewatering of wet trenches	Pumps will be available for dewatering of trenches	Throughout construction programme
8	Pipes laid	Open end of pipes will be end capped to prevent debris from entering.	Once pipe is laid
9	Areas with high water table	Silt fences will be constructed	Pipe laying in wetland
10	Storage of tanks and containers at site camp	The building shall be constructed of a material impermeable and resistant to the stored material. A preventive measure to retain the stored material in the case of run-off with storm water.	Site camp establishment
11	Storm water Management system in place	There will be periodic inspections of all drainage systems along the route to ensure that the water flows are unobstructed	During Pipe Laying

PS.6 ELECTRICAL PLANT

PS.6.1 General

Various types of electrical cables including high voltage, low voltage, street lighting and domestic connection cables are affected by the contract.

The laying, relocation and jointing of all cables will be carried out by eThekwini Electricity's work gangs, or agents appointed by them, whilst the excavation and backfilling forms part of this contract. Close liaison will therefore be necessary with eThekwini Electricity throughout the contract.

PS.6.3 MV / LV Cables

In the case of new construction work, the water route is confirmed and prior to any excavations, the Water & Sanitation Unit Control Centre and/or site personnel shall study the electronic GIS records to establish if there are any electrical cables at that location.

If the GIS records indicate there are no electrical cables, the area to be excavated must still be scanned (as records are one month old), using approved cable locating devices, to confirm no cables are present. Only if there are no cables, can a TLB or other mechanical excavation tools/equipment can be used to excavate. The Water & Sanitation Unit uses the Cat & Genny cable location devices. If the existing number of devices are insufficient, additional devices must be procured and issued to relevant field personnel.

If the GIS records indicate there are electrical cables, the area to be excavated must be scanned, using approved cable locating devices, to confirm the horizontal position and vertical depth of the cables.

Note: The depth of lay of electrical cables are as follows:
Low voltage cables and fiber optic cables: 500 mm medium voltage cables: 800 mm High voltage cables: 1 200 mm the depth of lay of electrical cables may vary due to subsequent changes to ground levels.

A sufficient number of proving trenches must be dug across the area to be excavated. At least one proving trench is required at each extremity of the area to be excavated. These proving trenches must be dug using hand tools to expose the exact positions of the electrical cables to prevent electrocution/injury and damage

to these cables. Once the exact positions of the cables have been exposed to the proving trenches, the TLB can be used to excavate away from the cables. All excavations close to the cables must be dug by hand to prevent damage to the cables by any uncontrolled movement of the TLB backhoe/bucket or loader.

If the 300 mm wide orange danger tapes ("Danger: eThekwini Electricity High Voltage Cables") are uncovered and/or concrete slabs are exposed, this indicates the presence of high voltage (HV) cables below. Work must stop and the HV Control Room must be contacted on 031311 9447 (ext. 19447).
Note: The orange danger tapes are placed 200 mm above the concrete slabs. Most older high voltage cables have concrete slabs (with the letters "ED") placed 300 mm over these cables. The HV Control Room will then dispatch the HV Cables Inspector during normal office hours or the HV Cables Standby Superintendent after normal hours to provide assistance on site.

Note: The persons dispatched from the HV Control Room will ensure no damage is made to the cables, the proper soil is reinstated, no sharp rocks or objects make contact with the cables during backfill, the slabs are correctly repositioned, new danger tape reapplied, etc.

Where low voltage (LV) or medium voltage (MV) cables are encountered (no concrete cable slabs above the cables) then the LV/MV Control Room must be contacted on 031 311 9176 (ext. 19176) prior to any backfilling. The MV/LV Operations Department Electrician/Faults man/Electrical Inspector or Superintendent/Clerk of Works will be dispatched to establish if there is any damage to the cables before approving the commencement of the backfill.

Note: The above number is available from 6:00am to 10:00pm. The 24-hour numbers are: Central and Central Western: 031 311 9377. In addition, it must be understood that damage to the outer protective layer of the cable or significant bending of the cable will lead to premature failure of the cable.

PS.6.2 Street Lighting

The existing lighting will be removed in stages and replaced in the centre median / intersection corners. Relocation will take place during this contract and be executed by eThekwini Electricity or their agents. It is a requirement that the street lighting be operational at all times.

PS.7 TELKOM S.A. LIMITED / NEOTEL PLANT

Telkom and Liquid Telecom fibre optic cables are envisaged at points indicated on the tender drawings. The relevant service provider must be contacted with reasonable notice before any construction activity within its vicinity. The Contractor shall be responsible for the safety of all personnel involved in construction activity in the vicinity of fibre optic cables. The Contractor shall be responsible for any damage caused to the shown Telkom and Liquid Telecom fibre optic cables.

PS.8 DEPARTMENT OF TRANSPORT ROADS

The Contractor shall pay special attention to the Department of Transport (DOT) wayleave requirements when working within a DOT road reserve. The Contractor is to inform DOT before work within the road reserve commences.

PS.9 WORK WITHIN ROAD RESERVES

Generally, the pipeline is to be laid within road reserves which is located across the road hardening. In certain areas along the route, steep bank run parallel to the pipe trench. The contactor is to ensure that boundary fences are protected from loose sliding excavated material. Any damage to such fences or any other properly will be to the contractor's account.

The contractor will only be allowed to close half the width of the road at any one time and must carry out

work in the following sequence:

Step 1: working area to be barricaded as per specifications.
Step 2: Existing services to be proved and protected. Chainage and levels of all services to be provided and bed pipe trench
Step 3: excavate and bed pipe trench
Step 4: Lay pipe and have joints X-rayed or Tested
Step 5: Backfill trench and carry out compaction test before road reinstated.

The work within the road reserve shall generally be carried out in a manner which will create as little disturbance to residents and through traffic as possible, and the length of trench left open shall not exceed 40m

Only when the above work has been carried out and approved by Engineer will the contractor be allowed to re-open the road to traffic and close the next section of road. The contractor shall allow in his rates this limitation on the rate of progress of construction.

PS.10 MATERIALS SUPPLIED BY THE EMPLOYER

The Employer will supply the following materials (if available). However, if not available contractor shall supply all the materials:

a) At Springfield Store in Electron Road, which is situated approximately 20km from the site:

b) 100mm Ø Air Valves;
c) 200mm Ø, 150mm Ø, 100mm Ø Scour Valves;
d) No. 5 valve covers;
e) Spindle extensions;
f) Valve spacer rings;
g) Manhole frames and covers;
h) Pipeline Route markers and paint;
i) At Hammarsdale pipe yard situated approximately 30km from the site (9.144m) lengths of 300mm, 400mm, 500mm diameter x 4,5mm thick plate cement mortar lined, 3LPE coated grade X42 steel pipes.

b) All valves and air valves include jointing materials and matching flanges.

It must be noted that the above materials may not be available at the store during construction, in this case, the contractor will be instructed to order these materials. The contractor shall allow for taking delivery of these items, provide crainage, transport etc. A provisional sum has been allowed for in the Bill of Quantities for material that may not be available at EWS stores.

All other materials are to be supplied by the Contractor and are to be allowed for in the rates.

Once the materials are delivered to site, the Engineer 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 Engineer in writing. Such written acceptance shall not prejudice the right of the Engineer to reject such materials should they be shown to be defective at a later stage.

PS.10.1 Procedure for the Withdrawal of Materials

The Contractor shall notify the Engineer at least one week in advance of his intention to withdraw materials from the Employer's stores. A list of the materials which he wishes to withdraw shall accompany such notification.

The Engineer shall then issue to the Contractor the necessary requisition forms to allow him to withdraw the required materials from the Employer's store. Contractors are to note that materials are to be collected between 08h00 and 14h00 on weekdays, the Contractor must supply craneage where required.

PS.10.2 Ownership of Materials Once Collected by Contractors

All materials supplied by the Employer 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's stores.

PS.10.3 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 Engineer shall be notified in writing. The Employer will then:

(a) replace the defective materials, or
(b) repair the defective materials, or
(c) instruct the Contractor to repair the materials at the Employer's cost.
(d) instruct the Contractor to purchase materials at the Employer's cost.

However, should the Engineer 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 a 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.10.4 Return of Excess Materials

On completion of the works the Contractor shall be responsible for the return of all surplus materials to the Employer's pipe yard at Electron Road, Springfield.
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 Engineer of their intention to do so.

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

PS.10.5 Pipe Storage Areas

It is recommended that the Contractor collect pipe just prior to laying thereof. The Contractor shall take full responsibility for the safety of all pipes once collected from the Employer’s pipe yards.
On collection of pipes, the Contractor, together with the Engineer's representative shall inspect all the pipes and shall mutually agree the extent of damage to pipe lining and coating. This information shall be made known to the Engineer in writing. From the date of collection, the Contractor shall become fully responsible for the pipes, and any damages found and not recorded at the time of hand-over shall be deemed the

Contractor's responsibility.

PS.11 PREFERENTIAL PROCUREMENT

For the purpose of this contract, the Contractor shall comply with the preferential procurement statement provided in Part F.3.11 of the Tender Data.

PS.12 RELOCATION OF EXISTING SERVICES

Should it be necessary to adjust the line, level and/or position of any service not catered for in the contract to enable the construction to proceed the Contractor shall on no account effect such adjustment himself but shall notify the Engineer who will arrange for the work to be carried out at no cost to the Contractor.

PS.13 MANAGEMENT OF THE ENVIRONMENT

The Contractor shall pay special attention to the following:

PS.13.1 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 Engineer.

PS.13.2 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.14 CONSTRUCTION AND MANAGEMENT REQUIREMENTS

PS.14.1 General

The Contractor is referred to SANS 1921: 2004 parts 1, 2, 3 and 5: Construction and Management Requirements for Works Contracts. These specifications shall be applicable to the contract under consideration and the Contractor shall comply with all requirements relevant to the project. Certain aspects however require further attention as described hereafter.

PS.14.2 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 Engineer. To this end it will be the full responsibility of the Contractor to institute an appropriate Quality Assurance (QA) system on site. The Engineer will audit the Contractor's quality assurance (QA) system on a regular basis to verify that adequate independent checks and tests are being carried out and to ensure that the Contractor's own control is sufficient to identify any possible quality problems which could cause a delay or failure.

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

PS.14.3 Management and disposal of water *(Read with SANS 1921 - 1: 2004 clause 4.6)*

The Contractor shall pay special attention to the management and disposal of water and storm water on the site. It is essential that all completed works or parts thereof are kept dry and properly drained. Claims for delay and for repair of damage caused to the works as a result of the Contractor's failure to properly manage rain and surface water will not be considered.

The possibility of flooding shall be borne in mind by the Contractor when drawing up his tender and he shall effect relevant insurance as the Council will accept no responsibility whatsoever for any loss or damage from such flooding including any loss or damage to the temporary or the permanent works.

PS.14.4 Testing *(Read with SANS 1921 – 1: 2004 clause 4.11)*

The costs of such tests shall be included in the rates tendered in the Bill of Quantities and no additional payments will be made for testing. The following quality control testing will be undertaken during construction:

Dye penetration testing: - Immediately after the weld has cooled it is to be visually inspected. The Contractor will make arrangements for an approved specialist testing company to undertake dye penetration testing of all fillet welds.

X-ray testing: The Contractor shall have all butt welds x-rayed by an approved specialist testing company.

CCTV inspection: The Contractor shall inspect the internal repairs to all joints which are not accessible by means of CCTV inspection. The internal surface of the pipe is to be checked for any local damage. Photographs of the weld are to be taken from four (4) different angles at approximately 90° spacing, identified with adjoining pipe numbers and recorded. Internal lining approval is to be signed off by representatives of the Contractor and Engineer.

Compaction testing (AASHTO densities): The Contractor shall make arrangements with an approved soil testing laboratory to undertake the following tests and to pass the test results to the Engineer.

- Material imported from outside the Contract Site as working surfaces, subgrade improvement or fill material:
    - One CBR and indicator test per 200 m³ of compacted material brought onto site, (river sand will normally be exempted from this requirement). A sample and one CBR indicator test of the material proposed for importation shall be submitted to the Engineer for approval prior to the commencement of importation.
- Fill material in place:
    - One density and moisture content per 100 m³ of compacted fill.
- Compacted subgrade or finished level:
    - One density and moisture content per 200m² of compacted surface area. Should any of the above density tests fail to comply with the specified requirements, the Contractor shall at his own expense remedy the failure and submit a new test to the Engineer.

Determination of Compaction: 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.

Tests at the Employer's Request (New Sub-Clause): Where CBR, indicator tests and the like are required on materials from within the Contract Site, the Contractor shall also make arrangements with an approved soil testing laboratory to undertake these tests, the costs of which have been allowed for in the Bill of Quantities as a provisional sum. Payment for such tests will be per sample tested and reported to the Engineer.

Concrete Cube Testing: The Contractor shall make arrangements with an approved testing laboratory to undertake the required concrete cube tests and to pass the test results to the Engineer. The costs of such

tests shall be included in the rates tendered for the appropriate item in the Bill of Quantities

PS.14.4.1 Process control

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

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

PS.14.4.2 Acceptance control

The process control test results submitted by the Contractor for approval of materials and workmanship may be used by the Engineer for acceptance control. However, before accepting any work, the Engineer may have further control tests carried out by a laboratory of his choice. The cost of such additional tests will be covered by a provisional sum provided in the schedule of quantities, but tests that failed to confirm compliance with the specifications, will be for the account of the Contractor.

PS.14.5 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 benchmarks, stand boundary pegs and trigonometrical beacons, regardless of 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.14.6 Overhaul

No payment will be made for overhaul on this contract unless provision is made therefore in specific items.

PS.15 SITE FACILITIES AVAILABLE

PS.15.1 Contractor's campsite and depot *(Read with SANS 1921 - 1: 2004 clause 4.14)*

The Contractor's office for this contract shall be as required to fulfil his obligations under the Contract. The Contractor is responsible for providing a suitable site for his camp. If the Employer can make any specific site available to the Contractor, such site will be pointed out to the Contractor.

(a) Contractor's campsite/store yard

The Contractor shall make his own arrangements for a depot site, for the establishment of his offices, workshops, stores, sheds, repair yards and all other facilities required by the Contractor for the execution of the Works adjacent to the site. The Contractor shall provide on the depot site all his office accommodation and all associated facilities required for the adequate supervision, control and execution of the Works. The Contractor's office for this contract shall be as required to fulfil his obligations under the Contract. The Contractor is responsible for providing a suitable site for his camp and for providing accommodation for his personnel and labourers. The area occupied shall be neatly fenced off to denote its limit. The Contractor shall be responsible for the proper upkeep control and security of the area for the duration of the Contract and all structures and buildings shall be kept in good repair.

Any clearing of the site that is necessary and the making good after de-establishment will be the responsibility of the Contractor. In addition to the requirements of SANS 1200 A clause 8.3.2.2 the following conditions shall also apply: -

(i) None of the existing roads shall be damaged in any way.

(ii) It shall be the responsibility of the Contractor to make good any damage caused to the campsite area or any improvements on it, including services, and for reinstating it to its former condition when vacated. The standard of reinstatement must be to the satisfaction of the Engineer, or other owner. Particular attention should be directed to these requirements and written clearances from the relevant Departments or other owners will be required.

(b) Notice Board

The typical notice board layout is given in Section C4.3 The following requirements shall apply with regard to the notice board:

(i) The wording in the space for "Name of Contract" shall be**:**

30583-5W: Blackburn to Phoenix 1: Construction of a 6.6km, 4.5mm Thick, Grade X42, Continuously Welded Steel Gravity Main Load Shift Pipeline: Ward 102, 35 & 48.

(ii) The words to follow "Designed" shall be:

ETHEKWINI WATER AND SANITATION, ENGINEERING DEPARTMENT, WATER DESIGN AND NON-REVENUE WATER BRANCH.

(iii) The notice board shall be of sufficient size to accommodate the eThekwini Municipality Logo.

PS.15.2 Accommodation of Employees

No employees except for security guards will be allowed to sleep or 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.

The Contractor shall provide 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.

PS.15.3 Power supply, water and other services

The Contractor shall make his own arrangements concerning the supply of electrical power, water and all other services. No direct payment will be made for the provision of electricity, water and other services. The cost thereof shall be deemed to be included in the rates and amounts tendered for the various items of work for which these services are required, or in the Contractor's preliminary and general items as the case may be.

(a) Water for Works

The Contractor shall allow in his Establishment rates for the securing of a suitable water supply, the payment of any connection fee and for any water charges for the duration of the contract.

(b) Power supply for works

The power supply authority is eThekwini Electricity Services Unit. The contractor will be responsible for arranging for whatever temporary supplies may be required and he will be required to bear all costs involved and to pay the ruling tariffs applicable to such supplies.

PS.16 SITE FACILITIES REQUIRED

PS.16.1 Temporary offices

See PS. AB for detailed description of office requirements.

PS.17 OCCUPATIONAL HEALTH AND SAFETY PLAN

PS.17.1 General Statement

When considering the safety on site the Contractor's attention is drawn to the following:

(1) The works will require machinery and plant of varying size.
(2) The works is in the vicinity of an active public road. Plant and machinery need to be well controlled.

It is a requirement of this contract that the Contractor shall provide a safe and healthy working environment and to direct all his activities in such a manner that his employees and any other persons, who may be directly affected by his activities, are not exposed to hazards to their health and safety. To this end, the Contractor shall assume full responsibility to conform to all the provisions of the Occupational Health and Safety Act No. 85 and Amendment Act No. 181 of 1993, and the OHSA 1993 Construction Regulations 2014 issued on 7 February 2014 by the Department of Labour. For the purpose of this contract the Contractor is required to confirm his status as mandatory and employer in his own right for the execution of the contract by entering into an agreement with the Employer in terms of Section 37(2) of the Occupational Health and Safety Act.

PS.17.2 Health and Safety Specifications and Plans to be submitted at tender stage

PS.17.2.1 Employer's Health and Safety Specification

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

PS.17.2.2 Tenderer's Health and Safety Plan

At the tender stage only a brief overview of the tenderer’s perception on the safety requirements for this contract will be adequate. This will be attached to Part T2.2.23: Contractor’s Health and Safety Plan.

Only the successful Tenderer shall submit a separate Health and Safety Plan as required in terms of Regulation 7 of the Occupational Health and Safety Act 1993 Construction Regulations 2014 and referred to in Part T2.2: Contractor’s Health and Safety Plan. The detailed safety plan will take into consideration the site-specific risks as mentioned under PS.17.1 and must cover at least the following:

(i) A proper risk assessment of the works, risk items, work methods and procedures in terms of Regulations 9 to 29;
(ii) Pro-active identification of potential hazards and unsafe working conditions;
(iii) Provision of a safe working environment and equipment;
(iv) Statements of methods to ensure the health and safety of subcontractors, employees and visitors to the site, including safety training in hazards and risk areas (*Regulation 7)*;
(v) Monitoring health and safety on the site of works on a regular basis, and keeping of records and registers as provided for in the Construction Regulations;
(vi) Details of the Construction Supervisor, the Construction Safety Officers and other competent persons he intends to appoint for the construction works in terms of Regulation 8 and other applicable regulations; and

(vii) Details of methods to ensure that his Health and Safety Plan is carried out effectively in accordance with the Construction Regulations 2014.

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

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

PS.17.3 Cost of Compliance with the OHSA Construction Regulations

The rates and prices tendered by the Contractor shall be deemed to include all costs for conforming to the requirements of the Act, the Construction Regulations and the Employer's Health and Safety Specification as applicable to this contract. Should the Contractor fail to comply with the provisions of the Construction Regulations, he will be liable for penalties as provided in the Construction Regulations and in the Employer's Health and Safety Specification. Items that may qualify for remuneration will be specified in the Employer's Health and Safety Specification.

PS.18 TEMPORARY WORK

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 their removal, in his rates.

PS.19 CONTRACTOR'S PLANT

The Engineer 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 a satisfactory plant to replace that removed. Any costs arising out of the removal and subsequent replacement of the plant shall be to the Contractor's account.

PS.20 BARRICADING OF EXCAVATIONS

All excavations in road reserves and in any other areas in close proximity to pedestrian and vehicular traffic are to be barricaded to the satisfaction of the Engineer. All costs arising from these requirements are to be included in the tendered rates.

PS.21 WORK IN A RESTRICTED / CONFINED AREA

Due to the presence of structures, certain underground and overhead services and servitudes which exist on the site, the Contractor may experience difficulty in working in a confined or restricted space. 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.22 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 areas(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 Engineer.

PS.23 SPOIL MATERIAL

No indiscriminate spoiling of material will be allowed. All surplus or unsuitable material shall be spoiled in designated areas or approved spoil sites, unless otherwise specified in the Project Specifications.

PS.24 DRAWINGS AND SPECIFICATIONS TO BE PROVIDED

The Contractor shall be entitled to receive free of charge, the following: -

(a) THREE (3) paper copies of each drawing; and
(b) ONE (1) paper copy of the signed Contract Document.

PS.25 LENGTH OF TRENCHES

No trench may be left open over the Builders' Holidays. The cost of backfilling any trenches before the shut-down period and the re-opening thereof after the shut-down period shall be for the Contractor's account. Unless otherwise permitted in writing by the Engineer, no more than 40m of trench shall be opened in advance of and after pipe-laying operations within the road section. In the green field area where the working space is not conflicting with the daily use of traffic and pedestrians, the open trench can be increased to 100m. This clause takes preference over any other clauses in this document.

PS.26 DRAWINGS

Any information in the possession of the Contractor which is necessary for the Engineer's Representative to complete his records must be submitted to the Engineer's Representative before a certificate of completion will be issued. Only figured dimensions shall be used and drawings shall not be scaled unless so instructed by the Engineer. The Engineer will supply any figured dimensions, which may have been omitted from the drawings.

PS.27 ACCESS TO PRIVATE PROPERTY

The Contractor shall keep the occupants of affected properties advised at all times prior to disrupting access to, or egress from their properties.

Vehicular and pedestrian access may not be denied to occupants of affected properties unless prior approval has been obtained in writing from the occupants concerned and the Engineer.

The Contractor must make allowance in his rates for all necessary bridging of excavations in order to permit uninterrupted access at all times.

PS.28 SITE SECURITY

The Contractor shall, for the duration of the contract, provide sufficient security and watchmen to adequately ensure the safety and protection of the works, the Contractor's staff, including local labour and subcontractors, and all site plant and construction equipment required for the works.

Site Security, in conjunction with the SAPS (where necessary), shall be responsible for removal of disruptive elements, that may interrupt the progress of the contract through acts such as, but not limited to, intimidation, threats of disruption, violent disruption, or criminal and illegal activity by the local community

or independent organisations or entities that may result in slowing down or partial or total stoppage of the works.

Payment for this item shall be made under Section 1, Part A of the Bill of Quantities.

PS.29 PERFORMANCE MONITORING OF SERVICE PROVIDERS

The performance of service providers that have been selected to provide assistance in the provision of a municipal service, otherwise than in circumstances where Chapter 8 of the Municipal Systems Act applies, is required, by Section 116 of the Municipal Finance Management Act, to be monitored and reported on (see Cl.53 of the SCM Policy). Appropriate key performance indicators (KPIs) for the contract must be set by the Municipality as a yardstick for measuring performance.

The following KPIs will be applicable to this contract:

(a) Ensure project construction is managed in accordance with GCC and CIDB regulations.
(b) Ensure the project is progressing as per programme or works is accelerated to cover time delays.
(c) Good communication skills are required with honest responses.
(d) Prompt honest responses to activities or items required at site progress meetings.
(e) EPWP, PMSP, CPG Reporting.

PS.30 REMOVAL AND REINSTATEMENT OF SIGNPOSTS

The unit of removal and reinstatement is number (no.) and rate shall cover excavation, loading, transporting to both the store yard and reinstatement site, re-excavation and backfilling. Removed signposts shall be reinstated to a condition not worse than the original.

PS.31 REINSTATEMENT OF PROPERTY CONNECTIONS

The unit of removal and reinstatement is metres (m) and rate shall cover excavation, loading, transporting to both the store yard and reinstatement site, re-excavation and backfilling. Removed house connections shall be reinstated to a condition not worse than the original.

PS.32 SITE DE-ESTABLISHMENT AND RE-ESTABLISHMENT

Construction and commissioning of the new pipeline may possibly be co-ordinated with the construction of the intersecting Go Durban C9 route. The contractor may need to de- establish and re-establish site in the event that the alignment of the two contracts requires it. Should the contractor be required to de-establish and re-establish site, details of de-establishment and re-establishment are to be submitted to the Employers Agent for approval. Contractor to price for all costs related to de-establishment and re-establishment, should it be required.

PS.33 COMPLIANCE WITH WAY LEAVE REQUIREMENTS.

The contractor shall comply with all requirements and regulations as stated in this document under relevant specification failing which sanctions may be imposed by the Employer / the relevant Authorities under this contract. Wayleaves relevant to the project are provided in Section C.4.

PS.34 TIE-IN TO EXISTING PIPELINE.

There is 1 tie-in to the existing 500mm Ø steel pipe Blackburn to Cornubia outlet pipeline chamber and seven offtakes tie-ins to be performed in fulfilment of the zone transfer. The contractor is to ensure efficiency in conducting shuts to minimise the shut number and period.

The tie -in details are as follows:

- Tie-in 1: Sheet 2 – 500mm Ø steel pipe Blackburn to Cornubia outlet
- Tie-in 2: Sheet 9 – Reticulation: Siphosethu to Hillhead (500mm Ø - 250mm Ø)
- Tie-in 3: Sheet 10 – Reticulation: Phoenix Highway to Redberry Rd (400mm Ø - 250mm Ø)
- Tie-in 4: Sheet 11 – Reticulation: Phoenix Highway to Greenbury Dr (300mm Ø - 300mm Ø)
- Tie-in 5: Sheet 13 – Reticulation: Phoenix Highway to Rockford (300mm Ø - 300mm Ø)
- Tie-in 6: Sheet 15 – Reticulation: Phoenix Highway to Stonebridge (300mm Ø - 300mm Ø)
- Tie-in 7: Sheet 16 – Reticulation: Greenbury Dr to Princess Crl (300mm Ø - 100mm Ø)
- Tie-in 8: Sheet 16 – Reticulation: Greenbury Dr to Rainham (300mm Ø - 160mm Ø)

The Contractor shall submit a detailed method statement, program, and risk assessment for completing each of the proposed tie-ins to existing the infrastructure, for approval by the Engineer and the Employer's Operations Department, at least 21 days prior to the date of the proposed tie-in taking place.

PS.35 SETTING OUT PIPELINE.

(read with SANS 1921-1 Clause 4.15 and SANS 1921-1 Essential Data Clause 4.5)

Setting out control points in the form of labelled steel pegs in a cement mortar pad cast into the ground at regular intervals will be provided to the Contractor by the Engineer's Surveyor as a main reference for all setting out work. The elevations and co-ordinates for the points are shown on the drawings and are in accordance with the WGS 1984, Lo31 system adjusted for the Hartebeesthoek 1994 datum and the units are in meters.

Should the Contractor cause displacement of a benchmark, the Engineer's Surveyor will provide a new benchmark, the cost of which shall be borne by the Contractor.

The Contractor shall take special precautions to protect all permanent survey beacons or pegs such as benchmarks, stand boundary pegs and trigonometrical beacons, regardless of 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.36 CATHODIC PROTECTION.

An investigation on the cathodic protection requirement has been undertaken by the department and proved to be required. The design has been completed by a specialist consultant and a report will be made be made available to the contractor. A Provisional Sum has been allocated for the construction supervision of cathodic protection supply and installation by a nominated sub-contractor. A separate Provisional Sum is allocated in the bill of quantities for the procurement of a cathodic protection specialist sub-contractor by the Contractor to supply and construct the design, based on a schedule of quantities and specifications made available by the nominated sub-contractor to the Employer's Agent.

PS.37 ROAD REINSTATEMENT

All road surfaces and pavements that are required to be excavated for the installation of the proposed pipeline shall be reinstated and rehabilitated as per the requirements of the relevant Project Specifications.

In some instances, road rehabilitation will be required for haulage routes which were damaged as a result of construction activities. Items have been allowed for in the Bill of Quantities for such work.

PS.38 PIPELINE SERVITUDE AND WORKING SPACE

The working space along the pipeline should not exceed 9m width. The Contractor may experience difficulty in working in a confined or restricted space. Sections along the pipeline that include restricted access will be subject to 3m working space. The method of construction in these confined/restricted areas will depend largely on the Contractor's resources.
Generally, the pipeline is to be laid within the road reserve. In certain areas along the route, steep banks run parallel to the pipe trench. The contractor is to ensure that boundary fences and other services are protected from loose sliding excavated material. Any damage to such fences or other services or property will be to the contractors' account.

The contractor will only be allowed to close half the width of local roads at any one time. The work within the road reserve shall generally be carried out in a manner which will create as little disturbance to residents and through traffic as possible, and the length of the trench left open shall not exceed 40 m.

However, the Contractor must note that measurement and payment will be according to the specified cross-sections and dimensions, that the rates and prices tendered shall be deemed to include full compensation for any difficulty encountered while working in limited areas and narrow widths, and that no extra payment will be made, nor will any claim for payment due to these difficulties be considered.

PS.39 ALLOWANCE FOR THE APPOINTMENT OF AN ISD CONSULTANT

Provision is made in the bill of quantities for the appointment of an ISD Consultant which shall be nominated by the Employer's Agent and with the approval of the Employer.

PS.40 TECHNICAL SPECIFICATIONS FOR METERS

PS.40.1 Electromagnetic Flow Meter Specification

a. The flow meter shall be the electromagnetic type comprising a sensor 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.
b. The flow meter shall have no moving parts to ensure that there is no damage from particulate matter e.g., stones, weed etc.
c. The meter shall be suitable for 9 to 40 D.C. Volts 40 to 400Hz supply without the need for link setting or voltage selection.
d. The system accuracy shall be better than +/- 0.2% of rate or 1mm/s whichever is the greater in irrespective of flow direction with a flow range of 0.01 m/s to 15 m/s full scale (i.e. 1500:1 turndown). Repeatability shall be better than +/-0.05%.
e. The meters shall be suitable for a maximum working temperature of 70 DegC at pressures up to 16bars or as limited by the flange rating.
f. 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.
g. The meter performance shall have been verified on a fully traceable test facility that is internationally accepted. Laboratory traceability packs shall be available on request.
h. 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 magnetic meters to facilitate interchangeability of product.
i. 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 equal. Acceptable electrode material is stainless steel.
j. 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

manufacturer shall, on request, provide evidence of satisfactory operation of similar sensors for a minimum period of 5 years in buried installations.

k. Cabling between the flow transmitter / converter shall be by one single cable providing both power to the flowmeter sensor and the return flow signal from the sensor to the flow meter ransmitter / converter, thus reducing cabling costs and can be up to 250 meters in length.
l. The transmitter / converter unit shall be protected to IP65.
m. Dual alphanumeric displays shall indicate user-defined flow rate and flow total 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 for a minimum retention of 10 years.
n. The meter software shall incorporate multi password protection to prevent inadvertent or fraudulent programming or units of measurement changes.
o. There shall be independent totaliser displays to give forward total, reverse total, nett totals, time and date.
p. The facility to verify the calibration of the flowmeter system in-situ by testing the transmitter, cable and sensor in-situ traceable to International standards can be provided and accompanied with a verification test certificate, thus facilitating direct burial and thereby substantially reducing the cost of installation.
q. Condition monitoring by use if an in-situ calibration verification device may be used to actively carry out corrective or preventive maintenance of the flow meter system.
r. The transmitter must be fitted with a communication interface with the integral MODBUS protocols.
s. The transmitter must be of a wall mounting type.
t. Cabling between the flow transmitter / converter shall be suitably designed screened cable providing both power and measurement signal from the flowmeter sensor to the flow meter transmitter / converter.
u. The instrument must be configurable via the integral display keypad and via a portable computer.
v. The performance of the flow meter must be immune to stray currents, cathodic currents and electromagnetic interference.
w. The meter software must be capable of providing a datasheet of the meter configuration and setting.
x. The meter system must through the software be capable of providing the historical information of the calibration setting, flow rates, peak, reverse average etc. These must be date stamped.
y. The meter must be fitted with potential free relay contacts for power, instrument fault etc.

PS.40.2 Ultrasonic Flow Meter Specification

a. 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.
b. The flow meter shall have no moving parts to ensure that there is no damage from particulate matter e.g., stones etc.
c. The meter shall be suitable for 85 to 265 volts A.C. or 9 to 40 volts D.C. 40 to 400Hz supply without the need for link setting or voltage selection.
d. The system accuracy shall be equal to or better than +/- 0.2% 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%.
e. The meters shall be suitable for a maximum working temperature of 180^{0}C at pressures up to 16 bars or as limited by the flange rating.
f. 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.
g. 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.

h. The meter shall be designed and manufactured under the ISO 9000 series of quality standards.
i. 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.
j. The flow sensor shall be rated to IP68.
k. Cabling between the flow transmitter / converter shall be by one 6 core screened cable providing both power and measurement signal from the flowmeter sensor to the flow meter transmitter / converter.
l. The transmitter / converter must be fitted with a communication interface with the integral MODBUS protocols.
m. The transmitter / converter must be of a wall mounting type.
n. The remote transmitter / converter unit shall be protected to a minimum IP67.
o. The transmitter / convertor 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.
p. The meter software shall incorporate multi password protection to prevent inadvertent or fraudulent programming or units of measurement changes.
q. There shall be independent totaliser displays to give forward total, reverse total, nett totals, time and date.
r. 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.
s. 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.

PS.41 STEEL PIPES

(Read with SANS 1921-1:2004 Clause 4.18)

All pipes will be manufactured in accordance with SANS 719 and are to be supplied by the Contractor. in the event that there is stock available at EWS stores, the Contractor will collect the steel pipes required for the construction of the works from the designated pipe storage yard at Hammersdale Depot, unless otherwise specified.

As per the contract, it will be deemed the contractor's responsibility to collect the pipes from the pipe storage yards and sign off before construction of the works can commence.

Any payments for the collection and laying of the pipes will only be made after the eThekwini Representative, the Engineer or his representative has inspected and approved the pipes on site, in particular with regard to the pipe linings and coatings and pipe ends. If any defects are discovered, they are to be rectified by the Contractor.

Pipes that are moved from the designated pipe storage yards to the proposed sites must be kept within the pipeline working servitude unless further discussed and agreed with the Engineer on Site.

If the Contractor so chooses, pipes damaged beyond reasonable repair, on-site or during transport to site, may be set aside & marked for use as cut-pipe to reduce wastage.

All crotch plates, wrappers, collars, and gussets are to be provided by the Contractor under this Contract and are to be manufactured from API 5L Grade X42 steel as applicable and shall be solvent free epoxy coated to a minimum thickness of 600 microns. Welded joints between crotch plates and the pipe where water is likely to be trapped are to be packed with Denso butyl profiling mastic or an equivalent product approved by the Engineer.

PS.42 PROGRAMME FOR GO DURBAN C9 ROUTE

Construction and commissioning of the new pipeline may possibly be co-ordinated with the construction of the intersecting Go Durban C9 route. The contractor is to set up the programme such that the commencement of the workfront is to start on the developed area from Phoenix to Blackburn reservoir. Since the two projects intersect, the contractor is to programme the works to construct along the C9 Route last.

PS.43 EXCAVATION AND REINSTATEMENT OF TRENCHES IN ROADS AND SIDEWALKS IN THE ETHEKWINI MUNICIPALITY AREA (EMA)

Should there be any ambiguity, contradiction, difference or conflict between the contents of this Project Specification compiled by the Roads and Storm-Water Maintenance Department (RSWMD) and the relevant contents of the Standard Engineering Specifications, then the requirements of the Standard Engineering Specifications shall apply.

PRE-REQUIREMENTS

No work shall commence prior to:

a) The way leave application being granted by all Municipal departments and other service authorities.
b) Meeting with and undertaking a joint site inspection with the RSWMD official/s.
c) Resources undertaking the work being approved by the RSWMD.

A. Existing Services

a) All existing services, active and inactive, must be identified and exposed, through test pits and other means, to ensure that the new works do not interfere with the existing services in any way.

b) Notwithstanding the as built/existing services information obtained from the various service providers through the initial wayleave process, the fibre service provider or their authorised contractors must ascertain the position of all services (both active and inactive) through whatever means, and satisfy themselves, fully, that the intended works with regard to line, level, position and grade, involving excavation or drilling, shall be completed clear of such existing service/s, so as to avoid same and any consequential damage.

c) All costs relating to the damage to existing services will be to the contractor's account.

d) Should negligence be identified as the cause of damage to an existing service, same will be viewed in a very serious light, with the resultant action against those responsible.

e) Resources engaged by service providers who are found to be uncaring, irresponsible and working without due diligence with regard to the presence and accommodation of existing services, will be denied permission to undertake work on the Municipal road reserve.

B. Excavation of Trenches

f) Trenches and other areas excavated for service provision and upgrading purposes on roads, sidewalks and verges, shall be done in compliance with Engineering Specifications pertaining to location, depth and accommodating traffic (both vehicular and pedestrian). All Health and Safety requirements needs to be complied with. Trench depth to top of duct is 600mm in sidewalks and verges, and 1000mm in roadways.

g) The RSWMD shall be kept informed, in advance of all proposed excavations in roadways. The option of trenchless technology will be explored and only when this avenue or alternative options have been exhausted, shall trenching be permitted within the roadway. Application for each road crossing shall be by written communication to the RSWMD. The way-leave application process is separate to the above requirement. No roads or lanes shall be closed without authority from the ETA unit.

h) In areas where the proposed excavation falls within any other work in progress, being undertaken by any other department or service provider, the Contractor shall liaise accordingly for ease of implementation and reinstatement purposes.

i) Spoil and rubble emanating from daily trench or other excavations, shall be removed to a designated spoil site, no later than the following day. Should such spoil remain on site for reuse, same shall be adequately stored, barricaded and maintained. Such spoil is to be used within 5 days. Where the spoil is to be dumped on private property by agreement, the Municipality shall be indemnified in writing against any future claims or queries. All such agreements to be in writing and a copy made available to the RSWMD.

j) In areas where the trench traverses through established gardens, flower beds and grassed areas, the contractor shall need to liaise with the relevant authority or owner prior to the work commencing. All costs in re-establishing ground cover will be to the contractor's account.

k) All affected property owners and businesses shall be informed of the intended work prior to the same commencing and a contact shall be available at all times to resolve problems should they arise.

l) Special written permission shall be obtained from the RSWMD for night, weekend work or public holiday work. Normal weekday working hours are between 07h00 and 17h00. No lanes shall be closed during morning and afternoon peak hours. Each project shall have a safety and traffic management plan in place.

C. Backfilling of Trenches

Trenches in roadways and/ or sidewalks shall be backfilled with suitable material that is easily workable and compactable in layers not exceeding 200mm (loose) thickness. The backfill material will be free of grass, roots, rubbish, clay and aggregates greater than 50mm in size. Should the backfill material be dry, it shall be moistened prior to placing and compacting. Should the excavated material be unsuitable for backfill purposes, suitable material shall be imported to site.

D. DCP Testing of Backfill

a) Each layer of 150mm thick compacted backfill shall be tested to the following requirements using the standard 8Kg DCP test method:

TRENCH AREA	DCP REQUIREMENT
Roadways	Minimum of 5 blows per 100mm penetration.
Sidewalk, driveways and median:	Minimum of 3 blows per 100mm penetration.
Verge :	Minimum of 3 blows per 100mm penetration

b) Trenches in the verge (unhardened areas) may be backfilled and compacted in 300mm (loose) layers.

c) All test results shall be recorded and made available to RSWMD, on request.

d) RSWMD reserves the right to carry out its own testing and should the minimum requirements not be achieved on completed work, the contractor will be required to remove and redo the operation, to ensure compliance.

E. Temporary Reinstatement of Trenches

a) All road crossings and road patches shall be temporarily reinstated with 100mm thick 10 MPA concrete. No crossings or patches in the roadway shall be left uncapped for any period of time.

b) Sidewalks and median areas shall be temporarily reinstated with suitable material.

c) Cold mix or emulsion treated base (ETB) is permitted for use as alternative temporary reinstatements.

d) Maintenance of all temporary reinstatements shall be the full responsibility of the contractor.

F. Road Categories / Asphalt Trench Reinstatement

a) The EMA road network comprises of the following road categories with the corresponding upper layer constructions:

CATEGORY	UPPER LAYERS
Category A:	150mm G2 Crusher run and 240mm mix D Asphalt
Category B:	150mm G2 Crusher run and 160mm mix D Asphalt (incl. industrial driveways)
Category C:	150mm G2 crusher run and 80mm mix D Asphalt (incl.commercial driveways)
Category D:	150mm G2 crusher run and 50mm mix D Asphalt (incl. residential driveways)
Category E:	100mm G2 Crusher run and 25mm mix A Asphalt (sidewalks)
Residential driveways concrete:	100 mm thick concrete
Commercial driveways concrete	150 mm G2 and 100mm concrete
Industrial driveways concrete	225mm thick concrete

The onus is on the contractor to ascertain from the Roads Department details pertaining to road and driveway categories.

b) Private contractors are not permitted to reinstate category A and B roads, without the written authority of the RSWMD.

c) Asphalt shall be compacted in layers (not exceeding 40mm) using suitable rolling equipment.

d) G2 crusher run shall be adequately moistened and mixed prior to placing and compacting, all in compliance with the Standard Engineering Specification. G5, US base or A1 refuse will not be accepted as G2.

e) The DCP test requirements on the G2 crusher run layer is a minimum of 20 blows per 100mm penetration.

f) Existing trench edges need to be straight line and parallel saw cut prior to placing asphalt.

g) All loose material shall be swept off prior to the placing and compacting of asphalt.

h) A liquid emulsion shall be brush applied at 0.3 l/m2 to the vertical asphalt sides of the existing trench and the horizontal surface that is to receive asphalt.

i) The finish levels shall be true to the surrounding existing road/sidewalk levels. No humps or bumps shall be permitted.

j) All damaged road markings shall be reinstated without delay

G. Concrete and Brick Paved Areas

a) Slabs shall be saw cut at the joints and removed full slab width.

b) The CBD sidewalks are generally brick, concrete and special paved and therefore the reinstatement of trenches in these areas shall be undertaken to match existing.

c) In areas covered with special type pavers, where trench excavation is to take place, the existing pavers shall be carefully removed and stored for reuse, as the availability of new suitable materials for reinstating these areas may be a challenge. The Contractor shall take full responsibility for removing, storing and safekeeping of the recovered materials for reuse. The contractor shall be held accountable to reinstate any disturbed areas to its original standard. Prior to any removal of existing paving taking place, a method statement detailing the permanent reinstatement of the affected areas, needs to be submitted to the RSWMD for approval.

d) The following mix proportions are to be used when undertaking trench reinstatement work:

i. Bedding for brick paved and precast concrete slab-bed areas: minimum 50mm thick river-sand mixed with cement at a ratio of 10:1 i.e. 5 wheelbarrows of river-sand to 1 pocket cement.

ii. Joints to precast slabs shall comprise of a 3:1 plaster sand/cement mix i.e. 1 ½ wheelbarrows of plaster sand to 1 pocket of cement.

iii. Cast in-situ concrete slabs shall comprise of a full depth of 100mm, 75mm of which is concrete and 25mm Umgeni/cement topping. Both layers are required to be done on the day of construction and not any period later.

Should ready blend be used to mix the 75mm thick concrete, a mix ratio of 6:1 shall be used i.e. 3 wheelbarrows of ready blend to 1 pocket cement. For the 25mm topping, a mix proportion of 2:1 shall be used i.e. 1 wheelbarrow of river-sand to 1 pocket of cement.

e) Cast in-situ slabs in non CBD areas may be constructed with full depth of 100mm concrete using a 6:1 ready blend/cement mix.

f) Either option requires that the finished surface be wood floated and jointed accordingly.

g) Should stone, sand and cement be used as separate mix materials for mixing concrete, then a mix proportion of 3:3:1 shall be used i.e. 3 wheelbarrows of stone, 3 wheelbarrows of river-sand and 2 pockets of cement.

h) The mixing of mortar and cement directly on hardened surfaces is not permitted. The contractor will be held fully responsible to clean and make good in areas of non-compliance.

i) Expansion joints shall be reinstated per existing locations and detail.

j) Crusher run material is not permitted for use in mixing concrete.

k) The use of clean uncontaminated river sand for cementitious mixes is a requirement to ensure compliance.

H. Trenching in Verge Areas

Where trenches are excavated and required to be reinstated in unhardened or grassed areas, the following shall apply.

a) The final 75 -100mm of backfill shall comprise of organic topsoil material; placed and levelled off flush with the surrounding ground level. No humps or bumps shall be permitted.

b) All loose stones and other obstructions shall be moved to spoil.

c) The establishment of suitable ground cover over the trench width will be the responsibility of the Contractor.

I. Service Related Structures

Where minor structures such as chambers, manholes, earth retainers and connecting junction boxes are to be erected, the following requirements shall apply:

a) All structures are to be constructed in accordance with an approved design detail, provided by the Excavator Department/Authority's and approved by the RSWMD.

b) All exposed vertical surfaces above ground shall either be of face brick (satin red) or reinforced concrete with an off shutter class 1 finish.

c) Where earth retainers such as loffelstein blocks are used, same shall be erected to the manufacture's guidelines, specifications and recommendations.

d) Generally, manhole covers shall comprise of a reinforced concrete slab which incorporates a standard access cover and lid. The finish on the concrete covers shall be to a smooth wood floated finish. In asphalt, brick and other special paved areas, the finish on the cover slabs shall be such that it matches the existing surface finish. The finish level on manhole covers shall be horizontal with the surrounding surface modified to suit, so as to avoid sudden changes in levels.

J. Special Requirements

a) Where trenching across roadways are authorised, the service provider is required to provide a minimum of 2 additional 110mm ducts, full width, at no cost to the Municipality, for future use by any other service provider.

b) The contractor is permitted to use unused / empty existing ducts should same be present under roadways.

c) Should any service be exposed during the excavation operation, the contractor shall make contact with the relevant service owner for inspection and further direction and repeat the communication prior to backfilling the service / trench

d) Where existing services are damaged through trenching operations and the contractor fails to report such damage and closes up same without admitting liability, a penalty of R 20 000.00 is applicable.

e) The service provider is required to ensure that effective and timeous communication and interaction takes place between the trenching and the reinstating contractors.

f) In areas where excavated trench material has ended up in the storm-water infrastructure, the contractor shall be required to remove same, ensuring that the incoming and outgoing pipes are free of obstruction. Should pressure jetting be required to clean and unblock same, this must be arranged at the contractors' expense.

g) Where trench reinstatements are undertaken by resources employed by the trenching contractor, the trenches are required to be permanently reinstated within a period of not exceeding 3 days from date of final backfill/ per length of trenching permitted.

h) All reinstatements shall carry a maintenance guarantee period of 12 months from the date of completed works being handed over / signed off by the RSWMD. At the end of the 12 months defect liability period, the contractor shall arrange a final inspection and signoff with the RSWMD. Should premature failures occur during the construction stage or the defect liability period, the contractor shall undertake the necessary remedial works without delay. Any delay in handing over projects will result in the contractor taking full responsibility of associated consequences, including new work by others on the trench awaiting handover.

i) The following shall apply with regards to maximum open and un-reinstated trenches:

CBD, entertainment, industrial and shopping nodes:	50m + 50m
Residential area:	100m + 100m
Open areas:	250m + 250m

Non-compliance to the above limitations will result in the work being stopped.

j) The attached forms. Annex (1) and (2) shall be used for pre-inspection and end of project handover, end of maintenance period respectively. Part handover on lengthy projects is permitted and encouraged.

k) The use of common trenches or existing trenches per agreement with other service providers is encouraged. This requirement demands extreme care and attention.

l) Should the contractor not comply with departmental requirements and continue to ignore the instructions from Municipal officials, the Municipality reserves the right to request that such contractor/s be removed off site and be barred from undertaking further work in the City's Road reserve.

C3.3: STANDARD SPECIFICATIONS

C3.3.1 STANDARD ENGINEERING SPECIFICATIONS

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

C3.2.1 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:

A	GENERAL (SABS 1200 A)
C	SITE CLEARANCE (SABS 1200 C)
D	EARTHWORKS (SABS 1200 D)
DB	EARTHWORKS (Pipe Trenches) (SABS 1200 DB)
DK	GABIONS AND PITCHING (SABS 1200 DK)
G	CONCRETE (SABS 1200 G)
L	MEDIUM PRESSURE PIPELINES (SABS 1200 L)
LB	BEDDING (Pipes) (SABS 1200 LB)
LG	PIPE JACKING (SABS 1200 LG)
LE	STORMWATER DRAINAGE (SABS 1200 LE)
M	ROADS (General)
ME	SUB-BASE
MF	BASE
MH	ASPHALT BASE AND SURFACING
MK	KERBING AND CHANNELLING
MM	ANCILLARY ROADWORKS

The following SANS specifications are also referred to in this document and the Contractor is advised to obtain them from the Standards Division of SABS in Pretoria.

SANS 1921 (2004): Construction and Management Requirements for Works Contracts
Part 1: General Engineering and Construction Works;
Part 2: Accommodation of Traffic on Public Roads Occupied by the Contractor;
Part 5: Earthworks activities which are to be performed by hand;

Preface on Interim Situation until Full Suite of SANS Series of Specifications are Available

The Bill of Quantities is based on the SANS 1200 system of specifications and measurement. Where SANS specifications are available, these have been incorporated into the “Contract” section of this document.

Where overlapping specifications from the SANS 2001 series of specifications occur the appropriate SANS 1200 specifications have been incorporated in the Project Specifications. In such cases, the requirements of the latter shall prevail over the requirements of the SANS specification(s).

The payment clauses in the Bill of Quantities are based on the SANS 1200 series of specifications for consistency and the Tenderer is required to ensure that he has priced all of the requirements pertaining to the SANS specifications.

C3.3.2 AMENDMENTS TO THE STANDARD SPECIFICATIONS

INTRODUCTION

In certain clauses the standard, standardized and particular specifications allow a choice to be specified in the project specifications between alternative materials or methods of construction and for additional requirements to be specified to suit a particular contract. Details of such alternative or additional requirements applicable to this contract are contained in this part of the project specifications. It also contains additional specifications required for this particular contract.

The number of each clause and each payment item in this part of the project specifications consists of the prefix PS followed by a number corresponding to the number of the relevant clause or payment item in the standard specifications. The number of a new clause or payment item, which does not form part of a clause or a payment item in the standard specifications and which is included here, is also prefixed by PS, but followed by a new number which follows on the last clause or item number used in the relevant section of the standard specifications.

PS A	General
PS AB	Engineers Office
PS C	Site Clearance
PS D	Earthworks
PS DB	Earthworks for Pipe Trenches
PS DK	Gabions and Pitching
PS G	Concrete
PS L	Medium Pressure Pipelines: Steel
PS LB	Bedding
PS LG	Pipe Jacking

The following SANS specifications are also referred to in this document and the Contractor is advised to obtain them from the Standards 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.

SANS 1921-5 (2004) Earthworks activities which are to be performed by hand.

PSA: GENERAL

(As Applicable to SABS 1200A)

PSA. 3. MATERIALS

PSA.3.1 QUALITY

Where there is a standardisation mark for any material, all such material supplied shall bear the official standardisation mark. Alternative materials or equipment proposed by the Contractor shall be tested. The test, as well as the materials or equipment, shall be approved by the Engineer prior to any such materials or equipment being built into the works and all costs involved in testing shall be deemed to be included in the rates tendered. All materials, shall, except where otherwise specified, be new and of the best quality and shall be suitable to withstand and to operate satisfactorily under all possible climatic and weather conditions which can reasonably be expected at the site.

PSA.3.3 APPLICABLE STANDARDS FOR CEMENT

The standard cement specifications SANS 471, SANS 626, SANS 831 and SANS 1466 have been withdrawn and are replaced by the new SANS 50197-1 and -2: Common cements, and SANS 50413-1 and -2: Masonry cement. These specifications will be applicable to this contract, and the descriptions and types of cements specified, will be based on the designations as defined in these specifications.

PSA.3.4 ORDERING OF MATERIALS

Add this new item.

The quantities set out in the Schedule of Quantities have been carefully determined from calculations based on data available at the time and should therefore be considered to be only approximate quantities. The liability shall rest entirely and solely with the Contractor to determine before ordering, the required types and quantities of the various materials required for the completion of the Works in accordance with the Specifications and the Drawings issued to the Contractor for construction purposes. Any reliance placed by the Contractor on the estimated quantities stated in the Schedule of Quantities issued for tendering purposes, or measurements made by the Contractor from the drawings issued for tendering purposes, shall be entirely at the Contractor's risk, and the Employer accepts no liability whatever in respect of materials ordered by the Contractor on the basis of Tender Documents.

PSA. 4. PLANT

PSA. 4.2 CONTRACTOR'S OFFICES, STORES AND SERVICES

Add the following.

"The Contractor's construction camp shall be fenced off and shall contain all offices, stores, workshops, testing laboratories, toilet facilities, etc. The camp shall always be kept in a neat and tidy condition. No personnel will be allowed to reside on the site. The Contractor shall be responsible for the security of his construction camp and of the construction site, at his own cost. Only night-watchmen may be on the site after hours. The site diary, in triplicate format, which will be supplied by the Contractor, must be filled in on a daily basis and submitted to the Engineer or Engineer's representative on a daily basis. No claims will be considered without the site diary's schedules properly completed and submitted.

PSA. 5. CONSTRUCTION

PSA.5.1 SURVEY

PSA 5.1.1 Setting Out of the Works

Add the following to this clause.

“The Contractor shall check all reference pegs, benchmarks and line pegs well before he intends constructing any portion of the Works. Should any peg have been disturbed or any discrepancy in the positions or levels be discovered, the Engineer shall be informed as soon as possible in writing, but in any event at least 7 days before such construction is due to start. If no written statement is received from the Contractor, it will be held that the Contractor has satisfied himself that the positions and levels of the reference pegs and benchmarks are correct."

PSA 5.1.3 As-Built Data

Add the following new Sub clause:

“PSA 5.1.3 The Contractor shall submit the following “As Built” data to the Engineer to enable him to complete the required Record Drawings before a Certificate of Completion will be issued:

- A tache survey of the completed works carried out in accordance with TMH11: Standard Survey Methods, issued by the Committee of Land Transport Officials.
- Each point shall be suitably coded and identifiable by the Engineer and shall be supplied on a computer disk in an ASCII file with the following format: Code [SPACE] X Co-ordinate [SPACE] Y Co-ordinate [SPACE] Level [SPACE] Description.
- The above information is to be given to an accuracy of three decimal places and is to be surveyed by a suitably qualified person.
- In addition to the above, all as-built information must be provided on a drawing in DXF and hard (paper) copy formats showing the pipe / duct network and all road edges. All other surveyed information must also be shown on drawings.
- The co-ordinate of all welds, bends, reducers, -T-pieces, fittings, chambers, valves etc., both cover and invert level of chambers where applicable to be recoded.”
- No connections will be done until the as-built information is approved by EWS.

Suitable checks on the accuracy of the information provided may be carried out by the Engineer and should any of the information provided be found to be inaccurate or untrue, the Employer reserves the right 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. The Contractor shall raise site queries highlighting any conflicts, errors or design changes requiring amendments to any of the Engineers drawings. The Contractor shall mark-up the approved changes on the Engineers drawings and reference any relevant site queries and sketches.

Upon completion of the works, the updated information must be forwarded to the Engineer for incorporation into the Record Drawings. The Contractor is required to price the work required in terms of this Clause.

PSA 5.1.2 Preservations and Replacement of Beacons and Pegs subject to the Land Survey Act.

Delete the first sentence in the 2nd paragraph, “Before the commencement of construction…compile a list of such pegs that are apparently in their correct positions.”, and replace with the following.

“Before commencing work on the site the Contractor shall locate and mark all survey beacons within and on the perimeter of the site. The marking shall consist of a cairn of stones painted white and iron standard to the approval of the Engineer protruding at least one metre above the ground. Should any beacon be found to be missing or disturbed during the initial search, the Engineer must be informed in writing immediately.

The Engineer will immediately arrange for the beacon to be re-established by a registered Land Surveyor at no expense to the Contractor. Should any beacon be disturbed or destroyed during the contract for whatever reason, it will be replaced by a registered Land Surveyor at the Contractor's expense. Allowance must be made by the Contractor for beacons which may unavoidably disturbed during the contract.”

PS.A.5.2 Watching, Barricading, Lighting and Traffic Crossings

Add the following:

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, the departmental publication entitled “Safety in Road Construction”, must be approved by the Engineer before erection. The signs shall be reflectorized or adequately illuminated at night in a manner approved by the Engineer and kept clean and legible at all times. The Contractor shall reposition, cover or remove signs as required during the progress of the works.

PS.A.5.4 Protection of Overhead and Underground Services

Replace with the following:

The Contractor is reminded of his obligations in terms of Clause 3 (1) of the Conditions of Contract and Special Conditions of Contract is to prove the actual position of all services on site before any work commences in the vicinity of the services. The Contractor is further required to measure accurately the chainage and level at which these services occur and to report this information to the Engineer for comparison with the contract drawings prior to work commencing in the vicinity of the services.

The drawings illustrate the positions of services as accurately as has been possible to ascertain from existing records. However, it is possible that there are services existing which are not reflected on the Contract drawings which might have an effect on the works. Therefore, the Contractor must take cognisance of the above possibility and provide sufficient flexibility within his programme of works to accommodate any alterations that might be necessary.
Should it be necessary to adjust the line, level and / or position of any service not catered for in the contract to enable the construction to proceed, the Contractor shall on no account effect such adjustments, without the prior consent of the Engineer. Buried electrical and telephone cables shall be exposed using hand tools initially before allowing the uncontrolled use of picks and other implements, or before using machines to excavate. Supporting or diverting cables must be done by, or in consultation with, officials of the Electricity Service Unit, Eskom, or Telkom respectively.

When cables are not in the positions shown on the drawings and cannot be found after proving trenches have been put down, assistance may be obtained by calling an official from the appropriate authority during office hours. Existing services including water mains, sewer pipes, storm water pipes and drains, electricity and telephone lines, cables, poles, and conduits shall be protected, supported, maintained in service and restored to the condition in which found by the Contractor at his expense, or where necessary by the appropriate authority at the Contractor's expense.

Provided that where it is necessary to relocate such existing services, such relocation shall be arranged by and carried out at the Employer's expense.

PSA 5.7 SAFETY

Add the following: -

"The Contractor will refer to the OHSA 1993 Safety Specification. In addition, the Contractor shall provide security watchmen and all measures necessary to secure the works for the contract as he deems fit. 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."

PSA 5.8 GROUND AND ACCESS TO WORKS

Add the following: -

" Where necessary the contractor will make provision for temporary gates, ramps and roads to obtain access to the site. Where it involves these activities, the Contractor will obtain the necessary approvals from the landowners to do so.

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".

PSA 5.9 ACCOMMODATION OF TRAFFIC

Where construction work has to be carried out on or near public roads, the Contractor shall deal with traffic as specified in SANS 1921-2 (2004): Construction and Management Requirements for Works Contracts, Part 2: Accommodation of Traffic on Public Roads occupied by the Contractor. The Contractor is also referred to Project Specification PS.1.3."

PSA 8 MEASUREMENT AND PAYMENT

PSA 8.2.1 Fixed-Charge and Value-Related Items

Refer to C2.1 Pricing Instructions Clause C2.1.8(a) for payment terms of Fixed Charge Items.

PSA 8.2.2 Time Related Items

Refer to C2.1 Pricing Instructions Clause C2.1.8(b) for payment terms of 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 Engineer.

PSA 8.5 Sums stated provisionally by the Engineer

Amend the penultimate sentence of Sub clause 8.5 to read:

"The percentage rate for (b) (2) above shall cover the Contractor's overheads, charges and profit on the work covered by the sums originally stated for (1) (b) above. Payment shall be made on the basis of the sums actually paid for such work."

PSA 8.9 As Built Drawings and Survey flush

The cost of supplying "as built" drawings to the Engineer shall be provided for in the sum in the Bill of Quantities. The amount shall include marked up drawings and survey data in electronic format, including X, Y and Z co-ordinates, of all items set out in clause PSA 5.1.3 of this document.

PSA 8.11 Acceptance Control Testing

A Provisional Sum has been included in the Bill of Quantities for acceptance control testing carried out by the Engineer. Should the tests reveal that the material failed to conform compliance with the Specifications, the tests will be for the account of the Contractor.

Acceptance control tests shall only be carried out on the written instruction of the Engineer. The Contractor shall note that all costs related to his own Process Control Testing shall be included in his rates for the particular item.

PSA 8.7 DAYWORKS

Dayworks are covered in a separate Particular Specification and are therefore measured in that section C3.4.4.

PSA 8.8 TEMPORARY WORKS

Add the following-

The contractor shall price under this item for any temporary measures he might take in order to protect the Works during construction due to the uncontrolled flow of storm water. These measures would include the construction of temporary earth mounds and channels, inlet manholes, protection berms, etc. Should the Engineer allow the Contractors to leave these temporary works in place no extra payment will be made.

PSAB ENGINEERS OFFICE (SABS 1200AB – 1986)

PSAB 1 SCOPE

PSAB 1.1 Sub-Clause 1.1

Delete the second sentence and substitute the following:

It covers a scheduled number of identical offices and allows for mobile, semi-mobile and prefabricated offices.

PSAB 2 Interpretations

PSAB 2.1 Supporting Specifications

- ***Delete subclause (b) and replace with the following:***

"(b) SABS 1200 AA"

PSAB 2.3 Definitions

- ***Delete the first two lines and replace with the following:***

"For the purposes of this specification the definitions given in SABS 1200 AA shall apply:"

PSAB 3.1 Nameboards

Replace Clause 3.1 with:

A notice board as detailed in Section C4.3: Site Information is to be erected to the satisfaction of the Employer's Representative.

PSAB 3.2 Office Building(S)

- ***Delete the first sentence and replace with the following:***

" The Contractor shall supply and furnish one air-conditioned "Kwikjack" (6 m x 3 m) office for the use of the Employer's Agent and his/her staff, and one air-conditioned "Kwikjack" (9 m x 3.4 m) conference facility for conducting meetings.

- ***Add to the subclause****:*

"In addition to the furnishings listed under subitems (a) to (j), the following shall be provided and properly:

- electrical installation to include a light and two 15 A plug points plus an adequately sized air conditioning unit (for heating and cooling) for each room
- one refrigerator of at least 100 litre capacity
- one kettle of at least 2 litre capacity
- one tea set comprising six cups and saucers, six teaspoons, one teapot, one sugar bowl and one milk jug
- covered parking for four vehicles
- covered parking space for two vehicles, for the sole use of the employer's Representative.
- two 'Barhold' or similar wall-mounted racks each with 6 clamps suitable for hanging A0-sized drawings
- All weather access road and maintenance thereof.
- one large meeting table
- eight additional chairs."

PSAB 4 Plant

PSAB 4.1 Telephone

- ***Delete the subclause and replace with the following:***

"The Contractor is to provide, the Employer's Agent's Representative or Clerk of Works with mobile Wi-Fi for his/her own mobile phones for the duration of the contract."

PSAB 5 CONSTRUCTION

PSAB 5.2 ENGINEER'S OFFICE(S) (Refer SANS 1921-1 Clause 4.14)

- ***Add to the subclause:***

"The toilet facilities provided for the sole use of the Employer's Agent or his representative(s) shall be maintained in a hygienic and sanitary condition and shall be removed on completion of the Works. The facilities provided shall conform to the local health authority's requirements as applicable and the Contractor shall pay all sanitary fees and charges."

PSAB 8 MEASUREMENT AND PAYMENT

PSAB 8.1 SCHEDULED ITEMS

- ***delete the first sentence and replace with the following:***

"Items will be scheduled in terms of Subclauses 8.3.2 and 8.4.2 of SABS1200 AA."

PSAB 8.2.1 Fixed and Time-related Charges

- ***delete the first sentence and replace with the following:***

"The terms of Subclause 8.2 of SABS 1200 AA shall apply."

PS.C SITE CLEARANCE (SABS 1200C – 1998)

PSC 2 INTERPRETATION

PSC 2.1 Supporting Specifications

Replace the text of sub-clause (b) with:

"Part A of the Project Specification."

PSC 3 MATERIALS

PSC 3.1 DISPOSAL OF MATERIALS

Add the following:

The free haul 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. Burning of combustible material shall not be allowed. The site is situated adjacent to an existing road and the Contractor shall ensure that the road disruptions are kept to a minimum and the road is kept clean for the duration of the construction.

The requirements of the EMP are to be met at all times.

Replace the first paragraph with the following:

"All material, other than that suitable for re-use in the Works, shall be disposed of at an approved tip. No burning of vegetation will be permitted."

PSC 5 CONSTRUCTION

PSC 5.1 AREAS TO BE CLEARED AND GRUBBED

Add to Sub-Clause:

The Employer wishes to control and limit erosion as well as preserve the existing natural bush and trees as far as possible. The areas to be cleared must be kept to a minimum but be such as not to affect the quality of the work and hamper the efficient execution of the Contract. The Contractor shall also take all necessary precautions to protect the existing fauna and flora during clearing and construction operations.

The Employer's Representative reserves the right to order manual clearing and grubbing should the conditions warrant this.

PSC 5.3 CLEARING

Add to the Sub-Clause:

Where pipes are to be laid the Contractor shall be allowed to clear and grub the construction corridor for the maximum width of the allowed working space corridor width as specified. No construction activities may be undertaken outside the construction corridor demarcated by the temporary fencing to be erected.
All trees with a girth more than 250 mm or a height of more than 2,5m within this strip, shall be protected and may only be trimmed or removed after a written order by the Employer's Representative.

No site clearance activities shall commence before the issuing of an "Access Certificate "by the Employer's Representative. Such access certificate" is not the same as "provision of access "as required by the Conditions of Contract. It merely indicates that the Engineer has verified that preconditions for work in the proposed work area may commence as preconditions have been met. The tendered rates for site clearance

shall be deemed to include for the removal of waste from site and the disposal thereof.

With reference to SANS 1200 C clauses 5.3 and 5.4 and 8.2.1, payment will be made for clearing and grubbing only where required and to an extent that will enable excavation of trenches to proceed and not necessarily along the entire length of the pipeline. Disturbance of vegetation and roots should as far as possible be confined to the width of the trench, except that vegetation may be cut back to provide reasonable access and working space, without destroying the potential for re-growth.

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 unit of measurement shall be metre (m).

The tendered rate shall include for storing and reinstatement of the fence as directed by Employer’s Representative on site.

PSC 8.2.7 Dismantle and Remove Existing Services

Add to the Sub-Clause:

The unit of measurement shall be metre (m).

The tendered rate shall include for stockpiling of dismantled services for returning to the Employers depots, where required.

The rate for removal of Asbestos Cement pipelines shall cover the cost of the cutting of the existing pipe, dismantling, lifting and stockpiling in accordance with Construction Regulations, 2014, Asbestos Regulations, 2001 and Environmental Management Plan, PEM 5.11 Hazardous Waste.

PSC 8.2.8 Demolish and remove existing structures/buildings

Add to the Sub-Clause:

The tendered rate shall include transporting rubble to an approved spoil site. The unit of measurement shall be metre (m^3).

PSC 8.2.10 Remove topsoil to stockpile

Add to the Sub-Clause:

"The topsoil, where approved by the Engineer, shall be conserved for later use by stockpiling clear of the working area."

Add the following new Sub-clause:

The unit of measurement shall be cubic metre (m^3).

The tendered rate shall include full compensation for removing topsoil to a depth of 150mm for the maximum width of the allowed working space corridor width. and for loading and transporting the material to and from a stockpile in the vicinity of the site of works. No indiscriminate clearing and spoiling shall be allowed. Replacing after backfilling shall be the even spreading of topsoil over the entire surface area where it was removed, to a uniform depth over the entire surface area.

Where topsoil conditions allow for removal more than 150mm deep, the Engineer may instruct accordingly up to a depth of 300mm.

PSC 8.2.11 Saw Cutting of Existing Asphalt Surface (New Sub-Clause)

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 (New Sub-Clause)

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 (New Sub-Clause)

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 Layer works to Spoil (New Sub-Clause)

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 layer works 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 (New Sub-Clause)

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 Remove Existing Concrete Kerbs (including Haunching), Channels, Driveways and Roadways

Add new Sub-Clause:

The unit of measurement shall be metre (m).

The rate shall cover the cost of removing, loading, transporting and disposal to spoil 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. Removed kerbs and channels shall be reinstated to a condition not worse than the original.

PSC 8.2.17 Dismantle, Storing and Re-Erection of Road Signs

Add new Sub-Clause:

The unit of measurement shall be number (No).

a) Exceeding but not exceeding surface area of 0 - 2,0m^2

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 signpost holes.

PS. D EARTHWORKS (SABS 1200 D-1988)

PS. D 2 INTERPRETATIONS

PSD 2.3 Definitions

Where a slope or batter is given in the specifications or drawings as a ratio, the first figure refers to the vertical e.g., 1,5: 1 means 1,5 verticals to 1 horizontal.

PS. D 3 MATERIALS

PS. D 3.1 CLASSIFICATION

Delete Clause 3.1 and replace with the following:

Classification of Excavation

For the purpose of measurement and payment excavated material shall be classified under the following four headings:

(a) **Rock:** Rock shall be held to be under-composed boulders exceeding 0,2m³ in volume and solid rock occurring in bulk, banks or ledges, the excavation of which would normally necessitate the use of explosives and shall have a total rating in excess of 75, as defined in the following Table. In addition, when tested with Type L Schmidt hammer, the rock shall have a rebound value above 30, when tested vertically downwards.

(b) **Hard Material:** Hard material shall be held to be the material other than rock which needs to be loosened by pneumatic, hydraulic, or mechanical breakers prior to being excavated and shall have a total rating between 25-75 as defined in the following Table. In addition, when tested with a Type L Schmidt hammer, it shall have a rebound value in the range 5-30 when tested vertically downwards.

1) Hard rock excavation, other than in restricted excavation, shall be excavation (excluding boulder excavation) in material that cannot, before removal, be efficiently ripped by a bulldozer equivalent to that specified in PS. D 8.3.2.

NOTE: Such excavation generally includes material such as formations of unweathered rock that can be removed only after blasting.

2) In the case of restricted excavation, hard rock excavation shall be excavation in material (excluding boulder excavation) that cannot be efficiently removed without blasting or without wedging and splitting

(c) **Soft Material:** Soft material will be held to be material not falling into the categories of rock and hard material such as gravel, earth, sand, silt, clay and completely weathered rock and shall have a total rating less the 25 as defined in the following Table. In addition, when tested with a Type L Schmidt hammer, it shall have a rebound value less than 5 when tested vertically downwards.

1. Soft excavation, other than in restricted excavation, shall be excavation in material that can be efficiently removed or loaded, without prior ripping, by any of the following plant:

   i) a bulldozer of mass (including mass of ripper if fitted) approximately 22 t and flywheel power approximately 145 kW, or
   ii) a tractor-scraper unit of total mass approximately 28 t and flywheel power approximately 245 kW, pushed during loading by a bulldozer equivalent to that specified in (b)(I) below, or iii) a track type front-end loader of mass approximately 22 t and flywheel power approximately 145 kW –

2. In the case of restricted excavation, soft excavation shall be excavation in material that can be efficiently removed by a back-acting excavator of flywheel power approximately 0,10 kW per millimetre of tined-bucket width, without the use of pneumatic tools such as paving breakers.

d) Intermediate excavation

1) Intermediate excavation, other than in restricted excavation, shall be excavation (excluding soft excavation) in material that can be efficiently ripped by a bulldozer of mass approximately 35 t, fitted with a single-tine ripper suitable for heavy ripping, and of flywheel power approximately 220 kW.

2) In the case of restricted excavation, intermediate excavation shall be excavation (excluding soft excavation) in material that requires a back-acting excavator of flywheel power exceeding 0,10 kW per millimetre of tined-bucket width or the use of pneumatic tools before removal by equipment equivalent to that specified in (a)(2) above.

Table 1: Rock Classification

CLASS	I	II	I	IV	V
DESCRIPTION	Very Good Rock	Good Rock	Fair Rock	Poor Rock	Very Poor Rock
Seismic Velocity (m/s)	>>2 150	2 150-1 850	1 850-1 500	1 500-1 200	1 200-450
Rating	26	24	20	12	5
Rock Hardness	Extremely Hard	Very hard	Hard	Soft	Very soft
Rating	10	5	2	1	0
Rock Weathering	Unweathered	Slightly Weathered	Weathered	Highly Weathered	Completely Weathered
Rating	9	7	5	3	1
Joint Spacing (mm)	>>3 000	3 000-1 000	1 000-300	300-50	<<50
Rating	30	25	20	10	5
Joint Continuity	Non Continuous	Slightly Continuous	Continuous -no gouge	Continuous Some gouge	Continuous With gouge
Rating	5	5	3	0	0
Joint Gouge	No Separation	Slight Separation	Separation <<1mm	Gouge <<5mm	Gouge >>5mm
Rating	5	5	4	3	1
Strike and Dip Orientation	Very Unfavourable	Unfavourable	Slight Unfavourable	Favourable	Very Favourable
Rating	15	13	10	5	3
Total Rating	100-90	90-70	70-50	50-25	<<25

Add:

PS. D 3.1.3 General

Method

The method of excavation shall be at the discretion of the Contractor provided that the work complies with the specification and the following requirements:

(a) excavations shall be confined within the limits defined by the drawings or as instructed by the Engineer;

(b) surfaces in excavations shall be at all times be formed to shed stormwater and groundwater without ponding;

(c) where excavation is accomplished by blasting and the material is required for fill, sufficient fragmentation shall be attained to allow the material to be used as fill; and

(d) excavated faces in abandoned borrow shall be formed to stable slopes.

Since borrow sites are usually required for future development, the Contractor shall not excavate haphazardly, and strict level control shall be maintained at all times. Site design levels will be supplied to the Contractor, and he shall ensure that these levels are strictly adhered to.
Where topsoil is to be removed prior to excavation this will be considered a separate operation and will be measured as such. The Contractor or his representative shall jointly with the Engineer keep a record of the depths, dimensions and classification of excavation as defined in clause PSD 3.1.
Add:

PS. D 3.1.4 Overbreak

Excavation carried out in excess of the specified depth, unless authorized by the Engineer, shall be made up with concrete class 15/20 or other approved material, as directed by the Engineer, at the Contractor's expense.

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 Engineer 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.

PS.D 3 MATERIALS

PSD 3.2.2 Replacing Over break in Excavations for Foundations

Under no circumstances are foundations or other supports be founded on earth fill or rock fill or made-up ground of any description without the written approval of the Engineer.

Where instructed by the Engineer, the Contractor shall replace over break with mass concrete of the grade as directed, at his own expense.

PSD 3.4 Backfill below surface beds

Unless otherwise specified, fill or backfill material below surface beds shall be in accordance with the requirements of SABS 1200D Clause D3.2.2 i.e. Material Suitable for Replacing Over break in Excavations for Foundations.

PS.D 4 PLANT

PS.D 4.1 General

In general, the Contractor may use whatever plant he considers appropriate to construct the work to required specification.

PS.D 5.1.1.3 Explosives

Add the following to D 5.1.1.3

General

Blasting shall not be carried out without the prior consent of the Engineer. This consent will not be given where in the opinion of the Engineer, blasting may give rise to unnecessary risk or damage to surrounding property when other means of excavation are available to the Contractor. Where consent to blasting is given, such consent shall in no way relieve the Contractor of any of his liabilities under the contract. The Contractor shall notify the Engineer 24 hours in advance of any blasting to be carried out on site.

a) Blasting Near Dwellings/Installations/Services

i) Prior to any blasting being carried out, representatives of both the Employer and the Contractor shall thoroughly inspect each private property surrounding the site of the works for any structural defects. All defects shall be photographed by the Employer's photographer and brought to the property owner's attention in writing.

ii) The Contractor is to submit to the Engineer for approval a professional report on the proposed method of blasting to be adopted for the works.

iii) During the initial blasting on site the Engineer shall arrange for a survey to be carried out in order to monitor the magnitude of the blast vibrations and to establish the most vibration sensitive point on the perimeter of the site. Should it be required, the Contractor shall modify the adopted method of blasting as instructed by the Engineer.

iv) For every blast carried out on site the Contractor shall provide three vibro recorders and a peak particle velocity meter. Calibration certificates are to be supplied to the Engineer prior to commencing blasting on site. The Engineer shall arrange for random checking of the calibration of such instruments.

v) The Contractor shall keep full records of every blast on site, e.g., number, depth and size of holes, amount and type of explosive used per hole, number of blasts at any one time, magnitude of recorded vibrations etc., a copy of which is to be forwarded to the Engineer.

vi) All blast surfaces are to be covered with mats and/or a suitable thickness of soft cover material all to the satisfaction of the Engineer.

vii) For every blast carried out on site, the Contractor shall cover the cordtex etc., with soft sandy material to dampen the noise levels of the blast all to the satisfaction of the Engineer.

viii) The maximum allowable peak particle velocity measured at any point 10m from the nearest structure to the blast shall not exceed 25mm/sec.

The Contractor shall include for all costs in complying with the above requirements/ conditions in the tendered rates for excavation.

Notwithstanding any of the requirements of the Specifications the Contractor will be required to carry out a sufficient number of test blasts (minimum 3), each comprising of a maximum number of 9 holes charged with small charges, in order to ascertain the attenuation affects of the in-situ material and to satisfy both himself and the Engineer that the proposed methods of blasting will not damage any existing services and/or dwellings and structures.

All persons occupying property in the vicinity shall be informed in writing at least 24 hours before the first blast and shall be informed of the warning procedures to be employed. In addition, before any blasting is carried out, the Contractor shall notify the Durban Metro Police in writing of proposed operations, the warning procedures to be employed, and the anticipated duration of the blasting operations. Immediately prior to blasting, all approaches to the area shall be guarded by personnel carrying red warning flags.

PS.D.5.1.2 Existing Services

Add the following:
In all cases where other services are shown on the drawings either crossing or adjacent to the pipe or where ordered by the Engineer, the Contractor shall carefully excavate by hand to expose and prove the position of such service prior to the commencement of any main trenching operations in the area.

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.
In all cases where underground power or telephone cables, water mains 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 Engineer, carefully excavate by hand, to expose and prove position of such prior to the commencement of the main trenching operations in the area.

The cost of this pilot trenching shall be included in the rates for excavation under payment clause D 8.3.2 – Excavation and Backfilling in All Materials. 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 Engineer 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 and will be paid for under item; - Proving Existing Services as directed by the Engineer. Should any service be damaged by the Contractor in carrying out the works and should it be found that the procedure 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 trench width required for proving of services need only be of sufficient width to enable the service to be exposed.

PS.D.5.1.2.4 Damage to Roads or Services and Reinstatement

Where the Contractor is required to rectify or repair damaged services or roadwork, such repair work shall be carried out in such a manner that all road layers or services are reinstated to their previous condition in all respects and to the satisfaction of the Engineer.

PS.D.5.1.2.4 Surplus Excavated Material

Surplus excavated material which is suitable for later use in the works shall be stockpiled on the site in a position approved by the Engineer. Unsuitable surplus excavated material shall be removed from the site and disposed of at the contractor's discretion at an approved Landfill.

PS. D 5.2 METHODS AND PROCEDURE

PS. D 5.2.1 Site Preparation

PS. D 5.2.1.1 Conservation of Topsoil

Add the following to D 5.2.1.2:

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.

PS. D 5.2.1.2 Excavation

Where permanent structural concrete or a blinding layer is to be cast on or against an excavated surface the allowable tolerance for a projection into the excavation profile shall be ±10mm.

PS. D 5.2.1.3 Borrow Pits

The Contractor shall be responsible for the identification of suitable sources of imported materials, and he shall provide the Engineer with results of Atterberg Tests on the proposed materials at the least, two weeks prior to the commencement of importation of material from these sources.

PS. D 5.2.3.2 Backfill around structure

Unless otherwise directed or indicated, backfill around structures shall be compacted to at least 95% Modified AASHTO density.

The use of heavy compaction plant adjacent to structures is subject to approval of the Engineer but such approval shall not relieve the Contractor of his obligations under the Contract and the Contractor shall remain fully responsible for the safety of the structures.

PS.D 6 TOLERANCES

PS.D 6.1 Position, Dimensions, Levels, etc.

The works shall be finished to Degree of Accuracy I and the permissible deviations shall be within the limits given in Clause 6.1 of SABS 1200D for Degree of Accuracy I.

PS.D 6.2 Moisture Content and Density

Degree of Accuracy I will be applicable to the works.

PS.D 7 TESTING

The results of all tests carried out by the Contractor shall be made available to the Engineer as soon as possible after the tests have been carried out. All compaction tests for his own quality control shall be at the expense of the Contractor. Control tests by the Engineer shall be paid for separately from the provisional amount provided for this purpose.

PS.D 8 MEASUREMENT AND PAYMENT

PS.D 8.1 Basic Principles

All costs for temporary storage and double handling of excavated material which is destined for use in the works at a later stage shall be included in the rates.

All costs in respect of levelling, trimming, and covering of waste dumps shall be included in the excavation rates. No additional payment shall be made for the replacement of over break necessary to provide working space or for other over break by the Contractor.

All rate for earthworks shall include the cost of haulage and transportation of materials. No additional items shall be included in the Bill of Quantities for the haulage and transportation of imported and spoil materials.

PS.D 8.3.2 Excavation in Hard Rock where the Use of Explosives is Prohibited

A separate item has been scheduled in the Bill of Quantities for excavation in hard rock where the use of explosives is prohibited by the Engineer. The rate shall allow for drilling, wedging or other suitable methods other than blasting, which may be required for such excavations and for the disposal of excavated material at an off-site dumping site selected by the Contractor.

PS.D 8.3.3 Restricted Excavation

Restricted Excavation for footings, trenches and the like shall be measured in m^3 in depths indicated in the Bill of Quantities. The depths stated shall be measured from the underside of bulk fill level or bulk excavation level as the case may be.

PS.D 8.3.4 Importing of Materials

The rate for importing of materials shall include the placing and compaction of the material for the different areas of use and separate rates are applicable to each compaction density.

PS. D 8.3.7 Additional Lateral Support

Replace D 8.3.7 with the following:
In compliance with clause D.5.1.2, the tendered rate for Excavation and Backfilling shall include for the provision of temporary lateral support where this is required.
Contractors are advised that in the case of the proposed pipelines, the depth of trench will generally require this temporary lateral support to be provided. Furthermore, sections of the main run parallel to or across existing services. Contractors are further advised that in such cases, lateral support will be essential. Where a pipe is to be laid in a vertically sided trench with temporary side support, it is necessary to ensure that the compacted bedding and backfill is hard up against the soil forming the trench side by withdrawing the temporary supports stage by stage as the backfill rises up the trench.

PS. D 8.3.14 Survey of Surrounding Structures before Blasting (New Sub-Clause)

Add new sub-clause:

The rate for extra over for excavation in rock shall cover the cost to examine and measure up any buildings, houses or structures in the vicinity of the proposed blasting and establish and record together with the owners thereof the extent of cracking or damage that may exist before commencement of blasting operations. The rate to include for pre and post blasting photographs of affected dwellings.

PS. D 8.4 Trimming of Excavated Surfaces

The trimming of excavated surfaces on or against which structural or foundation concrete or a blinding layer is cast shall be measured and paid per square metre and the rate shall include the trimming to final excavation level, compaction in the case of horizontal surfaces, the additional volume of concrete used in accordance with the tolerance stated in Clause PSD5.2.1.2 and for all measures necessary to render the excavation suitable for concreting. Any additional concrete utilized beyond the tolerance stated in Clause PSD5.2.1.2 shall be for the Contractor's cost.

PS.DB EARTHWORKS (PIPE TRENCHES) (SABS 1200 DB-1989)

PSDB-3 MATERIALS

PSDB-3.5(c) Cement Stabilised Backfill

- ***Add the following new sub clause:***

"Where scheduled or directed by the Engineer, backfill shall be stabilised with 5% cement by mass. The backfill material shall have a plasticity index not exceeding 10 and all material must pass through a sieve of aperture size not exceeding that specified in SANS 1200 LB, sub-clause 3.2.

The dry materials shall first be mixed in a cement mixer, where after sufficient water shall be added to produce the stiffest consistency available for placing and compacting with vibrators.

PSDB-3.6 Materials for Reinstatement of Roads and Paved Areas

- ***Delete this sub clause and replace with the following:***

"Material used in the reinstatement of roadways shall fall into the following categories: -

a) Foundation material recovered from the excavation of trenches across existing roadways, which, if so, instructed by the Engineer, shall be set aside, and re-used as subbase material.

b) New material, which shall conform to the requirements of: -

i. Clause 3.2.1 of SANS 1200 ME for the subbase
ii. Clauses 3.2 and 3.3 of SANS 1200 MF for the base course
iii. Clause 3.2.2 of SANS 1200 ME for the gravel wearing course
iv. Clause 3 of SABS 1200 MH for the asphalt surfacing"

c) The edges of existing surfaces shall be trimmed to a depth of at least 100mm with an approved mechanical cutter to obtain even, regular and straight joints and then painted with a primer. The permanent reinstatement shall comply of the following:

CATEGORY	TYPE OF ROAD	ASPHALT LAYERS	CRUSHER RUN LAYER	TRENCH BACKFILL MATERIAL
A	Arterials, CBD Streets and Industrial Roads	240mm Mix D in 3 layers of 80mm each	150mm	CBR 7 or more
B	Residential Bus Route and Collector Roads	160mm Mix D in 2 layers of 80mm each	150mm	CBR 7 or more
C	Residential Roads	80mm Mix D	150mm	CBR 4 or more
D	Parking Areas and Access Roads	50mm Mix A	150mm	CBR 4 or more
E	Footpaths	25mm Mix A	75mm	CBR 4 or more

PSDB-3.7 Selection

- ***Add the following to the clause:***

Contractors are advised that the stockpiling of excavated material suitable for use as backfilling, will be permitted alongside trench excavations where possible. All other excavated material unsuitable for re-use, either as backfill or for the formation of embankments shall be disposed of at the spoil site. No overhaul will be paid.

PSDB-5 CONSTRUCTION

PSDB-5.1 Precautions

PSDB-5.1.5 Trench Excavations

- ***Add the following additional sub clause:***

"The precautions for excavations as specified in Clause 5.1.1 of SANS 1200 D, 1200 DA, shall also apply to all trench excavations.

The Contractor shall take all the steps necessary to ensure that no person is required or allowed to work in a trench or any other unsupported overhanging excavation which is more than 1,5 m deep, and any excavation which has not been adequately supported, shored or braced if there is any danger whatsoever of the sides of the excavation collapsing.

The support, shoring or bracing to be designed and constructed by the Contractor, shall be strong and sturdy enough to support the sides of the excavation in question."

PSDB-5.3 Site Clearance

- ***Add the following to the clause:***

"The Contractor shall dispose of all surplus and unsuitable material to the closest municipal dump site. All costs related to the disposal of surplus material shall be deemed to be included in the tendered rates. No overhaul will be paid.

Where pipes are to be laid, the Contractor will be allowed to clear and grub a strip 3.0m wide along the centreline of the trench. No vegetation outside this strip may be damaged without the written approval of the Engineer. All trees with a girth of 250 mm or a height of 2, 5 m within this strip, shall be protected and may only be trimmed or removed after a written order by the Engineer."

PS.DB 5.3.1 Disposal of Soft Excavation Material

Add the following:

Material which the Engineer 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 93% Mod. AASHTO density.

PS.DB.5.4 Excavation

The requirements of PS. D 5.1.2 are applicable.
Add the following to DB 5.4

General

(a) 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 Engineer. 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 Project Specification.
(b) Control of the dimensions of the excavations shall be by means of boning rods and sight rails, an acceptable base beam device or other approved method.
(c) The Contractor shall place a reference peg alongside each sight rail, take the levels and give their values to the Engineer.

(d) The total length of open trench in advance of the backfilled trench shall be restricted to a maximum of 60m. Should the Contractor excavate to a greater depth than specified he shall, at his own expense, replace the excess material so removed with selected fill compacted to 93% Mod. AASHTO density or grade 15/26 concrete if the use of selected fill is not practical.

(e) 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 hedges, trees, gardens, etc., from damage by material so stacked.

PSDB-5.4.1 Explosives

The requirements of PSD 5.1.1.3 are applicable.

PSDB-5.5 Trench bottom

- ***Add the following to the sub-clause:***

(a) For welded 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. The trench will also be widened and deepened over a suitable length at all air valve and scour valve installations to cater for the chamber. This additional excavation is to be included in the tendered rates.

(b) "In waterlogged conditions and/or where so instructed by the Engineer, a 150mm thick layer of imported single sized stone (19mm size unless otherwise instructed by the engineer) with a geofabric filter surround (“Bidim” Grade A3 or similar approved) shall be constructed under the bedding layer specified for the pipes.”

PSDB 5.5.1 Jointing Holes

Jointing holes shall be cut of sufficient length and depth to allow for the proper making or bolting of pipe joints and to ensure that joint collars or sleeves do not rest on the trench bottoms. After the pipework has been inspected, tested and approved by the Engineer, the jointing holes shall be refilled with selected soft material free from stone (padding materials as specified under PSLB in the case of coated steel pipes) and then rammed to provide a continuous uniform support for the pipework. No specific payment will be made for forming and refilling holes, the cost of which is deemed to be included in the tendered rates."

PSDB 5.6 BACKFILLING

PSDB 5.6.1 General

- ***add to the sub-clause:***

"Notwithstanding the requirements of Subclauses 5.6.1 and 5.6.6, no pipe joint or pipe fitting shall be covered by either blanket or backfill material prior to the successful completion of the visual inspection and pressure testing of the relevant section of the pipeline.

All backfilling shall be carried out by hand and the Contractor must price his tender accordingly. No mechanical plant shall be used in backfilling without prior written consent of the Engineer."

PSDB 5.6.2 Material for Backfilling

- ***delete fourth, fifth and sixth lines and replace with:***

"Hard rock material shall not be used for, or incorporated into, the backfill above the bedding layers without the Engineer's approval."

PSDB-5.6.3 Disposal of soft material

- ***Add the following to the sub-clause:***

Material which the Engineer considers to be unsuitable for the bottom of the trench shall be excavated to depths as instructed and disposed of as surplus material. Surplus and/or unsuitable excavated material must be disposed of at the closest municipal dumpsite. The resultant space shall be refilled, as ordered, with approved material and compacted to a 93% Mod. AASHTO density.

"Surplus material or unsuitable material shall be disposed of off site by the Contractor."

PSDB-5.6.4 Disposal of intermediate and hard rock material

Surplus and/or unsuitable excavated material must be disposed of at the closest municipal dumpsite.

PSDB-5.6.8 Transport for Earthworks for Trenches

For this Contract all haul will be regarded as free-haul and the cost of transportation of all materials will be deemed to be included in the rates and prices tendered in the schedule of quantities.
No overhaul will be payable on this Contract.

PSDB 5.7 Compaction

- ***Add the following to DB 5.7:***

The unit rate for excavation and backfilling in all materials shall include for compacting backfill to 93% Mod. AASHTO density.

PSDB 5.7.2 Areas Subject to Traffic Loads

- ***Replace the DB 5.7.2 with the following:***

a) 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 93% Mod. AASHTO.

b) Backfill materials such as cohesionless sand (Umgeni sand or similar, which is easily eroded) is not permitted.

c) 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 Engineer, 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.

d) Backfill materials for the road crossings shall be unspecified base crushed stone 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 stabilised by the addition of 2 pockets of cement per cubic metre of backfill.

e) 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 Engineer.

PSDB 5.7.3 *Add the following additional sub-clause*

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 Engineer, 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.

PSDB 5.9 REINSTATEMENT OF SURFACES

PSDB 5.9.4 Bitumen Roads, Subbase and Base

- ***add to the subclause:***

"Each Tenderer is required to make provision in his/her tender for allowances to cover the costs of reinstating all surfaces, inclusive of all layers to their conditions pertaining before the commencement of construction.

Items have been included in the Bill of Quantities to cover the reinstatement of certain surfaces (grassed lawns, concrete and/or asphalted/gravel driveways and/or roads) and for payment purposes, the area of those specific surfaces shall be calculated from the product of the length of the trench and the specified trench width plus 400 mm (refer PSDB 5.4)."

PSDB 7.1 TESTING

Notwithstanding the contents of Clause 7.1, the Contractor shall bear the cost of all quality control tests regardless of whether the tests indicate acceptable compaction or not.

The following are the minimum frequencies for the process control tests to be executed by the CONTRACTOR at his own expense:

a) Pipe bedding: one density test on each 25 m of pipe trench.
b) Normal trench backfilling: one density test on every second layer for every 25 m of pipe trench.
c) Backfilling in areas subject to vehicle loads: one test on each layer of 100 mm at each road crossing.

The positions of this minimum number of density tests shall be determined randomly by the Contractor and shall be clearly documented with the results. The results of the tests shall be submitted to the Engineer and shall prove to the Engineer that the work as a whole was done satisfactorily.

The Engineer could order additional tests, over and above the minimum tests. Payment for these tests will be made under Preliminary and General if the tests indicate that the density is as specified. If any tests fail, the cost of such tests shall be for the account of the contractor.

PSDB 7.1.1 Add the following additional sub-clause

The Contractor shall maintain accurate and up to date records of all materials, processes, process parameters and measurements necessary to ensure compliance with this specification.

The Contractor's quality control records shall be available for inspection at all times. Copies of these records shall be made available on request.

PSDB 7.1.2 Add the following additional sub-clause

The Engineer may appoint an independent body to carry out Quality Surveillance on its behalf. The Contractor shall provide all facilities and access to works at all reasonable times as may be necessary for the independent body to carry out its function.

Quality Surveillance will be undertaken by the Engineer:

a) when requested by the Contractor
b) at the discretion of the Engineer after reviewing the results of the control testing.

Advance notice of a minimum of 8 normal working hours shall be given by the Contractor to the Engineer when requesting inspection of any portion of the works for acceptance, and a minimum of 3 working days before commencement of the contract is required. Notwithstanding any surveillance carried out by the Engineer the Contractor shall retain full responsibility for the quality of all trench compaction carried out under the contract.

PSDB 7.1.3 Add the following additional sub-clause

Density readings will be taken at random over the layer. The layer is acceptable should the Quality Surveillance fulfil the following requirements:

$X \geq A\ \% + 0{,}5S$ where :

X = Arithmetic means of density readings for the layer.
A = Percentage Mod. AASHTO as defined in the specification for the layer.

S = Standard deviation.

The compaction control testing shall be carried out by the Contractor.

Density

Position	**Roadways, Sidewalks**	**Other Locations**
Trench formation	1 No, per 30 lin m	1 No. per 100 lin m
Bedding Cradle & Selected Fill Blanket	2 No. per 30 lin m	1 No. per 100 lin m
Backfill	1 No. per layer per 15m² or part hereof	1 No. per 2 layers per 50m² or part hereof

The positions of the tests shall be selected by the Engineer.

The cost of all control testing is covered under the Preliminary and General section of the Schedule of Quantities.

PSDB-8 MEASUREMENT AND PAYMENT

PSDB-8.1 Basic Principles

Disposal of surplus and/or unsuitable material will be as specified in PSDB-5.6.3 and PSDB-5.6.4. No additional payment other than the tendered scheduled rates will be made for such disposal of material.

- ***Add the following to DB 8.1.2***

Separate items shall be scheduled for excavation to accommodate differing pipe sizes when measured by length and also for each length of trench with various depth horizons starting with 0 to 1,5m depth and thereafter in 0,5m increments.

PS.DB.8.2 Computation of Quantities

- ***Add the following to D 8.2.1.***

No allowance will be made for bulking or shrinkage and excavation will be paid as being the volume in place before excavation commenced.

- ***Add the following to D 8.2.3:***

Prior to commencement of any excavation, the contractor shall notify the Engineer in good time to ensure that measurements, cross-section, levels of the undisturbed ground, or any other relevant information are taken in order that the excavation quantities can be agreed upon between the Engineer and the Contractor.

PSDB-8.3 Scheduled Items

PS.DB.8.3.1 Excavation

- ***Add the following to DB 8.3.2:***

No separate measurement or payment shall be made for any necessary deepening or widening of the trench to enable any jointing or inspection to be undertaken.

- ***Add the following to DB 8.3.2 (b):***

Excavation in Hard Material and/or Rock – (Provisional)

The unit of measurement shall be cubic metres (m^3) and shall be measured as an Extra Over item.

The unit rate for excavation in hard material and/or rock shall also include for-

a) the additional cost of excavation and handling the material;
b) the provision of material and backfilling of any over break greater that the pay trench width.

Excavation in road and Paved Areas

The unit of measurement shall be the cubic metre (m^3) and shall be measured Extra Over to clause DB.8.5. The volume shall be computed from the trench length, the pay trench width and depth of bituminous or cement bound surfacing materials only.

Unbound materials such as crusher run, or road stones will not be included in this measurement or paid for separately. The unit rate for excavation in road and paved areas shall also include for-

a) the additional cost of excavation;

b) cutting through and trimming edges of surfacing;

c) disposal to tip of material unsuitable for re-use; and

d) selection and storage of existing materials suitable for possible re-use in trench reinstatement as required in clause DB.5.3.1.(b).

Cement Stabilised Backfill – (Provisional)

The unit of measurement shall be the cubic metre (m^3) and shall be measured Extra Over to item DB.8.3.2. The unit rate for cement stabilization of the backfill shall also include for-

1)supply of cement;

2)all mixing and processing of the backfill material: and

3)complying with the time restriction of 6 hours.

PS.DB.8.3.2 Particular Items

Add the following as DB 8.3.4 (c)

The unit of measurement shall be square metre (m^2) and both sides of the trench shall be measured. The unit rate for trench shoring to remain in the excavation shall include for-

(1) the supply and placing of trench shoring and other support measures;

(2) maintenance; and

(3) additional costs for backfilling and compaction with trench support left in trench.

PSDB-8.3.6 Finishing

- ***Add the following additional sub clause:***

PSDB-8.3.6.2 Grassing .....Unit: m^2

Approved grass shall be planted after top-soiling has been completed. The work in grass planting shall be measured in square metres (m^2) of area effectively covered with a satisfactory cover of living grass. A satisfactory cover of grass is defined as a cover of living grass in which no bare patches exist.

The rate shall cover the supply of the topsoil, grass and fertilizer, the preparation, application of fertilizer, planting and for the maintenance of the planted area (including cutting of grass). The planted area shall be neatly trimmed. Fertilized and watered and the Contractor shall ensure that the planted areas are not allowed to dry out. The Contractor shall, at his expense, replace any grass that fails to grow with fresh grass, until satisfactory cover is obtained. The rate shall include for supplying, planting and maintaining the grass, all in accordance with this specification."

PS.DB 8.3.7 Additional Lateral Support

The requirements of PSD 8.3.7 are applicable.

PS.DB 8.5 Excavation in Hard Rock where the Use of Explosives is Prohibited

The requirements of PSD 8.3.2 are applicable.

PSDK GABIONS (SABS 1200DK)

PSDK 1 SCOPE

Add to Sub-Clause:

This specification also applies to Reno Mattresses, Terramesh and the materials that they are manufactured of. For simplicity the word “Gabion” is used and may be changed or have the words Reno Mattress and or Terramesh added singularly or in combination as appropriate unless specifically stated otherwise. In general, for protection over large flat areas the word “mattress” describes the implementation of a small height gabion basket. The word ‘’Plastic Coated” refers to a UV stabilised/resistant polymer coating extruded over the externally-coated wire.

PSDK 2 INTERPRETATIONS

PSDK 2.3 Definitions

Add to the Sub-Clause

Box dimensions for gabions are stated under sub-clause PSDK 3.1.2. Wire for cages need to zinc/Al coated and not just zinc coated. Mattress dimensions are sated under sub-clause PSDK 3.1.2.

PSDK 3 MATERIALS

PSDK 3.1.1.1 QUALITY

Add to the Sub-Clause:

The stone shall be subjected to the weathering test. The stone shall be subjected to the durability test.

PSDK 3.1.2 Gabion Cages and Mattresses

Add to the Sub-Clause:

Wire for wire baskets (Mattress and/or Gabion structures) shall be double twisted hexagonal steel wire mesh manufactured to EN 10223-2 with wire being coated with inner zinc/Al5% coating and outer Polymer coating where required.

The gabion baskets shall be as follows:

Boxes of double twisted, hexagonal wire mesh gabions of nominal 80mm mesh made up from minimum of 2.7mm o/d mesh wire with zinc/Al coating and polymer coating taking final o/d to a minimum of 3.7mm, complete with partitions at 1m centres, complete as described in SANS 1200DK and in the following sizes: -

L	W	H
1.0m	1m	.5m
1.0m	1m	1m
1.5m	1m	1m
2.0m	1m	1m
3.0m	1m	1m
4.0m	1m	1m

Mattress baskets shall be as follows:
Boxes of double twisted, hexagonal wire mesh gabions of nominal 60mm mesh made up from minimum of 2.2mm o/d mesh wire with zinc/Al5% coating, complete with partitions/diaphragms in the following sizes: -

L	W	H
2.0m	1m	.17m
2.0m	1m	.23m
2.0m	1m	.30m
2.0m	2m	.17m
2.0m	2m	.23m
2.0m	2m	.30m
3.0m	2m	.17m
3.0m	2m	.23m
3.0m	2m	.30m

PSDK 3.1.3 Geotextile

Add to the Sub-Clause:

The geotextile shall consist of 100% polyester continuous non-woven filaments having a mass of 210g/m² with minimum energy absorption of 6.5kN/m such as “AG200”.

The filter blanket must be attached to the gabion wall, basket or mattress by an approved method of fastening, which must ensure that the blanket will stay in position during construction of the infilling behind the gabion wall. The material to be used as fill immediately adjacent to the gabion wall must have good drainage properties to ensure that there is no build-up of pore pressure behind the wall and be free of sharp rocks that could damage the filter blanket.

PSDK 3.1.6 Wire and Polymer Coating (New Sub Clause)

New Sub-Clause:

The wire used for the fabrication of wire mesh cages for gabions or mattresses and for lacing and bracing operations shall be plain mild steel wire with external zinc aluminium(5%Al) coating and where required, with UV resistant Polymer coating. Mild steel wire for gabion baskets shall be a minimum of 2.7mm thick before coating is applied. Mild steel wire for mattress baskets shall be a minimum of 2.2mm thick before coating is applied.

It shall be capable of resisting effects of natural weather exposure, immersion in saltwater and not show any material difference in its initial characteristics over an extended period of time.

PSDK 3.2 Pitching

PSDK 3.2.1 Stone

In Table 2, Column 2 for Extra heavy: delete “300” and replace with “500”.

PSDK 5 CONSTRUCTION

PSDK 5.2.3 Assembly

Add to the Sub-Clause*:*

All cages shall be connected to adjacent cages by lacing the adjacent edges together with 2,7mm dia. coated wire. The lacing shall be in accordance with Sub-Clause 5.1.2.
All wire shall comply to the manufacturers specifications and quality standards and the supplier of the cages’ specification requirements.

PSDK 5.2.4 Rock Filling

Add to Sub-Clause:

Particular care shall be taken in the filling of gabions so as to ensure that the voids in the rock fill are reduced to the minimum which can be reasonably achieved. In order to minimise the voids in the rock filling, the filling shall proceed in layers not exceeding 300 mm deep and each layer shall be rodded and barred so as to compact the rock fill before filling of the next layer commences. Where appropriate, hand packing of selected rock particles shall be carried out.

Terramesh cages are to be filled and packed in accordance to the manufacturers specifications and guidelines (In some cases soil fill may be required).

PSDK 5.2.4.2 Mattresses used in revetments and aprons

Add to the Sub-clause:

Where gabions and mattresses are placed in exposed positions the rock particles forming the exposed faces shall be specially selected so as to present a fair and even surface.

PSDK 5.3.4 Wired Pitching Mattresses used in revetments and aprons

Add to the Sub-Clause:

The areas in which wired or grouted wire pitching is to be used will be indicated on site by the Engineer.

PSDK 7 TESTS

Add to the Sub-Clause:

The Contractor is to provide proof of materials testing as described in the specification. An item has been allowed for additional testing should this be deemed necessary by the Engineer.

PSDK 8 MEASUREMENT AND PAYMENT

PSDK 8.2.2 Gabions

Delete the 2nd and 3rd sentence and replace with:

The unit of measurement shall be the cubic metre of the rock-filled cages. Where specified for Terramesh the unit will be the cubic metre of imported soil filled gabion. The quantity shall be calculated from the dimensions of the gabions indicated on the drawings or prescribed by the Engineer, irrespective of any deformation or bulging of the completed gabions. The Tendered rate shall include compensation for supplying all material, including rock or imported soil fill wire-mesh cages, galvanizing or Al coating, Polymer coating, tying and connecting wires, loading, transporting and off-loading, the assembly and filling of cages, and any other work necessary for constructing the gabions.

a) Galvanised gabion boxes	Unit: m3
b) Polymer –coated gabion boxes (Terramesh)	Unit: m3
c) Galvanised gabion mattresses (Reno's)	Unit: m3
d) Polymer –coated gabion mattresses (Terramesh)	Unit: m3

PSDK 8.2.3 Extra Over Item 8.2.2 For Packing Selected Stone for Exposed Faces

Add to the Sub-Clause:

The method of selecting and packing stone for exposed faces as scheduled, shall be as specified in Sub-Clause 5.2.7 - Special Finish.

PSDK 8.2.4 Geotextile or Geomembrane

Add to Sub-Clause:

The geotextile type shall be AG 200 Geotextile……..Unit: m2

PSDK 8.2.8 Excavate Material for Gabions (New Sub Clause)

Add new Sub-Clause:

The tendered rate shall cover the cost of clearing, excavation, stockpiling, backfilling and compacting all material for gabions and to spoil the surplus material at the designated spoil site……Unit:m3

PSDK 8.2.9 Foundation Trench and Backfilling (New Sub Clause)

Add new Sub-Clause:

The unit of measurement shall be cubic metre of excavation made in accordance with the authorized dimensions. The tendered rates shall include full compensation for excavating in each class of material, including unavoidable over break, trimming of trenches, compacting the trench inverts, backfilling and compacting the backfill, and the disposing of surplus excavated material at the designated spoil site

Foundation trenching and backfill in all classes of material, inclusive of spoil disposal at an approved spoil disposal site……..Unit: m^3

PSDK 8.2.10 Surface Preparation for Bedding the Gabions (New Sub Clause)

Add new Sub-Clause:

The unit of measurement for levelling and preparing surfaces for receiving the gabion cages shall be the square metre to the neat dimension's revetments, aprons or wall foundations. The tendered rate shall include full compensation for preparation, filling any cavities with rock and the levelling of the ground surface so as to be ready for receiving the gabion cages.

Surface Preparation to Gabions ……Unit: m^2

PSL: MEDIUM PRESSURE PIPELINES (As Applicable to SABS 1200 L 1983)

PSL 2.1.2 SUPPORTING SPECIFICATIONS

Add the following to L2.1.2:

The following Standards and Codes of Practice shall form part of the contract document:

a) SABS 62 - Steel pipes and pipe fittings up to 150 mm nominal bore
b) SABS 135 - ISO metric black bolts, screws and nuts (hexagon and square)
c) SABS 136 - ISO metric precision hexagon-head bolts, screws and nuts (coarse thread medium fit series)
d) SABS 455 - Covered electrodes for the manual arc welding of mild steel and medium-high tensile steel.
e) SABS 471 - Portland cement and rapid hardening Portland cement
f) SABS 558 - Cast iron surface boxes and manholes and inspection covers and frames
g) SABS 719 - Electric welded low-carbon steel pipes for aqueous fluid
h) SABS 926 - Two-pack zinc-rich epoxy primer
i) SABS 1083 - Aggregates from natural sources
j) SABS 1123 - Steel pipe flanges
k) SABS 1130 - Glass fibre reinforced material for pipe wrapping
l) SABS 1137 - Hot-applied bitumen for steel pipeline protection
m) SABS 1178 - Production of lined and coated steel pipes using bitumen or coal tar enamel
n) BS 534 - Steel pipes and specials for water and sewage
o) BS 2494 - Materials for elastomeric joint rings for pipework and pipelines
p) BS 2815 - Compressed asbestos fiber jointing
q) BS 4504 - Flanges and bolting for pipes, valves, and fittings. Metric series Part 1: Ferrous
r) API. 1104 - Standard for field welding of pipelines
s) eThekwini Water Services Technical Specification for Waterwork Gate Valves and RSV Valves
t) eThekwini Water Services Technical Specification for Air Release and Vacuum Break Valves
u) eThekwini Water Services Technical Specification for Special Anti–Theft Air Release and Vacuum Break Valves
v) eThekwini Water and Sanitation Departmental Specification for steel pipes 100mm to 2 000mm nominal diameter

PSL-3 MATERIALS

The Contractor shall supply and install all pipes, valves and fittings for the works except material which will be supplied by the Employer.

All above ground pipes shall be cement mortar lined and 3LPE coated steel pipes with a minimum Dry Film Thickness of 300 microns.

All flanges on flanged couplings shall be drilled in accordance with Table 1600 of SANS 1123.
All specials shall be of welded steel construction and shall have a minimum wall thickness of 4,5 mm and 6.0 mm for diameter up to and including 500 mm. All bends shall be medium radius bends unless otherwise specified or indicated on drawings. The specials shall comply with the requirements of SANS Specification 719 unless otherwise specified and shall be manufactured from API Schedule 40 pipes. Where specials have to be attached by welding the diameters of the specials shall exactly match those of the pipes supplied.

The Contractor shall supply all other flanges required on pipes and specials, suitable for welding to the pipes and specials in accordance with Table 1600 of SANS 1123.

Bolts and nuts shall be in accordance with SABS 135 unless otherwise approved by the Engineer and shall project two threads beyond the run-out of the nuts. All bolts, nuts and washers shall be hot dip galvanized. Electrolytic or other special corrosion protection methods are not required.

PSL 3.1.1 Material Storage (New Sub-Clause)

Add new Sub-Clause:

The Contractor shall store all items so that no damage occurs whilst awaiting installation. Where practical, items are to be stored in lockable containers for protection from the weather and pilferage.

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. Pipes taken over from the Employer shall receive the required attention in order to ensure safe storage in yards, protected from fires, vandalism and incidental damage that can reasonably be prevented.

PSL 3.1.2 Handling Pipe, Fittings and Equipment (New Sub-Clause)

Add new Sub-Clause:

Strict supervision shall be maintained by the Contractor at all times when handling pipes and equipment. Particular attention is to be given to correctly rated lifting gear, slings and lifting beams.

All lifting gear is to be inspected regularly for signs of wear and tear in terms of the relevant Safety Legislation and Clauses. Equipment is to be lifted at the recommended points specified by the manufacturer. Pipe is to be lifted with a lifting beam and slings which shall be fitted at quarter points around the pipe. Due care shall be taken when fitting and placing slings to ensure that ancillary items do not get crushed during lifting.
Pipe coating is to be protected by padding or otherwise from scuffing damage during lifting. The equipment utilized for lifting pipes, must be approved by the Engineer for the purpose of ensuring that the lifting equipment is appropriate and will not damage the pipe coating. It is prohibited to handle pipes with chains or any other device involving metal contact with the pipe coating.

The Contractor shall ensure that all lifting equipment complies with the relevant safety regulations.

PSL 3.1.3 Stacking of Pipes and Pipe Spools (New Sub-Clause)

Add new Sub-Clause:

The Contractor shall take due care when stacking pipe or pipe spools at the workplace. Pipes must never be placed directly on the ground but shall be stacked on dunnage according to approved methods and shall be separated from one another by the use of applicable methods approved by the Engineer.

PSL 3.2.1 Materials control (New sub-clause)

Add new Sub-Clause:

PSL 3.2.1.1 Checking material lists and drawings (New sub-clause)

Add new Sub-Clause:

Not more than 4 weeks after the contract has been awarded, the Contractor shall check the Materials Lists against the drawings and advise the Engineer in writing of any shortages or omitted items. This applies to free issue items, if issued. If any variations in the contract is authorized, the Contractor shall ensure that any additional items to be supplied by the Employer and the Contractor, are ordered in good time so as not to cause delay to the works. The Contractor shall check the delivery timing of all pipe and fittings and ensure that it is in line with the Contract programme. Any critical items that could be delivered late are to be brought to the attention of the Engineer. The delivery status of materials is to be checked and followed up upon by the Contractor throughout the contract.

PSL 3.2.1.2 Materials control – general (New sub-clause)

Add new Sub-Clause:

The Contractor is held responsible for the inspection and control on site of all the pipe supplied as free issue materials for the duration of the contract. Once pipe material and equipment has been accepted, any subsequent damage shall be made good to the satisfaction of the Engineer at the expense of the Contractor. Damage to internal linings and external coatings that are necessary and incidental to good welding practices and the manufacturing of pipe specials are excluded. Any item damaged beyond repair shall, at the discretion of the Engineer, either be replaced at the Contractors expense or the value of the asset reimbursed in full to the Employer.

PSL 3.2.1.3 Material storage (New sub-clause)

Add new Sub-Clause:

The Contractor shall store all items to be incorporated into the Works so that no damage occurs whilst awaiting installation. Where practical, items are to be stored in containers for protection from the weather and pilferage. All piping, pipe fittings, and equipment stored outside or awaiting installation are to be protected from the weather and stormwater and soil wash, using plastic sheeting that is highly UV resistant and storing same on pre-prepared concrete surfaces.

Pipes taken over from the Employer shall receive the required attention in order to ensure safe storage in yards, protected from fires, vandalism, and incidental damage that can reasonably be prevented.

PSL 3.2.1.4 Handling pipe, fittings, and equipment (New sub-clause)

Add new Sub-Clause:

Strict supervision shall be maintained by the Contractor at all times when handling pipes and equipment. The pipe is to be lifted with a lifting beam and slings which shall be fitted at quarter points around the pipe. Due care shall be taken when fitting and placing slings to ensure that ancillary items do not get crushed during lifting. Pipe coating is to be protected by padding or otherwise from scuffing damage during lifting. The equipment utilized for lifting pipes must be approved by the Engineer for the purpose of ensuring that the lifting equipment is appropriate and will not damage the pipe coating. It is not allowed to handle pipes with chains or any other device involving metal contact with the pipe coating. The Contractor shall ensure that all lifting equipment complies with the relevant safety regulations.

PSL 3.2.1.5 Stacking of pipes and pipe spools (New sub-clause)

Add new Sub-Clause:

The Contractor shall take due care when stacking pipe or pipe spools at the workplace. Pipes must never be placed directly on the ground but shall be stacked on dunnage according to approved methods and shall be separated from one another by the use of applicable methods approved by the Engineer. Should the Contractor wish to use tyres as dunnage, all tyres shall be removed from site upon completion of the Works or upon completion of work at a specific location where tyres were utilized.

PSL 3.2.1.6 Segregation of special items (New sub-clause)

Add new Sub-Clause:

All items/equipment which are to be used as paired items shall be marked as “special items” by the Contractor. Examples of this are valve mating flanges, flat faced flanges, etc. The Contractor shall take special care when storing items that are marked,” special items “, in order to ensure that they are not utilized by mistake as bulk items.

PSL 3.2.1.7 Controlled issue of lined pipe (New sub-clause)

Add new Sub-Clause:

The Contractor shall establish a data base of free issue and or procured pipe material which will reflect each and every pipe number of pipe length under his control, together with the pipe data of each of the pipes, next to the pipe number. The pipe data will clearly indicate the grade of steel and the wall thickness for each pipe number. Any lengths of pipe or piece of pipe cut from a full length, shall be able to be traced to original manufacturing data, at all times.

The Contractor shall control the issue of lined pipe using cutting lists, in order to minimize scrap metal and avoid unnecessary field butts. The Contractor shall ensure that pipe identification marks are transferred in a controlled manner onto cut sections of pipe to ensure 100% future traceability. The cutting of pipes and the transferring of identification marks shall be carried out under the close supervision of the Contractor's Quality Control Officer. The Contractor shall, at any stage as required by the Engineer, produce the pipe data base on site in order for the Engineer to verify the origin of section of pipe built into pipe specials.

The Contractor's rates for compliance with his obligations in terms of quality control shall be deemed to include for the establishment of the required data base and the control of pipe material on site. The Contractor shall take note that any cutting of standard length of pipe, for the purpose of making the pipe more manageable in restricted areas, will not be compensated for by payment for additional field joints.

Free issue pipe, if any, shall be utilized optimally to reduce waste. Any pipe damage, to a point that the pipe length requires rejection for use, as a result of the Contractor manhandling pipe inappropriately, shall be noted and the Employer shall require financial compensation to the equivalent value of the asset value. The resultant scrapped pipe shall be removed from site at the Contractor's cost.

PSL 3.2.1.8 Scrap material (New sub-clause)

Add new Sub-Clause:

Scrap metal from free issue pipe where applicable, shall be sold to scrap dealers at the best rate obtainable and the income generated from these sales shall be refunded to the Employer where such refund shall be consolidated in the following payment certificate, shown as a deduction. A consolidated summary sheet shall be added to the payment certificate for this purpose.

PSL 3.2.1.10 Cleaning of inside of pipe supplied by the Employer (New sub-clause)

Add new Sub Clause:

The Contractor shall, upon instruction of the Engineer, clean the internal surface of pipe before incorporation of the Works. This might be required as a result of the duration of the pipe laid in the pipe yard before use.

PSL 3.2.1.11 Acceptance of pipes, fittings, and materials – free issue materials (if applicable) (New sub-clause)

Add new Sub-Clause:

Before acceptance of any pipes, fittings or other items of equipment issued as free issue materials (where applicable), the Contractor is to carry out a thorough inspection to ensure that the materials have been delivered undamaged and are as ordered.

Pipes shall be checked for:

- Identification
- Certification
- Soundness of internal lining

- Ends beveled correctly
- Circumference according to specification and within tolerance
- Quantity agrees with advice note

Inspection of pipe fittings, valves and other equipment shall include but is not limited to:

- Identification
- Certification
- Material, schedule, and rating
- Lining where specified
- Coating where specified
- Circumference according to specification and tolerance
- Damage to items - example flange faces

Defective items shall not be accepted, but marked, quarantined, and immediately reported to the Engineer. If accepted, the Contractor shall take the required steps to ensure that all delivery documentation together with signed acceptance notes is filed in the construction dossier.

PSL 3.4 Steel Pipes, Fittings and Specials

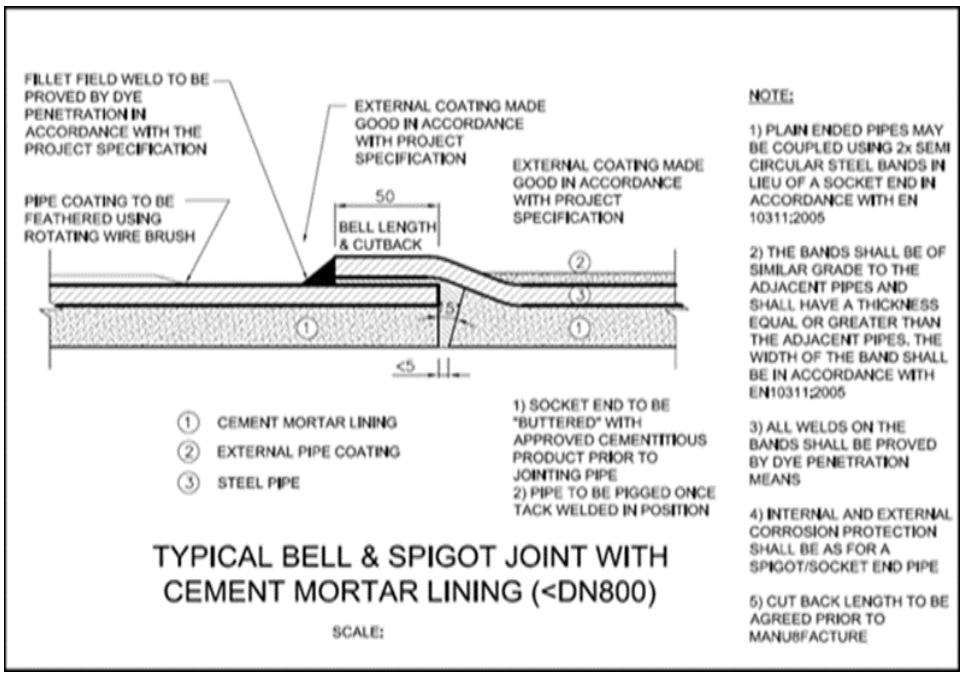
PSL 3.4.1 General

- ***Add the following to L3.4.1:***

Steel pipes, fittings, flanges, and specials shall be coated and lined in accordance the lining or coating systems approved by eThekwini Water and Sanitation as detailed in the Linings and Coatings Particular Specification. The steel pipes and steel pipe specials to be laid under this contract are DN300, DN400, and DN500.

The pipes to be laid under this contract are 300mm, 400mm, and 500 mm Ø API 5L Grade X42 4.5 mm thick steel pipe which must be cold-rolled seamless pipes API 1104. The 300mm, 400mm, and 500 mm Ø steel pipes will have bell and plain ends that must be fillet welded for construction of the trunk main and will be Three-Layer Polyethylene (3LPE) coated on the outside and cement mortar lined internally. All steel pipes shall comply with the requirements of the particular specification attached hereto and named: eThekwini Water and Sanitation: Departmental Specification for Steel Pipes 100mm to 2000mm Nominal Diameter: STPIPE v13.

Where a bell and spigot are specified, this shall comply with the Figure below.



For all branch connections, the plate thickness of the barrel and branch shall be such that the

All steel pipes shall comply with the requirements of the particular specification (C.3.4.1) attached hereto and named: eThekwini Water and Sanitation: Departmental Specification for Steel Pipes 100mm to 2000mm Nominal Diameter: STPIPE v13.

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.

It is noted that certain special precautions need to be taken to avoid excessive deflections and over-stressing of the pipeline material during construction. Various physical properties as well as requirements and recommendations for the construction of the pipeline are as follows, as per API 5L:
The pipes to be laid under this contract are 300mm, 400mm, and 500mm diameter steel pipes, with details as follows:

Diameter (mm)	Length (m)	Grade (API 5L)	Plate Thickness (mm)	(Approx.) Mass kg/m	Coating	Lining
500	9.14	X42	4,5	55.75	3LPE	Cement Mortar
400	9.14	X42	4,5	44.60	3LPE	Cement Mortar
300	9.14	X42	4,5	35.43	3LPE	Cement Mortar

The steel pipe diameter will have one end plain, and the other end belled for all the pipe to be installed under this contract. It is noted that certain special precautions need to be taken to avoid excessive deflections and over-stressing of the pipeline material during construction. Various physical properties as well as requirements and recommendations for construction are given on the drawing and in the schedule of quantities.

Steel pipes shall be grade X42. 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.

PSL 3.4.4 Fittings and Specials

- ***Add the following to L3.4.4:***

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. Pipes shall be sleeve welded with the sleeve having a width of 100 mm and the internal diameter being the measured outside diameter of pipe plus 3 mm. The ends of pipes shall be plain finished.

Specials are to be fabricated complete with specified coating and ends as stated in the schedule of quantities and/or drawings.

Specials shall be fabricated from API L Schedule 40 steel of the specified thickness required for the working pressure of the pipeline. Provision must be made in the item rates for stiffening plates on Wyes and Tees.

All specials shall be protected in accordance with clause PSL 3.9.2.3 and 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 DN500 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.

Direction changes with bell ended pipe can be effected with a maximum deflection angle of 5 degrees. A direction changes in the bell of a bell ended pipe will be treated as a straight joint and payment will be effected for such a direction change.

All steel bends, fittings and specials shall be fabricated to the dimensions and details shown on the drawings and/or described in the Bill of Quantities. The sides of taper pieces shall diverge at an angle of not more than 11° to each other. The bend, fitting, and special fabricator shall supply written confirmation that all hand welding was carried out by coded welders against appropriate welding procedures.

Bends, fittings, and specials DN350 and larger shall have the internal lining and external coating made continuous (“made good”) as specified elsewhere for welded joints on coated and lined pipes.
Bends, fittings, and specials shall be manufactured and tested in accordance with the specification for straight pipe and additionally with Section 18 of BS 534.

Bends shall generally be of the segmented (gusseted) type except where otherwise stated or shown on the drawings or where the Tenderer can offer a price advantage for supplying even curvature bends. For deflection angles up to and including 9º bends may be fabricated from pipe lengths “on site” in accordance with the Table below.

Deflection of Angle	
Up to and including 3 °	One pipe end scarfed on site
Exceeding 3 ° and up to and including 9 °	Mitre cut (two pipe ends scarfed on site)

Bends greater than 9º shall be fabricated at an approved pipe fabrication shop in accordance with the requirements of clause 21 of BS534:1990. Bends less than 30º, between 30º and 45ºas well as between 45º and 90º, shall be fabricated from combinations of items from clause 21 of BS534.

(1) Shop drawings of bends, fittings and specials shall be submitted to the Engineer for approval prior to manufacture.

(2) All flanged bends, fittings and specials shall be hydraulically tested at the fabricator’s premises to the same pressure that they will be subjected to during the hydraulic testing of the completed pipeline. No visible signs of leakage will be permitted.

All segmented bends shall be fabricated in accordance with the criteria in Table 7.

Table 7:

Total deflection angle	Number of segments	Number of Welds	Number of scarf cuts
0 to 3 degrees	N/A	1	1
Greater than 3, equal or less than 9	N/A	1	2
Greater than 9, equal of less than 15	2	1	0
Greater than 15, equal or less than 30	3	2	0
Greater than 30, equal or less than 45	4	3	0
Greater than 45, equal or less than 60	5	4	0

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.

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 3.4.5 Puddle Collars and Anchoring Flanges (New sub-clause)

Add new Sub-Clause*:*

Puddle collars and anchoring flanges used as pipe anchorages shall be of the same dimensions as corresponding flanges but those cast into concrete walls shall not be drilled. The anchoring collar or flange shall be capable of transmitting a longitudinal force 33% greater than the internal hydraulic pressure to be applied when testing, multiplied by the area of the bore and, under that condition, the stress in the material shall not exceed its yield stress.

'Thin' puddle collars/flanges are not required to transmit thrust, their purpose being to assist with the waterproofing of the concrete chambers by increasing the path that ground water might have to take to enter the chambers. These will be shown on the drawings with a thickness dimension which is much less than the standard flange thickness for the relevant pressure class of pipe.

The minimum distance of puddle flanges from reinforcement bars is 100mm to ensure that there is no current leakage between reinforcement and puddle flanges where cathodic protection systems are installed.

PSL 3.4.6 Pipe Material (New sub-clause)

Add new Sub-Clause:

The Employer will provide pipe materials and Pipe supplied needs to comply with the requirements of the particular specification attached hereto.

PSL 3.4.7 Ovality of Pipe (New sub-clause)

Add new Sub-Clause:

It is the Contractors responsibility to ensure that the ovality of the large diameter slender pipe remains within specified limits during construction. Should it be required, the Contractor shall utilise spiders of approved type and design to support the pipe during backfilling, in order to ensure that the pipe does not deform outside the specification tolerances and also ensuring that the internal lining of the pipe is not damaged.

PSL 3.8 Jointing Materials

PSL3.8.2.1 Flexible Couplings

Delete the Sub-Clause and substitute the following:
Where ordered, steel flexible couplings are to be of the "Viking Johnson"/"Klamflex"/" Aqualok" or similar approved type without central registers, each comprising one centre collar, two special flanges, two rubber rings and hot dipped galvanized mild steel bolts. Steel couplings shall be assembled strictly in accordance with the manufacturer's instructions and all bolts shall be torqued to the value recommended by the manufacturer. On completion of hydraulic pressure testing of the installation, the entire joint shall be protected as described in the particular clauses for corrosion protection.

The tendered prices for laying and jointing are to include for the supply of all necessary materials, plant and labour to complete the joint. Flexible couplings shall conform generally to Clause 15 of BS 534 for slip-on type couplings and shall be of approved manufacture. 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.

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 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 65% of the yield point.

Mild steel couplings shall be protected by an approved epoxy coating system such as “Copon KSIR88” (or similar approved) within 4 hours of abrasive blast cleaning the metal surfaces of the coupling in accordance with Swedish Standard SIS 05 5900 Grade SA 2,5. Nuts, bolts and washers shall be hot dipped galvanized. The plain end of the pipe shall be properly prepared, and in the case of steel pipes before corrosion protection, so as to accept the flexible coupling.

Adaptor couplings and anchoring adaptor joints shall comply with the above specification for flexible couplings and be of a similar design, but one end shall be flanged to enable connection of plain ended pipes to flanged joints. The adaptor joints are to be complete with bolts and nuts for connecting the flanged joint to the anchoring flange situated generally 300 mm to 400 mm from the plain end of pipe. All bolts, nuts and washers are to be hot dipped galvanized. In order to anchor the plain ended pipe to the flanged joint all of the bolts for the flanged joint are to pass though the anchoring flange and are to be fitted with nuts and washers at the flanged joint and on either side of the anchoring flange. Each coupling shall permit a repeated movement of 10mm to cater for thermal expansion and contraction of the pipe and shall allow for the following angular deflections:

- 6° up to and including 600 mm diameter;

PSL 3.8.2.1.1 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

PSL 3.8.3.1 Bolted Connections (New sub-clause)

All flanges, gaskets, bolts, nuts washers and other appurtenances required for the execution of the work shall be supplied and installed by the Contractor.

PSL 3.8.3.1.1 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 3.8.3.1.2 Gaskets

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. Gaskets are to be installed centrally without damage. No grease or other compound shall be used to hold the gasket in place prior to tightening the bolts. Ring Insert gaskets shall be installed after fitting the bottom half of the bolts and nuts loosely in order to ensure that the gasket assembly is centered properly. Full Face gaskets are to be centered by inserting bolts and nuts loosely around the circumference of the flange, at

an even spacing.
The mating faces of flanges that are to be in contact with gaskets shall not be painted or coated. After application of all pipe and flange coatings, there shall be no runs or drips on the mating face and, where applicable, the flange profiling shall be clearly visible. After blast cleaning the mating faces shall receive one coat of rust inhibitor (Plascon Rustrix 84 or equal approved). There shall be no coating build-up in the flange bolt holes that could snag the bolts.

PSL 3.8.3.1.3 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 builds up in flange bolt holes that could snag bolts will not be permitted.

PSL 3.8.3.1.4 Insulating Flanges

Insulating flanges shall comply with the requirements of eThekwini Water and Sanitation. 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. Remaining bolts and nuts shall be galvanised to SANS 763. Galvanised and stainless-steel bolts and nuts shall comply with the relevant requirements of SANS 135-1985 and SANS 136-1985.

PSL 3.8.3.1.5 Bolts Threads

Bolts and tie bolts to be grade 4.8. Bolts, nuts, and washers shall be hot dipped galvanised to SANS 121:2000/ ISO 1461:1999. 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.
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 two full threads. Tie-bolts on restrained/anchoring couplings shall be fitted with “backing nuts” and washers.

PSL 3.8.3.1.6 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 3.8.3.1.7 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.

PSL 3.8.8 Joining of pipe with plain end conditions with collar welded band (New sub-clause)

Add new sub-clause

Pipe of nominal diameter, less than DN800mm, supplied with plain end conditions, shall be joined with the use of a band welded onto one end of the pipe where a joint is to be formed.
The band is to form a socket type end condition with the pipe to be joined in a spigot and socket manner.
The band dimensions shall be 100mm wide with a minimum thickness of 1.25 the wall thickness of the pipe.
The fillet weld where the band is welded to the pipe shall be a full fillet weld with no undercut.

The band shall be fitted with 50% of its width overlapping with each pipe end inserted into the band socket. The band shall have an internal dimension of 0.75% larger than the outside diameter of the pipe it is being welded to. Should this tolerance be required to be relaxed, this needs to be agreed with the Engineer and approved of by the Engineer. Weld procedures shall be developed for the welding of the band to pipe ends and for pipe joints made with fitted bands.

PSL 3.9 Corrosion Protection

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 3.9.2.2 Steel pipes of nominal bore over 150mm

Replace the clause with the following:

B. General

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. All bends, specials and steel pipes supplied under this contract shall be coated with thermoplastic powder coating. Flange profiling shall be clearly visible, and no runs or drips will be permitted.

C. Preparation and Cleaning of Pipe

Degreasing

Pipes shall be grease free prior to the application of a coating or lining. In the event that degreasing is required, Pipes shall be thoroughly washed with clean potable water to remove all residues. The surface shall be water break free. The pipe shall then be allowed to dry. Abrasive used for blast cleaning shall be free from oil or grease, as shall be the compressed air used in air blast cleaning.

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:

(i) Cleanliness shall be equal to SA 2½ of Swedish Standard SIS 05 5900 when tested in accordance with SANS method 767.

(ii) 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.

(iii) Residual dust and debris shall not exceed 0.2% when tested in accordance with SANS Method 769.

(iv) 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.

(v) The pipe surface shall not be contaminated by oil, grease or another harmful contaminant.

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. 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 - 30mm from the belled end of the pipe and 55mm from the plain end of the pipe.

The maximum cut-back shall be 100mm.

D. Application of Coating

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.

E. Thickness of Coating

The pipes shall be coated to a dry film thickness of a minimum of 300 and a maximum of 500 microns and shall be free from sags and runs.

PSL 3.9.2.3 Repairs to Epoxy Coatings

- ***Replace the clause with the following:***

Repairs to Coatings and Linings

3LPE, 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 3LPE 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 Engineer's representative, whichever is applicable. It shall be a requirement of this contract that the Holiday testing device utilised be calibrated and approved by the Engineer prior to the conducting of any Holiday tests.

2. Surface Preparation

a) Defects in epoxy coating detected by the holiday testing. At each pinhole detected by the Holiday test, the surrounding area shall be abraded to 25mm beyond the defective area. It is noted that any cluster of pinholes within a radius of 25mm 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 3LPE and epoxy coating caused by welding, damage at joints and bends and damage at scour and air valve tees, crotch plates and buries valves.

(i) All damaged and blistered 3LPE and epoxy coating caused by welding shall be removed back to sound epoxy coating by mechanical grinding or other approved means.

(ii) The exposed steel surface shall be power, or hand wire brushed to remove dirt, scale, rust and other foreign matter to a surface equivalent to a Class St 2 finish. Weld spatter shall be removed by chipping or grinding to a smooth surface flush with the surrounding steel. Welds shall have a smooth contour free from sharp edges, protrusions and undercut. Sharp edges and protrusions shall be removed by grinding to a smooth radius of curvature of not less than 3mm.

(iii) The surrounding sound 3LPE and epoxy surface shall be abraded to a distance of 50mm 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.

3. Cleaning of Area to be Repaired

Grease and oil shall be removed with a non-volatile solvent (e.g. "Aquasolve", "Arc Nr. 261 Safety Solvent Cleaner" or similar approved). The surface shall then be cleaned with potable water and

allowed to dry completely.

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 solvent less epoxy repair kit (e.g. “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 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 (or wrapped in the case of the coating reinstatement joints) with Denso Ultra Flex System, or similar approved. The following criteria shall be strictly in accordance with the manufacturer’s instructions:

- surface preparation
- application of the primer
- application of the tape
- recommended minimum overlap width (where applicable)
- capping of overlap joints (where applicable)

(v) Notwithstanding the above, the tape cover strip shall overlap the sound 3LPE coating by at least 50mm (in the case of patches) and 100mm (in the case of joint wraps) and shall be applied in layers if necessary to form a final cover patch or strip at least 2,5mm thick.

(vi) The tape repair for 3LPE defects shall be continuously, spirally wrapped around the complete circumference of the pipe with a minimum overlap of 25mm.The dielectric resistance of the tape cover strip shall not be less than that of the 3LPE (10 000 V) or fusion-bonded epoxy coating (3 500 V).

b) Defects in 3LPE coating detected by Holiday tests. Where the repair area is less than 650mm^2, 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 3LPE coating other than those detected by Holiday tests. Any single repair area less than 0.1m^2 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 circumferential direction, nor twice the nominal pipe diameter in 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), A.4.a(v) and A.4.a(vi) 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 with two coats of “ABE Silvakote” or similar approved bitumen base aluminium paint applied with brush or roller to a final minimum dry film thickness of 80 micrometres. The over coating time shall be as per the manufacturer’s instructions.

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), A.4.a(v) and A.4.a(vi) 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 150mm 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.

(ii) Exposed specials in chambers including valves, flanges, crotch plates, flexible couplings etc. shall be protected by the application of "Copon Hycote 151", "Arc 982" or similar approved epoxy coating to a minimum dry film thickness of 300microns. Surface preparation and application shall be strictly in accordance with the manufacturer's instructions.

(iii) When coating valves, care shall be taken to prevent the epoxy coating covering the descriptive name plates and flow direction indicators on the valves by masking off these plates.

h) Buried Valves. Buried valves or other appurtenances with intricate shapes will be inappropriate for wrapping with a tape system. Such items shall be protected by the application of a zinc-rich epoxy primer such as "Berger Master", "Zinc Anode 304" followed by two coats of a pitch extended epoxy resin coating such as "Fosroc Nitocote ET550", "Epilux 5 Coal Tar Epoxy" or similar approved to a minimum dry film thickness of 250 microns. Alternatively, a petrolatum system "Denso" type or similar approved may be employed and then wrapped in polythene sheeting to the approval of the Engineer.

B. <u>Internal Repairs – Epoxy Lined Pipes</u>

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

a) Defects in epoxy lining detected by Holiday testing. At each pinhole detected by the Holiday test, the surrounding area shall be abraded to 25mm beyond the defective area. It is to be noted that any cluster of pinholes within a radius of 25mm 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.

(iii) The exposed steel surface shall then be prepared in accordance with the requirements of section A.2.b(ii) and A.2.b(iii) of the clause.

2. Cleaning of Area to be Repaired. Grease and oil shall be removed with a non-volatile solvent (e.g., "Aquasolve", Arc Nr.261 Safety Solvent Cleaner" or similar approved). The surface shall then be cleaned with potable water and allowed to dry completely. To this end adequate ventilation shall be provided.

3. Methods of 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 2mm 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 e.g., eye and hand protection, ventilation, fire precautions, etc.

(iii) After the repair has been adequately cured, the repair and the surrounding 250mm 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.4.a(i) above.

(ii) The requirements of Clauses B.4.a(ii) and B.4.a(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.4.a(i), (ii) and (iii) above. The epoxy repair material shall be applied to overlap the existing sound cement mortar lining, by 25mm at access openings, valve bypasses and scour tees.

C. <u>Internal Repairs – Cement Mortar Lined Pipes</u>

1. The internal surface of the bell mouth is to be power or hand wire brushed from the pipe end to the cement mortar lining to remove dirt, scale, rust, and other foreign matter.

2. Any grease and oil shall be removed from the pipe surface with a non-volatile solvent (e.g., "Aquasolve", "Arc Nr 261 Safety Solvent Cleaner" or similar approved). The surface shall then be cleaned with water and dried and a 50mm wide x 20mm thick band of "Epidermix 338" or similar approved shall be applied internally on the uncoated steel adjacent to the cement lining.

3. The plain end of the adjoining pipe shall be pushed into the bell mouth in such a way that the Epidermix band is compressed and makes contact with the transverse face of the concrete lining of both pipes. The excess lining material which is squeezed into the pipe shall be removed by drawing a plug which is 5mm smaller in diameter than the bore of the pipe, across the joint. The plug shall be so shaped as to apply a smooth even surface to the lining material at the joint.

PSL 3.9.7 Making Good of Field Welded Joints, Repairs and Puddle Pipes

This specification is based on "Denso" products. Alternative products may be accepted at the discretion of the Engineer. 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 "Ultra flex 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 Ultra flex 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.

Corrosion Protection of Flanged and Flexible Joints: All buried flanges and flexible joints shall, in addition to being epoxy/ thermoplastic powder / Rilsan coated, be protected as described below. This specification is based on a "Denso" system. Alternative products will be subject to the approval of the Engineer.

(i) 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.

(ii) Priming: 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.

(iii) Application of 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. The blanket shall be overlapped at least 50mm and the blanket shall extend at least 150mm along the barrel of the pipe on each side of the joint.

The ends of the blanket shall be bound to the barrel of the pipe on each end with 100mm wide “Denso Tape”. “Denso Tape” overlaps shall be 50mm and shall extend 100mm onto the blanket and 150mm onto the pipe barrel.

PSL 3.10 Valves

Add the following to end of the Sub-Clause:

All valves DN600 and less shall be wedge gate valves to SANS 664 of type “AVK” / “VAG” or equal approved. Valves of size DN350 and larger shall be supplied complete with gearboxes. All Valves shall be 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 1461:1999.

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 Engineer. 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 Engineer.

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.

PSL 5 CONSTRUCTION

PS.L.5.1 Laying

PS.L.5.1.1 General

Add the following to L.5.1.1:

It is of paramount importance that the right type and class of pipe be laid as shown on the drawings. 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 work in confined spaces and for shoring of trenches. When handling 9.14m pipe lengths the pipes shall be lifted with band slings (minimum 300 mm wide) placed centrally around pipe at two points 5 meters apart. It is noted that a through flow of air is required when work is to be carried out inside the pipeline. The necessary electrical equipment and fittings must be provided to produce this airflow. An Item in the Schedule of Quantities has been provided for complying with these requirements.

PS.L.5.1.2 Damage

Add the following to L 5.1.2:

Inspection at the Laying Site. All pipes, specials, valves, and fittings shall be carefully examined by the Contractor for internal and external damage at the following stages:

(a) on arrival at laying site;
(b) prior to laying;
(c) after laying;
(d) prior to backfilling; and
(e) during backfilling.

All damage or defects of any kind shall be repaired by the Contractor in accordance with Clause 3.9.2.3 and to the satisfaction of the Engineer immediately after detection at any of the above inspections. Where, in the opinion of the Engineer, satisfactory repairs are practicable, the damaged materials shall be replaced by the Contractor at his own cost.

PS.L.5.1.3 Keeping Pipelines Clean

Add the following to L 5.1.3:

Exposed ends of the pipe in the trench shall be tightly closed by a suitable end cap at all times when pipe laying is not in progress. Add the following as L 5.1.5:

Stacking of Pipes and Specials, where a pipe yard is provided, all pipes and specials shall be neatly and methodically arranged on the ground on delivery, as directed by the Engineer. They shall be segregated according to diameters and working pressures and the various stacks shall be arranged and separated in such a way that a pipe of any diameter and working pressure can be located from the stacked position for transportation to its laying position without necessity of moving other pipes.

PS.L.5.2 Jointing Methods

PS.L.5.2.1 Flanges

Add the following to L.5.2.2:

Flanges to fittings or joints will generally be to SABS 1123. 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 used are to be electro galvanized and yellow passivated.

PS.L.5.3 Setting of Valves, Specials and Fittings

Add the following to L 5.3:

Valves and fittings shall be installed in accordance with the manufacturer's instructions. Valves shall be enclosed in chambers in accordance with the drawings and specifications and shall be installed with their operating spindles vertical. The Contractor shall supply the insertions and bolts necessary for the installation of the valves.

- All air valves shall be set level.
- All scour valves shall be installed in such a way that the spindle is vertical.
- The Installation of Butterfly Valves:
- 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.

Storage:

i. It is preferable that the valve is stored in the vertical position.

ii. The valve should be stored in the cracked position (i.e., not shut).

iii. The valve should not be stored in the vicinity of electrical equipment.

iv. The valve should be stored under cover and protected from temperature extremes.

Installation and Commissioning:

i. 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.

ii. 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).

iii. The valve must not be lifted by the hand lever, valve actuator or the hand wheel.

iv. The valve must not be used for lining up the pipework.

v. The valve should be left in the fully open position after installation and prior to commissioning of the system.

Seal Adjustment

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.

Payment

All costs incurred for the seal adjustment as stipulated above shall be included in the respective rates for installation of the valves.

PS.L.6 TOLERANCES

Add the following to L 6:

The tolerances for the line and level of pipelines shall be as follows:

(a) positions of bends: within 150 mm of the locations shown on the drawings or as agreed with the Engineer;
(b) level of pipe invert: within 25 mm of the level shown on the drawings;
(c) location of pipe centre in plan; within 25 mm of the location shown on the drawings through the sleeves and culverts and elsewhere within 75 mm of position shown on the drawings.

The depth of pipes below ground level shall be 1000mm to top of pipe. Pipeline route markers and valve markers shall be supplied by the Employer and erected and painted by the Contractor in accordance with details on drawings. Specials shall be joined by welding. Welder certificates shall be produced for all welders employed on the works. The Contractor shall submit a complete method statement regarding the welding work, as well as the application of liners and coatings at the welds, to the Engineer for approval before commencement of the works.

PS.L.7 TESTING

PSL 7.1 General

Add the following to L 7.1:
Inspection: Facilities shall be provided to the Engineer 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 Engineer 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 Engineer 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 unauthorized 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:

All fillet welds shall be dye penetrant tested. Any reduction in the percentage of welds to be tested shall

be at the sole discretion of the Engineer.

PSL 7.2.2 Radiographic Examination

Add the following to L 7.2.2:

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 Engineer.

PS.L.7.3 Standard Hydraulic Pipe Test

PS.L.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:

Static Test: When the pipeline is filled with water, all scours and hydrants shall be opened fully for one minute or until the water emerges clean.

Pressure Test: When the pipeline is filled with water, all scours and hydrants shall be opened fully for one minute or until the water emerges clean. A suitable pump shall be connected to the pipeline at a mutually agreed point.

The pressure in the pipeline under test shall be raised slowly by means of the pump and measured by a pressure gauge connected to the pipeline.

PS.L.7.3.1.2 The required test pressure for steel pipework shall be 2500 KPa measured at the lowest point of the pipeline(s).

The hydraulic testing of the pipelines is to be carried out in two stages:

a) The pressure test as described above, is to be carried out with the pipeline fully blanked and all valves in the open position. All costs relating to this work inclusive of scouring, supplying and install blank flanges, spade pieces etc. are to be included in the rate for testing. The minimum duration of this test will be 8 hours on steel pipelines and 2 hours on non-steel pipelines.

b) On successful completion of the pressure test as per (a) above, the Contractor is to remove all temporary blank flanges, spade pieces, etc. and pressurise the line to maximum working pressure against closed valves. Should any valve not be drop tight at this pressure the Contractor is to advise the Engineer in writing of all defects encountered. The duration of this test shall be 2 hours. (An item has been allowed for this work in the Schedule of Quantities).

All tests shall be carried out in the presence of the Engineer at such times and in such manner as he may direct. The hydraulic testing of pipelines against closed valves shall not be allowed and provision shall therefore be made by the Contractor for the supply of all necessary bullnoses and blank flanges.
Water for testing shall be made available free of charge in the first instance but for the subsequent tests shall be charged to the Contractor's account. A water connection will be provided by eThekwini Water for filling the pipeline for testing purposes.

The Contractor shall, at his own cost, provide a suitable means of conveying water from this connection to the mains to be tested, as well as a connection on the new pipeline in order that it may be filled. This connection shall be capped or removed to the satisfaction of the Engineer upon completion of the hydraulic test. Payment of this shall be allowed for under the rates for the hydraulic testing of the pipeline.

For hydraulic testing of the pipe's sections after installation, as per Clause 7.3 of SABS 1200L, each test section shall be chosen such that it is subjected to a test pressure not exceeding 250m water head at the lowest point and not less than 200m at the highest point. This pressure shall be obtained by continuous

pumping so as to ensure a gradual increase of pressure until the specified value is obtained.
After the entire piping system have been laid and all parts thereof have been tested to the satisfaction of the Engineer and backfilled, the pipe system will be put into operation and the Contractor shall inspect and commission the same in the presence of the Engineer, to ensure that all valves and other equipment are operating satisfactory and to check that all pipe supports, brackets and the like are capable of withstanding the loads imposed on them.

Any faults or defects which are detected during this inspection shall be repaired by the Contractor, or where necessary, the defective parts or materials shall be replaced by the Contractor, to the satisfaction of the Engineer, all at the Contractor's expense. All items of equipment not specifically mentioned in the Specifications, shall be inspected during the commissioning period for proper operation and to verify that these items comply with the requirements of the Specification.

PSL 7.3.1.3 Testing Procedure for new mains only

The required test pressure for all pipelines shall be 2500 KPa measured at the lowest point of the pipeline(s) with a maximum elevation difference of 20metres and maximum horizontal distance of 500metres between pressure test points. Prior to testing, sections of the new pipeline shall be installed between one or more reticulation isolating valves complete with all fittings, valves, and communication pipelines.

The hydraulic testing of pipework against closed valves is allowed for reticulation pipelines. The pipe section shall not be filled until associated structural concrete has cured for 28 days and attained design strength and all permanent anchors and fasteners are in place. The pipe shall be filled at a rate that permits the escape of air and does not induce transient pressure surges. Permissible leakage for pipe = 0 litre/m.

PSL 7.3.1.4 Remedial Measures

In the event that a pipe section fails the test, the Contractor shall carry out all remedial measures necessary to obtain a successful test of the section at his own expense.

PSL.8 MEASUREMENT AND PAYMENT

PSL.8.1 Inspection or Testing and Repair of Valves Supplied by the Employer

No payment shall be made for dye-penetration tests and radiographic testing at the manufacturer's works for specials supplied by the Contractor and all costs in connection therewith shall be included in the rates and prices for the various specials.

PSL.8.2.1 Supply, Lay, and Bed Pipes Complete with Couplings

Add the following to L 8.2.1:

(i) provision of craneage, transporting and lowering pipes into trench, cutting to closures and preparing ends for jointing, laying true to line and level on prepared trench bed and jointing, including the supply of joint sleeves where required;

(ii) bonding mechanical joints for electrical continuity in case of steel pipes;

(iii) completing both internal and external protection at joints and making good any damage to sheathing or lining, which has occurred after acceptance at the pipe yard; and

(iv) all other operations necessary to complete laying not separately scheduled.

PSL.8.2.2 Extra-over 8.2.1 for the Supplying, Laying, and Bedding of Specials Complete with Couplings

Add the following to L 8.2.2:
The Contractor will only receive payment for a scarfed bend if the pipe is cut to fabricate the scarf bend.

PS.L.8.2.3 Extra-over 8.2.1 for the Supplying, Fixing and Bedding of Valves

Add the following to L 8.2.3:

The unit rate for the installation of scour and air valves when supplied by the Employer shall include for taking delivery of the valve at the Municipal depot, provision of craneage, transporting to site and installing the valve as specified and shall allow for the supply of all nuts, bolts and gaskets as required.

PSL 8.2.4 Rate for The Supply, Laying and Bedding of In-Line Specials

Add to Sub-Clause:

The rates tendered for the manufacturing 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, welding of joints as well as welding into position and all internal lining and external coating repair and wrapping where required for:

- In-Line Tees
- In-Line Reducers
- In-Line Elbows and Bends
- In-Line Flanges
- Bull Noses
- Segmented Bends
- 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.

PSL 8.2.5 SUPPLY AND INSTALLATION OF OTHER SPECIALS

Add to Sub-Clause:

The rate shall cover the cost of the supply, installation, welding, jointing, fasteners and NDT inspections of all the non-in-line specials. The rate for the blank flanges must be inclusive of the specified gaskets, fasteners, washers, lining and painting. The rates for any test flanges must be inclusive of the blank flange, flanged connection, isolation valve, gasket and bolts, nuts and washers required to assemble test flanges and to attach test flanges to a flange.

The rates shall cover the cost of uplifting and transportation, handling, installation and testing of all valves supplied by the Employer, and/or receipt, off-loading, storing, handling and transportation, installation, and testing, for valves received at the Contractors storage areas as supplied by the Employer.

PSL 8.2.6 PREPARATION BY MEANS OF CUTTING

Add to Sub-Clause:

The rates tendered shall cover the cost of supply and installation of all materials, equipment, procedures and personnel to carry out cutting of pipe where directed by the Engineer, for the installation of same, under conditions where dense services require the laying of pipe in shorter than standard lengths. The rate for

cutting shall include for joining by means of butt or mitred weld, external tape wrapping, internal coating repair as well as NDT testing.

PSL 8.2.11 Anchor blocks/Thrust blocks and pedestals

Insert "concrete" *before* "and" *in the last line of the last paragraph*.
Add the following:

"The tendered rates shall also include the wrapping of pipes and fittings with Densopol 80 or a similar approved material where the pipes and fittings come into contact with concrete."

PSL 8.2.16 Pipeline Marker Posts

Payment shall be per cost installed and shall include for the uplifting and transporting to site from the Municipal depot, handling, excavation, installation, backfilling and painting.

PSL.8.2.17 Cathodic Protection

Cathodic Protection (CP) System work is to be done by a Nominated Sub-Contractor.
The Civil Contractor is to liase & co-operate with the CP specialist to ensure that the activities of the specialist proceed in the best possible manner. Precise details of the location of elements of the Cathodic Protection System will be confirmed by the Engineer's Instructions on site, but the following points are noted:

a) Continuity bonding is required around all in-line valves.
b) Monitoring test points are to be installed in the line valve chambers, where shown.

Insulating flanges are required at all inlet and outlet pipe positions. This will be indicated during construction period by the CP-PSP and are to be reflected on as-built drawings.

PSL 8.2.18 Testing and disinfecting of Pipeline **Unit: m**

Add the following Clause:

Pressure test pipeline including all hydrant assemblies and new metered connections. Disinfection will be carried out in accordance with Clause 5.10 of SANS 1200 L. The rate shall cover the cost of testing the pipeline in accordance with clause PSL 7.3 including all hydrant assemblies, air valve assemblies and new metered connections. 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.

PSL 8.2.20 Preparation and Butt Welding of straight joints in pipeline

Add the following Clause:
:
The Contractor shall include in his rate for welding of straight joints in pipeline, the supply of materials, labour, plant, equipment, supervision, and NDT testing required at each joint.

1. Butt welding of straight joints in pipeline (Diameter Nominal specified) .....Unit: No.

PSL 8.2.21 Installation and removal of temporary connection and anchors to the Contractor's detail approved by the Client's Representative.

Unit: Prov Sum

Supply and install reusable temporary fittings, complete with special tee, valve, couplings, and anchorage. The rate shall include for the following in connection with the decommissioning of existing Water mains: -

1. Closing off the affected section of the existing and new reticulation to isolate the area where the tie in / cut into the existing reticulation is to be carried out. This can only be carried out with the approval of the Engineer who will liaise with the Operations Section of eThekwini Water and Sanitation on a suitable time and date for this to be carried out. The Contractor is to give the Engineer seven working days' notice in writing of his intention to carry out this work.
2. Informing persons affected by the shutting off of the existing reticulation by erecting posters in the area affected by the shutdown at least three working days before the work is carried out
3. Draining those sections of the existing and new reticulation through the nearest hydrant / scour valve.
4. Excavate for and open section of GRP water main where tie- in / cur-in is to be affected.
5. Cutting out a section of the existing GRP water main to effect the tie in / cut in
6. Installation of the equal tee including additional sections of pipe and fittings necessary to affect the tie-in. All pipes, fittings, valves and thrust blocks will be measured under this item.
7. Installation of end cap including additional sections of pipe, fittings, valves and thrust blocks necessary to effect the cut-in.
8. Re-open valves on existing reticulation and monitor tie-in's / cut-ins for any signs of leakage.
9. Only after the Engineer has approved the tie-in / cut in, the Contractor may backfill and reinstate the ground as per items in the schedule of quantities.

PSL 8.2.22 All works on Existing Water Reticulation Pipelines.

The rate shall include for the following in connection with installation of new pipework specials on existing Water mains: -

1) Closing off the affected section of the existing and new reticulation to isolate the area where the tie in / cut into existing reticulation is to be carried out. This can only be carried out with the approval of the Engineer who will liaise with the Operations Section of eThekwini Water and Sanitation on a suitable time and date for this to be carried out. The Contractor is to give the Engineer seven working days' notice in writing of his intention to carry out this work.
2) Informing persons affected by the shutting off of the existing reticulation by erecting posters in the area affected by the shutdown at least three working days before the work is carried out.
3) Draining those sections of the existing and new reticulation through the nearest hydrant / scour valve.
4) Excavate for and open section of existing water main where tie- in / cur-in at reservoir is to be affected.
5) Cutting out a section of the existing steel water main at reservoir to effect the tie in / cut in.
6) Installation of new pipework special including additional sections of pipe and fittings necessary to affect the tie-in. All pipes, fittings, valves and thrust blocks will be measured under this item.
7) Installation of end cap including additional sections of pipe, fittings, valves and thrust blocks necessary to effect the cut-in.
8) Re-open valves on existing reticulation and monitor tie-in's / cut-ins for any signs of leakage.
9) Only after the Engineer has approved the tie-in / cut in, the Contractor may backfill and reinstate the ground as per items in the schedule of quantities.

PSL.8.3 Connections to Existing Pipeline

Line items has been provided in the Schedule of quantities for connections to existing pipelines as per drawings and PS.34 or directed by the Engineer. The operations required for the connections shall be measured and paid according to the tendered rates in the Schedule of quantities.

PSL.8.4 Cutting of Pipes

No separate payment shall be made for cutting of pipes by the Contractor and all costs in connection therewith shall be included in the rates for pipe laying.

PSL.8.4 Corrosion protection at welds

No separate payments shall be made for the corrosion protection to be provided at welded joints and all costs in connection therewith shall be included in the rates for pipe laying.

PSL.8.6 Route Markers and Valve Markers

The installation of route markers and valve markers supplied by the Employer or purchased by the contractor shall be measured per unit and the rate shall include for the uplifting and transporting to site from the Municipal depot, handling, excavation, installation, backfilling and painting thereof in accordance with details shown on drawings.

PSL.8.7 Pipe Anchor Brackets and Bolts

Pipe anchor brackets for surface mounted pipes shall be measured and paid separately per sum tendered in the Schedule of quantities, including galvanizing and galvanized bolts, fixed to the relevant elements as specified.

PS.LB : BEDDING (PIPES)

(As Applicable to SABS 1200 LB-1983)

PSLB 2 INTERPRETATIONS

PSLB 2.3 DEFINITIONS

Replace “150mm” in the definition for main fill with the following:
“300mm”

PSLB 3 MATERIALS

PSLB 3.1 SELECTED GRANULAR MATERIAL

Replace subclause with the following:
“Only a clean non cohesive sand containing no particles of diameter exceeding 10 mm, having a Plasticity Index (P.I.) not exceeding 6 and free from vegetation and lumps shall be used for the bedding cradle. It is anticipated that most of the bedding material will have to be provided from an off-site source. Bedding shall be constructed to the dimensions required for Class ‘C’ flexible bedding.”

PSLB 3.2 SELECTED FILL MATERIAL

Add the following to this subclause:
“Only a clean non cohesive sand containing no particles of diameter exceeding 10mm, 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. Selected fill shall be constructed to the dimensions required for Class ‘C’ flexible bedding.”

PSLB 3.4 SELECTION

PSLB 3.4.1 SUITABLE MATERIAL AVAILABLE FROM TRENCH EXCAVATION

Replace the subclause with the following:
"The excavation of a pipe trench shall comply with the requirements of Subclause 5.4 of SANS 1200 DB and the provisions of Subclause 3.7 of SANS 1200 DB (in terms of which, for the purposes of providing bedding materials, the Contractor is not required to use selective methods of excavating) shall apply. Nevertheless, the Contractor shall take every reasonable precaution to avoid burying or contaminating material that is suitable and is required for bedding or covering the pipeline. If, in the opinion of the Engineer, bedding material can be produced from the excavated material, the Contractor shall, if so ordered by the Engineer, screen or otherwise treat (as scheduled) the excavated material in order to produce material suitable for bedding (see also Subclause PSLB 8.2.1)."

PSLB 5 CONSTRUCTION

PLSB 5.1 General

PSLB 5.1.2 DETAILS OF BEDDING

Add to this subclause:
"The pipelines shall be laid on the class of bedding indicated in the Bill of Quantities and/or on the drawings."

PSLB 5.1.2.1STONE DRAINAGE LAYER BENEATH BEDDING (ADD NEW SUBCLAUSE)

Add the following to the new subclause:

“Where indicated on the drawings, or as otherwise indicated by the Engineer, a 200 mm thick layer of 19 mm stone shall be placed beneath the bedding layer to act as a drainage channel for excessive groundwater. This layer shall be wrapped in approved geofabric and provided with outlet pipes if and where required or indicated by the Engineer's Representative.”

PSLB 5.1.4 COMPACTING

Replace “ 90 % ” with the following:
“93 %”

Add the following to this subclause:
"Steps will have to be taken by the Contractor to ensure that flexible pipes do not deform excessively in cross-section during and after construction and backfilling operations. The maximum deflection which will be acceptable at any stage during or after construction is 2% of the pipe diameter horizontally or vertically. The Contractor will be required to provide the necessary apparatus and to monitor deflection during construction.

Pipe deformations will only be maintained within the specified tolerances by correct backfilling practice. No heavy compaction equipment will be permitted for compaction of any pipe bedding, only pneumatic or hand rammers being acceptable. To this end, and to achieve the 93% compaction specified, it is required that the bedding material be brought up evenly on either side of the pipe. The use of complete saturation of the material as a method of achieving the specified compaction may, subject to the Engineer's approval, be used. However, in this regard, Contractors are advised that the presence of excessive quantities of water in the pipe trench could lead to flotation of the pipe.

Prior to the commencement of pipe laying the Contractor shall be required to submit, to the Engineer, for his approval, his proposed methods of placing, and compacting methods which he proposes to implement in order to ensure compliance with the specification."

PSLB 5.1.5 TESTING (ADD NEW SUBCLAUSE)

Add the following to the new subclause:

“All flexible and flanged joints shall be left exposed with a minimum of 300 mm clearance around the bottom of the pipe during hydraulic pressure testing of the pipe to facilitate inspection."

PSLB 5.2 PLACING AND COMPACTING OF RIGID PIPES

PSLB 5.2.5 STONE BEDDING (ADD NEW SUBCLAUSE)

Add the following to the new subclause:
"In areas where waterlogged conditions exist or where ordered by the Engineer, special drains consisting of a 200 mm 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 shall be measured in cubic metres at the contract rate applying to unsuitable excavation below the bottom of the trench. The stone filling shall be paid for per cubic metre and the geofabric filter shall be paid for per square metre. All measurements in this connection shall be to a width equal to the base widths and depths ordered."

PSLB 5.3 PLACING AND COMPACTING FLEXIBLE PIPES

Replace subclause with the following:

"The pipes **Bedding Cradle** shall be bedded on a minimum 100 mm thick layer of compacted granular bedding material on which a 50 mm 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 (covered with rubber to prevent damage to the pipe coating), and additional selected granular material shall be added and compacted in layers up to the midpoint of the pipe diameter in the vertical plane. 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 a level of 300 mm above the crown of the pipe is reached.

All bell holes (fox holes) holes shall be filled with bedding material."

PSLB 5.3(b) 200 MM SELECTED FILL BLANKET

Change title from " 200 mm selected fill blanket" to the following:

"Select fill blanket"

PSLB-6 TOLERANCES

PSLB-6.1 **Moisture content and density**

Degree II accuracy shall be applicable.

PSLB 8 MEASUREMENT AND PAYMENT

PSLB 8.1 PRINCIPLES

PSLB 8.1.3 VOLUME OF BEDDING MATERIALS

Add the following to this subclause:

"(c) The volume of bedding material shall be measured net i.e. the volume of the pipe is to be deducted.
(d) No additional payment shall be made for bedding material placed in bell (fox) holes."

PSLB 8.1.5 DISPOSAL OF DISPLACED MATERIAL

Replace this subclause with the following:

"Material displaced by the pipeline and by imported material from sources other than trench excavation, shall be disposed of by the Contractor at an approved site(s). No haulage shall be paid. "

PSLB 8.1.6 FREEHAUL

Replace subclause with the following:

"All haul shall be regarded as free haul. No overhaul shall be paid for under this Contract."

PSLB 8.2 SCHEDULED ITEMS

PSLB 8.2.1 PROVISION OF BEDDING FROM TRENCH EXCAVATION

Replace subclause with the following:
“(i) Without the need for screening: Selected granular material or Selected fill material
The rates shall cover the cost of acquiring, from any point along the trench excavation as may be selected by the Engineer, 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, and of disposing of displaced material. The unit of measurement is m^3.

(ii)Including for screening: Selected granular material or Selected fill material
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 Engineer, 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, and of disposing of displaced material. The unit of measurement is m^3.

PSLB 8.2.2 SUPPLY ONLY OF BEDDING BY IMPORTATION

Replace subclause with the following:
“(i) Selected granular material
(ii) Selected fill material

The rates shall cover the cost of acquiring, loading, transporting, off-loading, 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 The rate will also include the cost of undertaking proctor test for 2 samples of the granular and selected fill material."

PSLB 8.2.3 CONCRETE BEDDING CRADLE

Add the following to this subclause:

"All concrete bedding to pipes will require formwork. The rate for concrete bedding shall include for the supply, installation and stripping of all formworks."

PSLB 8.2.4 ENCASING OF PIPES IN CONCRETE

Replace “encasing the pipe in concrete… flexible joints at 4 m centres.” with the following: "encasing the pipe in concrete 150 mm thick each side of the pipe and to 150 mm above the crown of the pipe including the cost of formwork, (if any), etc. and the cost of formwork to form stop ends on either side of collars, couplings, joints, etc if instructed by the Engineer."

Add the following to this subclause:
"The rate for concrete encasing shall include for the supply, installation and stripping of all formwork."

PSLB 8.2.5 OVERHAUL OF MATERIAL FOR BEDDING CRADLE AND SELECTED FILL BLANKET

Delete this subclause.

PSLB 8.2.6 DRAINAGE LAYER (ADD NEW SUBCLAUSE)

Add the following to the new subclause:

“a) Stone filling
b) Geofabric filter material (Bidim Grade A4 or similar)

Supply and place beneath pipe, 150 mm crushed stone layer as ground water drainage layer. The excavation for these drains shall be measured in cubic metres at the tendered rate applying to unsuitable excavation below the bottom of the trench (SABS 1200 DB 8.3.2 c).

The rate for stone filling shall be per cubic metre of stone fill, measured according to a width equal to the base widths and depths ordered.

Supply and installation of geofabric filter material (BIDIM Grade A4 or similar) around stone. The rate shall be per square metre of geofabric to enclose the stone material, measured net according to a width equal to the base widths and depths ordered. The unit of measurement for this item will be m^2"

PSLG PIPE JACKING

PSLG-2.1 SUPPORTING SPECIFICATIONS

In addition, the following Department of Transport standard specifications shall apply to this Contract:

- General Conditions: Services in Road Reserve
- Special Conditions: Installation on and through Structures
- Special Conditions: Services Crossings

PSLG-5 CONSTRUCTION

- ***Add the following additional sub clauses:***

PSLG-5.4 Backfilling of thrust and reception pits:

Unless otherwise specified thrust and reception pits shall be backfilled to 90% MOD AASHTO density in maximum 300mm thick layers.

No discriminate spoiling of material will be allowed. All surplus or unsuitable material shall be spoiled in areas identified by the Contractor and approved by the Engineer. No overhaul will be paid on this contract.

PSLG-8 MEASUREMENT AND PAYMENT

PSLG-8.2.9 Measurement and payment of grouting voids:

The cost of operating equipment and supplying materials will be apportioned by the Engineer depending on the quality of work produced and if good pipe jacking practice.

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 – **30583-5W**

C3.4.2 Baseline Risk Assessment – **30583-5W**

C3.4.3 PEM: Environmental Management Specification

C3.4.4 Part AA: Dayworks (3 Pages)Part PVM - Cathodic Protection Particular Specifications (In addition the following Particular Specifications / Policies shall apply to this contract that have been included under Part C5: Annexures)

C3.4.5 Part PVM - Cathodic Protection Particular Specifications (In addition the following Particular Specifications / Policies shall apply to this contract that have been included under Part C5: Annexures)

C3.4.6 Cathodic Protection & AC Mitigation Technical Specifications
(178 Pages)

C3.4.7 eThekwini Municipality - eThekwini Water and Sanitation Departmental Specification for Steel Pipes 100mm to 2 000mm Nominal Diameter

C3.4.8 Engineering Unit Roads and Storm-Water Maintenance Department (RSWMD) Excavation and Reinstatement of Trenches in Roads and Sidewalks in the EMA Areas.

C3.4.9 eThekwini Municipality's Specification and Requirements for Traffic Management Plans

C3.4.10 eThekwini Water and Sanitation Technical Specification for Air Release and Vacuum Break Valves

C3.4.11 eThekwini Water Services Technical Specification for Waterwork Gate Valves and RSV Valves

C3.4.12 eThekwini Water and Sanitation Technical Specification for Special Anti – Theft Air Release and Vacuum Break Valves

C3.4.13 Technical Specifications – For Wafer Valves and U Section Flanged Butterfly Valves

C3.4.14 Code of Conduct

The following Particular Specifications / Policies shall apply to this contract and are available on web address:

ftp://ftp.durban.gov.za/cesu/StdContractDocs/

C3.4.1 HEALTH AND SAFETY SPECIFICATION

ETHEKWINI MUNICIPALITY

HEALTH AND SAFETY SPECIFICATION

· OCCUPATIONAL HEALTH AND SAFETY UNIT

Approved by Occupational Health & Safety Unit.

Project Description: 30583-5W: Blackburn to Phoenix 1 Grade X42 continuously welded 5km Load shift Pipeline.

C3.4.3 STANDARD ENVIRONMENTAL MANAGEMENT PLAN FOR CIVIL ENGINEERING CONSTRUCTION WORK (8 Pages)

PEM: ENVIRONMENTAL MANAGEMENT SPECIFICATION

PEM1 PURPOSE

The purpose of the EMP is to encourage good management practices through planning and commitment with respect to environmental issues, and to provide rational and practical environmental guidelines to minimise disturbance of the natural environment.

PEM2 RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT

The contractor will be responsible for environmental control on site during construction and the maintenance period. The construction activities will be monitored by an independent environmental specialist and audited against the EMP.

PEM3 TRAINING AND INDUCTION OF EMPLOYEES

The contractor has a responsibility to ensure that all those people involved in the project are aware of and familiar with the environmental requirements for the project (this includes sub-contractors, casual labour, etc.)

PEM4 COMPLAINTS REGISTER AND ENVIROMENTAL INCIDENT BOOK

Any complaints received by the project team from the community will be recorded. The complaint will be brought to the attention of the site manager.

All complaints received will be investigated and a response given to the complainant within 28 days. All environmental incidents occurring on the site will also be recorded.

PEM5 ENVIROMENTAL SAFETY

The management of impacts associated with various categories of concern is discussed as separate topics, indicated below.

PEM5.1 Soil

(a) Topsoil should be temporarily stockpiled, separately from (clay) subsoil and rocky material, when areas are cleared. If mixed with clay sub-soil the usefulness of the topsoil for rehabilitation of the site will be lost.

(b) Stockpiled topsoil should not be compacted and should be replaced as the final soil layer. No vehicles are allowed access onto the stockpiles after they have been placed.

(c) Stockpiled soil should be protected by erosion-control berms if exposed for a period of greater than 14 days during the wet season. The need for such measures will be indicated in the site-specific report.

(d) Topsoil stripped from different sites must be stockpiled separately and clearly identified as such. Topsoil obtained from sites with different soil types must not be mixed.

(e) Topsoil stockpiles must not be contaminated with oil, diesel, petrol, waste or any other foreign matter, which may inhibit the later growth of vegetation and micro-organisms in the soil.

(f)

(g) Soil must not be stockpiled on drainage lines or near watercourses without prior consent from the Project Manager.

(h) Soil should be exposed for the minimum time possible once cleared of invasive vegetation, that is the timing of clearing and grubbing should be co-ordinated as much as possible to avoid prolonged exposure of soils to wind and water erosion. Stockpiled topsoil must be either vegetated with indigenous grasses or covered with a suitable

fabric to prevent erosion and invasion by weeds.

(i) Limited vehicular access is allowed across rocky outcrops and ridges.

(j) All cut and fill surfaces need to be stabilized with appropriate material or measures when major civil works are complete.

(k) Erosion and donga crossings must be dealt with as river crossings. Appropriate soil erosion and control procedures must be applied to all embankments that are disturbed and destabilized.

(l) All equipment must be inspected regularly for oil or fuel leaks before it is operated. Leakages must be repaired on mobile equipment or containment trays placed underneath immobile equipment until such leakage has been repaired.

(m) Soil contaminated with oil must be appropriately treated and disposed of at a permitted landfill site or the soil can be regenerated using bio-remediation methods.

(n) Runoff must be reduced by channelling water into existing surface drainage system.

PEM5.2 Water

(a) Adequate sedimentation control measures must be instituted at any river crossings when excavations or disturbance of a riverbanks or riverbeds takes place.

(b) Adequate sedimentation control measures must be implemented where excavations or disturbance of drainage lines of a wetland may take place.

(c) All fuel, chemical, oil, etc spills must be confined to areas where the drainage of water can be controlled. Use appropriate structures and methods to confine spillages such as the construction of berms and pans, or through the application of surface treatments that neutralise the toxic effects prior to the entry into a water course.

(d) Oil absorbent fibres must be used to contain oil spilt in water.

(e) During construction through a wetland, the majority of the flow of the wetland should be allowed to pass downstream.

(f) Vehicular traffic across wetland areas must be avoided.

(g) No dumping of foreign material in streams, rivers and/or wetland areas is allowed.

(h) The wetland area and/or river must not be drained, filled or altered in any way including alteration of a bed and/or, banks, without prior consent from the DWAF. The necessary licenses must be obtained in terms of Section 21 and 22 of the National Water Act, 36 of 1998 from DWAF.

(i) No fires or open flames are allowed in the vicinity of the wetland, especially during the dry season.

(j) No swimming, washing (including vehicles and equipment), fishing or related activity is permitted in a wetland or river without written permission from the Project Manager.

(k) Disturbances to nesting, breeding, and roaming sites of animals in or adjacent to wetland areas must be minimized.

PEM5.3 Air

(a) Speed limits must be implemented in all areas, including public roads and private property to limit the levels of dust pollution.

(b) Dust must be suppressed on access roads and construction sites during dry periods by the regular application of water or a biodegradable soil stabilisation agent. Water used for this purpose must be used in quantities that must not result in the generation of run-

off.

(c) The site-specific investigation will quantify the impact of dust on nearby wetlands, rivers and dams in terms of sedimentation. Mitigation measures identified during the site-specific study must be implemented.

(d) The Contractor must notify the principal of all schools within 50m of the site of proposed activities. The principal must in turn ensure that children with allergies and respiratory ailments take the necessary precautionary measures during the construction period. The Contractor must ensure that construction activities do not disturb school activities e.g., dust clouds may reduce visibility affecting sports activities.

(e) Waste must be disposed of, as soon as possible at a municipal transfer station, skip or on a permitted landfill site. Waste must not be allowed to stand on site to decay, resulting in malodours.

(f) Noise control measures must be implemented. All noise levels must be controlled at the source. All employees must be given the necessary ear protection gear. IAP's must be informed of the excessive noise factors.

(g) The Contractor must inform all adjacent landowners of any after-hour construction activities and any other activity that could cause a nuisance e.g., the application of chemicals to the work surface. Normal working hours must be clearly indicated to adjacent landowners.

(h) No loud music is allowed on site and in construction camps.

(i) No fires are allowed if smoke from such fires will cause a nuisance to IAP's.

PEM5.4 Social and Cultural

(a) Access by non-construction people onto any construction sites must be restricted. The Contractors activities and movement of staff must be restricted to designated construction areas only.

(b) The Contractors crew must be easily identifiable due to clothing, identification cards or other methods.

(c) Rapid migration of job seekers could lead to squatting and social conflict with resident communities and increase in social pathologies if not properly addressed. The Contractor must ensure that signs indicating the availability of jobs are installed.

(d) Criteria for selection and appointment (by the Contractor) of construction labour must be established to allow for preferential employment of local communities. The Local Authority must be actively involved in the process of appointing temporary labourers.

(e) Sub-Contractors and their employees must comply with all the requirements of this document and supporting documents e.g., the Contract document that applies to the Contractor. Absence of specific reference to the sub-contractor in any specification does not imply that the sub-contractor is not bound by this document.

(f) No member of the construction workforce is allowed to wander around private property, except within the immediate surroundings of the site.

(g) The Contractor must provide suitable sanitation facilities for site staff.
Sanitation provided during the construction phase should be managed so that it does not cause environmental health problems. The use of the surrounding veld for toilet purposes is not permitted under any circumstance.

(h) The Contractor must arrange for all his employees and those of his sub-contractors to be informed of the findings of the environmental report before the commencement of construction to ensure:

- A basic understanding of the key environmental features of the work site and

environments, and

- Familiarity with the requirements of this document and the site-specific report.

(i) Supervisory staff of the Contractor or his sub-contractors must not direct any person to undertake any activities which would place such person in contravention of the specifications of this document, endanger his/her life or cause him/her to damage the environment.

(j) The demand for construction materials and supplies will have an effect on the local economy. This impact can be optimised by sourcing and purchasing materials locally and regionally wherever possible, insofar as the material complies with the design specification.

(k) The Contractor must maintain a detailed complaint register. This must be forwarded, together with solutions, to the authorities when requested.

PEM5.5 Aesthetics

(a) Scenic Quality

Damage to the natural environment must be minimized.

Trees and tall woody shrubs must be protected from damage to provide a natural visual shield. Excavated material must not be placed on such plants and movement across them must not be allowed, as far as practical.

The clearing of all sites must be kept to a minimum and surrounding vegetation must, as far as possible, be left intact as a natural shield.

No painting or marking of natural features must be allowed.

(b) All above ground structures could be treated or painted to blend in with the natural environment.

(c) Cut and fill areas, river and stream crossings and other soil stabilisation works must be constructed to blend in with the natural environment.

(d) Natural outcrops, rocky ridges and other natural linear features, must not be bisected. Vegetation on such features must, as far as possible, not be cut unless absolutely necessary for construction.

(e) Excavated material must be flattened (not compacted) or removed from site. No heaps of spoil material must be left on site once the Contractor has moved to a new construction site.

(f) Any complaints from interest groups regarding the appearance of the construction site must be recorded and addressed promptly by the Contractor.

PEM5.6 Archaeology and Cultural Sites

(a) All finds of human remains must be reported to the nearest police station.

(b) Human remains from the graves of victims of conflict, or any burial ground or part thereof which contains such graves and any other graves that are deemed to be of cultural significance may not be destroyed, damaged, altered, exhumed, or removed from their original positions without a permit from the South African Heritage and Resource Agency (SAHRA).

(c) Work in areas where artefacts are found must cease immediately.

(d) Under no circumstances must the Contractor, his/her employees, his/her sub-contractors, or his/her sub-contractors' employees remove, destroy or interfere with archaeological artefacts. Any person who causes intentional damage to archaeological or historical sites and/or artefacts could be penalised or legally prosecuted in terms of

the National Heritage Resources Act, 25 of 1999.

(e) A fence at least 2 m outside the extremities of the site must be erected to protect archaeological sites.

(f) All known and identified archaeological and historical sites must be left untouched.

(g) Work in the area can only be resumed once the site has been completely investigated. The Project Manager will inform the Contractor when work can resume.

PEM5.7 Flora

(a) All suitable and rare flora and seeds must be rescued and removed from the site. They must be suitably stored, for future use in rehabilitation.

(b) The felling and/or cutting of trees and clearing of bush must be minimised.

(c) Bush must only be cleared to provide essential access for construction purposes.

(d) The spread of alien vegetation must be minimized.

(e) Any incident of unauthorised removal of plant material, as well as accidental damage to priority plants, must be documented by the Contractor.

(f) Woody vegetative matter stripped during construction must either be spread randomly throughout the surrounding veld so as to provide biomass for other micro-organisms and habitats for small mammals and birds, or it may be stockpiled for later redistribution over the reinstated top soiled surface. No vegetative matter must be burnt or removed for firewood other than those removed during the grubbing and clearing phase. Such vegetation can be made available to the local inhabitants to be used as firewood.

(g) No tree outside the footprint of the Works area must be damaged.

PEM5.8 Fauna

(a) No species of animal may be poached, snared, hunted, captured or wilfully damaged or destroyed.

(b) Snakes and other reptiles that may be encountered on the construction site must not be killed unless the animal endangers the life of an employee.

(c) Anthills and/or termite nests that occur must not be disturbed unless it is unavoidable for construction purposes.

(d) Disturbances to nesting sites of birds must be minimized.

(e) The Contractor must ensure that the work site is kept clean and free from rubbish, which could attract pests.

PEM5.9 Infrastructure

(a) The relevant authorities must be notified of any interruptions of services, especially the Local Municipality, National Road Agency, Spoornet, TELKOM and ESKOM. In addition, care must be taken to avoid damaging major and minor pipelines and other services.

(b) The integrity of property fences must be maintained.

(c) No telephone lines must be dropped during the construction operations, except were prior agreement by relevant parties is obtained. All crossings must be protected, raised or relocated as necessary.

(d) All complaints and/or problems related to impacts on man-made facilities and activities must be promptly addressed by the Contractor and documented.

(e) Storage Facilities

- Proper storage facilities should be provided for the storage of oils, grease, fuels, chemicals and hazardous materials.
- The Contractor must ensure that accidental spillage does not pollute soil and water resources.
- Fuel stock reconciliation must be done on all underground tanks to ensure no loss of oil, which could pollute groundwater resources.
- Cement must be stored and mixed on an impermeable substratum.

(f) Traffic Control

All reasonable precautions must be taken during construction to avoid severely interrupting the traffic flow on existing roads, especially during peak periods.

Before any work can start the Local Traffic, Department must be consulted about measures to be taken regarding pedestrian and vehicular traffic control.

(g) Access Roads

The Contractor and the affected landowner must collaborate on the planning and construction of new access routes and the repair or upgrading of existing routes.

Access to the site must be controlled such that only vehicles and persons directly associated with the work gains access to the site.

Temporary access roads must not be opened until required and must be restored to its former state as soon as the road is no longer needed.

(h) Batching Plants

Concrete must be mixed only in an area demarcated for this purpose. All concrete spilled outside this area, must be promptly removed by the Contractor and taken to a permitted waste disposal site. After all concrete mixing is complete, all waste concrete must be removed from the batching area and disposed of at an approved dumpsite. Stormwater must not be allowed to flow through the batching area. Water laden with cement must be collected in a retention area for evaporation and not allowed to escape the batching area. Operators must wear suitable safety clothing.

(i) Chemical toilet facilities should be managed and serviced by a qualified company. No disposal or leakage of sewerage should occur on or near the site.

(j) Blasting

Blasting must not endanger public or private property.

Noise mufflers and/or soft explosives must be used to minimize the impact on animals.

All the provisions of the Explosives Act, 26 of 1956 and the Minerals Act, 50 of 1991 must be complied with.

The Contractor must take measures to limit fly-rock.

PEM5.10 Safety

(a) Measures must be taken to prevent any interference that could result in flashover of power lines due to breaching of clearances or the collapse of power lines due to collisions by vehicles and equipment.

(b) Measures must be taken during thunderstorms to protect workers and equipment from lightning strikes.

(c) All tall structures must be properly earthed and protected against lightning strikes.
(d) The process of excavation and back filling must be carried out as a sequential process following one another as quickly as possible. Excavations must only remain open for a minimum period of time and during this time they must be clearly demarcated. If excavations place the public at risk these sites must be fenced.

(e) The residents directly affected by open trenches must be notified of the dangers. This will be done during the site-specific phase.

PEM5.11 Waste

Solid Waste

(a) Littering on site and the surrounding areas is prohibited.

(b) Clearly marked litterbins must be provided on site. The Contractor must monitor the presence of litter on the work sites as well as the construction campsite.

(c) All bins must be cleaned of litter regularly.

(d) All waste removed from site must be disposed at a municipal/permitted waste disposal site.

(e) Excess concrete, building rubble or other material must be disposed of in areas designated specifically for this purpose and not indiscriminately over
(f) the construction site.
(g) The entire works area and all construction sites must be swept of all pieces of wire, metal, wood or other material foreign to the natural environment.

(h) Contaminated soil must be treated and disposed of at a permitted waste disposal site or be removed and the area rehabilitated immediately.

(i) Waste must be recycled wherever possible.

Liquid Waste

(a) The Contractor must maintain mobile toilets on site.

(b) The Contractor must provide adequate and approved facilities for the storage and recycling of used oil and contaminated hydrocarbons. Such facilities must be designed and sited with the intention of preventing pollution of the surrounding area and environment.
(c) All vehicles must be regularly serviced in designated area within the Contractors camp such that they do not drip oil.

(d) All chemical spills must be contained and cleaned up by the supplier or professional pollution control personnel. Run-off from wash bays must be intercepted.

Hazardous Waste

(a) No hazardous materials must be disposed of in the veld or anyplace other than a

registered landfill for hazardous material. Hazardous waste must be stored in containers with tight lids that must be sealed and must be disposed at an appropriately permitted hazardous waste disposal site. Such containers must not be used for purposes other than those originally designed for.

(b) The Contractor must maintain a hazardous material register.

PEM5.12 Rehabilitation and Site clearance

(a) When all major construction activities are completed, the site must be inspected to determine site-specific rehabilitation measures. This may be considered as unplanned work e.g., soil rehabilitation due to oil spills.

(b) All temporary buildings and foundations, equipment, lumber, refuse, surplus materials, waste, construction rubble fencing and other materials foreign to the area must be removed.

(c) If waste products cannot be recycled, they must be disposed of at a permitted landfill site.

(d) All drainage deficiencies including abandoned pit latrines and waste pits must be corrected.

(e) Cut and fill areas must be restored and re-shaped.

(f) The area must be restored to its natural vegetation condition using indigenous trees, shrubs and grasses as directed by a grassland and/or rehabilitation expert.

(g) Borrow pits must be re-shaped into even slopes and surfaces to blend with the natural terrain and topsoil must be replaced.

(h) The grass mix, shrubs and trees used for rehabilitation must be compatible with the species identified in the site-specific investigation.

(i) Areas compacted by vehicles during construction must be scarified to allow penetration of plant roots and the regrowth of natural vegetation.

PEM6 MEASUREMENT AND PAYMENT

An item has been included in the Bill of Quantities to comply with the above actions.

C3.4.4 DAYWORKS (3 Pages)

PAA: PARTICULAR SPECIFICATION: DAYWORK SCHEDULE

PAA.1 GENERAL

In cases where the Engineer orders any variation in the form, quality or quantity of the work or any extra work to such an extent that the tendered rates for specific items are no longer applicable, or where a combination of tendered rates cannot be applied to compensate for such work, the Engineer may, in terms of the General Conditions of Contract, order that the amended or extra work be carried out as daywork at the cost of labour, plant and materials. For that purpose, provision is made for the Contractor to tender his rates for labour and plant in the Daywork Schedule which forms part of this contract.

No work will be measured as daywork unless:

a) The Engineer agrees that the varied work is not in accordance with the specification or scope of a measured item in the contract.

b) The Engineer has issued an order in writing for the execution of such varied work; and

c) Statements of plant and labour are submitted daily to the Engineer for his consideration and approval.

All work valued at the tendered rates in the Daywork Schedule will be subject to contract price adjustment as applicable to the Contract.

PAA.2 SALARIES AND WAGES OF WORKMEN

The amount to be paid for labour will be based on the rates tendered in the Daywork Schedule for the workers executing the work. The tendered rates shall be all-inclusive and shall be held to cover all charges for the Contractors profits, timekeeping, clerical work, insurance, establishment, superintendence, the use of hand tools, etc., and no additional surcharge over and above the tendered rates will be applicable.

PAA.3 CONSTRUCTIONAL PLANT

The rates for constructional plant as tendered in the Daywork Schedule shall cover all costs, overheads and profit for the contractor and no further surcharge will be payable on the tendered rates. The cost of operators shall be included in the tendered rates except where otherwise specified in Clause PAA-5 (Measurement and Payment) hereafter. Where plant or equipment for which no rates exist in the Daywork schedule are employed, the cost thereof shall be determined as agreed with the Engineer in terms of the General Conditions of Contract. In such case contract price adjustment will only be applicable if the agreed cost is based on rental rates at the time of the base month before closing of tenders, or if the ruling rates current at the time of the execution of the work are de-escalated to the base month.

The Contractor will be paid for the transport to and from the site of constructional plant not on site and specially ordered by the Engineer to be brought on site. No payment will be made for transport of equipment listed in the Contractor's Schedule of Constructional Plant in the tender document, or for equipment which has been removed from the site on request of the Contractor, or for equipment already on site, regardless of whether it appears on the Schedule of Constructional plant or not.

PAA.4 MATERIALS

Materials required for daywork items which cannot be compensated under existing rates and have to be purchased, will be paid for at cost, excluding VAT, plus a surcharge of 15%. The cost of materials provided for daywork at current rates at the time when the work is executed, will not be subject to contract price adjustment unless the prices of the materials are de-escalated to the base month for escalation.

PAA.5 MEASUREMENT AND PAYMENT

Item		Unit
PAA.5.1	**Labour**	
(a)	Unskilled workers	hour (h)
(b)	Skilled workers (Artisans)	hour (h)
(c)	Operators and drivers (where measured separately)	hour (h)
(d)	Foremen	hour (h)
(e)	Others (specify)	hour (h)

The unit of measurement is the hour or part thereof during which workers were engaged in daywork.

The tendered rate shall include full compensation for all salaries, wages, bonuses, pension, insurance, medical aid and other benefits as well as overheads arising from administrative personnel, site agents, supervisors, tools and profit. No surcharge will be paid on the tendered rates

The cost of operators included in the rates for constructional plant, will not be measured again under Labour.

Item		Unit
PAA.5.2	**Constructional Plant**	
(a)	Lowbed transport of plant to and from the site……ton-kilometre (t.km)	
(b)	Bulldozer and ripper	
(i)	..... (Specify power and mass).....	hour (h)
(ii)	..... etc. (for other bulldozers)	hour (h)
(c)	Grader	
(i)	..... (Specify power and mass).....	hour (h)
(ii)	..... etc. (for other graders)	hour (h)
(d)	Front-end loaders	
(i)	..... (Specify type, power and mass).....	hour (h)
(ii)	..... etc. (for other front-end loaders)	hour (h)
(e)	Back-acting excavators	
(i)	..... (Specify type, power and mass).....	hour (h)
(ii)	..... etc. (for other back-acting excavators)	hour (h)
(f)	Tractors and drawn rollers and trailers	
(i)	Tractor..... (Specify type, power and mass)	hour (h)
(ii)	Roller..... (Specify types, masses)	hour (h)
(iii)	Tractor with trailer, complete (Specify tractor, and type and capacity of trailer) ……	hour (h)
(g)	Compactors	
(i)	..... (Specify type and mass).....	hour (h)
(ii)	..... etc. (for other types and masses).....	hour (h)
(h)	Compressors	
(i)	..... (Specify capacity and number of tools).....	hour (h)
(ii)	..... etc. (for other compressors and tools)	hour (h)

(i) Trucks

(i) ..... (Specify type, and capacity) ..... hour (h)
(ii) ..... etc. (for other trucks) ..... hour (h)

(j) Light delivery vehicles

(i) ..... (Specify load capacity) .....kilometer (km)
(ii) ..... etc. (for other) .....kilometer (km)

Item Unit

PAA.5.3 Cost of materials delivered to .....site (specify) P-Sum or as scheduled

The unit of measurement for subitem 5.2(a) is the ton constructional equipment multiplied by the kilometer distance over which the plant has been transported with a lowbed transporter as ordered by the Engineer.

The unit of measurement for subitems 5.2(b) to (i) is the hour or part thereof during which the item of plant had been in active use for the daywork operation, including stopping time of less than five minutes.

Where applicable travel time to and from the normal parking position on site, or the position of the most recent non-daywork activity, as well as stopping time exceeding five minutes shall be multiplied by a factor of 0,6. Time shall be measured by means of a vibrating clock card.

The unit of measurement for subitem 5.2(j) is the kilometer travelled to collect or transport small quantities of materials. Kilometers travelled in light delivery vehicles by supervisors in the execution of normal supervision duties, shall not be measured for payment.

The tendered rates shall include full compensation for the supply, maintenance, service, repairs, depreciation as well as fuel, lubricants, licensing, insurance, overheads, and profit. It shall also include the cost of drivers and operators except in the case of subitem PAA-5.2(h) where the operators of tools are paid for under labour.

C3.4.5: PVM CATHODIC PROTECTION

PVM 1 CATHODIC PROTECTION SYSTEM

PVM 1.1 Cathodic Protection System - Professional Services

In order to assess the need or otherwise for Cathodic Protection (CP), a specialist CP consultant, is required to carry out the following in accordance with the requirements of NACE SP0169-2007 Control of External Corrosion on Underground or Submerged Metallic Piping Systems for Cathodic Protection Installations:

- Soil resistivity survey
- Stray current survey
- Anode ground bed identification survey
- Design of a suitable CP system(s)
- Prepare enquiry documentation, and invite quotations, for the CP installation
- Prepare and submit a report on the quotations/tenders received
- Inspect the CP materials and equipment to be supplied by the CP sub-contractor so as to ensure compliance with the specifications
- Inspect the CP sub-contractor's installation work from time to time during the pipelaying construction period
- Pipe to soil potential survey(s)
- PCM (Pipe Current Mapping) or DCVG (Direct Current Voltage Gradient) coating integrity surveys along the full length of the pipeline after laying and backfilling of the pipe up to 300 mm above the crown of the pipe. (PCM testing method will be used except in the vicinity of Eskom's HV overhead power lines where the DCVG method of testing will be used).
- Commission and handover of the CP system complete with three copies of the Operation & Maintenance Manuals
- Issue a certificate of completion for the whole CP installation.

PVM 1.2 Cathodic Protection System - Supply and Installation

The supply and installation of all of the components of the CP system shall be carried out by the pipelaying Contractor who shall engage the services of a suitably experienced specialist CP sub-contractor to carry out the work on site in accordance with the requirements of the Engineer who will receive technical guidance from the Employer's CP consultant referred to above.

Details of certain elements of the CP system that are to be supplied and installed under this Contract are specified below and/or are shown on the drawings.

A provisional sum has been included in the Bill of Quantities to cover the cost of supplying, transporting, installing, testing and commissioning of certain components of the CP System.

PVM 2 Continuity Bonding of Steel Pipelines

Electrical continuity along the steel pipeline is to be implemented by linking together individual pipes and fittings, where not jointed by welding to one to another, by bonding as follows:

Immediately after each joint in the steel pipeline is fitted, whether it be a coupling, flanged joint, or adaptor joint, and whether connecting valves, fittings or pipes, the two adjacent metallic pipes, or pipe and valve, pipe and fittings, or as the case may be, shall be electrically bonded together by two separate bonds each of copper not less in equivalent

cross sectional area than 35 mm2 copper wire bifurcated at each end and welded at each end by two No 15 Cadwelds or equivalent approved means to the end of the pipe, valve or fitting in such a manner as not to damage the internal lining of the pipeline. Butyl putty shall be packed over the exposed copper cable adjacent to the weld block to prevent the copper strands from burning. The bonds and their Cadwelds are to be so placed as not to interfere with the completing of the external protection around couplings and the pipe wrapping shall be made good if it is in any way disturbed by the bonds and Cadwelds. The four welds on each side of the joint are to be tested by tapping the weld lightly with a 1 kg hammer.

In addition, test points are to be provided as required by the cathodic protection specialist and as directed on site for each section of steel pipeline. Test points are to comprise two 16 mm2 stranded black PVC covered wires bonded to the pipeline and led to the surface where they are to be clamped to a concrete marker pole set to protrude at least 600 mm above the ground and the wires are to terminate in a terminal box with a cover plate set into the concrete pole. The wires shall be protected by galvanised steel tubular conduits to avoid exposure.

To ensure electrical continuity at all times, the Contractor shall be responsible for supplying and installing, at his own cost temporary conductors as the laying and jointing proceeds. Under no circumstances may any section of the pipeline remain electrically discontinuous and thus unprotected against electrolytic corrosion from the main pipeline for more than 24 hours.

PVM 3 INSULATED FLANGED JOINTS

PVM 3.1 Insulating Flange Sets

The flange insulating sets shall be supplied complete. Each set must include an insulating gasket, insulating sleeves, two insulating washers and two machined steel washers per bolt, and an explosion proof spark gap. The entire insulating flanged joint is to be factory assembled and tested prior to delivery to the Site and shall be proved to be electrically discontinuous on completion of the project.

After the assembly of the joint and hydraulic pressure testing, the entire insulating flange shall be wrapped circumferentially with a white PVC backed polymer modified bituminous tape 1,5 to 2,0 mm thick with a minimum 25 mm overlap.

The insulating sets must be suitable for use with standard raised face flanges and shall comprise the following:

PVM 3.1.1 Insulating Gaskets

The insulating gasket shall be made from sheet material of thickness 3 mm ± 1 mm. The material shall be fabric based laminated thermo setting phenolic to minimum specification BS 2572:1990 and BS EN 60893-3-4: 2004. When tested in accordance with Appendices A-P it shall be of the equivalent or better than the figures quoted for Type F5 material. This gasket shall be faced with Nitrile on both sides with a thickness of 0,8 mm to 1 mm and a Shore hardness from 75 to 90. This material shall be factory bonded onto the gasket.

PVM 3.1.2 Insulating Sleeves

The insulating sleeves shall be made from material which when tested in accordance with Appendices A-K of BS 1314 shall be the equivalent of or better than the figures quoted to Type B.

The wall thickness shall be not less than 1,5 mm. The sleeves shall be of length to give a total longitudinal gap of 1 mm at the ends when the flange bolts are fully tightened (i.e. the sleeves shall be 1 mm shorter than the final distance between the outsides of the insulating washers). The outside diameter of the sleeve must be not less than 1,5 mm in diameter smaller than the flange hole for each class and size of flange as detailed in ASA B.16.5-1961.

PVM 3.1.3 Insulating Washers

Insulating washers are to be of sheet material, not less than 4 mm thick. The material shall be fabric based laminated thermo setting phenolic to minimum specification BS 2572: 1990 and BS EN 60893-3-4: 2004. When tested in accordance with Appendices A-P it shall be of the equivalent or better than the figures quoted for Type F5 material. The diameter and material of the washer must suit the flanges and insulating sleeves, for each class and size at the stated test pressures. The washers shall have truly paralleled faces and they shall not deform or crack under the stress of tightening the flange bolts or during testing.

PVM 3.1.4 Machined Steel Washers

The steel washers shall have machined and truly parallel faces and shall be of dimensions to suit the bolts and nuts and insulating washers. These washers shall be of suitable material, and shall have a thickness of not less than 4 mm.

PVM 3.1.5 Lightning Protection

An explosion proof spark gap type "Denn ex FS" with tungsten copper discharge or similar approved device is to be securely fixed across the insulated flange by means of one of the flange bolts ie the brackets are to be in contact with the face of each flange.

The spark gap is to ensure electrical discontinuity at all times except during high voltage build up due to lightning.

PVM 4 MEASUREMENT AND PAYMENT

PVM 4.1 Continuity Bonding at Joints and Test Points..... Unit: Prov Sum

Allow the Provisional Sum of R 250 000 for the supply, installation, testing and commissioning of transformer rectifier unit and or national drain unit

PVM 4.2 Continuity Bonding at Joints..... Unit: No

Electrical continuity bonding (and the associated repair of pipe coating) will be measured and paid per joint (other than welded joints) completed as specified in PVM 2. Each continuity joint comprises two 35 mm2 x 19 strand double insulated copper cables fastened with eight suitably sized thermit welds and all necessary repairs to damaged pipe coatings.

PVM 4.2 Test Points ..... Unit: No

Test points will be measured and paid per test point complete as specified in PVM 2 above

PVM 4.4 Insulating Flanged Joints..... Unit: No

Extra over the foregoing respective items (Note - "the forgoing items" refer to pipework items) for the supply and installation of Insulating Flange kits complete as specified in PVM 3 above including high tensile bolts and nuts and all insulating sleeves and washers and spark gaps including for ensuring electrical continuity and watertightness during hydraulic pressure

C3.4.14 CODE OF CONDUCT

ETHEKWINI MUNICIPALITY

CODE OF CONDUCT

Applicable to the Procurement of Goods, Services, Engineering and Construction Works

1. INTRODUCTION

Section 217. (1) of the Constitution of the Republic of South Africa reads as follows:
"When an organ of state in the national, provincial or local sphere of governments, or any other institution identified in national legislation, contracts for goods or services, it must do so in accordance with a system which is fair, equitable, transparent, competitive and cost-effective".

It goes without saying that, in addition to the foregoing requirements, it is essential that the procurement of goods and services, including engineering and construction works, by eThekwini Municipality should not be affected, or tainted, by illegal action, or default, at any stage of the process, by any party involved.

The foregoing serves to establish the broad framework within which an action, or default, by any party to the procurement process should be judged. Any action, or default, which conflicts with the objectives of section 217. (1) of the Constitution, or which is illegal, is unacceptable.

A party to the procurement process, who wittingly, commits an unacceptable action, or default, renders itself liable to the appropriate sanction, or even, in the case of an illegal action, or default, to prosecution.

This document contains examples of actions, or defaults, by parties to the public procurement process, which are unacceptable. The lists of examples are, however, not exhaustive and each party must, itself, assess whether an action, or default, would be unacceptable in the light of section 217. (1) of the Constitution, or be illegal.

2. INVOLVEMENT OF PARTIES IN THE PROCUREMENT PROCESS

The various parties that could be involved in the procurement of goods, services and engineering and construction works by a public process are the following, which are denoted by capital initial letters in this document.

Employer: Any Output Unit or Department within eThekwini Municipality procuring goods, services or engineering and construction works, including other public bodies/ partners assisting in, or exercising control over, the procurement process e.g. Procurement and Tenders Sub-Committee etc.

Official: An employee of the Employer.

Agent: One who acts on behalf of the Employer.

Consultant: A professional service provider engaged by the Employer.

Tenderer: One who submits a competitive bid for the supply of goods, services, or engineering and construction works to the Employer.

Contractor: The successful Tenderer to whom the Employer awards the contract for the supply of goods, services, engineering or construction works.

Subcontractor: One who contracts to a Contractor to assist the latter in the execution of his/her contract by supplying certain goods, services, or works.

Representative: A political, or other, representative of the public, or of the private sector, who serves on the Procurement and Tenders Sub-committee responsible for policy, oversight of the appointment process or approving any aspect of procurement by eThekwini Municipality.

3. UNACCEPTABLE ACTIONS AND ESSENTIAL PRACTICES

Examples of actions which are unacceptable and essential practices, which would constitute unacceptable defaults if not observed, are given below. The schedules are not exhaustive, but serve to highlight unacceptable actions and defaults which are more commonly encountered.

3.1 The Employer

The Employer should, himself, or through his officials, or agents:

3.1.1 Not invite tenders without having a firm intention to proceed with the procurement.
3.1.2 Ensure that the basis on which tenders will be adjudicated is clearly set out in the tender documents and that tenders are adjudicated and awarded accordingly.
3.1.3 Ensure that the tender documents are clear and comprehensive and set out the rights and obligation of all parties.
3.1.4 Not breach the confidentiality of information, particularly intellectual property, provided by Tenderers in support of their tenders.
3.1.5 Not attempt to “trade off” Tenderers against each other in an attempt to obtain better offers.
3.1.6 Ensure that all Tenderers are fairly treated and that tenders are adjudicated without bias.
3.1.7 Ensure that, except when extra ordinary circumstances dictate otherwise, transparency is maintained in the tendering process. This implies, *inter alia,* inviting tenders as widely and publicly as possible, opening tenders in public and reading out/ making available key information, such as tender prices, basic award criteria and times required for completion, and, in due course, making known to unsuccessful Tenderers the outcome of the adjudication process.
3.1.8 Ensure that his/her obligations in terms of contracts with Contractors and Consultants are scrupulously and timeously met, particularly in regard to making payments and giving decisions.

3.2 Officials

An Official should: -

3.2.1 Strictly observe all code of conduct laid down by the Employer.
3.2.2 Ensure that he is not responsible for an unacceptable action, or default, being attributed to the Employer.
3.2.3 Not allow himself/herself to be influenced in the execution of his/her duties by any consideration other than the legitimate and reasonable interests of the Employer.
3.2.4 Not accept any gifts, favours or other considerations, of anything more than token value from any other party to the procurement process.
3.2.5 Administer contracts in an even-handed manner.
3.2.6 Disclose any circumstance which may possibly be construed as constituting a conflict of interest and excuse himself/herself from deliberations in such matters

3.3 Agents

An Agent should, insofar as is relevant, act in the same way as the Official is expected to act in terms of Section 3.2.

3.4 Consultants

A Consultant should:

3.4.1 Strictly observe the code of conduct laid down by the body governing his/her profession.
3.4.2 Act in an impartial manner towards all other parties in the procurement process and take account of the legitimate and reasonable interests of them all.
3.4.3 Not accept gifts, favours or other considerations, of anything more than token value from any other party to the procurement process.
3.4.4 Not undermine the development objectives of the Employer through tokenism, fronting or any other misrepresentation.
3.4.5 Disclose any circumstance which may possibly be construed as constituting a conflict of interest and excuse himself/herself from deliberations in such matters.

3.5 Tenderers

A Tenderer should:

3.5.1 Not, except for the purpose of joint venture formation, become involved in collusion with other Tenderers, or potential Tenderers.
3.5.2 Not exchange information regarding tenders with any other Tenderer prior to the closing date for tenders.
3.5.3 Not knowingly price his/her tender in such a way as to gain an unfair advantage from an obvious error, or oversight, in the tender documents.
3.5.4 Not attempt, in any way, to influence the tender adjudication process.
3.5.5 Not approach any Representative or Official directly in connection with a tender, subsequent to the closing of all tenders.
3.5.6 Tenders only on projects for which they are capable of executing with the resources they are able to marshal in accordance with the terms and conditions of contracts.

3.6 The Contractor

The Contractor should:

3.6.1 Undertake the contract with the objective of fulfilling it in accordance with the needs of and in the best interests of the Employer and, in pursuit of this objective, co-operate with all other parties in the procurement process.
3.6.2 Aim to meet all statutory and contractual obligations fully and timeously in regard to, inter alia, conditions of employment, occupational safety, training, employment of subcontractors and fiscal matters.
3.6.3 Not attempt to influence the judgement, or actions, of Consultants, Officials/Agents, or Representatives by inducements of any sort.
3.6.4 Employ Subcontractors only on the basis of fair, unbiased, written subcontracts.
3.6.5 Not engage in unfair, or unethical, practices in order to drive subcontract prices down.
3.6.6 Not make unwarranted claims for additional payment, or time, in the belief that “nothing ventures, nothing gains”.
3.6.7 Not approach any Representative directly in connection with a contract.
3.6.8 Not undermine the development objectives of the Employer through tokenism, fronting or any other misrepresentation.

3.7 Subcontractors

A Subcontractor should, insofar as is relevant, act in the same way as the Contractor is expected to act in terms of Section 3.6.

3.8 Representatives

A Representative should:

3.8.1 Perform his duties in an unbiased and conscientious manner, bearing in mind the legitimate interest of all parties to the procurement process and the public.
3.8.2 Not entertain representations, except through the Employer or such person as may be delegated by the Employer, from any Consultant, Tenderer, Contractor, or Subcontractor, in regard to a tender, or contract.
3.8.3 Not allow himself to be unduly influenced by, or accept any gifts, favours or other considerations from any party which might have an interest in the procurement process.
3.8.4 Disclose any circumstance which may possibly be construed as constituting a conflict of interest and excuse himself/herself from deliberations in such matters.

3.9 Penalties

Where there is non-compliance with this code of conduct, sanctions and/penalties will be applied as follows:

3.9.1 Officials and Representatives

Reference to the Multi-Disciplinary Team in the first instance and thereafter, appropriate action by Management, if applicable.

3.9.2 Contractors/suppliers

Depending on the severity of the non-compliance, a contractor/supplier may be disqualified as a registered contractor/supplier for a period of not less than six months. Over and above that financial penalties may be imposed in terms of the Conditions of Contract.

C3.5: CONTRACT AND STANDARD DRAWINGS

C3.5.1 CONTRACT DRAWINGS / DETAILS

The drawings issued to Tenderers as part of the tender documents must be regarded as provisional and preliminary for the tenderer's benefit to generally assess the scope of work.

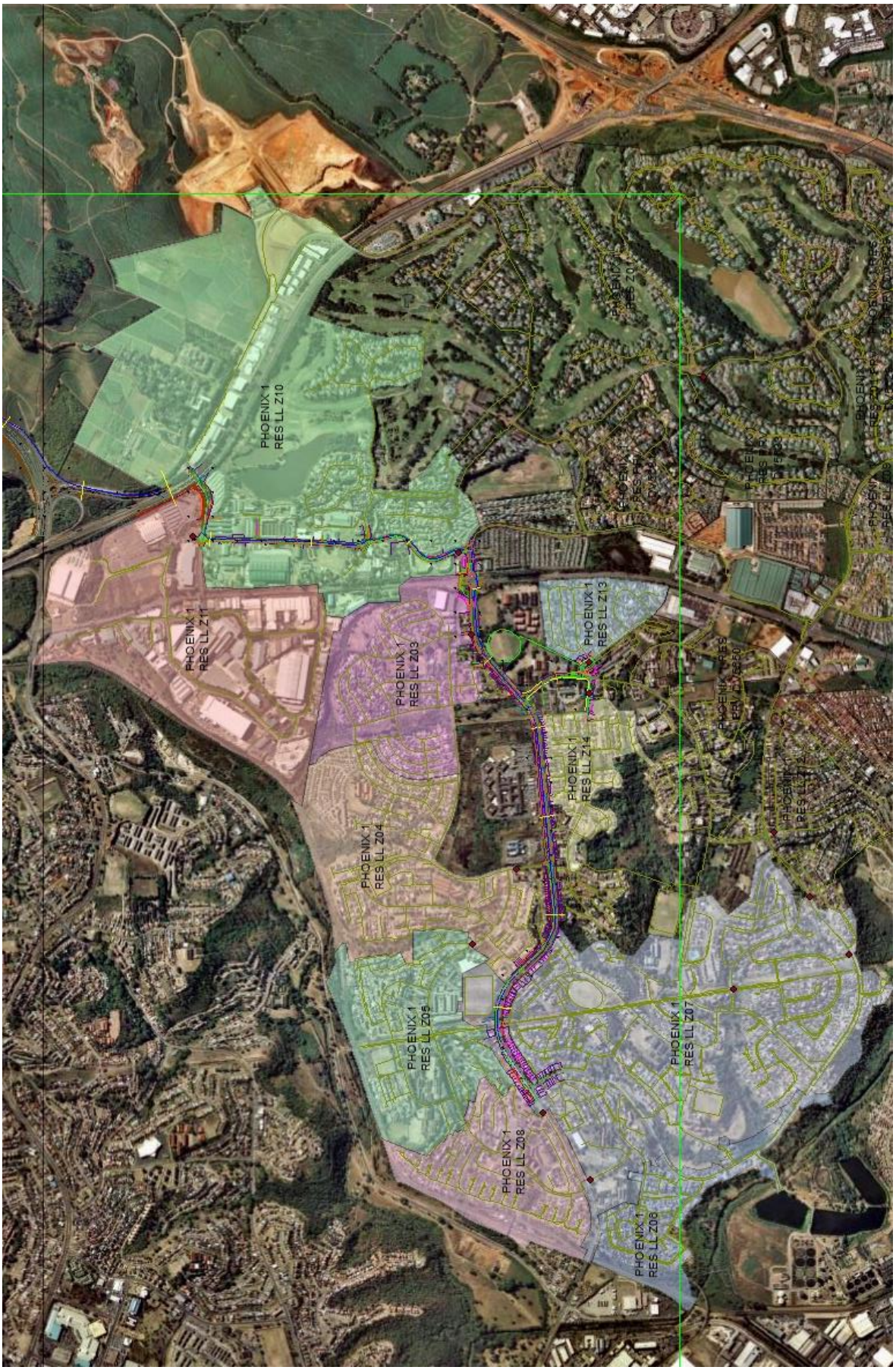
The drawings are issued as a separate book of drawings. The work shall be carried out in accordance with the latest available revision of the drawings approved for construction (AFC). At commencement of the contract, the Engineer shall deliver to the contractor copies of the AFC drawings and any instructions 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.

Drawings issued separately are listed in the Book of Drawings. Drawings issued as part of this volume are listed hereafter. All drawings and specifications and copies thereof remain the property of the Employer, and the Contractor shall return all drawings and copies thereof to the Employer at the completion of the contract. The Reference Drawings to which these Standard Engineering Specifications refer are listed below.

PART C4: SITE INFORMATION

C4.1 LOCALITY PLAN

The study area falls under Ward 35, 48, and 102 and is located in the Northern Operational area of eThekwini Municipality at the following midpoint: Y: 29°42'22.7'' X: 31°02'22.01''. A section of the pipe is to be constructed in the proposed Go Durban C9 corridor route, which is currently undeveloped (greens fields), with the remaining section to be constructed in a built-up area comprising of existing residential units with access road and pathways as seen in figure 1 below study.


PHOENIX 1
RES LL Z10
PHOENIX 1
RES LL Z11
PHOENIX 1
RES LL Z03
PHOENIX 1
RES LL Z13
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RES LL Z14
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RES LL Z04
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RES LL Z05
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RES LL Z07
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RES LL Z08
PHOENIX 1
RES LL Z06

C4.2 CONDITIONS ON SITE

Refer to Geotechnical Report attached for site conditions.

C4.3 Project Name Board