CLUSTER

TRADING SERVICES

UNIT

WATER AND SANITATION

DEPARTMENT

SPECIAL PROJECTS

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: **30976-5W**

Contract Title: **Verulam and Umdloti Wastewater Treatment Works in the Northern Sewer Drainage Catchment: Storm damage repairs**

Est. CIDB Grade/ Class: **7 CE**

CLARIFICATION MEETING AND QUERIES

Clarification Meeting: **Compulsory Clarification Meeting**

Meeting Location, Date, Time: **eThekwini Verulam Waste Water Plant, 32 As-Salaam Rd, Riyadh, Verulam**
On 14 April 2025 at 10h00

Queries can be addressed to: The Employer's Agent's Representative: **Siduduzo Mtshali. Email queries to be submitted by 23 April 2025 and consolidated question and answers will be uploaded 30 April 2025**
Tel: 031-311-8794
eMail: Siduduzo.mtshali@durban.gov.za eMail: Siduduzo.mtshali@durban.gov.za

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, 09 May 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: Special Projects

Date of Issue: 12/03/2025

Document Version 24/02/2023(c)

FOR OFFICIAL USE ONLY

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

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PART T1: TENDERING PROCEDURES

T1.1.1: TENDER NOTICE AND INVITATION TO TENDER

Tenders are hereby invited for the storm damaged repairs of the Verulam and Umdloti Wastewater Treatment Works in the Northern Sewer Drainage Catchment, over the period not exceeding 36 months.

Subject	Description	Tender Data Ref.
Employer	The Employer is the eThekwini Municipality as represented by: Deputy Head: **Special Projects**	F.1.1.1
Tender Documents	Documents can only be obtained in electronic format, 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 **7 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	**eThekwini Verulam Waste Water Plant, 32 As-Salaam Rd, Riyadh, Verulam** **On 14 April 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: **Siduduzo Mtshali. Email queries to be submitted by 23 April 2025 and consolidated question and answers will be uploaded 30 April 2025** **Tel: 031-311-8794** **eMail: Siduduzo.mtshali@durban.gov.za**	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, 09 May 2025** at or before **11h00**.	F.2.15
Evaluation of Tender Offers	**The 80/20** Price Preference Point System, as specified in the PPPFA Regulations 2022 will be applied in the evaluation of tenders. Refer to Clause F.3.11 of the Tender Data for the **Specific Goal(S)** for the	F.3.11

awarding of Preference Points, and other related evaluation requirements.

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 contract are the NEC4 Professional Services Contract (June, 2017), copies of which may be obtained from the South African Institution of Civil Engineering (tel 011-805 5947) or Engineering Contract Strategies (tel 011 803-3008) and the additional conditions contained in the Z clauses below.

The following additional conditions of tender apply:

The contract may only be awarded to a Tenderer who is not directly or indirectly involved in the contract which requires the Programme Management and Cost Consulting services as such involvement will be construed as a conflict of interest.

The Tenderer shall notify the Employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the employer to prequalifying the Tenderer, prior to being invited to submit a tender offer, and obtain the Employer's written approval to do so prior to the closing time for tenders before making such changes.

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

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

The Employer shall only accept the tender offer, if in the opinion of the Employer, it does not present any unacceptable commercial risk and only if the Tenderer:

a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement,
b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract,
c) has the legal capacity to enter into the contract,
d) is not insolvent, in receivership, bankrupt or being wound up, has his affairs administered by a court or a judicial officer, has suspended his business activities, or is subject to legal proceedings in respect of any of the foregoing,
e) complies with the legal requirements, if any, stated in the tender data, and
f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

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: **Special Projects**

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

1) This procurement document.

2) The conditions of contract are the NEC4 Engineering and Construction Contract (June, 2017), copies of which may be obtained from the South African Institution of Civil Engineering (tel 011-805 5947) or Engineering Contract Strategies (tel 011 803-3008) and the additional conditions contained in the Z clauses below.

3) 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.

4) "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.

5) Drawings, issued separately from this document, or bound in Section C3.4 (as an Annexure).

6) 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's Representative is:

Siduduzo Mtshali. Email queries to be submitted by 23 April 2025 and consolidated question and answers will be uploaded 30 April 2025
Tel: 031-311-8794

eMail: Siduduzo.mtshali@durban.gov.za

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

Joint ventures are eligible to submit tenders provided that:

(a) Every member of the joint venture is registered (as "Active") with the CIDB (at time of tender closing),

(b) The lead partner has a contractor grading designation in the 7 **CE** class of construction work and has a grading designation of not lower than one level below the required grading designation, and

(c) The combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations (2013) is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a 7 **CE** class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.

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

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

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

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:
eThekwini Verulam Waste Water Plant, 32 As-Salaam Rd, Riyadh, Verulam
On 14 April 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. : **30976-5W**
- Contract Title : **Verulam and Umdloti Wastewater Treatment Works in the Northern**

Sewer Drainage Catchment: Storm damage repairs

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, 09 May 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.2.20 **Submit securities, bonds, policies:** The tenderer is required to submit with his tender a letter of intent from an approved insurer undertaking to provide the Performance Bond to the format included in T2.2 of this procurement document.

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

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

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

Tax Clearance

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

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

Failure to comply will make the tender non-responsive.

Compensation Commissioner

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

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

Failure to comply will make the tender non-responsive.

Central Supplier Database (CSD)
Reference is also to be made to returnable form T2.2.14: "Eligibility: CSD Registration Report".

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

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

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

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

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

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

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

F.3: THE EMPLOYER'S UNDERTAKINGS

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

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

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

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

Eligibility

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

Functionality

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

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

"Additional Conditions of Tender".

Price Points

The **80/20** preference points system will be applied. The Formula used to calculate the **Price Points (max. 80)** will be according to that specified Regulation 4.1.

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: 40%

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

Ownership Categories	Criteria	80/20	90/10
Race: Black (w1)	Equals 0%	0	n/a
	Between 0% and 51%	1,28	n/a
	Greater or equal to 51% and less than 100%	2,56	n/a
	Equals 100%	3,2	n/a
Gender: Female (w2)	Equals 0%	0	n/a
	Between 0% and 51%	0,96	n/a
	Greater or equal to 51% and less than 100%	1,92	n/a
	Equals 100%	2,4	n/a
Disabilities (w3)	Equals 0%	0	n/a
	Between 0% and 51%	0,96	n/a
	Greater or equal to 51% and less than 100%	1,96	n/a
	Equals 100%	2,4	n/a
	Maximum Goal Points:	8	n/a

The **Weightings** of the **Ownership Categories** will be:
- w1 = 40%, w2=40%, w3=20% (where: w1 + w2 + w3 = 100%)

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

- **RDP Goal: The promotion of South African owned enterprises**
  Goal Weighting: 40%

  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	80/20	90/10
Not in South Africa	0	n/a
South Africa	2	n/a
Kwa Zulu Natal	4	n/a
eThekwini Municipality	8	n/a
Maximum Goal Points:	8	n/a

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

- **RDP Goal: The promotion of enterprises located in a specific municipal area**
  Goal Weighting: 20%

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

Municipal Area	80/20	90/10
Not within eThekwini Municipality	0	n/a
Within eThekwini Municipality	4	n/a
Maximum Goal Points:	4	n/a

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.3.13 **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 NEC 4 Dispute Resolution Service Contract and the Contract Data.

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

Tenderers are to include, with their "hard copy" submission, a memory-stick containing an electronically scanned (300 dpi resolution) Public Document Format (PDF) copy of their complete bid submission. This PDF file should be named using the contract number and the Tenderer's name, eg. "**WS-7671 – Tenderers Name.PDF**". The memory-stick must be labelled with the Tenderer's name and securely fixed to the paper submission.

T1.2.3 ADDITIONAL CONDITIONS OF TENDER

T1.2.3.1 Appeals

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

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

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

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

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

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

T1.2.3.3 Code of Conduct and Local Labour

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

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

T1.2.3.4 Targeted Procurement

(SCMP Cl.52.21(d) If feasible to contract for a contract above R30m, an organ of state must apply subcontracting to advance designated groups.

(SCMP Cl.52.21(e) Tenders that are between the contract value of R5m and R30m (incl.) must, where feasible, allow for subcontracting in line with the Council approved Economic Empowerment Framework.

Refer to **Economic Empowerment Framework**.

T1.2.3.5 Functionality Specification

Functionality Evaluation is applicable to this tender.

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		**40**
Experience of Key Staff	Contracts Manager	20
	Site agent	15
	Foremen	15
Construction Methodology		10
	Maximum possible score for Functionality (M_s)	100

The minimum number of evaluation points for Functionality is 7**0**. 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**
0	40	70	90	100

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

Criteria	**Returnable Schedules**
Tenderer's Experience	• Experience of Tenderer
Experience of Key Staff	• Proposed Staffing • Key Personnel • Experience of Key Personnel
Project Organogram	• Proposed Organogram for the team to be used
Construction Methodology	• Construction Approach, Methodology, and Quality Control • Schedule of Proposed Subcontractors • Plant and Equipment

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

- "**successfully completed**" implies a project has been completed on time and to specification;
- "**similar nature**" implies projects that were of a value of at least 70% of this tender's value, and had a comparable Scope of Work in terms of technical requirements and operations;
- "**experience**" implies experience on projects of a similar nature;
- "**accredited degree / diploma**" implies a minimum 3-year qualification within the built environment, from a registered University or Institute of Technology.
- "**Key Staff**" actively involved and below the retirement age .

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

Criterion: Experience of Key Staff			
	CONTRACTS MANAGER	**SITE AGENT**	**FOREMAN**
Level 0	No information provided OR submission of no substance / irrelevant information provided OR less than 2 years' experience OR Relevant accredited diploma / degree and less than 1 years' experience.	No information provided OR submission of no substance / irrelevant information provided OR less than 2 years' experience. OR Relevant accredited diploma / degree and less than 1 years' experience.	No information provided OR submission of no substance / irrelevant information OR Less than 2 years' experience.
Level 1	Relevant accredited diploma / degree and minimum 2 years' experience.	Relevant accredited diploma / degree and minimum 2 years' experience.	Minimum 3 years' experience.
Level 2	Relevant accredited diploma / degree and minimum 4 years' experience.	Relevant accredited diploma / degree and minimum 4 years' experience.	Minimum 5 years' experience.
Level 3	Relevant accredited diploma / degree and minimum 7 years' experience.	Relevant accredited diploma / degree and minimum 7 years' experience.	Minimum 8 years' experience.
Level 4	Relevant accredited diploma / degree and minimum 9 years' experience.	Relevant accredited diploma / degree and minimum 9 years' experience.	Minimum 10 years' experience.

Criterion: Construction Methodology & Quality Control	
Level 0	No information provided; OR submission of no substance / irrelevant information provided
Level 1	The technical approach and/or methodology is less than acceptable and unlikely to satisfy project objectives or requirements. Plant and equipment is unlikely to provide adequate protection of the works.
Level 2	Brief overview of the methodology which encompasses all programmed activities in appropriate order and includes staff, plant and equipment resources, including subcontractors if applicable, a brief description of preparatory work, construction processes including finishing works for each activity.
Level 3	The methodology is specifically tailored to address specific project requirements. The methods and approach to managing risk etc. are specifically tailored to the critical characteristics of the project. The plant and equipment are specifically tailored to the project requirements and are sufficiently adaptable to accommodate changes that may be required during execution
Level 4	Besides meeting the "above Level 4" rating, the important issues are approached in an innovative and efficient way, indicating that the tenderer has excellent knowledge of working in the projects environment and producing the required final product. Plant and equipment proposals and ownership/provision arrangements are most likely to ensure a satisfactory project outcome.

PART T2: RETURNABLE DOCUMENTS

T2.1 LIST OF RETURNABLE DOCUMENTS

T2.1.1 General

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

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

T2.1.2 Returnable Schedules, Forms and Certificates

Entity Specific

T2.2.1	Compulsory Enterprise Questionnaire	19
T2.2.2	Certificate of Attendance at Clarification Meeting	21
T2.2.3	Tax Compliance Status PIN / Tax Clearance Certificate	22
T2.2.4	Contractor's Health and Safety Declaration	23
T2.2.5	MBD 4: Declaration of Interest	25
T2.2.6	MBD 5: Declaration for Procurement Above R10 Million	27
T2.2.7	MBD 6.1: Preference Points Claim Form ITO the Preferential Regulations	28
T2.2.8	MBD 8: Declaration of Bidder's Past SCM Practices	31
T2.2.9	MBD 9: Certificate of Independent Bid Determination	33
T2.2.10	Joint Venture Agreements (if applicable)	36
T2.2.11	Record of Addenda to Tender Documents (if applicable)	37

Eligibility

T2.2.12	Eligibility: Declaration of Municipal Fees	38
T2.2.13	Eligibility: Registration with Compensation Commissioner	39
T2.2.14	Eligibility: CSD Registration Report	40
T2.2.15	Eligibility: Verification of CIDB Registration and Status	41
T2.2.16	Eligibility: Experience of Tenderer	42

Technical or Functionality Evaluation

T2.2.16	Experience of Tenderer	42
T2.2.17	Proposed Organisation and Staffing	43
T2.2.18	Key Personnel	44
T2.2.19	Experience of Key Personnel	45
T2.2.20	Preliminary Programme	46
T2.2.21	Construction Approach, Methodology, and Quality Control	47
T2.2.22	Schedule of Proposed Subcontractors	48
T2.2.23	Plant and Equipment	49
T2.2.24	Contractor's Health and Safety Plan	50

T2.2 RETURNABLE SCHEDULES, FORMS, AND CERTIFICATES

The returnable schedules, forms, and certificates, as listed in T2.1.2, can be found on pages 19 to 37.

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:

(tenderer 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 / TAX CLEARANCE CERTIFICATE

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 Tax Clearance Certificates / 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 tender 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 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: _____ _____

T2.2.4 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
If yes, furnish particulars: ……		
……		
3.9 Have you been in the service of the state for the past twelve months?	YES	NO
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 80/20 preference point system.

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

1.2 Either the 80/20 or 90/10 preference point system will be applicable in this tender. The lowest/ highest acceptable tender will be used to determine the applicable system once tenders are received.

1.3 Preference Points for this tender shall be awarded for:

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

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

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

2.0 DEFINITIONS

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

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

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

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

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

3.0 FORMULA FOR CALCULATION OF PREFERENCE PRICE POINTS

3.1 PROCUREMENT OF GOODS AND SERVICES

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

80 / 20 Points System

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

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 (80/20 system)	Maximum Number of points ALLOCATED (90/10 system)	Number of points CLAIMED (80/20 system)	Number of points CLAIMED (90/10 system)
Ownership Goal: Race (black)	3.2	n/a		n/a
Ownership Goal: Gender (female)	2.4	n/a		n/a
Ownership Goal: Disabilities	2.4	n/a		n/a
RDP Goal: The promotion of South African owned enterprises.	8	n/a		n/a
RDP Goal: The promotion of enterprises located in a specific municipal area.	4	n/a		n/a
Total CLAIMED Points (20 Maximum)				n/a

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

I acknowledge that:

1) The information furnished is true and correct.

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

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

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

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

NAME (Block Capitals): **Date**

SIGNATURE:

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

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

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

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

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

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

		Circle Applicable	
4.1	Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? (Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer / Authority of the institution that imposed the restriction after the audi alteram partem rule was applied.) The Database of Restricted Suppliers now resides on the National Treasury's website (www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page.	YES	NO

4.1.1 If YES, provide particulars.

……

……

4.2	Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.	YES	NO

4.2.1 If YES, provide particulars.

……

……

4.3	Was the bidder or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	YES	NO

4.3.1 If YES, provide particulars.

……

……

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

4.4.1 If YES, provide particulars.

……

……

4.5	Was any contract between the bidder and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	YES	NO

4.5.1 If YES, provide particulars.

……

……

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

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

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.9 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).

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: _____ _____

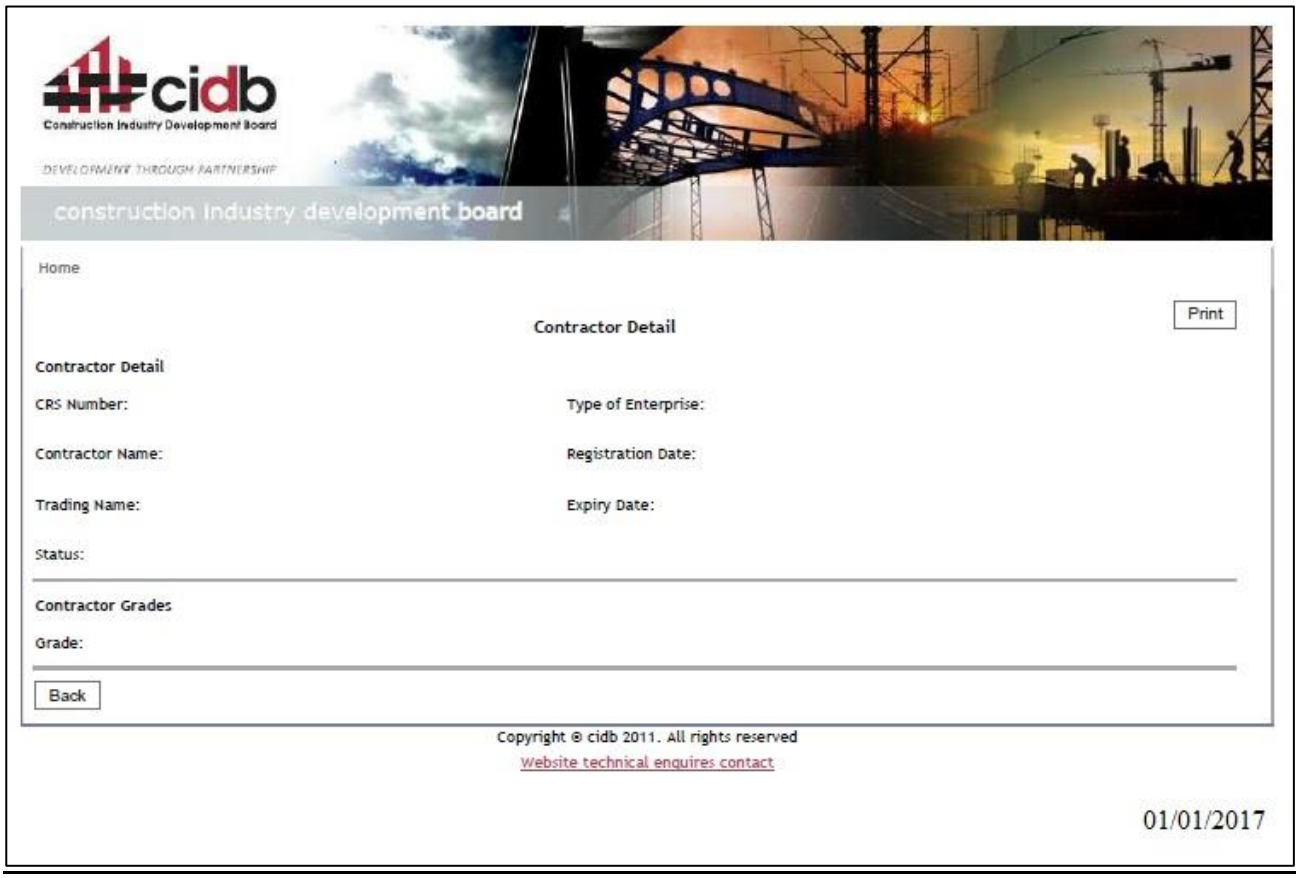
T2.2.15 ELIGIBILITY: VERIFICATION OF CIDB REGISTRATION AND STATUS

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 7 years) executed by myself / ourselves.

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 (NOT APPLICABLE)

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's Manager, Site Agent, and Foremen) which may have to be brought in from outside if not available locally.

CATEGORY OF EMPLOYEE	NUMBER OF PERSONS	
	KEY PERSONNEL, PART OF THE CONTRACTOR'S ORGANISATION	KEY PERSONNEL TO BE IMPORTED IF NOT AVAILABLE LOCALLY
Site Agent, Project Managers		
Foremen, Quality Control and Safety Personnel		
Technicians, Surveyors, etc		
Artisans and other Skilled workers		
Plant Operators		
Unskilled Workers		
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: _____ _____

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 CONSTRUCTION APPROACH, METHODOLOGY, AND QUALITY CONTROL

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

Construction Approach and Methodology

The construction approach and methodology must respond to the Scope of Work and outline the proposed approach to undertake the work showing a detailed programme including health and safety aspects, the use of plant and resources for this Project.

Quality Control

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

The tenderer must attach 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 SCHEDULE OF PROPOSED SUBCONTRACTORS

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

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

Attach additional pages if more space is required

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

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

SIGNATURE: _____ _____

T2.2.23 PLANT and EQUIPMENT

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

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

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

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

Attach additional pages if more space is required

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

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

Attach additional pages if more space is required

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

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

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

SIGNATURE: _____ _____

T2.2.24 CONTRACTOR'S HEALTH AND SAFETY PLAN

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

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

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

The detailed safety plan will take into consideration the site specific risks as mentioned under C.3: Project Specification. A generic plan will not be acceptable.

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

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

SIGNATURE: _____ _____

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: **(30976-5W)**

Contract Title: **Verulam and Umdloti Wastewater Treatment Works in the Northern Sewer Drainage Catchment: Storm damage repairs**

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

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

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

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

.....)

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

For the Tenderer:

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

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

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

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

Address : .....

: .....

Telephone : .....

Witness:

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

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

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

C1.1: FORM OF OFFER AND ACCEPTANCE

C1.1.2: FORM OF ACCEPTANCE

This Form will be completed by the Employer

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

The terms of the contract are contained in:

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

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

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

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

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

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

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

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

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

Address : .....

: .....

Witness:

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

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

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

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

1. **Subject** : ……..

Details : ……..

: ……..

2. **Subject** : ……..

Details : ……..

: ……..

3. **Subject** : ……..

Details : ……..

: ……..

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

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

FOR THE TENDERER		**FOR THE EMPLOYER**
……..……..	Signature	……..……..
……..……..	Name *(in capitals)*	……..……..
……..……..	Capacity	……..……..
……..……	Name and Address of	……..……
……..	Organisation	……..
……..		……..
……..		……..
……	Witness Signature	……
……..	Witness Name	……..
……..	Date	……..

C1.2: CONTRACT DATA

C1.2.1 PART ONE – DATA PROVIDED BY THE *CLIENT*

1 General

The conditions of contract are the NEC4 Engineering and Construction Contract (June, 2017), copies of which may be obtained from the South African Institution of Civil Engineering (tel 011-805 5947) or Engineering Contract Strategies (tel 011 803-3008) and the additional conditions contained in the Z clauses below.

Specifically, the core clauses and the clauses for main **Option B: Priced Contract with bill of quantities**, dispute resolution Option W1 and secondary Options:
X1: Price adjustment for inflation
X2: Changes in the law
X5: Sectional Completion
X7: Delay damages
X13: Performance bond
X16: Retention
Z: Additional Conditions of Contract

Each item of data given below is cross-referenced to the sub-clause in the *conditions of contract* to which it mainly applies.

The Employer is the eThekwini Municipality as represented by: DEPUTY HEAD: **Error! Reference source not found.**

10.1 The address of the Employer is:
Physical:
Postal:
Telephone:
Fax:
E-Mail:

The **name of the Employer's Agent** is: Siduduzo Mtshali
The address of the Employer' Agent is:
Physical:
Postal:
Telephone:
Fax:
E-Mail:

The *Project Manager* is:	The Built Environment Professional Consulting Company appointed by eThekwini Municipality (still to be appointed) The Project Manager will also perform the role of Programme Manager on behalf of eThekwini and, as Project Manager and Programme Manager, will schedule and allocate Sections of work to the Contractor.
The *Supervisor* is:	AfriCoast Consulting Engineers(Pty) Ltd
Represented by	Thomas Jachens

	Address for electronic communications : thomas@africoast.com
th11.2(2)	The *works* are :**Storm damaged repairs of the Verulam and Umdloti Wastewater Treatment Works in the Northern Sewer Drainage Catchment** Generally: Repairs to water and sanitation infrastructure. Specifically: Particular Sections of work (projects) as allocated to the Contractor by the Project/Programme Manager during the course of the contract, with no guarantee of any specific quantity or number of projects being allocated. Detailed Works Information will be issued by the Project Manager for each Section of work (project) allocated to the Contractor.
11.2(14)	The following items will be included on the Risk Register: 1. Spending of not less than 90% of the allocated budget for a financial year within that year 2. Timing and resourcing of the services and allocation of sections of work such that the contractor can execute sufficient work to enable the allocated budgets to be spent. 3. Those matters recorded in accordance with Clause 16.1 of the Contract 4. The risks listed in the indicative risk register as included in Annexure 1 to this section C1.2 Contract Data. *It is noted for reference that the inclusion of an item on the risk register does not assign responsibility for that risk, which remains the responsibility of the Party to whom it is allocated under the Conditions of Contract.*
11.2(15)	The *boundaries of the site* are the Site, as shown on the layout drawings included with the Works Information applicable to, and issued for, a specific Section of work (project)
11.2(16)	Indicative Site Information is included in Part C4. Project specific site information will be issued by the Project/Programme Manager for each identified Section of work (project). It is specifically noted that each Section of work will typically take place on a discrete, limited size Site and that these Sites are wide-spread, across the eThekwini Municipality. Furthermore, the access and working conditions on each site are typically restrictive in nature and subject to complexities relating to the involvement of the local communities and use of local labour.
11.2(18)	The *working areas* are the Site for each specific Section of work (project) as defined in the site specific Works Information issued by the Project Manager, along with a Commencement of Works instruction.
11.2(19)	Indicative Works Information is included in Part C4. Project specific Works Information will be issued by the Project/Programme Manager for each identified Section of work (project) It is specifically noted that no guarantee of any specific minimum or maximum allocation of work to the Contractor is made.
12.2	The *law of the contract* is the law of the Republic of South Africa subject to the jurisdiction of the Courts of South Africa.
13.1	The *language of this contract* is English
13.3	The *period for reply* is 2 weeks

2	**The *Contractor's* main responsibilities**
	No additional data is required for this section of the *conditions of contract*.
3	**Time**
11.2(3)	The *completion date* for the whole of the works is 36 months from the *starting date* The *completion date* for each Section of work (project) will be based on a programmed period after the *access date* for that Section/project, in accordance with the first programme submitted by the Contractor for that Section/project and accepted by the Project Manager. The Project Manager will not grant access for a Section/project if the planned access date plus programmed period would end later than the completion date for the whole of the works.
30.1	The *access dates* for each Section of work (project) are upon formal written instruction from the Project Manager to commence with that identified Section of work (project)
31.1	The Contractor is to submit a first programme for acceptance, for each Section of work (project) to be allocated by the Project Manager, within 2 weeks of the instruction from the Project Manager to submit that programme
31.2	The *starting date* for the whole of the works is the date of commencement of this Contract. The *starting date* for each Section of work (project) will be the date indicated by the Project Manager on the formal written instruction to commence with that identified Section of work (project)
31.2	Non-working days are: weekends, public holidays and the annual statutory builder's holiday. If approved extensions of time extend the *completion date* of a Section of work (project) beyond the start of the contractor's holiday (starting in December of each year), the holiday period shall not be considered as working days. Any remaining extension of time at this date shall be calculated from the first statutory working day in January the following year.
32.2	The *Contractor* submits revised programmes for each Section of work (project) at intervals no longer than 4 weeks.
35.1	The *Employer* is not willing to take over the *works* comprising a specific Section (project) before the *completion date* of that specific Section (project).
4	**Testing and Defects**
42.2	The *defects date* is 52 weeks after Completion (per Section / project)
43.2	The *defect correction period* is 2 weeks
5	**Payment**

50.1	The *assessment interval* is monthly, with specific assessment dates to be agreed by the *Contractor* and the *Project Manager* before the first Section of work (project) is allocated. As set out in the Employer's Works Information, which prescribes the required details, the assessment process is summarised as follows: The *Contractor* (in conjunction with the *Supervisor's* certification) will be required to prepare progress claims by completing quantities of work done in accordance with the bill of quantities for each Section (project). The *Supervisor* will only certify quantities of work completed in accordance with the Works Information The *Contractor* will be responsible for ensuring that the progress claim is submitted to the *Project Manager* in time for processing at the agreed *assessment interval* and on the agreed assessment dates. Claims must be submitted in the formats and using both the hardcopy and electronic systems prescribed by the *Project Manager*, which may vary from time to time. Any failure to submit the required, *Supervisor* certified claim information by the agreed date will result in the assessment by the *Project Manager* being held over until the *assessment interval* following the correct submission of the required information. These assessments and certificates shall not be regarded as late and interest shall not be applicable.
51.1	The *currency of this contract* is the South African Rand (ZAR)
51.2	The period within which payments are made is: within 30 calendar days following the date on which a valid tax invoice and statement, including a copy of the *Project Manager's* corresponding payment certificate, were received.
51.4	The *interest rate* is the Prime Lending Rate of the Standard Bank of South Africa at the time an interest payment is due.
6	**Compensation Events**
60.1(13)	The *weather measurements* to be recorded for each calendar month are: 1. The cumulative rainfall for the month (mm) 2. The number of days with rainfall more than 10mm
60.1(13)	The place where weather is to be recorded is on the Site of an identified Section of work (project)
60.1(13)	The *weather data* are the records of past *weather measurements* for each calendar month which were recorded at a site nearest to that of an identified Section of work (project) and which are available from the SA Weather Services at King Shaka International Airport (032 436 3817). *It is noted that the NEC4 ECC3 compensation event procedures governing weather events place a significant burden on the Contractor to prove that the events exceeded a 1 in 10 year return event.* - 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 Project Manager 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. Abnormal Climatic Conditions (Rain Delays): Extension of time as a result of rainfall shall be calculated monthly being equal to the number days certified by the Project Manager 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.		

7 Title

No additional data is required for this section of the *conditions of contract*.

8 Risks and insurance

84.1 The *Employer* does not provide any insurance.

NOTE:
The *works* comprise numerous identified Sections that are individually completed in relatively short timeframes compared to the overall project. For example: a typical project may take approximately 3 months to complete. As Sections of work (projects) are handed over after completion, the *Contractor* is generally only responsible for a limited number of Sections (projects) at a given time, rather than the full project value over 36 months.

84.2 The Contractor provides the following insurances:

INSURANCE TABLE

Insurance Against	**Minimum amount of cover of minimum limit of indemnity**
Loss of or damage to the *works*, Plant and Materials	The replacement cost, including the amounts for the replacement of Plant and Materials provided by the Employer
Loss of or damage to Equipment	The replacement cost
Liability for loss of or damage to property (except the works, Plant, Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the Contractor) caused by activity in connection with this contract	R10 000 000 (Ten million Rands (ZAR)) With cross liability so that the insurance applies to the Parties separately
Liability for death of or bodily injury to employees of the Contractor arising out of and in the course of their employment in connection with this contract	Whatever the Contractor deems desirable in addition to that which is prescribed by the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 as amended

84.2 The Contractor provides the following additional insurances:

Insurance Against	**Minimum amount of cover of minimum limit of indemnity**

Liability in respect of Contract Works SASRIA insurance subject to terms exceptions and conditions of the SASRIA coupon policy	Cover / indemnity is to the extent provided by the SASRIA coupon policy
Where the contract requires that the design of any part of the works shall be provided by the *Contractor* he shall satisfy the *Employer* that professional indemnity insurance cover in connection therewith has been affected	To a value agreed with the *Employer* and dependant on the value of works to be designed by the *Contractor.*
Where the contract involves manufacture, and/or fabrication of Plant & Materials, components or other goods to be incorporated into the works at premises other than the site, the *Contractor* shall satisfy the *Employer* that such plant & materials, components or other goods for incorporation in the works are adequately insured during manufacture and/or fabrication	The replacement cost
Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity	R10 000 000 (Ten million Rands (ZAR))

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 Require**
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

9 Termination

No additional data is required for this section of the *conditions of contract*.

10 Data for main Option clause

B **Priced contract with bill of quantities**

60.4 This clause is applicable to each Section of work (project), comparing the bill of quantities for that Section to the actual measurements of work completed for that Section. It is not applicable to the whole of the works.

60.6 The method of measurement is the relevant SANS 1200 and eThekwini Standard Specifications measurement and payment clauses, Particular Specifications and Project Specifications applicable to the whole of the works and each Section of work (project), all amended as stated in the preamble to the master bill of quantities and as measured for items in the Section specific bill of quantities

11 Data for Option W1 Dispute Resolution

W1.1	The *Adjudicator* is to be mutually agreed upon by the Parties prior to commencement of the Contract.
W1.2(3)	The *Adjudicator nominating body* is the Association of Arbitrators (Southern Africa)
W1.4(2)	The *tribunal* is a South African court of law

12 Data for secondary Option clauses

X1	**Price Adjustment for Inflation**
X1.1(a)	The base date for indices is the month prior to the month in which the tender closes
X1.1	The index is the Consumer Price Index for all items, published in "Table 2 – Consumer price indices for primary urban areas", Statistical release P0141, by Statistics South Africa.
X5 and X7	**Sectional Completion and delay damages used together**
X5.1 X7.1	A Section of work will consist of a specific project allocated to the *Contractor* by the Project/Programme Manager during the course of the contract, with no guarantee of any specific quantity or number of Sections/projects being allocated. The *completion date* for each Section of work (project) will be based on a programmed period after the *access date* for that Section, in accordance with the first programme submitted by the Contractor for that Section and accepted by the Project Manager. Delay damages for late Completion of the sections of the works are 0.1% of the total of the Prices per day for each section. *For clarity, delay damages will be applicable in accordance with the above per Section (and not for the whole of the works)*
X13	**Performance Bond**
X13.1	The amount of the performance bond is 10% of the value of the contract
X16	Retention
X16.1	If agreed between the Contractor and Employer and so recorded in the Schedule of Deviations to this contract, a Retention Money Guarantee shall be provided by the Contractor in accordance with Clause Z1, instead of amounts being retained from the Price for Work Done to Date in accordance with Option X16. In the absence of such recorded agreement, Option X16 shall apply, with contract data as follows: The *retention free amount* is nil. The *retention percentage* is 10% of the first R500 000 and 5% of the remainder, per Section (project). The amount retained per Section (project) is halved in the assessment made after the Completion of that Section (project). The amount retained per Section (project) remains at this amount until the Defects Certificate for that Section (project) is issued. No amount is retained in the assessments for that Section (project) made after the Defects Certificate has been issued for that Section (project).

Z Additional Conditions of Contract

Z1 Retention Money Guarantee

Z1.1 This Clause is applicable only if agreed between the Contractor and Employer and so recorded in the Schedule of Deviations to this contract.

The Contractor gives the Employer a Retention Money Guarantee, provided by a bank or insurer which the Project Manager has accepted, for the amount of 10% of the value of work issued and in the form set out in Section C1.4. A reason for not accepting the bank or insurer is that its commercial position is not strong enough to carry the Retention Money Guarantee. If the Retention Money Guarantee was not given by the Contract Date, it is given to the Employer within four weeks of the Contract Date.

Z2 The Project Manager shall obtain the specific approval of the Employer before executing his functions or duties according to the following Clauses of the conditions of contract in the cases indicated:

Clause 65: Implementation of Compensation Events for proposed instructions:
Where: the total of implemented compensation events for a particular Section of the works (project) would exceed 10% of the Prices for that Section or R1000 000, whichever is the greater; or would change the Completion Date by more than 3 months or would result in a Completion Date later than the completion date for the whole of the works.

Z3 The Contractor shall not commence working until they have an approved project specific health and safety plan in terms of the Occupational Health and Safety Act, 1993: Construction Regulations, 2014 and complied with the initial requirements thereof.

Z4 The Contractor:

(a) undertakes to appoint, as a sub-contractor in terms of the conditions of contract, selected from a panel of sub-contractors established by the Municipality specifically in respect of this project.
(b) acknowledges that the appointment of the sub-contractor(s) is a requirement of the Employer in meeting the participation goals outlined in the Employer's Works Information
(c) undertakes to ensure that the sub-contractor is supported, mentored and developed in accordance with the requirements set out in the Employer's Works Information.
(d)agrees to enter into a session agreement with the Sub contract for the purpose of payment which will be done by Employer (EThekwini Municipality)through session arrangement.

Z5 There is no guarantee of any minimum or maximum allocation of work to the Contractor by the Project Manager or Employer.

Allocation of work will be done by Project manager after consultation with the Employer (Ethekwini Municipality), this will include set aside of particular sites for purpose of developmental programme.

The Prices for any Section of work (project) allocated by the Project Manager will be determined on a Sectional (per project) basis in accordance with the forecast quantities for each BoQ item relevant to that Section (project), multiplied by the rates quoted in the master Bill of Quantities (Part C2: Pricing Data) for the matching item(s) and in accordance with the preamble to the bill of quantities as set out in Part C2

Z6 Payment for works identified in the Works Information as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the Works Information. Any non-payment for such works shall not relieve the Contractor in any way from his obligations either in Contract or in delict

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."

5.13.1 The **penalty for delay** in failing to complete the Works is **R 5 900.00**(per Day).

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

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: **R2,000,000**.
- Maximum first excess: **R10,000,000**.

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 50 000**
- 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: **R50 000**

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 10,000,000**
- Maximum first excess: **R 20,000**

Insurance of Works

- Minimum amount for additional removal of debris (no damage): **R 500,000**
- Minimum amount for temporary storage of materials off site, excluding Contractor's own premises: **R 10,000,000**
- Minimum amount for transit of materials to site: **R 5,000,000**.

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."

C1.2.2.2 DATA TO BE PROVIDED BY CONTRACTOR

The tendering Contractor is advised to read both the NEC4 Engineering and Construction Contract (June 2017) and the relevant parts of its Guidance Notes in order to understand the implications of this Data which the tenderer is required to complete.

Completion of the data in full, according to Options chosen, is essential to create a complete contract. Failure to complete the data in full may render the tender non-responsive.

Clause	Statement	Data
10.1	The *Contractor* is (The legal name of Contractor is): Address Tel No. Fax No. Email Address.	
11.2(8)	The *direct fee percentage* is The *subcontracted fee percentage* is	……..% ……..%
11.2(14)	The following matters will be included in the Risk Register	…… And those matters recorded in accordance with clause 16.1 of the contract
11.2(21)	The *bill of quantities*	The Master bill of quantities is in section C2 of the Contract. The bill of quantities for each Section of work (project) will be determined in accordance with the forecast quantities for each BoQ item relevant to that Section (project), and the rates quoted in the master Bill of Quantities for the matching item(s). The resulting Section/project specific bill of quantities will be the *bill of quantities* for that Section/project

11.2(31)	The Prices	for tender evaluation purposes are as set out in the Tender Evaluation Schedule: Pricing (Form A15) The initial Contract Prices are **nil** and will only be determined as and when the *Project Manager* formally allocates Sections of work (projects) to the *Contractor*. The Prices will then be determined on a Sectional (per project) basis in accordance with the forecast quantities for each BoQ item relevant to that Section (project), multiplied by the rates quoted in the master Bill of Quantities for the matching item(s), with no guarantee of any minimum allocation of quantities or sections of work and in accordance with the preamble to the Master bill of quantities.
24.1	The *Contractor's* key persons are: 1 Name: Job: Responsibilities: Qualifications: Experience: 2 Name: Job Responsibilities: Qualifications: Experience:	…… …… …… …… …… …… …… …… …… **CV's (and further key persons' data including CVs) are appended to Tender Schedule entitled** **……**

31.1	The programme identified in the Contract Data is	Will be submitted for each Section of work (project) to be allocated by the *Project Manager*, within 2 weeks of the instruction from the Project Manager to submit that programme		
	Data for Schedules of Cost Components			
B	**Priced contract with bill of quantities**	**Data for the Shorter Schedule of Cost Components**		
41 in SSCC	The percentage for people overheads is:	……..%		
21 in SSCC	The published list of Equipment is the last edition of the list published by			
	The percentage for adjustment for Equipment in the published list is	……..% **(State plus or minus)**		
22 in SSCC	The rates of other Equipment are:	**Equipment**	**Size or capacity**	**Rate**

C1.2.3 ADDITIONAL CONDITIONS OF CONTRACT

C1.2.3.1 COMMUNITY LIAISON OFFICER

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

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

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

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

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

C1.2.3.2 EMPLOYMENT OF LOCAL LABOUR

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

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

C1.2.3.3 CONTRACTOR PARTICIPATION GOAL (CPG)

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

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

C1.2.3.4 FTE (Full Time Equivalent) EMPLOYMENT INFORMATION

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

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

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

- Category of Employment

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

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

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

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

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

C1.2.3.5 PERFORMANCE MONITORING OF SERVICE PROVIDERS

[For contract awards over R10m] The Contractor shall be subjected to "Performance Monitoring" assessments in terms of the applicable Section (S.53) of the Employer's Supply Chain Management Policy.

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

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 NEC 4 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 NEC 4 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 NEC 4 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 NEC 4 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 15 pages. The pages are numbered BOQ 1 to BOQ 15.

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C3.1: PROJECT DESCRIPTION AND SCOPE OF CONTRACT

C3.1.1 Employer's Objectives

In April 2022 eThekwini Metro and surroundings suffered severe storms which caused damage to essential infrastructure and services. This tender specifically focuses on the damages to the wastewater infrastructure in the Umdloti WWTW Catchment which includes damages to sewers, sewer pumpstations and wastewater treatment works. All work described in the scope of works to be completed to SANS/eThekwini standards.

C3.1.2 Description of Works

The scope of work consists of the storm damaged repairs of the Veralum and Mhloti Wastewater Treatment Works in the Northern Sewer Drainage Catchment.

All works shall be carried out in accordance with the Specifications, the applicable Conditions of Contract and the Occupational Health and Safety Act 85 of 1993 and the Constructions Regulations of 2014

The Scope of Works covered by this Contract includes the following civil, mechanical and electrical works:

a) Head of Works

- supply, install, test and commission the following mechanical equipment:
  - new stainless-steel plate / stop log with frame for flow diversion into existing channel
  - complete new grit / stone removal spiral conveyor
  - full service of existing mechanical screen including replacement of motors, gearboxes and all bearings, clean and lubricate all sprockets and chains
  - full service of two (2) existing Pista degritters including replacement of motors, gearboxes and all bearings
  - full service of two (2) existing grit classifiers including replacement of motors, gearboxes and all bearings

b) Primary Settling Tanks (5 No.)

- Removal of sludge and silt from the PSTs and disposal of same at the Hammersdale solid waste disposal site (± 50 km distance)
- Removal of existing asbestos pipework in PSTs and replacement with mPVC pipework. AC pipework to be disposed of at Hammersdale solid waste disposal site
- Grit blasting, preparation and corrosion protection coating to central stilling wells and all other steel work in the PSTs

c) 4Ml/d Biological Reactor and Clarifier

- Removal and disposal of any water and sludge / silt from the reactor
- Replacement of centre bearing and electrical slip ring complete with all electrical connections
- Grit blasting, preparation and corrosion protection coating to central stilling well, scraper support system and all other steelwork in the reactor but excluding the bridge structure
- Replacement of scraper blades

d) Secondary Settling Tanks (2 No.)

- Removal and disposal of any water and sludge / silt from SSTs
- Replacement of centre bearings and electrical slip rings complete with all electrical connections
- Grit blasting, preparation and corrosion protection coating to central stilling wells, scraper support systems and all other steelwork in the SSTs but excluding the bridge structures
- Replacement of scraper blades

e) Sludge Digesters

- Provision of forced ventilation and all safety measures to allow work on and in the sludge digesters
- Remove approximately 50m^3 of sludge from the primary digester and dispose of at the Hammersdale solid waste disposal site (± 50 km distance)
- Remove approximately 10m^3 of sludge from the secondary digester and dispose of at the Hammersdale solid waste disposal site
- High pressure clean both digesters
- Supply, install, test and commission 1 x T10 Gorman-Rupp sludge pump complete with motor, baseplate, controls and 300mm diameter x 2,000mm long coated mild steel goose neck bend

f) Pumps and Pipework

- Supply, install, test and commission 2 x 11kW Hidrostal SNL pumps complete with motors, baseplates and controls
- Supply, install, test and commission 2 x 11kW Hidrostal raw sludge pumps complete with motors, baseplates and controls

g) Sludge Drying Beds

- Remove sand and sludge from existing damaged drying beds and dispose of at the Hammersdale solid waste disposal site
- Construct approximately 62m long x 1m high x 220mm wide brick walls
- Remove existing inlet valves, supply and install new knife-gate vales at existing inlet pipework (40 No.)
- Construct concrete slabs around the drying beds

h) Civil and Earthworks

- Underpin and stabilise blower room foundations
- Reinstate approximately 60m long x 20m wide x 10m high earth embankment
- Reinstate existing and provide additional new gabion protection
- Cut into existing 600mm diameter clarified effluent pipe, construct manhole complete with 2 x hand sluice gates, lay, bed and test approximately 20m long x 600mm diameter mPVC Cl 34 pipeline complete with outlet headwall
- Supply and install chlorine dosing pipework to and in the new manhole
- Clean and shape existing stormwater channels
- Construct inlet and outlet headwalls to stormwater channels
- Reinstate damage fences
- Re-gravelling of the Mhloti WWTW access road

C3.1.3 Description of Site and Access

The main site is located at Verulam and can be accessed via existing streets.

For full location and locality plans of the Veralum and Mhloti Wastewater Treatment Works refer to Drawings AFR2309-SEW-GA-01 to AFR2309-SEW-GA-02.

C3.1.4 Nature of Ground and Subsoil Conditions

The nature of the ground and subsoil conditions varies for sites.

C3.1.5 Temporary Works

The temporary works required under this project may include but not be limited to the following:

a) Design, supply, installation and maintenance of barricading / fencing around construction sites;

b) Design, supply, installation and maintenance of access scaffolding and lifting equipment, where applicable;

c) Design, supply and installation of formwork and support work, where applicable;

d) Design, supply, installation and maintenance of shoring and / or bracing, where applicable;

e) Supply of temporary power, lighting and water as needed.

f) Design, supply, installation and maintenance of temporary pipework, control and power systems to keep the plant operational while work is undertaken;

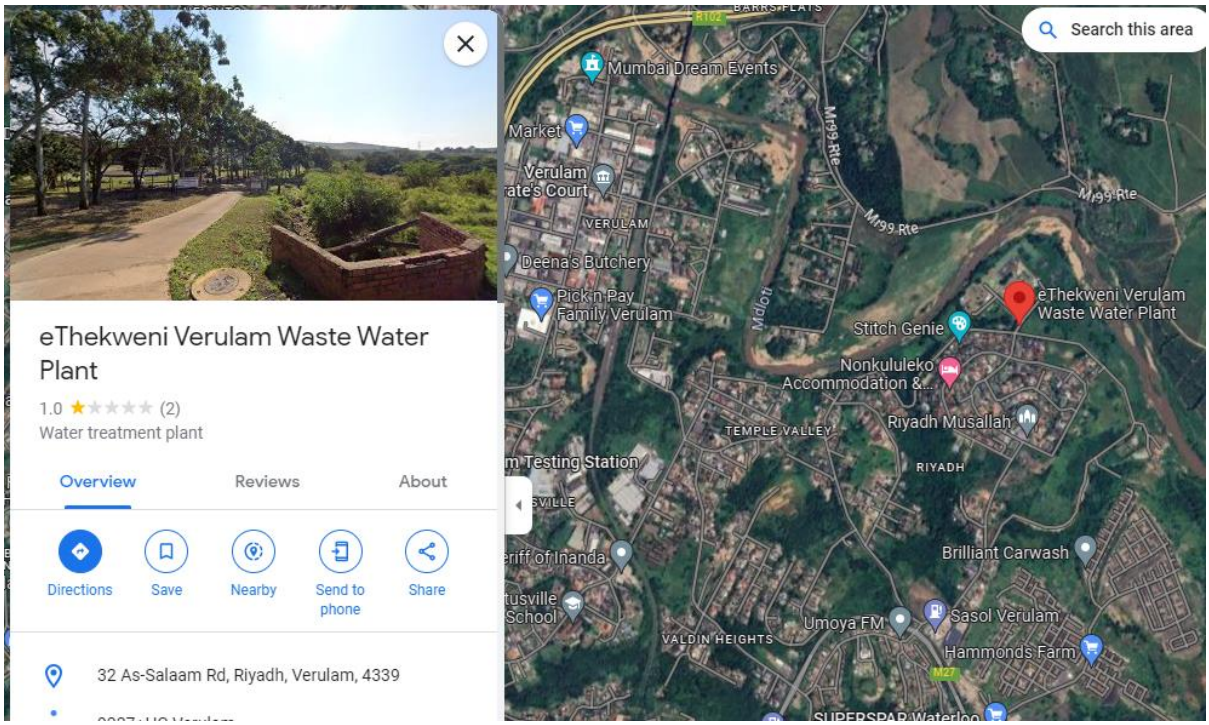
g) Provision of forced ventilation and all safety equipment required to allow safe working in all structures, particularly the sludge digesters;

h) Any other temporary works as required from time to time in order to complete the Works.

The above summary is not necessarily complete and shall not limit the work to be carried out.

C3.1.6 LOCATION OF THE WORKS

Verulam Wastewater Treatment Works is located at Verulam in the northern region of the eThekwini Municipality. Below is the location for the WWTW at 32 As-Salaam Rd, Riyadh, Verulam, 4339:



C3.1.7 ALLOCATION OF WORK

There is no guarantee of any minimum or maximum allocation of quantities or sections of work (projects). No compensation event will be applicable for any allocation of work over or under any allocation anticipated by the Contractor. The employer reserves the right to set aside some of the work for issue to CPG contractors.

C3.1.8 LABOUR INTENSIVE CONSTRUCTION AND SOCIO-ECONOMIC REQUIREMENTS

The works shall be constructed in such a manner that temporary work opportunities are created for unemployed persons in accordance with the latest edition of Guidelines for the Implementation of Labour-Intensive Infrastructure Projects (www.epwp.go.za) in so far as these guidelines may be applied.

The Employer may provide bonus incentives to achieve key performance indicators relating to socio-economic objectives.

For clarity, it is explicitly noted that the Contractor will not be permitted to utilize his own unskilled labour and that only local labour will be permitted at the unskilled level.

Only skilled and supervisory resources from the Contractor's own staff may be utilized on site to manage the works and deliver the site. The Contractor will therefore be required to employ unskilled local labour on a temporary basis, typically per Section / site and usually per eThekwini Ward, in accordance with appropriate policies and procedures in this regard. Wages and minimum wage rates for the local, temporary employees will typically be determined in accordance with South African legislation and any bargaining council agreements for the construction industry that may be relevant at the time.

The Contractor is also to note that the employment of local labour is often a time consuming task, requiring the involvement of and liaison with the relevant local political structures and furthermore that no guarantee of labour productivity can be given. The Contractor's programmes must take this into account.

Training and developmental opportunities shall be given to target groups as may be specified by the Employer from time to time.

C3.1.9 Excavation Support/Shoring Systems

Trenches and other excavations need to be barricaded and shored sufficiently in order to prevent any person from entering, falling into and/or being buried or trapped by a fall or dislodgement of material. The Contractor must ensure that the necessary steps are taken to ensure the stability of any road or other service that is likely to be affected.

Barricading and shoring of excavations shall be the responsibility of the Contractor and for the purposes of this contract these measures are considered to be temporary works.

C3.1.10 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 AB of the Bill of Quantities

3.2: ENGINEERING

C3.2.1 Design Services and Activity Matrix

Works designed by, per design stage*:*

Concept, feasibility and overall process	Employer's Agent
Basic engineering and detail layout to tender stage	Employer's Agent & Employer
Final design as approved for construction stage	Employer's Agent, Employer & Contractor
Approval of final designs for construction	Employer's Agent and Employer
Temporary works	Contractor
Preparation of 'As-built' drawings	Employer's Agent and Contractor

C3.2.2 Design Brief and Approvals

Prior to the closing of tenders, the design of the permanent works is the responsibility of the Employer's Agent.

The final design shall be carried out in conjunction with the Tenderer, who shall perform the detailed process and equipment designs to suit the equipment offered and provide sufficient information to enable the Employer's Agent to carry out the civil and structural designs to house the mechanical equipment, if necessary.

All designs by the Contractor are subject to the approval of the Employer's Agent and the Employer. These approvals shall be provided in writing to the Contractor within 10 working days of the Contractor's date of submission to the Employer's Agent.

After the closing of tenders the design and selection of the mechanical and electrical equipment is the responsibility of the successful Tenderer (Contractor) in terms of its suitability, efficiency and longevity to perform in compliance with the contract specifications.

The Contractor is responsible for the design of all temporary works required for the construction of the permanent works – again all to the approval of the Employer's Agent and Employer.

C3.2.3 Drawings

The Contractor shall conform in all aspects to the drawings and specifications and to any written instructions which the Employer's Agent may provide him with during the Contract. Should any differences or contradictions exist in the documents or dimensions shown on the drawings, it is the responsibility of the Contractor to clarify these matters with the Employer's Agent. Such clarification shall be in writing and shall be final and binding.

Should the Contractor fail to seek clarification of any differences or contradictions, then the Contractor shall be solely liable for any costs that may arise due to his failure in this regard.

The drawings issued with the tender documents are provided to give an overview of the project and are **not** construction drawings.

Construction drawings will be issued to the Contractor by the Employer's Agent on the commencement date and from time to time during the construction period as required.

The drawings that form part of the tender documents shall be used for tender purposes only. The successful Contractor will be supplied with 3 sets of unreduced paper prints of each drawing (free of charge). Any additional prints required will be for the account of the Contractor.

Only figured dimensions shall be used and drawings shall not be scaled unless so instructed by the Employer's Agent. The Employer's Agent shall supply all figured dimensions omitted from the drawings. Any ambiguities shall be clarified by the Tenderer with the Employer's Agent prior to the submission of Tenders

As may be requested from time to time by the Employer's Agent, the Contractor shall produce design drawings for the equipment offered and for any temporary works or temporary support structures for approval by the Employer's Agent. Work on these items shall not commence until the Employer's Agent has given written approval for these designs / drawings.

All 'as built' information in the possession of the Contractor that the Employer's Agent requires in order to complete 'As-built' drawings shall be supplied to the Employer's Agent before a Certificate of Completion will be issued.

C3.2.4 Manufacturing Drawings

The Contractor shall provide the Employer's Agent with three full sets of detailed to-scale manufacturing or shop drawings for approval prior to manufacturing any piece of equipment. Such drawings shall be delivered to the Employer's Agent's office either in hard copy or electronically. Electronic drawings shall be provided in an approved format such as AutoCad.

Manufacturing and/or delivery of equipment shall not take place until the drawings have been checked and approved by both the Employer's Agent and the Employer. Only after the Contractor has received hard copy drawings approved and signed by the Employer's Agent may manufacturing start. The Contractor shall allow in his works program 10 working days for the approval of his drawings.

C3.2.5 Installation Drawings

The Contractor shall provide the Employer's Agent with three full sets of to-scale outline drawings of the equipment being provided showing significant details and dimensions of how the equipment will fit into the relevant structures at least one month prior to the installation of the equipment. Such drawings shall be delivered to the Employer's Agent's office either in hard copy or electronically. Electronic drawings shall be provided in an approved format such as AutoCad.

The Contractor shall allow in his works program 10 working days for approval of his drawings by the Employer's Agent and the Employer.

C3.2.6 Electrical Drawings for Approval

Where applicable the Contractor shall provide the Employer's Agent with three full sets of detailed drawings for all switchboards for approval before the manufacture of the switchboards may commence. Such drawings shall be delivered to the Employer's Agent's office either in hard copy or electronically. Electronic drawings shall be provided in an approved format such

as AutoCad.

Manufacturing of the switchboards shall not take place until the drawings have been checked and approved by both the Employer's Agent and the Employer

.

The following information shall be provided:

a) Complete wiring diagram of the equipment on the boards

b) A complete layout arrangement of the boards showing all equipment positions and dimensions and the construction of the switchboards. The positions and methods of fixing and sizes of busbars shall also be shown

c) All labeling information on a separate sheet

d) The make, catalogue number and capacity of all equipment such as isolators, circuit breakers, contactors, etc.

A complete set of "as-built" drawings of all switchboards shall be submitted to the Employer's Agent within 14 days after delivery of the switchboards. The following information shall be on the drawings:

a) Items a) to d) above

b) Terminal strip numbers, numbers and colours of conductors connected to the terminal strips and numbers and colours of the conductors utilized for the internal wiring

c) A separate schedule of all equipment

The approval of drawings by the Employer's Agent and the Employer shall not relieve the Contractor of his responsibilities to supply the switchboards according to the requirements of the specifications.

The Contractor shall allow in his works program 10 working days for approval of his drawings by the Employer's Agent and the Employer.

C3.2.7 Record (as-built) Drawings

Within 14 days after the end of the contract, the Contractor shall provide to-scale record (as-built) general arrangement drawings of all civil works, equipment, pipe work, electrical cables and the like provided and installed under this contract. Such drawings shall be delivered to the Employer's Agent 's office electronically in an approved format such as AutoCad.

The Certificate of Completion will not be issued until these 'as-built' drawings have been received in an acceptable format and approved by the Employer's Agent and the Employer.

C3.2.8 Design Procedures

The successful Tenderer, hereinafter called the Contractor, is responsible for the design and selection of the mechanical and electrical equipment in terms of its suitability, efficiency and longevity to perform in compliance with the specifications. Note that, to simplify maintenance and spares holdings, the specifications require that the new equipment shall exactly match the existing in terms of brand, and, where possible, model.

The Contractor is also responsible for the design of all the temporary systems and works required for the construction of the permanent works.

Note that, although all designs are subject to the approval of the Employer's Agent and the Employer, this does not relieve the Contractor of his design responsibility nor accountability. The professional responsibility for such designs shall remain with the Contractor and his design engineer. Should any rectification be required due to design errors, unsuitable materials or unsuitable brands, this will be at the cost of the Contractor.

The Contractor shall record, and transmit to the Employer's Agent, all construction data to enable the Employer's Agent to compile 'As-Built' plans at the end of the contract.

The above summary is not necessarily complete and shall in no way limit the work to be carried out in terms of the Contract.

C3.2.9 Design Aspects Requiring Particular Attention

All pipework inside civil structures that forms part of the mechanical equipment must be allowed for.

Pipes through walls must have puddle flanges and shall be manufactured from Grade 316 stainless steel unless otherwise specified.

C3.2.10 Equipment to Match Existing

In order to allow full integration with the existing treatment works, and also to simplify spares holdings and maintenance issues the equipment brands offered must match the existing unless stated otherwise in the documents.

C3.2.11 Equipment from Single Supplier

All equipment of the same type installed shall be from a single supplier. This is to ensure interfacing compatibility of all equipment, prevent commissioning difficulties and to prevent guarantee issues between different brands of equipment.

The outputs of all equipment shall be compatible with the existing PLC and SCADA systems and all other equipment in the installation for communication, command and data recording functions.

C3.2.12 Mechanical Equipment – Local Agent and Spares Holding

All equipment offered should be supported by a local agent in eThekwini who has both the problem solving and the maintenance expertise to support the equipment. This agent shall carry, in the Metro, a stock of at least all the high use spares for all the equipment offered.

C3.2.13 Materials and Workmanship

Workmanship throughout shall be executed according to the latest professional standards to the satisfaction of the Employer's Agent and particular care shall be taken to ensure a neat installation.

All materials, plant and equipment shall comply with the requirements of the appropriate specification unless otherwise specified.

All materials, plant and equipment shall be of best quality, new and unused, in good condition and complete.

All material, plant and equipment shall be suitable for the permanent conditions likely to be encountered on the Site. Should the materials, plant or equipment not be suitable for use under temporary construction site conditions, the Contractor shall at his own cost provide suitable protection until the unfavourable site conditions cease to exist.

The Contractor shall, when requested by the Employer's Agent to do so, submit samples of plant, equipment and materials for approval prior to supply and installation.

Any plant, material or equipment considered to be not to specification, incorrect brands, faulty, incorrectly installed, of inferior quality or badly fixed shall be replaced by the Contractor at his own cost. The Contractor shall be held responsible for the correctness of all dimensions as set out.

The Employer's Agent will inspect the work from time to time during the progress of the work. Discrepancies will be pointed out to the Contractor and these shall be remedied at the Contractor's expense. Under no circumstances shall these inspections and remedies relieve the Contractor of any of his obligations or liabilities in terms of the Contract.

C3.3 CONSTRUCTION

C3.3.1 Certification by Recognised Bodies

Only SANAS accredited laboratories or other institutions may be used for certification purposes.

C3.3.2 Agrément Certificates

The use of alternative materials, which may be fit for purpose and are subject to an Agrément certificate, may be considered providing the following are adhered to:

- A full copy of the Agrément certificate must be provided,
- The certificate must be currently active,
- All work must be done in accordance with the terms of a specific certificate for the product,
- Details of any and all variations approved by Agrément South Africa must be provided,
- Details of who will erect or install the product must be provided,

C3.3.3 Plant and Materials

The Employer shall not supply any plant and materials for use on this contract. The Contractor shall provide all plant and materials.

C3.3.4 Materials and Samples

Where material to be used in this contract is specified to comply with the requirements of a South African National Standard Specification or any other international specification, and such material is available with the official SANS (SABS) or other international (e.g. BS) mark, the material shall bear the official mark.

The Contractor shall supply samples of sufficient size of proposed bedding and concrete materials, as applicable, to a SANS accredited laboratory for testing prior to any such materials being used. Only materials that comply with the specifications may be used. No separate payment shall be made for the testing of materials, the cost of which shall be deemed to be covered by the rate for the relevant items.

Copies of all test results shall be given to the Employer's Agent for his approval.

C3.3.5 Installation Equipment

The Contractor shall provide all necessary lifting equipment, tools, labour and plant required to install and erect the plant and equipment supplied in terms of the Contract.

The Employer will not provide any equipment for installation.

C3.3.6 Construction Plant

All construction plant and equipment used on this contract shall be in good working order, well maintained, of adequate size and fit for purpose. No machinery that leaks oil, fuel or hydraulic

fluids may be used on site.

Any plant or equipment that, in the opinion of the Employer's Agent, is not of adequate size or fit for use shall be removed from site and replaced with acceptable plant or equipment, all at the Contractor's cost.

C3.3.7 Requirements for Accommodation of Traffic

C3.3.7.1 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 "SADC Road Traffic Signs Manual - Volume 2: Roadworks Signing".

C3.3.7.2 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.

C3.3.7.3 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.

C3.3.7.4 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.

C3.3.8 Services

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

C3.3.8.1 Existing Services

The Tenderer's attention is drawn to the numerous existing services in the area.

The positions of existing services, insofar as they are known, are shown on the drawings. Although every effort has been made to depict these services accurately the positions shown must be regarded as approximate.

Items have been allowed in the Bill of Quantities for dealing with and protecting services. In addition to the above, the Contractor shall carry out his own investigations and surveys to locate any services that may be affected by any construction activities.

The Contractor shall take whatever precautions are required to protect these services from damage during the period of the Contract.

C3.3.8.2 Proving Underground Services

It is stressed that all services in a particular area must be proven before commencing work in that area. This clause shall be deemed to cover all earthworks operations whether for trenching or bulk earthworks, in the vicinity of underground services.

All affected services shall be located by the Contractor using hand excavation well in advance of any excavation. The Contractor shall check the levels of existing services for clearance with the proposed works and any clashes shall be reported to the Employer's Agent well before any excavation commences.

Services exposed in any excavation shall be properly supported and protected from construction damage and vandalism by suitable shielding or other protective measures.

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.

The cost of the proving trenches is to be included in the work covered by Clause DA.8.3.

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. The cost of this additional searching shall be to the Council's cost and shall be paid for under DB.8.19 - Proving Existing Services.

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.

C3.3.8.3 New Services and Relocation of Existing

This clause shall be read in conjunction with Clause C3.3.10.1.

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 topsoiled until all work on the services has been completed.

Services that may be affected by the contract are described as follows:

- Watermains;
- Sewers;
- Stormwater;
- Electrical Cables / Lighting;
- Telkom / Neotel;
- CCTV;

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.

C3.3.8.4 Accommodation of Services

Further to the Clauses above 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. The rates shall also cover liaison with the services organisations and accommodation of their work gangs / contractors on site.

C3.3.9 Damage to services

Any service damaged by the Contractor shall immediately be reported to the Plant Superintendent and the Employer's Agent. The cost of repair of these services will be for the Contractors account unless the position of the service is such that its location could not reasonable have been anticipated by a competent Contractor.

C3.3.10 Connection to Existing Services

Fourteen (14) days written notice shall be given to the Employer's Agent and to the Employer of intention to connect to any existing service or structure. Such connection may only be undertaken once written approval is granted. Such approval may NOT be granted by the

WWTW Superintendent.

The work to connect to existing services may have to be done outside of normal working hours to accommodate the requirements of the Employer as the wastewater treatment plant cannot be shut down. Work may have to be undertaken during periods of low flow, which normally occur at night and in the early hours of the morning.

This might require overtime work by the Contractor. Allowance for this must be made in the tendered rates as no additional payments shall be made in this regard.

C3.3.11 Watermains

C3.3.11.1 General

There may be sections of water mains to be repaired. The tie-ins to the existing live mains normally have to be done by the Water Supply Branch, even if the installation of the new main is included in the contract.

C3.3.11.2 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. Tolerances on valve cover levels shall be as specified in clause PH.6.5. 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.

C3.3.11.3 Restriction on Compactive Equipment

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

Under no circumstances will heavy road-making equipment, other heavy plant or vibratory compaction equipment be permitted to operate within 800mm 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 road or other works are far enough advanced to provide a minimum of 800mm 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 watermains, other pipes or electrical cables be damaged during construction of the road or other works.

C3.3.12 Electrical Plant

C3.3.12.1 General

Various types of electrical cables including high voltage, medium voltage, low voltage, street lighting and domestic connection cables may be 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.

C3.3.12.2 Street / Area Lighting

Any relocation of street or area lighting that will take place during this contract will be executed by eThekwini Electricity or their agents. It is a requirement that the street and area lighting be operational at all times.

C3.3.12.3 MV / LV Cables

The actual cable work associated with any MV / LV cables to be replaced within the contract area will be carried out by eThekwini Electricity and it is stressed that the fourteen day period referred to in Clause C3.3.12 is the minimum period required to enable eThekwini Electricity to be on site timeously.

C3.3.13 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.

C3.3.14 Telkom S.A. Limited / Neotel Plant

No work to Telkom / Neotel Plant is envisaged, but the tenderers attention is drawn to the fact that Telkom / Neotel copper cables and fibre optic cables may exist in the contract area.

C3.3.15 CCTV Pant

No work to CCTV Plant is envisaged, but the tenderers attention is drawn to the fact that CCTV cables and fibre optic cables may exist in the contract area.

C3.3.16 Site Establishment

C3.3.16.1 Service and Facilities Provided by the Employer

Source of Water Supply

Water for construction is available on site, at the prevailing tariff. The Contractor shall make his own arrangements with the eThekwini Municipality and pay all installation and usage charges for a water supply for his needs. To this end the Contractor shall provide and make

use of a metered connection at a position and in a manner agreed with the Municipality.

The Employer accepts no responsibility for the shortage of water due to any cause whatsoever, nor additional costs incurred by the Contractor as a result of such shortage.

The Contractor shall make himself thoroughly acquainted with the regulations relating to the use of water and shall take adequate measures to prevent the wastage of water.

The Contractor shall take note that no direct payment will be made for any costs incurred for the provision of a water supply point nor for the cost of water drawn. Payment for the aforementioned shall be deemed to be covered by the rates and prices tendered and paid for the various items of work included under the Contract.

Source of Power Supply

Electrical power is available on site, at the prevailing tariff. The Contractor shall make his own arrangements with the eThekwini Municipality and pay all installation and usage charges for an electrical supply for his needs. To this end the Contractor shall provide and make use of a metered connection at a position and in a manner agreed with the Municipality.

The Employer accepts no responsibility for the interruption of the power supply due to any cause whatsoever, nor additional costs incurred by the Contractor as a result of such interruption.

No direct payment, other than provided for under the preliminary and general items, shall be made for any costs incurred for the provision of a power supply. The cost of supplying electrical power will be deemed to be covered by the relevant items.

Location of Camp and Materials Storage Area

An area for a campsite and materials storage area is available. The Contractor may erect his site offices and materials storage depot within the demarcated boundaries of the area. The Contractor shall confine his camp and storage of materials to the areas designated.

The site and materials storage area shall at all times be kept in a clean, dry and tidy condition. Temporary buildings and fencing shall be neat and presentable and the surrounding area shall, at all times, be kept in a neat, clean and orderly condition.

Scavenger-proof litter containers to be provided on site and paper and plastic packaging shall be collected daily and binned so that they cannot be blown onto the surrounding property.

Precautions to be taken against hydrocarbon spillage from heavy equipment such as compressors and generators, e.g. through the use of sand or sawdust filled drip trays. If maintenance and refuelling activities take place in this area, adequate protection and clean-up mechanisms in the event of a spill must be in place. All contaminated material (including soil) to be disposed of at a registered waste site.

All toxic materials (cement, oil, petrol, diesel, etc.) used at or stored in the construction camps should be very strictly controlled and secured against theft at all times.

The Contractor shall not cut down or damage trees without the prior written permission of the

Employer's Agent. If any vegetation is damaged or destroyed during the construction period, the damaged areas should be re-vegetated using indigenous plants that are native to this area.

On completion of the construction works, the area shall be re-instated to its original condition.

No persons, other than a night watchman, may overnight at the campsite.

Housing

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

Disposal Site

The designated waste disposal site for this contract is the Hammersdale solid waste disposal site located approximately 50km from the Site.

All material generated or cleared on the site including rubble, spoil, sludge and refuse shall be disposed of the designated disposal site.

Tenderers shall appraise themselves of the availability of the waste site and the rates charged. No additional payment shall be made for waste site charges or transportation costs to the disposal site, the costs of which shall be deemed to be covered by the tendered rates.

C3.3.16.2 Facilities Provided by the Contractor

Temporary Offices

A furnished office for the Employer's Agent is required.

Sanitary Facilities

The Contractor shall supply chemical toilets for use by his workmen. Alternatively temporary toilet facilities that discharge into the WWTW inlet may be provided. The number of toilets shall be based on one toilet per fifteen personnel on site with separate toilets for males and females..

Toilets shall be positioned such that no member of the workforce is further than a maximum of 100m walking distance from a toilet. Under no circumstances may either the toilets in the existing water treatment works or the surrounding bush be used as a toilet.

Telephone Facilities

A separate site telephone will not be required by the Employer's Agent, but R250 worth of pre-paid cellular air time per month for the Employer's Agent or his Representative must be allowed for. The Contractor shall also provide the Employer's Agent with a 3G network card with 2GB of data per month.

Removal of Facilities on Completion

The Contractor shall remove all temporary offices and storage facilities, toilets, temporary water connections and the like on completion of the contract and leave the areas used in a neat and tidy condition free of any rubble, debris, oils spillage, concrete and the like.

C3.3.16.3 Other Facilities and Services

Facilities for the Employer's Agent

The Contractor shall provide for the use of the Employer's Agent, maintain and service as required, the following facilities as specified in SANS 1200 AB and PSAB:

i) One furnished office
ii) 6 x 6m car port
iii) one contract nameboard
iv) safety equipment
v) medical facilities
vi) survey equipment

Communication facilities

The Contractor shall supply and maintain a computer with email facilities coupled to a printer in the office for the Employer's Agent for the duration of the contract.

An adequate supply of paper and ink for the printer must be maintained at all times.

Site Instruction Book

A triplicate book for site instructions shall be supplied free of charge by the Contractor. The book shall be kept in the site office and be accessible to the Employer's Agent during normal working hours. The Contractor shall hand the book to the Employer's Agent at the end of the contract.

Security Services

The Contractor shall be responsible for any security services he deems necessary to safeguard his facilities, plant and equipment and personnel for the duration of the contract. Refer to Clause C3.1.8 in this document.

An item has been allowed in the Bill of Quantities in this regard.

Notice Boards

The Contractor shall supply, erect and maintain for the duration of the contract two notice boards providing the names and emergency contact details of the Contractor and the senior staff members responsible for the contract.

One notice board shall be erected at the entrance to the site and the other on the external wall of the site office, next to the door.

C3.3.17 Site Usage

The Contractor shall confine his activities to the site of the works and to the area allocated to him for his site offices and materials storage. The Contractor may not use or damage in any way any area that falls outside the boundaries of the site. Any area damaged by the Contractor

outside the site boundaries shall be rehabilitated to the satisfaction of the Employer's Agent at the Contractor's expense.

No hunting, trapping, fishing or snaring will be allowed on the Municipal property or adjacent properties.

All employees of the Contractor and his Sub-Contractors shall confine themselves to the construction site and area. Any employee found to be outside the construction area shall be immediately removed from site and shall not return for the duration of the construction period.

C3.3.18 Survey Control and Setting Out of the Works

The Contractor is solely responsible for the setting out of the works and shall take all precautions to ensure the accuracy thereof. Any discrepancies in levels or setting out data provided to the Contractor in the form of drawings, specifications or by any other means shall be brought to the immediate attention of the Employer's Agent for clarification. Failure by the Contractor to seek clarification from the Employer's Agent will result in the rejection of any claim for delays or costs and any work found to be incorrect in terms of setting out or level will be rejected at the contractor's cost.

Survey pegs and reference marks shall be pointed out to the Contractor. The Contractor is solely responsible for the setting out of the works from the pegs and reference marks. The Contractor is also solely responsible for the protection of the pegs and reference marks. The Contractor's attention is specifically drawn to the requirements of SANS 1200 A: General, Clause 5.1 Survey, in this regard.

Furthermore, the Contractor shall check the levels of all existing structures that the new works must connect to before commencing with construction. Any discrepancy in levels between the existing structures and the levels shown on the drawings must be brought to the Employer's Agent immediate attention. Failure to act in this regard shall result in the rejection of any claim for delays or costs by the Contractor due to level discrepancies.

C3.3.19 Survey Beacons and Benchmarks

The Contractor shall be responsible for the preservation of all land survey, erf or other pegs, benchmarks and beacons. If damage or disturbance of any such pegs or beacons is caused by the operations of the Contractor or his subcontractors, the pegs are to be replaced by a Registered Land Surveyor at the cost of the Contractor. Benchmarks will be replaced by the Employer's Agent at the Contractor's expense.

Information regarding the position of all such pegs will be made available to the Contractor by the Employer's Agent on request.

The Contractor is to ensure that no spoil is placed over any erf peg or benchmarks and that these are adequately protected for the full duration of the Contract.

Where disturbances of boundary pegs is unavoidable due to excavation or other operations adjacent to the pegs, the Contractor shall advise the Employer's Agent or his Representative immediately, and agreement is to be reached that the disturbance of the peg is unavoidable and a strict record of such disturbed pegs is to be kept. Such pegs are to be replaced by a Registered Land Surveyor as described above and the Contractor is to submit proof of the

cost of replacement of pegs. The Contractor will be reimbursed on a basis pro-rata to the total cost of peg replacement determined on completion of the Works.

C3.3.20 Alterations, Additions, Extensions and Modifications to Existing Works

The Contractor shall satisfy himself within 14 days of moving onto site that the dimensional accuracy, alignment, levels and setting out of existing structures or components thereof are compatible with the proposed works and procedures. Any discrepancies shall be brought to the attention of the Employer's Agent in writing where this is not the case.

Failure by the Contractor to give written notice to the Employer's Agent in this regard within 14 days of him becoming aware, or of him should of being aware, of any discrepancy as mentioned above shall result in any claim for additional time and / or costs being rejected.

C3.3.21 Valves

All valves must be supplied with a signed quality control certificate from the supplier which states that the valve complies with the standards and that it has been hydraulically tested to 1,5 x the working pressure specified, as well as having passed a leakage test at mean operating pressure.

C3.3.22 Hydraulic pressure tests

Hydraulic pressure tests will be carried out by the Contractor on all pipework and pipelines. Where the hydraulic testing cannot be performed for whatever reason, all pipework will be left exposed for a period of at least three (3) days under normal service conditions after which the work will be inspected by the Employer's Agent to determine the acceptability of the work. The Employer's Agent and the Employer must agree that in such cases the hydraulic test will not be performed.

A standard hydrostatic test certificate will be completed for each hydrostatic test performed.

C3.3.23 Quality Control Tests

The Contractor shall be responsible for undertaking any quality control tests, including compaction density tests, that are required or may be inferred as being required, in terms of the Contract. The results of all such tests shall be given to the Employer's Agent.

Concrete test cubes must be taken as required in terms of SANS 1200 for concrete works and tested according to specifications. A minimum of 3 test cubes per concrete cast shall be provided, irrespective of the volume of concrete cast.

No separate payment shall be made for quality control tests, the costs of which shall be deemed to be covered by the rates tendered for the relevant items.

C3.3.24 Safety Regulations

Both the "Factories, Machinery and Building Work Act (Act 22 of 1941)" and the "Machinery and Occupational Health and Safety Act (Act 6 of 1983)" must wherever they appear in any standardized specifications, be substituted by the "Occupational Health and Safety Act (Act 85 of 1993)".

C3.3.25 Health and Safety

The Site of the Works is a working wastewater treatment works. Special care should be taken to instruct workers of the potential health hazards likely to be encountered when working on such a Site. It is strongly recommended that all persons working on the site be inoculated against hepatitis.

All construction work storage / storage areas and site office areas must, as far is practically possible, be securely demarcated / barricaded from the general access areas of the WWTW.

These areas must be out of bounds to the Employer's WWTW staff and safe access routes to the normal work areas of this staff must be provided around or through the construction areas.

Where, due to the nature of the refurbishment portions of the work, clear demarcation of construction areas vs operational WTW areas is not possible, the Contractor shall issue the necessary personnel protection equipment to Employer's staff. The Contractor shall enforce the use of this equipment in these overlapping construction areas. The Employer will be expected to enforce these requirements with their staff.

Venomous snakes may be found on the Site of the Works. Workers must be warned of the possibility of encountering these snakes and warned not to disturb them.

C3.3.26 Continuous Operation of the Wastewater Treatment Works

The existing wastewater treatment works shall remain in operation at all times and the Contractor shall allow full access to the existing works for the Employer's operational staff at all times. The Contractor shall programme his work taking these requirements into account.

C3.3.27 Dust Control

The Contractor shall take all appropriate measured to limit and suppress dust on site to prevent nuisance.

C3.3.28 Record Drawings

As the work progresses, the Contractor shall keep full sets of records of all the true levels, sizes and positions of equipment as well as all amendments to and deviations from the drawings issue by the Employer's Agent from time to time. This information must be submitted with the Contractor's final claim for payment. A separate set of drawings will be issued to the Contractor for this purpose.

The completion certificate shall only be issued after the Employer's Agent has received a properly completed set of "record" drawings from the Contractor. No separate payment shall be made for this service as all costs related thereto shall be deemed to be included in the rates for the relevant items.

C3.3.29 Inspection of Adjoining Properties

In order to establish a condition benchmark, all existing buildings, walls, fences, manholes, roads, etc. shall all be carefully inspected and photographed before any other work is

commenced. This inspection will be used as the benchmark to evaluate any damage or reinstatement claims to these structures. These structures shall be left in an equal or better condition at the close of the contract.

C3.3.30 Deep Excavations and Trenches and High Embankments

The Contractor must ensure that sufficient precautions be taken to ensure that no unauthorized person or animals gain access to the Works and to prevent, as far as is reasonably practicable possible, any person from being buried or trapped by a fall or dislodgement of material.

Any shoring or bracing must be designed and certified by a competent person, approved and constructed in such a manner rendering it strong enough to support the sides of the excavation.

Embankments should be constructed at such angle of repose to ensure that no slip can occur.

C3.3.31 Protecting the Site

The Contractor shall be solely responsible for the protection of the Site against all damage to property, services, terrain, trees etc. If in the normal execution of this Contract, disturbance to the Site of the Works is necessary, the Contractor shall obtain the prior permission of the Employer's Agent.

After completion of this work, the Contractor shall reinstate the area concerned to its original condition at his own cost as covered under the rates for cleaning sewers. The Employer's Agent's ruling of what was the original condition of the Site or part thereof shall be final.

If the Contractor fails to reinstate the Site, the Employer shall do the reinstatement and the Employer's Agent shall establish the extent of the work as well as its costs. The Employer's Agent's ruling shall be final and payment for the work will be deducted from the Contractor's monthly certificate.

The Contractor shall ensure that his actions do not cause any nuisance to the public. Should spillages occur, the Contractor must adequately disinfect the work site, including the container site.

C3.3.32 Finishing and Tidying

On no account must rubble and spoil materials, other materials, equipment or unfinished operations be allowed to accumulate in such a manner as to unnecessarily impede the activities of other Contractors or Authorities.

Finishing and tidying must not simply be left until the end of the construction period. The Contractor may, subject to prior agreement with the Employer's Agent and within reasonable limits, request that work in a particular area and/or work of a particular discipline, be inspected for partial completion. Partial completion shall not entitle the Contractor to Practical Completion of the partially completed work. A Certificate of Practical Completion shall only be issued once the entire Works have reached Practical Completion.

On completion of the Contract the Contractor shall ensure that all materials used in the

construction of the temporary site offices, workshop and storage yard are removed from Site. Waste material such as construction debris and soil contaminated with oil and fuel are to be disposed of at a suitable appropriately licensed waste disposal site. Proof of disposal shall be given to the Employer's
Agent.

Prior to the Handover of the Site to the Employer, the Contractor and the Employer's Agent will conduct a post construction audit to determine if any additional measures are to be taken. The Completion Certificate will only be issued after this stage.

C3.4: MANAGEMENT OF THE WORKS

C3.4.1 Applicable SANS and SABS standards

As specified under Clause C5.2.

C3.4.2 Liaison with Plant Staff and Operational Requirements

The Contractor shall liaise with the Employer's Agent with regard to the timing of all work so as to fit in with the operational requirements of the plant. This shall particularly apply to operations which require the shutting down of the plant as no alternate wastewater treatment is available.

The Employer requires as a minimum fourteen (14) days prior notice of any such shutdown.

C3.4.3 Planning, Cashflow and Programming

C3.4.3.1 Preliminary Programme

The Contractor shall include with his tender a preliminary programme on the prescribed form (see 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.

Tenderers may submit tenders for an alternative Time for Completion in addition to a tender based on the specified Time for Completion. Each such alternative tender shall include a preliminary programme similar to the programme above for the execution of the works, and shall motivate his proposal clearly by stating all the financial implications of the alternative completion time.

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 and special non-working days as specified in the in the Contract Data.

C3.4.3.2 Programme in Terms of the General Conditions of Contract

It is essential that the construction programme, which shall conform in all respects to the requirements of the General Conditions of Contract, be furnished within the time stated in the Contract Data.

The preliminary programme to be submitted with the tender shall be used as basis for this programme.

The 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.

C3.4.3.3 Planning

The Verulam WWTW cannot be shut down and disruption of the treatment processes must be avoided as far as practically possible throughout the duration of the contract.

The Contractor shall therefore undertake the Works in a manner that ensures no unnecessary disruption of the operation of the treatment plant. Only plant shutdowns that are absolutely required shall be allowed, with the duration of such shutdowns as short as possible. No plant shut down shall exceed 24 hours.

Tenderers shall provide information as part of the method statements submitted with their tenders as to the number, sequence and durations of proposed plant shutdowns.

Note: No plant shutdown shall be allowed and no individual treatment unit may be taken out of commission at any time or for any reason whatsoever without the written permission of the Employer's authorised official responsible for this contract. Should the Contractor fail to adhere to this requirement, the full costs of any nature whatsoever incurred by the Employer for allowing raw or partially treated wastewater to enter the environment shall be charged to and recovered from the Contractor.

C3.4.3.4 Submitted Programme

The Contractor shall provide basic main activity and cashflow programmes as part of his tender offer.

It is a prerequisite of this contract that minimal disruption to the existing wastewater treatment works is ensured and the Contractor shall take this into account when drawing up his programme.

Detailed activity programmes showing the anticipated quantities of work to be performed, together with the manner in which the listed plant is to be used, including the project critical path and estimated cash flow shall be submitted by the successful tenderer within 21 days of the Commencement Date. This programme shall clearly indicate each of the work activities and take into account the work and time constraints.

If, during the progress of the work, the quantities of work performed per month fall below those indicated on the programme, or if the sequence of operations is altered, or if the programme is deviated from in any other way, the Contractor shall produce a revised programme showing the modifications to the original programme necessary to ensure completion of the works or any part thereof within the specified time for completion.

This revised programme shall be provided to the Employer's Agent within seven days of the occurrence causing the change. Alternatively, the Employer's Agent may request a revised programme due to general programme slippage, which programme shall be provided within seven days of Employer's Agent's written request.

The programme, including cashflow to date and projected cashflow, shall furthermore be updated for each site meeting showing the work completed and the progress and cashflow ahead, to or behind schedule as relevant. The Contractor shall submit these written reports two days before each and every monthly site meeting.

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

The Contractor's programme and method statements will not be accepted as the basis for claims for additional compensation without due reference to all relevant associated factors.

When requested by the Employer's Agent, the Contractor shall submitwithin two working days, a Method Statement dealing with his proposed procedure for certain elements of the works. No work to this element shall commence until the Employer's Agent's written approval of the Method Statement has been received.

C3.4.3.5 General Allowances

When drawing up his programme, the Contractor shall take into consideration and make allowance for, inter alia:

(i) preparation and submission of design drawings to the Employer's Agent the Employer for approval, and the time allowed for approval by the Employer's Agent, the time for approval being ten (10) working days,

(ii) the sequencing of the Works taking all pertinent information contained in the documents into account,

(iii) expected weather conditions and their effects,

(iv) known physical conditions or artificial obstructions,

(v) searching for, dealing with and carrying out alterations to the existing services,

(vi) the provision and implementation of the Health and Safety Plan in terms of the Construction Regulations, 2003 of the Occupational Health and Safety Act.

(vii) Time required for service relocations.

(viii) Time allowances to be made for the ordering of special items.

(ix) Notification required by service organisations.

(x) Any special sequence in which work must be carried out.

(xi) If delays are anticipated with service relocations the Contractor should be asked to allow time.

(xii) Is work required out of normal hours (e.g. to accesses).

(xiii) Vehicular access to private property is to be maintained.

(xiv) Traffic restrictions.

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.

C3.4.3.6 Employer's Agent / Employer's Inspection and Approval of Work

The Contractor together with the Employer's Agent and the employer shall set milestones or hold points for the inspection and approval by the Employer's Agent of each portion of the design, manufacturing, installation and commissioning of all plant and equipment to be supplied and installed under the Contract. On reaching a milestone or hold point the Contractor shall not proceed further until the Employer's Agent and the Employer have inspected and approved the work done up to the milestone or hold point.

The Contractor shall inform the Employer's Agent seven (7) days in advance of an approaching milestone or hold point to allow the Employer's Agent sufficient time to make the necessary arrangements for the inspection of the work.

Should the Contractor not inform the Employer's Agent of the milestone or hold point within the seven days stipulated, any delays due to the Employer's Agent or the Employer not being immediately available to undertake an inspection shall not be cause for a claim for extension of time by the Contractor.

Review of Progress

The Contractor shall review his progress each month and should progress lag behind the latest accepted programme by more than 2 weeks, he shall submit a revised programme and method statement of how he proposes making up lost time.

If, in the opinion of the Employer's Agent, such revised programme will not make up lost time, the Employer's Agent shall have the right to request the Contractor to reorganize his work in a manner which will ensure an acceptable programme. Claims for additional payments to meet any cost incurred due to such reorganization will not be accepted.

C3.4.4 Other Contractors on Site

The Contractor must note that other Contractors may also be on the Site during the contract period. Suitable arrangements must be made to ensure mutual cooperation between all contractors.

C3.4.5 Key Personnel and Supervision

The Contractor shall assign as a Contract Manager a person suitably qualified and experienced in all aspects of the Works and especially in the supply and installation of mechanical and electrical equipment for wastewater treatment works.

This Contract Manager shall be responsible for all aspects of the Works on behalf of the Contractor, including receiving instructions, providing quotations, attending meetings, dealing with contractual correspondence, payment certificates, preparation of programs and cash flows, and the like.

Senior personnel such as the Site Agent and foreman shall be on site at all times to control and supervise the site activities. No work may be undertaken without these senior personnel on the site.

The Contractor shall provide the Employer's Agent with the full names, qualifications,

experience and contact details of his key personnel, and especially his Contract Manager, Site Agent and the person responsible for installation of mechanical and electrical equipment, for approval within seven (7) days of the commencement date of the contract.

C3.4.6 Management Meetings

Management meetings will be held monthly on site for the duration of the Contract on dates and at times to be agreed.

It is a minimum requirement that the Contract Manager and Site Agent attend the monthly management meetings.

Two days prior to each monthly meeting the Contractor shall provide an updated programme and progress report, cash flow, labour report and plant and equipment report.

Ad hoc meetings may also be called by the Employer's Agent to address any pertinent issue that may arise from time to time during the contract period. The Contractor shall ensure that the relevant people needed to address the issue at hand attend such ad hoc meetings.

C3.4.7 Quality Plans and Control

Quality control plans, methods and testing shall be as specified in the Contract Data.

C3.4.7.1 Control Testing of Work

The Contractor is required to carry out his own control quality testing and record keeping. The Employer's Agent may conduct his own control tests as required to monitor the Contractors testing.

Should the Contractor wish to use the Employer's Agent's testing facilities, he will be charged for the various tests at the rates ruling at the time. Any additional tests requested by the Contractor or any retests required, due to failure of the initial tests, will be charged to the Contractor at the rates ruling at the time.

The Contractor shall engage the services of an approved independent laboratory or other institution – as applicable for quality testing – to ensure that his work complies with the Specifications.

No separate payment will be made for such testing, the cost of which will be deemed to be included in the Contractor's rates tendered for the items of work that require testing in accordance with the Specifications.

The onus to produce work that conforms in quality and accuracy of detail to the requirements of the Specifications and Drawings, rests with the Contractor, and the Contractor shall, at his own expense, institute a quality control system and provide experienced Site Agents, foremen, surveyors, material technicians, other technicians and technical staff, together with all transport, instruments and equipment to ensure adequate supervision and positive control of the Works at all time.

The cost of supervision and process control, including testing carried out by the Contractor,

will be deemed to be included in the rates tendered for the related items of work.

The Contractor's attention is drawn to the provisions of the various Specifications regarding the minimum frequency of testing required. The Contractor shall, at his own discretion, increase this frequency, where necessary, to ensure adequate control.

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

C3.4.7.2 Valves – Test Certificates

All valves supplied for installation under this contract shall be provided with test certificates. Batch test certificates are acceptable provided that each valve delivered to site is covered by serial number under these certificates.

C3.4.7.3 Control Testing of Earthwork Layers and Bedding

The Contractor is required to carry out his own control testing and record keeping of earthwork layers and pipe bedding. The Employer's Agent may conduct his own control tests as required to monitor the Contractors testing.

The Contractor shall engage the services of an approved independent laboratory or other institution – as applicable for quality testing – to ensure that his work complies with the Specifications.

No separate payment will be made for such testing, the cost of which will be deemed to be included in the Contractor's rates tendered for the items of work that require testing in accordance with the Specifications.

The Contractor's attention is drawn to the provisions of the various Specifications regarding the minimum frequency of testing required. The Contractor shall, at his own discretion, increase this frequency, where necessary, to ensure adequate control.

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

C3.4.8 Format of Communications

Throughout the construction period, the Contractor shall supply and maintain the following documentation that shall be kept on Site, accessible to both the Contractor and the Employer's Agent or Employer's Agent's Representative at all times:

a) Site Request / Instruction book: For the Contractor to provide the Employer's Agent or Employer's Agent 's Representative with information required, for giving notification in writing of inspections, drawings, etc., required by the Contractor, and for use by the Employer's Agent or Employer's Agent 's Representative for the purpose of writing day-to-day instructions or confirming verbal information or instructions given to the Contractor.

b) Safety File: Containing the site and safety hierarchy, contact details, safety plan, audits, safety equipment, safety training, injuries log, inspections and all other relevant safety data.

c) Quality Control File: Containing Quality Assurance and Quality Control Forms to be operated and maintained by the Contractor.

d) Measurement File: Containing records of work measurement and calculations.

e) Daily Register: Listing labour and plant status.

f) Daily Contract Diary: For recording the work carried out on site each day – shall reference the specific area of work and shall be signed by the Site Agent and the Employer's Agent 's Representative.

g) Monthly Labour Return Schedule.

h) One full set of contract drawings and contract documents.

i) Construction Programme.

C3.4.9 Giving Notice of Work to be Covered Up

The Contractor shall give the Employer's Agent reasonable time to accommodate examinations in his programme, in which case times for inspection can be agreed on. Requests for examination of work shall be made in the site request book at least 24 hours before the examination is required where the Employer's Agent's Representative is full time on site.

In cases where the Employer's Agent's Representative does not maintain a full time presence on site, written requests for examination shall be emailed to the Employer's Agent at least three working days before the examination is required.

C3.4.10 Progress Photographs

The Contractor shall set up a system of taking digital photographs on site on a weekly basis to monitor the progress of works. This digital photography shall be labelled with the date, location and description of the photograph and a copy handed to the Employer's Agent on a CD or other storage medium on a weekly basis for safe storage. The format shall be JPG, BMP or any other common format.

C3.4.11 Working Hours

Normal working hours shall be from 07:00 to 17:00 Monday to Friday. Normal working hours exclude gazetted public holidays.

C3.4.12 Payment Certificates

The Contractor should submit his claim for payment on or about the 25th day of each month.

Payment certificates shall be submitted in the form of the Bill of Quantities. Columns shall be provided showing the previous quantity, current quantity and total quantity claimed under each

item.

Calculations to substantiate the quantities claimed are to be agreed upon by the Construction Manager and Employer's Agent's Representative and be signed by them and submitted to the Employer's Agent with each monthly claim.

A declaration of ownership of unused materials must be submitted together with any claim made for payment of unused materials on site. No payment for materials on site will be made without such a declaration. A pro forma declaration of ownership is included in this document. An actual and predicted cashflow summary shall be included with each certificate.

C3.4.13 Occupational Health and Safety

C3.4.13.1 General Statement

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

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

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.

C3.4.13.2 Health and Safety Requirements and Procedures

The Contractor is solely responsible for health and safety on the Site and shall comply at all times with the requirements of the Health and Safety Act and its Regulations.

Any subcontractor shall be bound by the same health and safety requirements as the Main Contractor.

C3.4.13.3 Health and Safety Specifications and Plans to be Submitted at Tender Stage

At 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 T2.2: Contractor's Health and Safety Plan.

C3.4.13.4 Tenderer'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 T2.2: Contractor's Health and Safety Plan.

The detailed safety plan will take into consideration the site-specific risks as mentioned under PS.10.1 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.

C3.4.13.5 Expected Health and Safety Risks

Listed below are some, but may not be all, of the expected health and safety related risks that may be encountered during the contract duration. The Contractor shall identify and prepare assessments for all risks he is likely to encounter in the execution of the contract before commencing with any work. Further assessments shall be prepared as and when required for any other risks identified during the construction phase before work involving such risks is undertaken.

- The site is a working wastewater treatment works
- Hazardous and toxic gases including sewer gases and chlorine
- Explosive gases in the sludge digesters and manholes
- Hazardous materials such as cement, paint, thinners, sealants and the like
- Working at heights
- Working in close proximity to water
- Working in close proximity to operating machinery that starts and stops automatically
- Operating construction plant and equipment
- Lifting, loading and placing of heavy materials and other weights

- Working in confined spaces with limited ventilation and lighting
- Dust pollution
- Existing services including water pipes, sewer pipes and electrical cables
- Working with electrical power tools
- Working in close proximity to high and medium voltage electricity.
- Working with pneumatic tools
- Excessive noise levels
- Moving construction plant and vehicles on the Site
- Working in deep excavations
- Working near or at the toe of high embankments
- Venomous snakes such as mambas, boomslangs and puff adder

C3.4.13.6 Special Health and Safety Precautions Regarding Sludge Digesters

Working in sludge digesters is extremely hazardous due to the toxic and explosive nature of gases normally present in such structures.

The Contractor shall open and ventilate the digesters using forced ventilation for a period of at least 24 hours before allowing any person to enter the digester.
The Contractor shall ensure that no naked flame or sparks are allowed within 20m of the digesters so as to prevent the possibility of a catastrophic explosion.

Testing for toxic gasses shall be carried out each and every time before any person may enter a digester. Should the readings indicate gases levels that may be dangerous to human health, the digesters shall first be force ventilated until the gas readings drop to safe levels before a person may enter.

No person may be allowed to enter a digester containing sludge without appropriate fully operational self-contained breathing apparatus specifically designed for working in toxic gas environments.

Forced ventilation shall take place at all times whenever persons are working in a digester.

No person shall be allowed to enter a digester without wearing a safety harness connected to a rope of sufficient strength and length to allow him to be pulled out of the digester if necessary.

No person shall be allowed to enter a digester unless there is at least two other people present outside the digester who may pull him out quickly if necessary. A mechanical or electrical winch must be provided for this purpose.

The above is the minimum required when working in a digester and shall in no way whatsoever relieve the Contractor of his legal responsibility and/or liability to ensure a safe working environment for his staff at all times and under all working conditions.

C3.4.13.7 First Aid and Site Safety

The Contractor may be working in confined spaces and at height and shall especially be required to observe those sections of the Act and Regulations which deal with working in

confined spaces and heights and dealing with hazardous gases. This is especially relevant when working in the sludge digesters.

All digesters, manholes and pipes shall be tested for hazardous gases on a continuous basis to ensure worker safety. The Contractor shall ensure that the necessary functional gas testing equipment is available on Site at all times.

Breathing apparatus must be available as and when required. The Contractor shall ensure that the following list of personnel protective equipment is in general use as a minimum:

- Safety harnesses for working in confined spaces and at heights.
- Hazardous Gas testing equipment.
- Breathing apparatus for toxic gases and oxygen deficient areas.
- Hard hats where required.
- Leather gloves for cut resistance.
- Ear muffs or ear plugs for noise from machines.
- Overalls for body protection.
- Safety shoes with steel toe caps for foot protection.
- Where work is carried out over water, workers shall be provided with, and wear, flotation equipment. Lifesaving equipment shall be provided in these areas.

Anything set out in connection with the Safety Act in this document is supplementary to and in no way replaces, alters or supersedes the provisions of the latest revisions of the Occupational Health and Safety Act 1993 (Act 85 of 1993) which shall be complied with at all times.

C3.4.13.8 Protection of the Public and Employer's Staff

The Contractor shall at all times ensure that his operations do not endanger any member of the public or of the Employer's staff.

Open excavations and other hazardous conditions on the Site shall be barricaded and precautions shall be taken to protect persons from the same in terms of the Occupational Health and Safety Act (the Act).

As the Works are on an operating wastewater treatment works, the Contractor shall take special precautions to prevent access to any danger areas on the Works, e.g. by temporary barricades, notices and/or fencing.

C3.4.13.9 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.

C3.4.14 Environmental Management

C3.4.14.1 Methods and Procedures

Any subcontractor shall be bound by the same environmental requirements as the Main Contractor.

The following, together with the Construction Environmental Management Programme, shall be applied with regard to the operation and maintenance of the site:

- The site shall at all times be kept in a neat and tidy condition. Papers and packaging shall be binned and removed from site and waste stockpiles shall be properly demarcated and the waste removed at regular intervals and disposed of at a registered waste disposal site. Loose papers and bags shall be collected daily.

- Natural vegetation shall not be damaged unnecessarily and the working areas of the site be kept to the minimum reasonable possible for construction. An environmental awareness training programme for the construction staff should be implemented by the Contractor/sub-contractor(s) and all workers made aware of the recommended mitigation measures to be implemented.

- No wild animals (birds, snakes, lizards, game, etc.), domestic stock or indigenous plants are to be disturbed unnecessarily in any way by the construction activities or by the construction staff.

- All topsoil (containing indigenous plant seeds, rootstock, etc.) removed – that may be required in future rehabilitation – should be carefully stockpiled for later rehabilitation. Ensure that there is no dust nuisance from the stockpiles.

- Measures need to be taken to ensure that contamination from the work camp and lay-down site does not pollute adjacent areas. This should include the diversion of natural run-off away from the works and the containment thereof in drainage retention areas, where applicable.

- Stormwater and water from dewatering operations shall be disposed of so as not to return to the working area nor to cause damage or erosion to surrounding areas. Any claims resulting from flooding from construction or storm water will be for the cost of the Contractor.

- Dust from stockpiles and access roads shall be controlled by watering.

- Precautions shall be taken against oil spillage from heavy equipment through the use of sand or sawdust drip trays. All material (including soil) contaminated with hydrocarbons should be disposed of as hazardous waste at a registered waste disposal site.

- Any object of historical interest that may be uncovered in the course of the works shall immediately be protected and reported to the Employer's Agent for further action. There is a legal requirement to report any archaeological site of cultural significance to the National Monuments Council, according to the National Heritage Act (Act No. 25 of 1999).

- Access to the site shall be given to all sub-contractors and other contractors who may be appointed from time to time to allow then to complete their portion of the works. All subcontractors shall be issued with, and use, the personal protective equipment required for their work operations.

- The Contractor shall check and supervise his own work and the work of his sub-contractors to ensure that all work is carried out to the specified time schedule, safety and quality standards.

- The Contractor is responsible for the care, safekeeping and security of the works including all plant and materials, whether in store or already installed but not yet taken over by the Employer.

- Site Records – the Contractor shall maintain a diary reporting the daily progress referencing the area of work, any problems experienced, weather, plant complement and labour complement.

- Final audit: On completion of the works, but before the construction site is handed back to the Employer, a thorough environmental inspection or audit impacted by the construction activities shall be carried out and any 'problematic' or damaged areas shall be made good or rehabilitated to the satisfaction of all parties.

C3.4.14.2 Environmental Management Plan

In addition, anything contained in this Clause C3.4.7, all requirements according to the Environmental Management Plan as detailed in the Particular Specifications, will be adhered to.

C3.4.14.3 Fires and Burning of Vegetation

Under no circumstances whatsoever may fires be lit at the site of the Works.

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.

C3.4.14.4 Preservation of Flora and Fauna and Soil Conservation

The Contractor shall:

a. take all precautions to prevent:

   i) any damage to trees, shrubs and the surrounding natural environment. Any clearing of or damage to trees or bush shall only be done with permission from the Employer's Agent and Employer.

   ii) fires,

   iii) loss or injury to domestic or wild animals from any land used or occupied by the Contractor

   iv) refrain from destroying, removing or clearing trees, timber and scrub to any extent greater than is absolutely necessary for the execution of the contract.

b. take care to cause the minimum disturbance to the fauna and flora,

c. take measures as to ensure that his employees are aware of and abide by all laws and restrictions governing the hunting, disturbing, capturing or destroying of animals and birds in the vicinity of the camp or the Works or the taking of fish from any water.

and

d. prohibit all firearms from the site and temporary camps.

C3.4.14.5 Protection of Trees, Shrubs and Surrounding Environment

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.

The Contractor shall ensure that no trees, shrubs or the surrounding natural environment outside the site boundaries are disturbed, damaged or destroyed.

A penalty of R1,000 per tree or shrub damaged or destroyed or for damage to the natural surrounding environment may be charged to the Contractor. The Employer's Agent shall have the right to permanently exclude any person from the site who causes any damage to the natural environment.

C3.4.14.6 Prevention of Poaching

The Contractor shall ensure that none of his employees, including the employees of any appointed subcontractor, partake in any poaching activities of any nature during the duration of the contract.

Any person caught poaching or setting snares / traps or removing any flora shall immediately be banned from the site of the Works and shall be prosecuted under the relevant laws.

The Contractor shall be liable for a fine of R10,000 for every incidence of poaching committed by any of his employees, whether the employee is prosecuted or not. Repeated incidents may be considered as cause for cancellation of the contract.

C3.5: SPECIFICATION DATA

PREAMBLE

The Specification Data gives amendments and additions to the specifications that are listed in the List of Applicable Specifications. Clause headings are prefixed by the letters "PS" followed by alphabetic and numeric characters which identify the specification and main clause of the applicable specification. Where the Specification Data sub-clause is an addition and there is no appropriate clause in the applicable specification to which to link it, a new clause number is given following the last clause number used in the specification. New clauses are followed by an asterisk (*).

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.

C3.5.1 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.

C3.5.2 Works Specifications

For the purpose of this Contract the latest issues of the SABS 1200 Standard Specifications, applicable at the date of tender advertisement, shall apply. The following Standard Specifications are mostly applicable to this particular contract:

SABS 1200 A	:	General
SABS 1200 C	:	Site Clearance
SABS 1200 D	:	Earthworks
SABS 1200 DA	:	Earthworks (Small Works)
SABS 1200 DB	:	Earthworks (Pipe Trenches)
SABS 1200 DK	:	Gabions and Pitching
SABS 1200 DM	:	Earthworks (Roads, Subgrade)
SABS 1200 G	:	Concrete (Structural)
SABS 1200 HC	:	Corrosion Protection
SABS 1200 LB	:	Bedding (Pipes)
SABS 1200 LD	:	Sewers
SABS 1200 LE	:	Stormwater Drainage
SABS 1200 ME	:	Subbase
SANS 10085	:	Design, Erection, Use and Inspection of Access Scaffolding Scaffolding part III: Specification for mobile access

SANS 398-3	:	working towers
SANS 1396	:	Wooden Scaffold Boards
		Appropriate series applicable to general purpose mild steel metric threaded nuts, bolts and washers
SANS 1700 – Series	:	
SANS 1700-2-19 and 20		Tolerances for external and internal metric threads for hot dip galvanising
	:	
SANS 10142		Code of Practice for Wiring of Premises as ammended

The term "project specifications" appearing in any of the SABS 1200 Standardised Specifications, or any other specification, must be replaced with "Scope of Work".

The prefix "PSA" denotes an amendment to SABS 1200A. "PSAB" denotes an amendment to SABS 1200AB and so forth. The number following these prefixes refers to the relevant clause numbers of SABS 1200.

For example: "PSA 8.1" refers to Clause 8.1 of SABS 1200A.

New clauses are followed by an asterisk (*).

Further to the above, it should be noted that, where in a specific Standardised Specification reference is made to a sub-clause in another Standardised Specification, any amendment or addition to the sub-clause referred to, as provided in the Works Specification, shall apply.

C3.5.3 Particular Specifications

The following particular specifications, bound into this document, are applicable to this contract:

PDA	Quality Control and Assurance Systems
PDB	Manufacture, Supply & Installation of Electric Actuators for Valves
PDC	Manufacture and Installation of Valves
PDH	Preparation of steel Surfaces and Application of Coating Systems
PLI	Labour-Intensive Specification

C3.5.4 PLI: GENERIC LABOUR-INTENSIVE SPECIFICATION

PLI 1 SCOPE

This specification establishes general requirements for activities which are to be executed by hand involving the following:

(a) trenches having a depth of less than 1,5 metres

(b) storm water drainage

(c) low-volume roads and sidewalks

PLI 2 PRECEDENCE

Where this specification is in conflict with any other standard or specification referred to in the Scope of Works to this Contract, the requirements of this specification shall prevail.

PLI 3 HAND EXCAVATABLE MATERIAL

Hand excavatable material is material:

(a) Granular materials:

(i) whose consistency when profiled may in terms of table 1 be classified as very loose, loose, medium dense, or dense; or

(ii) where the material is a gravel having a maximum particle size of 10 mm and contains no cobbles or isolated boulders, no more than 15 blows of a dynamic cone penetrometer is required to penetrate 100 mm.

(b) Cohesive materials:

(i) whose consistency when profiled may in terms of table 1 be classified as very soft, soft, firm, stiff and stiff/very stiff; or

(ii) where the material is a gravel having a maximum particle size of 10 mm and contains no cobbles or isolated boulders, no more than 8 blows of a dynamic cone penetrometer is required to penetrate 100 mm;

Note: (1) A boulder, a cobble and gravel is material with a particle size greater than 200 mm, between 60 and 200 mm.

(2) A dynamic cone penetrometer is an instrument used to measure the insitu shear resistance of a soil comprising a drop weight of approximately 10 kg which falls through a height of 400 mm and drives a cone having a maximum diameter of 20 mm (cone angle of 60° with respect to the horizontal) into the material being used.

Table 1: Consistency of materials when profiled

Granular materials		Cohesive materials	
Consistency	**Description**	**Consistency**	**Description**
Very loose	Crumbles very easily when scraped with a geological pick.	Very soft	Geological pick head can easily be pushed in as far as the shaft of the handle.
Loose	Small resistance to penetration by sharp end of a geological pick.	Soft	Easily dented by thumb; sharp end of a geological pick can be pushed in 30 - 40 mm; can be moulded by fingers with some pressure.
Medium dense	Considerable resistance to penetration by sharp end of a geological pick.	Firm	Indented by thumb with effort; sharp end of geological pick can be pushed in up to 10 mm; very difficult to mould with fingers; can just be penetrated with an ordinary hand spade.
Dense	Very high resistance to penetration by the sharp end of geological pick; requires many blows for excavation.	Stiff	Can be indented by thumb-nail; slight indentation produced by pushing geological pick point into soil; cannot be moulded by fingers.
Very dense	High resistance to repeated blows of a geological pick.	Very stiff	Indented by thumb-nail with difficulty; slight indentation produced by blow of a geological pick point.

PLI 4 TRENCH EXCAVATION

All hand excavateable material in trenches having a depth of less than 1,5 metres shall be excavated by hand.

PLI 5 COMPACTION OF BACKFILLING TO TRENCHES (AREAS NOT SUBJECT TO TRAFFIC)

Backfilling to trenches shall be placed in layers of thickness (before compaction) not exceeding 100 mm. Each layer shall be compacted using hand stampers

(a) to 90% Proctor density;

(b) such that in excess of 5 blows of a dynamic come penetrometer (DCP) is required to penetrate 100 mm of the backfill, provided that backfill does not comprise more than 10% gravel of size less than 10 mm and contains no isolated boulders, or

(c) such that the density of the compacted trench backfill is not less than that of the surrounding undisturbed soil when tested comparatively with a DCP.

PLI 6 EXCAVATION

All hand excavateable material including topsoil classified as hand excavateable shall be excavated by hand. Harder material may be loosened by mechanical means prior to excavation by hand.

The excavation of any material which presents the possibility of danger or injury to workers shall not be excavated by hand.

PLI 7 CLEARING AND GRUBBING

Grass and small bushes shall be cleared by hand.

PLI 8 SHAPING

All shaping shall be undertaken by hand.

PLI 9 LOADING

All loading shall be done by hand, regardless of the method of haulage.

PLI 10 HAUL

Excavation material shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150 m.

PLI 11 OFFLOADING

All material, however transported, is to be off-loaded by hand, unless tipper-trucks are utilised for haulage.

PLI 12 SPREADING

All material shall be spread by hand.

PLI 13 COMPACTION

Small areas may be compacted by hand provided that the specified compaction is achieved.

PLI 14 GRASSING

All grassing shall be undertaking by sprigging, sodding, or seeding by hand.

PLI 15 STONE PITCHING AND RUBBLE CONCRETE MASONRY

All stone required for stone pitching and rubble concrete masonry, whether grouted or dry, must to be collected, loaded, off loaded and placed by hand.

Sand and stone shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150 m.

Grout shall be mixed and placed by hand.

PLI 16 MANUFACTURED ELEMENTS

Elements manufactured or designed by the Contractor, such as manhole rings and cover slabs, precast concrete planks and pipes, masonry units and edge beams shall not individually, have a mass of more than 320 kg. In addition, the items shall be large enough so that four workers can conveniently and simultaneously acquire a proper handhold on them.

Variations and Additional Clauses to the National Standards Listed in the List of Applicable Specifications

PSA **GENERAL** (SANS 1200 A)

PSA 2 **INTERPRETATIONS**

PSA 2.3 **Definitions**

The term “Engineer” shall mean “Employer’s Agent”.

Except for references to the Bureau itself, and to the (official) SABS mark, the term “SABS’” shall mean “SANS”.

The terms "Schedule of Quantities" and "Bill of Quantities" shall mean the same.

The term "project specification" shall mean the “Specification Data”, i.e. that portion of the Scope of the Works that completes and/or amends the standardized and standard specifications.

PSA 2.4 **Abbreviations**

Add to Subclause 2.4(b):

"MAMDD: Modified AASHTO maximum dry density.

TMH1: Technical Methods for Highways 1”.

PSA 2.8 **Items in Schedule of Quantities**

PSA 2.8.1 **Principle**

In the fourth line of Subclause 2.8.1, after the word "specification", add: "or in the measurement and payment clause of the standard specification, particular specification or Specification Data".

Add the following paragraphs:

"The Contractor shall be deemed to have inspected and examined the Site and its surroundings and information available in connection therewith and to have satisfied himself before submitting his tender (as far as is practicable) as to

(a) the form and nature of the Site and its surroundings, including subsurface conditions,

(b) the hydrological and climatic conditions,

(c) the extent and nature of work and materials necessary for the execution and completion of the Works,

(d) the means of access to the Site and the accommodation he may require

and, in general, shall be deemed to have obtained all information (as far as is practicable) as to risks, contingencies and all other circumstances which may influence or affect his tender.

The Contractor shall be deemed to have based his tender on the technical data given in the Documents and, if in the performance of the Contract any circumstances shall differ from the said technical data, which difference causes delay or additional Cost, the Contractor shall be entitled to make a claim in accordance with Conditions of Contract.

The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the Works and of the rates and prices stated in the priced Bill of Quantities and the Schedule of Rates and Prices (if any) or in the specification, which rates and prices shall (except in so far as otherwise provided in the Contract) collectively cover full payment for the discharge of all his obligations under the Contract and all matters and things necessary for the proper completion of the Works."

PSA 3 MATERIALS

PSA 3.1 Quality

Where applicable, materials shall bear an official standardisation mark.

Add the following to Clause 3.1:

"Where proprietary materials are specified, it is to indicate the quality or type of materials or articles required and where the terms "or other approved" or "approved equivalent" are used in connection with proprietary materials or articles, it shall be understood that the approval shall be at the discretion of the Employer's Agent. All materials shall be applied in accordance with manufacturer's specifications."

PSA 4 PLANT

PSA 4.2 Contractor's Offices, Stores and Services

The first aid services required in terms of Subclause 4.2 of SANS 1200 A shall include, inter alia, a First Aid cabinet fully equipped and maintained with at least the minimum contents as listed in the Annexure (Regulation 3) to the General Safety Regulations of the Occupational Health and Safety Act, 1993 (Act 85 of 1993), to deal with accidents and ailments which are likely to occur during the construction period.

The Contractor shall provide personal safety equipment and facilities as required by Regulation 2 of the General Safety Regulations of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).

The Contractor shall provide and maintain on the Site adequate and suitable sanitary and first aid services and a supply of potable water for his employees engaged on the Contract and, if necessary, suitable accommodation and similar facilities elsewhere for such employees off the Site.

A minimum of 1 toilet per 15 workers shall be provided with separate toilets for males and females.

PSA 5 CONSTRUCTION

PSA 5.1 Survey

PSA 5.1.1 Setting out of the Works

Before commencing any construction, the Contractor shall check the relative positions and levels of all reference pegs, benchmarks and line pegs and inform the Engineer of any discrepancy. The Contractor shall be responsible for setting out the Works from the pegs and benchmarks and the dimensions given on the drawings.

Any errors or suspected discrepancies with regards to levels, co-ordinates, dimensions or other related aspects of the existing or proposed works that come to light during the execution of the Works shall be brought to the attention of the Engineer without delay.

Add to Subclause 5.1.1

"The Contractor shall be responsible for the true and proper setting out of the Works and for the correctness of the position, levels, dimensions and alignment of all parts of the

Works and for the provisions of all necessary instruments, appliances and labour in connection therewith.

The Contractor shall carefully protect and preserve all benchmarks, sight-rails, pegs and other things used in setting out the Works.

The checking of any setting-out or of any line or level by the Engineer shall not relieve the Contractor of his responsibility for the correctness thereof.

If at any time during the progress of the Works, any error shall appear or arise in the position, levels, dimensions or alignment of any part of the Works, the Contractor, on being required to do so by the Employer's Agent , shall at his own expense rectify such error to the satisfaction of the Employer's Agent , but if such error is based on incorrect data supplied in writing by the Employer's Agent or if there is any delay in providing the particulars required, the Contractor shall, in respect of that delay and the Cost of such rectification, be entitled to make a claim in accordance with Clause 48."

The Contractor shall advise the Engineer of any conflict between the position of any part of the Works and an existing feature or service.

PSA 5.2 Watching, Barricading and Lighting

Add to Subclause 5.2:

"The Contractor shall comply in all aspects with the requirements of the Occupational Health and Safety Act (Act 85 of 1993).

The Contractor shall, in connection with the Works, provide and maintain all signs signboards, lights, barriers, barricades, fencing and watching when and where:

(a) specified in or reasonably to be inferred from the Contract, or

(b) required by any competent statutory or other authority, or

(c) required by the Employer's Agent for the protection of the Works or for the safety or convenience of the public or others;

provided that, if the Engineer shall instruct the Contractor to provide any sign, signboard, light, barrier, barricade, fencing or watching not included in paragraphs (a), (b) or (c), such requirement shall constitute a variation by the Engineer in terms of Clause 6.3 of the General Conditions of Contract 2015."

PSA 5.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES

Replace the heading and the contents of the Subclause with the following:

PSA 5.4 LOCATION AND PROTECTION OF EXISTING SERVICES

PSA 5.4.1 <u>Location of Existing Services</u>

Before underground or excavation work is carried out, the Contractor shall ascertain the presence and position of all services likely to be damaged or interfered with by his activities. He shall obtain up-to-date plans from the Engineer for this purpose, showing the position of services in the area where he intends to work. As services can often not be reliably located from such plans, the Contractor shall determine the exact position of such services by means of careful hand excavation where necessary in order to expose the services at the positions of possible interference by his activities. This procedure shall also be followed in respect of services not shown on the plans but believed to be present.

All such services, the positions of which have been located at the critical points, shall be designated as 'known' services and their positions shall be indicated on a separate set of Drawings, a copy of which shall be furnished to the Engineer.

While he is occupying the Site, the Contractor shall be liable for all damage caused by him to known services as well as for consequential damage, whether caused directly by his operations or by the lack of proper protection.

PSA 5.4.2 **Protection During Construction**

The Contractor shall exercise all the necessary care to prevent damage to known services during construction. Where applicable, major excavating equipment and other plant shall not be operated dangerously close to these services. Where necessary, excavation in close proximity to these services shall be carefully carried out with suitable hand tools, excluding picks wherever their use could damage the services. No additional payment will apply to such more difficult work. Services left exposed shall be suitably protected from damage.

PSA 5.4.3 **Alterations and Repairs to Existing Services**

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

When existing services are damaged by the Contractor, he shall immediately inform the Engineer, or when this is not possible, the relevant authority, and obtain instructions as to who should carry out repairs. In urgent cases the Contractor shall take the necessary steps to minimise damage to and interruptions of the service. No repairs of telecommunication cables or electric power lines and cables shall be attempted.

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

PSA 5.9 **ACCOMMODATION OF TRAFFIC**

Temporary traffic signs shall be erected at all open excavations and trench crossings. Traffic signs shall have a yellow background with either a red or black border.

PSA 5.10 **SITE MEETINGS**

The Contractor will be required to attend regular site progress meetings, normally held once a month to discuss general progress, quality of work, problems, claims, payments, etc, but not matters concerning the day-to-day running of the Contract."

PSA 7 **TESTING**

PSA 7.2 **Approved Laboratories**

Delete the clause and replace with the following

All checks/testing conducted by the Contractor and additional acceptance control testing as required by the Employer's Agent, will be done by a South African National Accreditation System (SANAS) accredited laboratory.

PSA 8 **MEASUREMENT AND PAYMENT**

PSA 8.2 **PAYMENT**

PSA 8.2.2 **Time-related Items**

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

The payment to the Contractor for Time-Related items shall be such proven additional cost in the event of the Contract being extended. Cost means all expenditure actually incurred (or to be incurred) by the Contractor, whether on or off the Site, but does not include profit

and markup. Typical examples: Extension of guarantee and insurances, cost for labour, plant, equipment and tools.

The Contractor shall provide the Employer's Agent with a breakdown of all costs claimed upon request.

For the purposes of applying this clause "Extension of Time" will exclude the Contractor's December/January close-down period, if applicable. No payment will be made for the shutdown period should an extension of time include the shutdown period.

The abovementioned adjustment of the payment for Time-Related Items shall be made once the claim ruling has been approved through a variation order in accordance with the approved and agreed Employer's Agent s ruling.

In the case of fixed price contracts, the amount by which the Time-Related Items is adjusted shall not be subject to the Contract Price Adjustment formula.

In the case of contracts subject to Contract Price Adjustment the amount by which the time-related item is adjusted shall be subject to the Contract Price Adjustment formula."

PSA 8.3 SCHEDULED FIXED-CHARGE AND VALUE-RELATED ITEMS

PSA 8.3.1 Contractual Requirements

Add to Sub-Clause 8.3.1:

"In addition, the sum tendered shall cover all initial costs incurred in complying with the Special Conditions of Contract."

PSA 8.3.3 Other Fixed-charge Obligations

Add after the last paragraph:

"Certain items will be scheduled purely to draw the Contractors attention to them. They are not all encompassing and do not relieve the Contractor from his obligation if not documented as a payment item."

PSA 8.4 SCHEDULED TIME-RELATED ITEMS

PSA 8.4.1 Contractual Requirements

The Contractor shall tender a lump sum in the Bill of Quantities to cover his Time-related Establishment costs. The amount tendered and paid shall be full compensation to the Contractor for:

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

Payment of the lump sum shall be made pro rata monthly in compliance with the method laid down in Sub-clause 8.2.2 of SANS 1200A, as amended.

The Contractor will not be paid Time-Related Preliminary and General charges for any Special Non-Working Days, as stipulated in the Contract Data, which shall be deemed to have been allowed for in his rates.

PSA 8.4.5 Other Time-related Obligations

Provision of Security Personnel ……..…… Unit: sum

This item shall cover the cost of providing such security personnel the Contractor deems appropriate, taking cognizance of the location of the site and the historical record of incidents of crime in the area. Payment shall be made in equal monthly instalments over the duration of the contract.

PSA 8.5 Sums Stated Provisionally by Engineer

Amend the penultimate sentence of Subclause 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 provisionally stated for (b)(1) above. Payment will be made on the basis of the sums actually paid for such work, exclusive of VAT."

PSA 8.5.1* **Additional Testing required by the Engineer** …….…... Unit: Provisional Sum

The provisional sum provided in the Bill of Quantities is to cover the payment of a SANAS registered soils laboratory to conduct any additional tests as directed by the Engineer.

PSA 8.5.2* **Overhead, charges, profit etc. on item PSA 8.5.1** ……Unit: %

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

- All costs involved in arranging the tests with the laboratory.
- Setting out the positions for the tests to be taken by the laboratory as indicated by the Employer's Agent.
- Making good all test holes.
- The cost of all overheads, charges and profits.

PSA 8.5.3* **Relocation of municipal services** ……..……..Unit: Provisional Sum

The provincial sum is to cover the costs payable by the Contractor to service providers, on the Employer's Agent's instruction only, for the relocation of existing services which impede construction activities

PSA 8.5.4* **Overhead charges, profit, etc on item PSA 8.5.3** ……..…….. Unit: %

The percentage tendered shall be paid to the contractor on the actual amount paid to the service provider and shall cover the cost of contacting the service provider and arranging for the relocation of the services, as well as briefing the service provider on the presence of other underground services which may affect their work, ensuring that the service providers workmen are correctly inducted on site and maintaining a competent supervisory presence whilst relocating work takes place.

PSA 8.5.5* **Community Liaison Officer (CLO) remuneration** ……..……Unit: Provisional Sum

A Provisional sum is provided in the Schedule of Quantities to cover reimbursement to the Contractor for payments made by him as remuneration to the Community Liaison Officer as and when directed by the Engineer.

The Contractor must provide proof of payments to the CLO in the form of copies of pay slips when claiming payment under this item. The actual proven amount paid to the CLO will be reimbursed to the Contractor, with the tendered markup.

PSA 8.5.6* **Overhead charges, profit, etc on item PSA 8.5.5** ……Unit: %

The percentage tendered shall cover the office administration of the CLO's employment

contract as well as on site management of the CLO, for the duration of the contract. No separate measurement and payment will be made for any costs incurred by the Contractor in liaising with the Community Liaison Officer. Such costs will be deemed to have been recovered in the rates tendered for the scheduled items.

PSA 8.7 Daywork

Provisional items for Daywork are scheduled as follows:

(a) Labour at hourly rates for skilled, semi-skilled and unskilled labourers.

(b) Material as a Provisional Sum with a percentage allowance on the net cost.

(c) The Contractor's own plant at hourly rates for various types.

Tendered unit rates or unit rates that are agreed for the Contractor's own plant used for Daywork shall cover the full cost of the use of such plant and shall therefore, in addition to the items listed in Subclause 8.7, cover the cost of plant operators, consumable stores, fuel and maintenance.

(d) Hired plant as a Provisional Sum with a percentage allowance on the net cost.

The Contractor will be paid the actual net cost of plant hired by him for Daywork and in addition will be paid a percentage allowance on the net cost of such hire, which allowance will cover the Contractor's own overhead costs and profit.

Daywork costs shall only be incurred on the instruction of the Employer's Agent.

PSA 8.8 Temporary Works

PSA 8.8.2 <u>Accommodation of Traffic</u>

A specific item has been included in the Schedule of Quantities to allow the Contractor to cover the costs of accommodating traffic on the adjacent roads at all times.

The sum shall cover the effect on the Contractor's programme, delay in the works, damage to or loss of a deviation, supply, erection and moving and re-erection of all necessary traffic signs, drums, barricades, the provision of flagmen and any other operation or equipment, plant or labour necessary.

Payment under this item will be made on a pro-rata basis to the duration of the contract.

The Contractor should note that supplies must be delivered to the WWTW from time to time. The Contractor's work shall not obstruct these deliveries and he shall maintain clear access to the treatment works at all times.

No sperate payment will be made for this and any costs associated with accommodating traffic are to be included under the relevant items in the Bills of Quantities.

PSA 8.8.4 <u>Existing Services</u>

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

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

Add the following:

"The rate tendered for (c) shall further cover the cost to expose existing services by hand, arranging for the service authority to be in attendance, if required, recording the position and level of the service when found, backfilling, and compaction to 90% Mod AASHTO supervision, loading, transporting and disposing of surplus material, where ordered by the Employer's Agent, keeping the excavation safe, dealing with water, protecting the exposed services plant and any equipment required to execute the work.

No distinction will be made between the various types of services to be exposed, or the depths to which excavations are taken. Excavations in excess of that authorized will not be measured for payment."

PSA 8.9* **Freehaul and Overhaul**

Notwithstanding any clauses in any Standardized Specification or Standard Specification Section dealing with the definition, measurement and/or payment for transport, freehaul and/or overhaul, neither measurement nor payment for overhaul will be made. All haulage will be considered to be freehaul and the cost thereof will be deemed to be covered by the rates for the provision or disposal of the applicable material.

PSA 8.10* **Miscellaneous Items**

An item which, in the payment clause column of the Schedule of Quantities, refers to this clause will be measured in the unit scheduled.

The sum or rate for such item shall cover the cost of all materials, labour and plant required to execute and complete the work as specified, described in the Schedule of Quantities or shown on the drawing(s).

PSA8.11* **Health and Safety**

PSA 8.11.1 **General health and safety obligations**…….…….…….…… Unit : Sum

Compliance with the general health and safety obligations may be scheduled as a fixed-charge and/or a time-related item.

The tendered sum(s) shall cover all costs, not included under the scheduled items below, of establishing and maintaining the general health and safety systems and general compliance with the Occupational Health and Safety Act and its Construction Regulations.

This shall include for any special precautions against Covid-19 or similar pandemics.

PSA 8.11.2 **Risk assessments**…….…….……Unit : sum

Risk assessments will be scheduled as a fixed-charge item only.

The tendered sum shall cover all costs associated with carrying out risk assessments at the start of the contract and for any subsequent risk assessment that proves necessary as the work proceeds, as well as the inclusion thereof in the health and safety plan.

PSA 8.11.3 **Health and safety plan**……..Unit : sum

This item may be scheduled as a fixed-charge and/or a time-related item.

The tendered sum(s) shall cover all costs of the preparation, approval process, implementation and continued maintenance of an approved health and safety plan as required in terms of the Construction Regulations.

PSA 8.11.4 **Health and safety file**…….…….…….Unit : sum

This item will be scheduled as a fixed-charge item only.

The tendered sum shall cover all costs for the compiling and continued maintenance of the health and safety file as required in terms of the Construction Regulations.

The tendered sum for this item shall also cover the cost of preparing and submitting to the Employer a copy of the health and safety file on completion of the contract.

PSA 8.11.5 **Construction safety officer and other appointments**……Unit : sum

This item will be scheduled as a time-related item only.

The tendered sum shall cover all costs related to the appointment of a competent and experienced construction health and safety officer and such other appointments required in terms of 3.4.2 and in terms of the Occupational Health and Safety Act and its Construction Regulations.

The sum tendered shall also cover the costs associated with the preparation and submission of the monthly health and safety reports required under 3.4.3.

PSA 8.11.6 **Training** …… Unit : sum

Training will be scheduled as a fixed-charge item only.

The tendered sum shall cover all costs for training required in terms of the Occupational Health and Safety Act and its Construction Regulations.

PSA 8.11.7 **Medical assessment of employees**……Unit : sum

This item will be scheduled as a fixed-charge item only.

When scheduled, the sum tendered shall cover all costs of having the Contractor's employees medically assessed with regard to their fitness for the work they will be required to perform and/or vehicles or plant they will required to operate and the provision of the appropriate certificate(s).

PSA 8.12* **Liaison between Contractors**…… Unit : sum

The tendered rate shall cover all fixed- and time-related costs for liaising with the other contractors, including attending both formal and informal meetings, providing the other contractors with written information relating to the Contract as and when required, and making adjustments to the program should this be required.

PSA 8.13* **Compliance with Requirements of the Environmental Management Plan (EMP)**..
Unit: sum

The Contractor shall comply with the requirements of the Environmental Management Plan as bound in this document, including ensuring that no alien vegetation shall take root in areas disturbed by him. Such vegetation shall be removed/eradicated as soon as their presences are detected. This sum will be paid to the Contractor in equal monthly amounts subject to proper/substantial compliance, and no other costs in this regard shall be paid. Compliance will be monitored by an Environmental Control Officer through regular audits.

PSAB **ENGINEER'S OFFICE** (SABS 1200 AB)

PSAB 3 **MATERIALS**

PSAB 3.2 **OFFICE BUILDING(S)**

Add the following:

"As an alternative, the Contractor may supply a 6m x 2,5x 2,5m high marine container, specially converted for use as an office. If this type of office is supplied, it shall be protected by an elevated waterproof roof, constructed over the container, and approximately 300 mm above the top of the container. The office shall be fitted with an air-conditioning unit.

The Contractor shall fully maintain, service and clean the Engineer's office and toilet.

The Contractor shall provide the following protective clothing and equipment for the exclusive use of the Engineer's staff (this equipment shall become the property of the Engineer at the end of the contract)."

Two (2) Hard hats (white)

Two (2) Reflective safety jackets

Two (2) pairs of gumboots”

PSAB 3.3 CAR PORT

A car port of minimum size 6 x 3m shall be erected abutting the Engineer’s office. Height to underside of roof beams shall be 2.3m minimum. The roof of the carport shall be constructed using corrugated galvanized steel sheeting, or similar water-resistant materials. The sides of the carport shall be open. The Contractor shall also provide a floor to the carport, and a pathway between the carport and the Engineer’s office, constructed of a 50 mm thick layer of 19mm concrete stone.

PSAB 4 PLANT

PSAB 4.1 Telephone

A separate site telephone will not be required by the Engineer, but R250 worth of pre-paid cellular air time per month for the Engineer or his Representative must be allowed for. The Contractor shall also provide the Engineer with a 3G network card with 2GB of data per month.

PSAB 4.2* Printer

The Contractor shall provide, maintain and service one size A4 printer in the site office for the duration of the contract together with an adequate supply of paper and ink.

PSAB 4.3* Survey Equipment

The Contractor shall provide the following survey equipment for use by the Engineer:

a) 1 x Employer’s Agent 's automatic level with tripod,

b) 2 x tacheometer staffs with staff bubbles,

c) 1 x level staff with staff bubble,

d) 1 x builder's spirit level of length 900 mm,

e) 1 x steel tape of length 30 m,

f) 1 x pocket tape of length 3 m,

g) all steel and wood pegs, concrete, hammers, picks, etc., that the Employer’s Agent may require.

The Contractor shall provide proof, at the start of the Contract, that the tacheometer and level have recently been serviced by an acceptable institution and shall, throughout the period of construction, service and maintain all survey equipment and he shall insure same and indemnify the Employer and the Engineer against all claims for loss, breakage or theft of such equipment.

The level and staffs may be shared by arrangement between the Contractor and the Engineer, but the other instruments shall be provided for the exclusive use of the Engineer.

PSAB 4.4* Medical Facilities and Safety Equipment

The Contractor shall make the first aid services and such personal safety equipment and facilities as are required in terms of PSA 4.2, available to the Engineer and his site staff.

PSAB 5 CONSTRUCTION

PSAB 5.1 Nameboards

Replace with the following:

"The Engineer's nameboard shall be erected within 14 days of the commencement date of the Contract and shall be placed as directed by the Employer's Agent. Any damage to this board shall be repaired within 7 days of a written instruction issued by the Engineer. Ownership of the board vests with the Employer.

Further to the above, the Contractor will be allowed to erect no more than two of his own nameboards in the area of the works. The position of these shall be agreed to by the Engineer.

No payment will be made for the supply, erection or maintenance of the Contractor's nameboards and the Engineer reserves the right to order the removal thereof if not properly maintained. The Contractor's nameboards shall be removed within 14 days of the issue of the Certificate of Completion of Construction Work."

PSAB 5.3 Key personnel

The Contractor shall inform the Engineer of the person whom he has charged with the duties with respect to the Site in terms of the Occupational Health and Safety Act and the person(s) who are in possession of a valid certificate of competency in first aid. The Contractor shall give copies of the minutes of the site safety meetings to the Engineer.

PSAB 5.5 Survey Assistants

The Engineer's Representative will occasionally need the assistance of a survey labourer to help with testing, survey, etc., envisaged at approximately 2 hours (non-consecutive) per week.

In terms of Subclause 5.5, two suitable, trained and experienced workmen to be used as survey assistants shall be made available to the Engineer during working hours as and when required. As far as practical the same assistants and labourers, shall be allocated to the Engineer for the full duration of construction

PSAB 8 MEASUREMENT AND PAYMENT

PSAB 8.2 PAYMENT

PSAB 8.2.2.1 Survey Assistants

Payment for the survey assistant shall be at the tendered daywork rates for the actual hours worked in assisting the Engineer's Representative.

PSAB 8.2.2* Printer

No separate payment for the printer shall be made and the costs there for shall be deemed to be covered by the rates tendered for the Engineer's office.

PSC SITE CLEARANCE (SABS 1200 C)

PSC 3 MATERIALS

PSC 3.1 Disposal of Material

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

"Debris arising from clearing and grubbing or from the demolition of structures on site or sludge and other material removed from structures, shall be removed by the Contractor and disposed of at the Hammersdale waste disposal facility.

The rate tendered shall include for any fees to be paid at the tip site."

PSC 5 CONSTRUCTION

PSC 5.1 Areas to be Cleared and Grubbed

Only the approved minimum area required for the execution of the Works including areas on which material shall be stockpiled for later reuse or on which material shall be dumped and spread, shall be cleared and grubbed.

For the pipe trenches indicated by the Engineer, generally a sufficiently wide strip equal to the trench width plus the estimated allowance for trench side slopes plus the width of stockpiled backfill and a 1000 mm width (which shall be maintained alongside the trench) plus the width of access to the trench shall be cleared of vegetation. The width cleared shall, however, not exceed 6m.

The vegetation cleared shall be disposed of at the disposal site specified under PSC 3.1.

PSC 5.6 Conservation of Topsoil

Topsoil up to a depth of 150 mm, if available, shall be removed from the cleared areas specified under PSC 5.1 and stockpiled on approved sites for later reuse. Until required for spreading, the stockpiles of topsoil material shall be stabilized by watering or other approved means.

PSC 8 MEASUREMENT AND PAYMENT

PSC 8.2 Scheduled Items

PSC 8.2.1 Clear and grub

Site clearance for pipe trenches will not be measured where such trenches lie within the carriageway of any road.

The rate tendered for clearing and grubbing shall cover the cost of disposal of the material at the solid waste site.

PSC 8.2.10 Removal of topsoil and stockpile

The rate tendered for the removal of in situ topsoil shall, in addition to the items listed in Subclause 8.2.10, also cover the cost of stabilizing and protecting the stockpiles of topsoil.

PSC 8.2.11* Demolish and Dispose of Existing Minor Structures

(a) Brickwork (headwalls, manholes and the like) ……Unit: m^2

(b) Concrete up to 200mm thick, reinforced or unreinforced (small structures, apron slabs, manhole bases and the like) ……
Unit: m^3

The rates for the above items shall cover the cost of demolition, loading, transportation and disposal at the waste disposal facility and all charges payable at the waste disposal facility.

PSD EARTHWORKS (SABS 1200 D)

PSD 2 INTERPRETATIONS

PSD 2.3 Definitions

Restricted excavation. Replace the definition of restricted excavation in Clause 2.3 with the following:

"Excavation as scheduled in the Bills of Quantities and/or indicated on the drawings, irrespective of the type of plant used."

Add the following to D 2.3

Sand (cohesionless and non-cohesive)

For the purpose of compaction requirements, sand is classified as a non-plastic material of which not less than 95% by mass passes a sieve of nominal aperture size 4,75mm and not more than 10% by mass passes a sieve of nominal aperture size 0,075mm.

PSD 3 MATERIALS

PSD 3.1 CLASSIFICATION FOR EXCAVATION PURPOSES

PSD 3.1 Classification for Excavation Purposes

Delete SANS 1200D Sub-clause 3.1 and replace with the following:

PSD 3.1.1 Method of Classifying

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

PSD 3.1.2 Classes of Excavation

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

(a) Hard rock excavation

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

This classification includes materials such as:

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

(b) Soft Excavation

Any material which can be removed by bulldozers or backhoes, shall be classified as soft excavation. Any material not falling into the category of hard rock excavation or calcrete shall be classified as soft excavation.

(c) Intermediate Excavation

Intermediate excavation shall not be separately measured and paid for. Should the Contractor consider the ground conditions to be intermediate excavation for which he requires payment, he shall allow for the cost of such intermediate excavation in his rates for soft excavation.

(d) Calrete

Excavation in solid calcified calcrete will be classified as hard rock excavation.

Calcrete is described as a material formed by in situ cementation and/or replacement of practically any pre-existing soil by the precipitation of calcium carbonate out of ground water. The calcium carbonate content of the material must be at least 50% by mass. Solid calcified calcrete is calcrete generally free of horizontal fissures and normally, to be excavated practically, requires the use of drills, wedges or splitting with a vibrating chisel attached to an excavator ("woodpecker").

The decision whether or not any material is solid calcified calcrete rests with Engineer.

PSD 3.1.3* Classes of Excavation for Hand Excavation

(a) Soft Excavation Class 1

Soft excavation Class 1, including restricted excavation, shall be excavation in material that can be readily excavated by hand by the average person by means of a suitable shovel without the use of a pick or other hand swung tool.

Where excavation will be made along existing pipelines, the excavation from ground level to pipe crown level and the removal of existing pipe bedding materials will be classified as soft excavation.

Note: The use of picks to loosen “soft excavation Class 1” shall not result in the Class 1 material being classified as Class 2 or Class 3 material. In the event of any disagreement, the Engineer shall make the final decision as to whether material shall be classified as Class 1 or not.

(b) Soft Excavation Class 2

Soft excavation Class 2, including restricted excavation, shall be excavation in material that can be readily excavated by hand by the average person with the aid of a pick or other hand swung tool.

(c) Soft Excavation Class 3

Soft excavation Class 3, including restricted excavation, shall be excavation in material that can be excavated with difficulty by hand by the average person with the aid of a pick or other hand swung tool.

(d) Intermediate Excavation

Material which is difficult to excavate by hand even with the aid of a crow bar and requires the assistance of pneumatic tools for economic removal. In the event of any disagreement, the Engineer shall make the final decision as to whether material shall be classified as “intermediate” or not.

(e) Hard Excavation

Material which cannot be economically fragmented and loosened by hand implements and pneumatic tools except by drilling and blasting or the use of rock breaking equipment.

In the event of any disagreement, the Engineer shall make the final decision as to whether material shall be classified as "hard" or not.

PSD 3.3 SELECTION

PSD 3.3.1 General

Substitute the second paragraph of D 3.3.1 with the following:

"The Contractor shall deal selectively in such a way with materials from all excavations to ensure that usable material is not contaminated with unsuitable material. No separate or additional payment shall be made in this regard and all relevant costs shall be deemed to be covered by the rates tendered for excavation items.

If usable material is contaminated by the Contractor's activities, such contaminated material shall be removed and replaced with suitable material, all at the Contractor's own expense."

PSD 3.4* MATERIAL FOR SUBSOIL DRAINAGE

PSD 3.4.1 Crushed Stone

Crushed stone for subsoil drains shall be 19mm single-sized stone complying with the grading requirements for concrete in SANS 1083.

PSD 3.4.2 Sand

Sand in subsoil drains shall comply with the requirements of PSD 2.3.

PSD 3.4.3 Geotextile

Filter fabric for groundwater drains shall be a non-woven continuous filament, needle punched, spun-bounded polyester geotextile having the following physical characteristics:

Mass per unit surface 150 g/m² (min)

Porosity under 0,5 KPa 93%

Porosity under 200 KPa 82%

Normal permeability under 2 KPa 3 x 10 - 3 m/s

Normal permeability under 200 KPa 7 x 10 - 4 m/s

Normal through flow under constant head of 400mm 270 ℓ /m²/s

Alternatively - for woven filter fabrics the following characteristics shall apply:

Mass per unit area 270 g/m²

Water percolation 160 ℓ/m²/s

Composition polypropylene tape and polyethylene monofil.

The material shall be placed as directed and shall not be exposed to direct sunlight for prolonged periods.

PSD 4 PLANT

PSD 4.5 AVOIDING QUAGMIRE CONDITIONS

In order to prevent quagmire conditions occurring in excavations, relatively static plant such as tracked excavators shall be used in combination with hand trimming to complete the excavation to final level. Should the Contractor allow quagmire conditions to develop, he shall, at his own cost, take such steps to rectify the conditions as the Engineer may order.

PSD 5 CONSTRUCTION

PSD 5.1 PRECAUTIONS

PSD 5.1.2.2 Detection, Location and Exposure

Add the following to D 5.1.2.2;

If existing services are not shown on the drawings but the existence thereof can be reasonably expected or determined, the Contractor shall, in conjunction with the relevant authorities, determine the exact depth and position of such services before starting with construction.

After the exact position of a service has been located, whether indicated on any drawing or not, such service shall be deemed to be a known service. The Contractor shall be liable for all costs of repair, as well as any subsequent costs, arising from the damage of such a service due to the result of the Contractor's activities. The type, position and depth of such known services must be indicated on the "as-built" drawings.

PSD 5.1.2.4 Negligence

The cost of repairing any service damaged due to negligence on the part of the Contractor shall be paid by the Contractor. In addition to the cost of repair, a penalty of ZSL5 000 may be charged to the Contractor for each and every incidence.

PSD 5.1.4.1 Dust nuisance

Add the following to D 5.1.4.1:

The Contractor shall be responsible for dust control and shall be held liable for any claims that may result from dust nuisance emanating at any time from any portion of the Site from the date of handover of the Site to the Contractor until the issue of the Certificate of Completion. Appropriate methods to suppress dust must therefore be implemented for the duration of the contract.

No separate payment shall be made for controlling dust and all costs associated in this regard shall be deemed to be covered by the tendered rates.

PSD 5.2 METHODS AND PROCEDURES

PSD 5.2.1.2 Conservation of topsoil

Add the following to Subclause 5.2.1.2:

"Topsoil shall not be stockpiled higher than 2,0m. Care shall be exercised to prevent the contamination and compaction of topsoil in any way especially by vehicles travelling over such material."

Topsoil shall consist of fertile, friable soil of loamy character obtained from areas having a good coverage of natural vegetation, preferably grasses. It shall be free from deleterious matter such as large roots, stones, refuse, stiff or heavy clays and the seeds of noxious weeds.

Topsoil shall be obtained from wherever suitable material occurs on the site or borrow

areas. The Engineer shall indicate the areas from where topsoil is to be removed, and unless otherwise permitted by the Employer's Agent topsoil shall be taken from within 400 mm of the surface. If the Contractor fails to stockpile the topsoil indicated, he shall obtain suitable topsoil from other sources at no extra cost to the Employer."

PSD 5.2.3 **Placing and Compaction**

PSD 5.2.3.3* **Filling under floors**

Filling under floors of buildings shall be selected suitable hardcore material, free of any organic material, compacted to 97% of Modified AASHTO density. A 50mm sand layer compacted to 100% Modified AASHTO density shall be placed on top of the filling up to the underside of the concrete floor slab.

PSD 5.2.4 **Finishing**

PSD 5.2.4.2 **Topsoiling**

Topsoil shall be placed as directed in Subclause D 5.2.4.2 or as ordered by the Engineer, to a nominal thickness of 100 mm after light compaction.

PSD 7 **TESTING**

PSD 7.3 **MATERIAL OR COMPACTION STANDARD NOT TO SPECIFICATION**

PSD 7.3.1* **Density Testing Under Structures**

The Contractor shall test the density of compacted material under structures to ensure the compaction meets the specified density.

Testing shall be carried out at a minimum of one test per 50m^2. Smaller structures and fill under floors of buildings shall have a minimum of three tests per structure or floor.

No statistical method of testing shall be allowed. All minimum densities and the average density must be equal to or higher than the specified density to be accepted.

PSD 8 **MEASUREMENT AND PAYMENT**

PSD 8.2 **COMPUTATION OF QUANTITIES**

PSD 8.2.4* **Hand Excavation**

The provisions of D 8.3.2 and D 8.3.3 shall apply mutatis mutandis for hand excavation.

PSD 8.2.5 **Crushed Stone and Sand**

The volume measured for payment shall be the net volume according to the dimensions as shown on the drawings or as required by the Engineer. The rate shall cover the cost of all additional excavation and preparation of the surface on which the stone or sand is to be placed, the removal of unsuitable material, the cost of obtaining, delivery and placing the stone or sand, as indicated on the drawings or ordered by the Engineer.

PSD 8.2.6 **Geotextile**

The net area of geotextile used shall be measured for payment purposes. No overlapping or wastage shall be measured. The tendered rate shall cover the cost of supply, transport, handling, placing, overlapping, jointing and wastage of the geotextile.

PSD 8.2.7 **Density Testing**

Unless otherwise scheduled no separate payment shall be made for density testing, the costs of which shall be deemed to be covered by the tendered rates for excavation.

PSD 8.3 **SCHEDULED ITEMS**

PSD 8.3.8 **Existing Services**

PSD 8.3.8.1 **Location** ……Unit: m³

Add the following to Subclause 8.3.8.1(c):

The rate tendered for (c) shall further cover the cost of backfilling the excavation with excavated material compacted to 90% Modified AASHTO density, loading, transporting within a free haul distance of 0,5 km and disposing surplus material as directed, keeping the excavation safe, dealing with water, taking special care that the exposed services are not damaged in any way and any other operation necessary to complete the work.

The tendered rates shall also include for keeping excavations safe, for dealing with surface and subsurface water, for removing surplus excavated material from the Site, for transporting all material within the free-haul distance, and for supplying adequate supervision during both excavation and backfilling operations.

No distinction will be made to the depths or the lengths to which excavations are taken.

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

PSD 8.3.10 **Topsoiling**

Delete the contents of this clause and replace with the following:

"The rate shall cover the cost of supplying topsoil from stockpile or other sources on site, preparing the area to be topsoiled in accordance with PSDB 5.2.4.2 including removal and spoiling of rocks, stones and debris; applying 2:3:2 fertilizer at a rate of 40gm/m2 and raking the topsoil surface ready for installation of vegetation cover."

PSDB **EARTHWORKS (PIPE TRENCHES)** (SABS 1200 DB)

PSDB 3 **MATERIALS**

PSDB 3.1 **Classes of Excavation**

Delete the contents of Clause 3.1 and replace with the following:

"The classification shall be as described in PSD 3.1".

PSDB 3.5 **Backfill Materials**

Delete the contents of Clause 3.5(b) and replace with the following:

"Materials used in the reinstatement of trenches beneath or within a new roadway, up to underside of the road layers, shall be 37,5mm basecourse quality material conforming to SABS 1200 MF compacted in 150mm layers to 98% Mod. AASHTO density. The area subject to loads from road traffic shall be held to apply for a width of 150mm beyond the back of kerb."

PSDB 3.6 Materials for Reinstatement of Existing Roads and Paved Areas

PSDB 3.6.1 Subbase and Base

Delete the contents of Clause 3.6.1 and replace with the following:

"Where trenches cross existing surfaced roads, the following will apply:

(a) The service (pipe, cable etc.) shall be laid on a bedding cradle, and covered with a fill blanket, as specified in section LB (Bedding - Pipes) SABS 1200 or in the Project Specification.

(b) The portion of the trench from the top of the fill blanket to 150mm below the underside of the road surface shall be filled with sand stabilised 3% by volume with OPC cement, compacted to 100% MOD AASHTO density.

(c) The final 150mm shall be backfilled with G5 material compacted to 98% MOD AASHTO density.

PSDB 3.6.4 Bituminous and Premix Surfacing

Delete the contents of Sub-clause 3.6.4 and replace with the following:

"Where this project is undertaken simultaneously with the construction of bituminous and/or premix surfaced roads, a hot premix and/or bituminous surfacing in accordance with the specifications applicable to the road surfacing shall be used in the reinstatement of the road surface. Where the construction of surfaced roads do not form part of this project a hot premix (type IVa or 7 mm sidewalk mix) laid on a cleaned surface which has been previously tack coated with an anionic emulsion shall be used in the reinstatement of the road surface."

PSDB 3.7 Selection

Notwithstanding Subclause 3.7, in terms of which the Contractor has a choice regarding methods of selection, the Contractor is required to use selective methods of excavation. The Contractor shall selectively remove and keep separate the sandy material from unsuitable material and place it adjacent to the trench for reuse as backfill, selected fill, selected granular material or for other use as ordered by the Employer's Agent .

When preparing his programme and construction methods, the Contractor shall make allowance for selective excavation

PSDB 5 CONSTRUCTION

PSDB 5.4 Excavation

Add the following to this sub-clause:

"The excavation of trenches across a concurrently constructed carriageway shall commence after the subgrade layer has been accepted. The pipe/duct shall be laid and the trench backfilled to the acceptable requirements, including density testing before the construction of the next layer may commence.

Unless otherwise ordered by the Engineer, all excavated material shall be kept within the pipe servitude. The toe of the bank of excavated material shall be trimmed well back from the edge of the trench so as to leave a minimum 1.0 m clearance between the toe of the bank and the edge of the trench. The Contractor shall keep this strip clear of excavated material at all times.

The Contractor shall take steps to avoid burying or contaminating topsoil, which shall be set aside for replacing, as far as practical, on the surface from which it was excavated".

PSDB 5.4.1* **Excavations Near Structures or Services**

If the lack of space near existing houses, structures, fences or services restricts the use of normal vehicles, or where trench excavations in hardrock material cannot be done by means of blasting, the excavation shall be carried out by other methods selected by the Contractor and approved by the Engineer.

PSDB 5.5 Trench Bottom

The Engineer may, upon consideration of the condition of the trench bottom, particularly with regard to the properties of the soil materials, order the use of a crushed stone layer in order to provide a stable platform for placing of the pipe bedding and laying the pipe in certain sections of the trenches. The stone layer shall consist of 19 mm single-sized crushed stone, and shall have a specified thickness of 150 mm over the specified minimum base width.

Should the material in the trench bottom or the bedding material be of such a nature that it can penetrate the stone layer, the Engineer may instruct the Contractor to enclose the stone layer completely within a geotextile filter blanket which shall comply with the requirements of PSD 3.4.3 and shall have overlaps of at least 200 mm.

PSDB 5.6 Backfilling

PSDB 5.6.3 **Disposal of Soft Excavation Material**

Delete the contents of Clause 5.6.3. and replace with the following:

"Excess material arising from the excavations will be disposed of at the designated tip site. The rate for spoiling of excess material shall include for the loading and carting of material, and the off-loading at the tip site. The Contractor shall be responsible for all charges levied at the tip site.

Where topsoil is encountered this will be set aside on site and re-used later."

PSDB 5.6.6 **Completion of Backfilling**

If in the opinion of the Engineer's Representative the Contractor is lagging in the backfilling of trenches, he will be entitled to order that no further excavation takes place until the backfilling operation has caught up."

PSDB 8 MEASUREMENT AND PAYMENT

PSDB 8.3 Scheduled Items

PSDB 8.3.2 **Excavation**

Delete the contents of payment Clause 8.3.2(b)(1). For the purpose of measurement and payment, material other than hard rock, will not be separately classified.

PSDB 8.3.2(d) Extra over 8.3.2(a) for hand excavation, where instructed by the Engineer …….. Unit: m^3

The rate shall cover the additional cost, over than provided for under 8.3.2(a), for carrying out hand trench excavation, where instructed by the Engineer in writing.

The volume shall be compacted from the dimensions specified, indicated on the drawings or

PSDB 8.3.6 **Finishing**

PSDB 8.3.6.1 **Reinstate road surfaces complete with all courses**

(e) Extra-over for backfilling trenches using cement stabilised sand ..... m^3

The volume will be computed from the length of trench as applicable, and the width determined from the applicable side allowances specified in 8.2.3, and the depth from 150mm below the underside of the road surface to top of selected fill blanket. Payment for this item will be additional to that for excavation covered by 8.3.2.

The rate shall cover the cost of temporary accommodation of traffic (including the signs and by-passes), arranging for safety of the public, excavation (including breaking up, removal and disposal of surplus material).

PSDB 8.3.8* **Crushed Stone Bedding Layer and Geofabric Blanket**

Crushed stone ……Unit : m^3

Geofabric ……Unit : m^2

Where the use of a layer of crushed stone in the trench bottom has been authorized by the Engineer, it will be measured by volume calculated according to the length multiplied by the specified thickness and specified minimum base width.

The rate shall cover the cost of all additional excavation and preparation of the trench bottom to accommodate the layer of stone, the removal of unsuitable material, the supply and placing of a layer of stone at least the specified thickness over at least the specified width and all related activities in order to produce a stable platform.

Where the Engineer has authorized the use of geotextile filter blanket, this will be measured by area as:

Area = 2 x (specified stone layer thickness + minimum base width) x net length.

The rate shall include the cost of supply, placing and losses as a result of overlaps and over excavated trench widths.

PSDK **GABIONS AND PITCHING** (SABS 1200 DK)

PSDK 3 **MATERIALS**

PSDK 3.1 **Gabions**

PSDK 3.1.2 **Gabion Cages**

Delete the last sentence of 3.1.2 and replace with the following:

"Gabion baskets shall be made of diagonal woven wire mesh ("double twist") and be zinc coated Class A as per SANS 675 – 1997 with a 0,5 mm nominal thick PVC coating extruded over the wire."

PSDK 3.1.3 **Geotextile**

Add the following to Sub-clause 3.1.4:

"Filter fabric for groundwater drains shall be a non-woven continuous filament, needle punched, spun-bounded polyester geotextile having the following physical characteristics:

Mass per unit surface	150 g/m² (min)
Porosity under 0,5 KPa	93%
Porosity under 200 KPa	82%
Normal permeability under 2 KPa	3 x 10 - 3 m/s

Normal permeability under 200 KPa 7 x 10 - 4 m/s

PSDK 5 CONSTRUCTION

PSDK 5.1.2 Lacing of Cages

Add the following to 5.1.2:

"In place of lacing wire, lacing may be done by means of "Spenax" tool with 3mm diameter stainless steel rings of tensile strength 156 to 178kg/mm² with spacing not exceeding 100mm."

PSDK 8 MEASUREMENT AND PAYMENT

PSDK 8.2.4 Geotextile ……Unit : m²

Delete the contents of Sub-clause 8.2.4 and replace with the following:

"The area measured will be that of the nett area of geotextile used.

The rate shall cover the cost of supplying geotextile, cutting, waste, placing, joining, overlapping and fastening the geotextile in position."

PSDM EARTHWORKS (ROADS, SUBGRADE) (SABS 1200 DM)

PSDM 3 MATERIALS

PSDM 3.1 Classification of Excavation

Clause PSD 3.1 will apply for this clause.

PSDM 5 CONSTRUCTION

PSDM 5.2.3.3 Treatment of Road Bed

(c) Preparation and Compaction of Road Bed

Add the following:

"Where road bed preparation takes place in sand the in-situ sand layer is to be watered and compacted to 100% Mod. AASHTO density. The surface of the in-situ sand layer is to be firm and smooth in order to receive the subsequent S.S.G. or subbase layer, as the case may be. To this end the Engineer may order that unnecessary construction traffic remain off the finished in-situ sand layer until the subsequent layer has been completed."

PSDM 5.2.9* Trimming and Grading of Verges

During the initial earthworks the verge width shall be cut or filled to approximately the final level and shall be kept trimmed and tidy during construction of the works. After completion of the road layers, including the premix surface, and after construction of the necessary kerbs, including the satisfactory backfilling behind the kerb, the verge shall be finished off to the lines and levels shown on the drawings or as specified.

The verge material shall consist of that material which would normally be occurring at that position or depth when in cut and shall not be contaminated by foreign materials such as bricks, basecourse material, horticulturally inferior materials from trench excavations, etc. Verges in fill conditions are to consist of the material as specified for the fills and similarly not be contaminated with foreign materials.

Over those sections of verge where grass is to be planted or where the Engineer deems it necessary to spread topsoil, he may instruct the Contractor at the stage of the major

earthworks operation to work to levels altered from those shown on the drawings.

Topsoil may be provided from stockpiles on site in which case the Contractor shall load, transport and spread as ordered by the Engineer. In the case of topsoil provided and imported by the Contractor the quality of the topsoil shall be approved of by the Engineer beforehand.

The Contractor shall be responsible for taking the necessary precautions and measures to control the dust nuisance which may arise due to his operations on the verge, whether from the natural ground surface or topsoil layer, until the verge is accepted by the Engineer.

PSDM 5.2.10 Dimension and Level Control and Process Control

The Contractor shall submit to the Engineer records of dimension and level control and/or process control prior to requesting the Engineer to carry out any routine tests and/or inspections.

A sample form can be obtained from the Engineer.

PSDM 5.2.11 Requesting of Tests

Tests and Inspections of the works will only be carried out by the Engineer once the appropriate test/inspection request forms have been fully completed. Test/inspection request forms can be obtained from the Engineer.

PSDM 8 MEASUREMENT AND PAYMENT

PSDM 8.1 Basic Principles

Add the following to DM 8.1:

"The cost of all testing shall not be paid separately but shall be covered by the tendered rates for the relevant work items."

PSDM 8.3 Scheduled Items

PSDM 8.3.4(a) Cut to Fill, Borrow to Fill

Add to Clause 8.3.4(1) the following:

"Where fill material is borrowed from trench excavations the rate shall include the selection from the sides of trenches, transporting, if necessary, stockpiling, preparing, processing, shaping (including forming side channels and benching if applicable), watering, mixing, compacting to the densities specified and finishing the slopes of fills."

PSDM 8.3.13 Surface Finishes

Add to Clause 8.3.13 the following Clause (c):

"The major earthworks required to bring the verge to the required level and the additional depth of excavation or reduction in fill height as ordered for the topsoil operation shall be measured and paid for under the appropriate excavation item.

PSDM 8.3.17* Extra over 8.3.7 for compacting spoil

Compaction in layers not exceeding 150mm thickness to 90% Mod AASHTO Maximum density ..…….. Unit:m^3

The rate shall cover the additional compactive effort required.

PSDM 8.3.18* Construct Selected Layers using the following Imported Material Compacted to 93% Mod. AASHTO

a) G7 selected subgrade material……unit: m^3

b) G9 selected subgrade material……unit: m^3

The rate shall cover the cost of locating the source, complying with all the relevant precautions required in terms of Clause 5.1, SABS 1200 D, procuring the material, basic selection, transporting from source to point of deposition on the road, spreading, watering, compacting, final grading and complying with the tolerances and testing.

PSG CONCRETE (STRUCTURAL) (SANS 1200 G)

PSG 2 INTERPRETATIONS

PSG 2.3 Definitions

Under (a) add:

"Construction joint: a joint required on account of constraints or convenience in the method of construction and that is not a movement, contraction or expansion joint."

PSG 2.4 Explanation of Terms

PSG 2.4.1 Exposure Condition

All concrete on the Works shall be as specified for severe exposure conditions.

PSG 2.4.2 Strength Concrete

Grade 30 MPa/19mm means strength concrete grade 30 MPa with 19mm stone. The same applies to all other strength concrete.

PSG 3 MATERIALS

PSG 3.2 Cement

PSG 3.2.2 Alternative Types of Cement

All cement used in the Works shall be Portland Cement type CEM1 of strength class 52.5 complying with SANS 50197-1.

If aggregates to be used on the project are alkali-reactive, the OPC used shall not have an alkali content (Na2O + 0.656 K2O) which exceeds 0.6% by mass of the cement.

PSG 3.2.2.1* Portland fly ash cement

Where specified, Portland Cement 25FA shall be used. Ordinary Portland Cement (to PDC 3.1) blended on site with 25% Pulverised Fuel Ash (PFA) in compliance with the requirements of SABS 831, may be used as an alternative. The fly-ash cement obtained by blending of OPC and PFA, shall comply with the requirements of SABS 1466-1988.

It must be noted that the 25% PFA cannot be used as a straight replacement for OPC and that the total cementitious material content of the mix should be determined by means of a proper mix design by an accredited laboratory, i.e. the total cementitious material content for a concrete with 75% OPC and 25% PFA will therefore be higher than that of a concrete with 100% OPC.

PFA shall be obtained from only one power station source, from which the PFA has been tested and approved in terms of SABS 1491 Part 2.

PSG 3.2.3 **Storage of Cement**

Cement shall be stored in weather-proof silos or in pockets in weatherproof sheds provided with damp-proof floors at least 300mm above ground level and covered with tarpaulins or other water-proof membranes. Cement shall be used in the order of delivery (first-in-first-out). All cement in storage for 8 weeks and longer shall be removed from storage and be discarded. Cement left in unsealed pockets shall also be removed from site and discarded.

Cement silos shall be painted white to reduce temperature rise in the cement

PSG 3.3 **Water**

Only potable water shall be used in the cement mortar mix. The water shall be clean, free from acid, alkali, oil, suspended matter and with a total dissolved solids content not exceeding 500 mg/liter.

Where tanks are used for mixing water, these shall be painted white and shall be shaded on all sides from direct sun by means of light-coloured plastic sheets at least 300 microns thick or light-coloured canvas sheets supported on a proper structure. Sufficient ventilation shall be provided to prevent a hot-house effect that would raise the water temperature.

When concrete is mixed, the temperature of the water mixing water shall be kept below 20oC and if necessary, ice shall be added to the water tanks at critical times to achieve this requirement.

PSG 3.4 **Aggregates**

The nominal stone size specified in the concrete grade (e.g. 30 MPa/40 mm) shall mean stone conforming to the grading specified in SANS 1083 for the nearest equivalent size, i.e. 40mm means stone that complies with SANS 1083 for 37.5mm size.

Fine and coarse aggregates shall fully comply with the requirements of SABS1083.

Aggregates shall be free from clay, lumps, shale, soft or flaky particles, mica, loam, oil, alkali, and other deleterious substances.

Coarse Aggregate dust content < 0.5% by mass.

maximum water absorption < 1%

Flakiness indices 26.5mm size < 30%

Flakiness indices 19.0mm size < 25%

Flakiness indices to be determined in accordance with SABS Method 847.

Maximum water demand of the fine aggregate shall be 190 l/m3.

Aggregates to be used shall be tested in accordance with subsection C-15 of SANS1083 or alternatively the source material supplier shall submit a test certificate to confirm that they are not potentially alkali-reactive.

The chloride ion content in the aggregates shall be determined and shall be within the limits specified in SANS1083. Test results shall be submitted to the Engineer.

The Contractor shall be responsible for locating the sources of all aggregates. The tendered rates shall therefore be deemed to allow for:

(a) the Contractor satisfying himself at tender stage by means of test and test mixes by an accredited laboratory of his source aggregate materials that he intends to use,

(b) the importation of aggregates, if necessary, that do comply with this Specification.

The Contractor shall ensure that the concrete placement temperature does not exceed 25°C. Concrete temperature readings shall be taken and recorded in the QA file (applicable also to off-site batching). When the following conditions exist, only the coarse aggregate shall be sprayed with water to assist cooling:

(a) when the ambient temperature exceeds 20°C or the relative humidity is low and /or high winds or berg wind conditions exist.

The following additional measures shall be taken to reduce concrete placement temperature:

(a) Aggregate shall be kept under shade cloth.

(b) Water and cement shall be stored in white silos/tanks.

PSG 3.4.2 Use of Plums

The use of plums will not be permitted.

PSG 3.4.4* Concrete Using Reactive Aggregates

The Contractor shall provide the Engineer with sufficient data to enable to enable him to assess the degree of alkali-aggregate reactivity of the aggregates to be used for concrete.

Where reactive aggregates such as Malmesbury Group aggregates and certain Table Mountain Formation and other quartzitic aggregates are used for concrete, the Contractor shall, in order to ensure that the concrete is not subject to alkali-aggregate reaction, design his mixes and/or use cement with a sufficiently low alkali content such that the total equivalent sodium oxide content of the concrete is less than 1.8kg/m^3.

Note: The equivalent sodium oxide content (alkali content) is measured as Na2O + 0.658 K2O. For cement it is expressed as a percentage by mass, for concrete it is expressed in kg/m^3.

In the case of other aggregates that are less reactive the Engineer will determine the type and degree of precautionary measures to be adopted.

For each delivery of cement or precast concrete units the Contractor shall provide acceptable written evidence that the requirements of this clause have been met.

PSG 4 PLANT

PSG 4.1 General

Plant shall be well maintained and not cause any machine or hydraulic oil spillage onto structures under construction.

Operators for tower cranes shall be well trained in the application of the equipment to avoid any thrust forces during pouring and moving of shuttering onto columns and wall sections when concrete is still “green”.

PSG 4.2 Batching Plant

Should the Contractor make use of readymix concrete, the readymix supplier shall be a certified member in good standing of the Southern Africa Readymix Association (SARMA). Proof of good standing membership shall be given to the Engineer in the form of a current valid certificate issued by SARMA.

Calibration certificates shall be provided to Engineer at regular intervals for readymix batching plants. No such certificate shall be older than 6 months.

Site batching plants may be either volume or mass batching type. The batching plant shall be tested and calibrated and a calibration certificate issued to the Engineer once the plant

has been set up and prior to any concrete being mixed for use in the works.

Site batching plants shall be tested and recalibrated at intervals not exceeding 4 months and a new calibration certificate given to the Engineer.

PSG 4.3 Mixing plant

Standby mixers and vibrators of adequate capacity and with an independent power unit shall be maintained on the Site for immediate use in the event of breakdown of the regular mixers or failure of the power supply.

PSG 4.5 Formwork

PSG 4.5.4* Chamfers and Fillets

All exposed external angles in concrete work shall have 25mm x 25mm chamfers unless otherwise specified or ordered, but the top edge of a slab that is to receive an applied finish shall not be chamfered.

Internal corners in concrete work need not have fillets unless such fillets have been specified on the drawings or ordered by the Engineer.

PSG 5 CONSTRUCTION

PSG 5.1 Reinforcement

PSG 5.1.2 Fixing

Fixing of reinforcing bars by welding and heating of bars will not be permitted.

Add the following to clause G5.1.2 :

Binding wires used for fixing reinforcement must be tightly bound around the nodes at bar intersections with cut ends bent inwards. A nominal reduction of the minimum specified cover by 3 mm will be allowed for binding wire. Binding wire shall be hot dipped galvanized for water retaining structures and where the final concrete product will be subject to wet conditions.

PSG 5.1.3 Cover

Concrete in wastewater retaining structures is rated as severe exposure conditions and minimum cover to reinforcement in such structures shall therefore be 40mm.

PSG 5.2 Formwork

PSG 5.2.1 Classification of Finishes

Formwork for formed concrete surfaces against which backfill will be placed shall be rough. This shall extend to 100mm below final ground level. Formwork for all other formed surfaces shall be special smooth finish, except where otherwise specified.

PSG 5.2.1(c) Special Smooth Finish

All concrete surfaces specified as having a special smooth finish shall have Degree of Accuracy I. The formwork used shall be high-grade, unblemished and regular in size. Formwork ties, if used, shall be placed in a regular pattern.

Small approved laminated wooden board inserts to steel framed panels may only be used in confined places and the use thereof will be subject to approval by the Engineer. Joints between panels shall be sealed tightly to prevent local honeycombing or leaching of concrete. Joints between panels shall form straight horizontal and vertical lines, spaced evenly on the formed concrete surface and shall be even and smooth and require minimal or no finishing.

The lay-out of all formwork panels and construction joints shall be discussed with the Engineer before application and shall be approved in writing prior to erection of formwork.

Concrete surfaces shall be smooth and free from irregularities, bulges, ridges, imperfections, air bubbles or honeycomb. The special smooth finish shall be an off-shutter finish to the concrete such that no after treatment is required other than at the positions of formwork ties.

PSG 5.2.5 Removal of Formwork

Notwithstanding the requirements of Table 2 of subclause G5.2.5, in order to improve the effectiveness of the curing treatment, the specified minimum time for the removal of formwork shall be 48 hours.

PSG 5.5 Concrete

PSG 5.5.1.1 General

The concrete mix design for strength concrete must be prepared in an approved laboratory and the results of actual test mixes must be submitted for approval together with 7-day and 28-day strength test results. Special attention is drawn to the fact that the concrete mix must provide a very dense and impervious concrete.

No concrete may be cast until the mix design has been approved by the Engineer. The Engineer may call for revised mix designs at any stage during the contract.

PSG 5.5.1.4 Chloride content

With reference to table 4 of clause G5.5.1.4, effervescence will not be acceptable on any exposed concrete surface.

PSG 5.5.1.5 Durability

All concrete work shall be as specified for “severe conditions”.

PSG 5.5.1.7 Strength concrete

Unless otherwise specified on the drawings or in the Schedule of Quantities, all structural concrete shall be Grade 30 MPa/19mm.

Target concrete strength shall not exceed the specified concrete strength by more than 25%.

PSG 5.5.1.8* Structural concrete

Except as specified hereinafter, structural concrete for water retaining structures shall comply with SANS 1200G.

The total alkali content of the concrete shall not exceed 2.1 kg/m^3. The Contractor shall submit the necessary test results before commencing with construction, to prove the above.

The concrete mix design shall ensure adequate strength, durability and impermeability. The cementitious content shall not exceed the maximum specified in order to restrict hydration temperature. The mix design is to comply with the following requirements:

- The total cementitious product (OPC and Fly Ash) shall be as follows:

Strength Concrete (MPa)	Minimum (kg/m^3)	Maximum (kg/m^3)
30	310	330
35	350	385
40	380	425

- 25% by mass of the cementitious product shall be fly-ash. The fly-ash cement obtained by blending of OPC and PFA, shall comply with the requirements of SANS 1466-1988.

- The maximum water/cementitious product ratio by mass shall be :

Strength Concrete (MPa)	Maximum W/C Ratio
25	0.60
30	0.55
35	0.50
40	0.45

- Coarse aggregates shall have a low coefficient of thermal expansion of not greater than 10x10-6/°C and shall have a maximum water absorption < 1%

- The minimum characteristic strength at 28 days shall be 30 MPa for ordinary reinforced concrete and 40 MPa for pre-stressed concrete.

In order to facilitate improved workability of concrete in the fresh/plastic state, to ensure watertightness without increasing the water/cement ratio, the Engineer may approve the use of an admixture as specified in PSG 3.5.

The workability of concrete shall be assessed by means of the slump test. The slump shall be between 70 and 90 mm for 30 - 40 MPa strength concrete.

The Contractor's concrete mix design shall be submitted to the Engineer for approval before any concrete may be placed.

PSG 5.5.7.4* **Sawn joints (where specified)**

Where sawn joints are located above waterstops, the Contractor shall record careful measurements of the position of the waterstop so as to be able to align the saw cut accurately along the middle of the waterstop.

Suitable guidelines or other devices shall be used to ensure that joints are cut truly to line.

Sawn joints shall be sawn as soon as the concrete has hardened to the degree that tearing and ravelling do not occur and before uncontrolled shrinkage cracking occurs. This time may be as short as four hours or even less in extremely warm weather, and rarely over twenty-four hours in cooler weather. Early sawing is imperative. In general, concrete poured before noon should be sawn within 8 hours and that poured after noon, within 18 hours after the final compaction. Although sawing at night will only be permitted with approval, suitable facilities shall be provided for sawing during the night.

Where a longitudinal joint has been formed by an inserted strip, sawing of the transverse joint shall be taken through the insert.

Immediately after sawing, the grooves shall be cleaned by means of a jet of clear water and shall be protected against dust or other foreign matter until sealed.

PSG 5.5.8 **Curing and Protection**

Curing of concrete by means of curing compounds will only be permitted' where approved, on horizontal surfaces. Curing compounds will not be permitted to be used where there is a possibility of permanent discolouration being unacceptable.

Curing shall be carried out in accordance with Sub-clause 5.5.8 of SANS 1200G except that:

a) The curing period shall be not less than 10 (ten) days for each completed element.

b) Walls shall be kept moist on both sides by means of an irrigation type mist spraying system. Sprayers shall be spaced at such intervals as to ensure that the complete concrete face is evenly wetted.

c) Columns shall be thoroughly sprayed with water immediately after removal of formwork. Columns shall then be wrapped in a double layer of hessian, watered and covered with white or other approved light pigmented plastic sheets. Column heads shall be well watered several times per day to ensure that water penetrates down the hessian over the full height of the columns. Plastic sheeting to be maintained in place.

d) Roof perimeter upstands which have been stripped shall be covered with hessian, or other approved absorbent material, which shall be maintained continuously damp. The material shall lap by at least 300 mm and shall be firmly secured to minimize flapping in the wind.

e) The floor and roof elements of structures shall be covered with 25 mm of sand and continuously water sprayed to ensure that the sand is water saturated at all times.

f) The duration of water application and the intervals at which it should take place will be determined on site by the Engineer, and shall be such as to prevent the concrete from drying out. The duration and intervals will be adjusted to allow for adverse conditions such as high temperatures and/or dry, windy conditions.

g) Vertical formwork shall remain in place for minimum of 48 hours after completion of a concrete pour. The Contractor shall make due allowance in his programme for this requirement.

h) Alternative curing methods may only be used on submission of a complete method statement and approval by the Engineer.

PSG 5.5.9.2 Hot weather conditions

No placing of concrete shall take place if the ambient temperature exceeds 32^{o}C, or is likely to rise to above 32^{o}C during the casting period or within eight hours after casting is completed.

If concrete is to be cast during times of high ambient temperature or hot drying winds, the Contractor shall take the necessary steps to keep the placement temperature as low as possible. Such steps may include the spraying of the coarse aggregate with water, the painting of storage silos with white paint, the insulation of tanks and pipelines and the protection of concrete ingredients against the rays of the sun. The area of the concrete pour shall be shaded before and during placing of the concrete and shall be kept shaded until at least 8 hours after placing.

PSG 5.5.11 Watertight Concrete

All structures that contain liquid shall be considered to be watertight concrete and subclause G5.5.11 shall apply.

PSG 5.5.14 Defects

All defects shall be repaired as soon as possible after the formwork has been removed and the Engineer has inspected the concrete. The Engineer may prohibit the further placing of concrete in the particular area concerned until he is satisfied that the repair has been satisfactorily executed.

PSG 5.5.16* Prevention and Repair of Plastic Shrinkage Cracks

The Contractor shall take whatever measures are necessary to prevent plastic shrinkage cracking in the concrete. Particularly on dry windy days and/or hot sunny days the

Contractors shall make provision for fine spraying of the exposed concrete surfaces with water within 1 hour of casting or shall cover the concrete surfaces with plastic sheeting.

It may be necessary to change the aggregates or the concrete mix proportions. In order to combat shrinkage cracking it may also be necessary to change the time at which, or the manner in which, floating is carried out.

If plastic shrinkage cracking occurs, the cracks may be closed by re-vibrating the concrete with a poker vibrator within about two - three hours of casting. Once the cracks have been closed, the concrete shall be kept thoroughly wet or covered with plastic sheeting for at least a further three hours.

PSG 8 MEASUREMENT AND PAYMENT

PSG 8.1 Measurement and Rates

PSG 8.1.1 Formwork

Formwork to risers will not be measured separately as narrow widths but will be measured with the formwork to walls or columns.

No separate payment will be made for fillets and chamfers and the costs there for will be deemed to be covered by the rates for the formwork.

PSG 8.1.2 Reinforcement

Notwithstanding the method of measuring and paying for reinforcement specified in Subclauses 8.1.2.2 and 8.1.2.3, reinforcement will be measured and paid for as scheduled.

PSG 8.4 Scheduled Concrete Items

PSG 8.4.3 Strength Concrete

The rates for strength concrete shall also cover :

a) the use of dolomitic aggregate where prescribed

b) the cost of meeting the requirements of SDG3.4.4

c) the cost of the preparation of design mixes by an approved laboratory and the submission for approval to the Engineer

d) the cost of non-designated joints

PSG 8.5 Joints

Only designated joints as shown on the drawings will be measured for payment according to the length of each type of joint constructed. The rate shall cover the cost of all labour, materials and plant required to construct each type of joint specified on the drawings, including the cost of all shuttering, treatment of the joint as specified in PSG 5.5.7.1, the provision of chamfers as specified where concrete is exposed, as well as testing and repairing where necessary.

Non-designated joints will not be measured for payment.

PSHC CORROSION PROTECTION OF STRUCTURAL STEELWORK (SABS 1200 HC)

PSHC 1 SCOPE

This specification must be read in conjunction with PARTICULAR SPECIFICATION PDH – SURFACE PREPARATION AND CORROSION PROTECTION OF STEEL SURFACES.

PSHC 3 MATERIALS

PSHC 3.4 Corrosion Protection Materials

Materials for corrosion protection of all steelwork at the Verulam WWTW shall comply with the following:

Solvent free, modified epoxy resin, 100% solids reinforced with ceramic micro beads

Cured density: 1.6g/cc

Minimum compressive strength: 85 MPa (ASTM D 695)

Minimum flexural strength: 50 MPa (ASTM D 790)

Minimum tensile adhesion: 40 MPa (ASTM D 4541)

Minimum tensile strength: 32 MPa (ASTM D 638)

Minimum tensile elongation: 2.5% (ASTM D638)

Shore D Hardness: 85 (ASTM D 2240)

PSHC 4 PLANT

PSHC 4.1 General

Add the following to PS 4.1:

“The Contractor may at his own discretion decide to remove steelwork items from the structures in which they are housed in order to prepare and coat them on site or, if sufficient access is available, to prepare and coat them in situ.

Items removed from structures may be transported off site to a manufacturing facility where preparation and coating are performed under controlled conditions. In such event the Contractor shall be solely liable for the handling, transport and safekeeping of the removed items until they are reinstalled back into their original positions in the structures. Any removed item that is damaged or lost by any means whatsoever shall be repaired or replaced at the Contractor’s expense.

No additional payment will be made for removing steelwork items, unless specifically provided for in the Bills of Quantities. The cost of removal of steelwork items, transport to and from off-site facilities and replacement back into position will be covered by the tendered rates for the establishment on site for corrosion protection and for the preparation and coating of such items.”

PSHC 5 CONSTRUCTION

PSHC 5.4 Preparation for Coating

PSHC 5.4.3 Methods of Preparation

PSHC 5.4.3.1 Abrasive blast cleaning

Add the following to HC 54.3.1:

"Steelwork shall be abrasive blast cleaned to remove all traces of corrosion and previous coatings. A blast profile of Sa 2.5 must be achieved."

PSHC 5.7 Coating System

The coating system used shall comply fully with the specifications of PSHC 3.4 above.

The Contractor shall provide the Engineer with all material data and safety data sheets for approval at least 14 days before commencing with coating applications.

PSHC 5.8 Application of Coatings

The coating system shall be applied strictly in accordance with the manufacturer's specifications taking all safety precautions into account to a minimum DFT of 375 microns.

Coatings systems shall not be applied unless the weather conditions comply with the manufacturer's requirements.

PSHC 8 MEASUREMENT AND PAYMENT

PSHC 8.1 PRINCIPLES

PSHC 8.1.1 Units

Replace Clause 8.1.1 with the following:

"Corrosion protection preparation and coatings shall be measured as indicated in the Bills of Quantities."

PSHC 8.2 SCHEDULED ITEMS

PSHC 8.2.5 Provision of Access for Corrosion Protection ..... Unit : Sum

The rate tendered for this item shall cover all costs associated with providing safe access to steelwork items within a particular position or structure to enable the steelwork to either be prepared and coated in situ or removed for preparation and coating on or off site.

PSLB BEDDING (PIPES) (SABS 1200 LB)

PSLB 3 MATERIALS

PSLB 3.1 Selected Granular Material

Delete Subclause 3.1 and replace with the following:

Selected granular material shall be an aggregate, sand, or granular material, all of a non-cohesive nature, the grading analysis of which shows 100% passing a 9,5 mm sieve and not more than 5% passing a 0,075mm sieve (metric sizes). The grading analysis shall produce a smooth S-curve across the full range of sieve sizes. Steep grading curves or curves that cross only a limited number of sieves shall only be used with the written approval of the Engineer.

The Compactability Factor shall not exceed 0.4."

PSLB 3.2 Selected Fill Blanket

Add the following:

"Where expansive clay is encountered in the trench bottom, the material in the selected fill blanket shall be selected granular material."

PSLB 5 CONSTRUCTION

PSLB 5.2.1 Class A Bedding

Add the following:

"… or a period of 5 days has elapsed after the placing of the concrete in that section, whichever occurs first"

PSLB 5.2.2 Class B and Class C Bedding

1. The dimension "x" for all rigid and flexible pipes (except for HDPE erf connections) as referred to in drawing LB-1 and LB-2, shall be 150 mm.

2. The Dimension "x" for HDPE erf connections shall be 100 mm.

PSLB 5.3 Placing and Compacting of Flexible Pipes

b) 200 mm selected fill blanket

Add to the end of the first sentence:

".., or, in the case where the pipeline consists of High Density Polyethylene (HDPE), to a height of 150 mm above the crown of the pipeline".

PSLB 8 MEASUREMENT AND PAYMENT

PSLB 8.1.3 Volume of Bedding Materials

Add: The volume of bedding material will be measured net, by deducting the volume of the pipe or pipes, using the pipe's nominal external diameter.

PSLB 8.2.2.3 Supply bedding by importation from commercial sources

Add : (c) Clean washed 13mm single size stone ……Unit: m^3

PSLB 8.2.6 Provision of stone / geofabric to deal with water ……Unit: m^3/m^2

If in the opinion of the Engineer, the Contractor complied with the requirements for dealing with water as specified in PSA 8.8.7, the Engineer may instruct the installation of crushed stone and filter fabric. Payment for these items will only be made where instruction was given in writing by the Engineer.

The provision of crushed stone bedding material will be measured by volume based on the specified trench width and a maximum layer thickness of 150 mm unless a greater depth has been specified by the Engineer.

The unit rate shall cover the cost of supplying and laying the crushed stone.

The filter fabric will be measured separately by area based on the specified trench width, a stone bedding thickness of 150 mm and an overlap of 300 mm.

The rate shall cover the cost of the supply, delivery and laying of the filter fabric."

PSLE **STORMWATER DRAINAGE** (SABS 1200 LE)

PSLE 3 **MATERIALS**

PSLE 3.4 **Manholes, Catchpits and Accessories**

PSLE 3.4.1 **Bricks**

Delete the first sentence and replace with the following:

"Bricks used in stormwater structures shall be:

Burnt clay engineering bricks, having a normal compressive strength of 28 MPa, and complying with the requirements of SANS 227."

PSLE 3.6* **Concrete**

Concrete for the lining of stormwater channels shall be Grade 25Mpa/19mm concrete.

PSLE 5 **CONSTRUCTION**

PSLE 5.2.2 **Pipe Culverts**

Add the following:

"Pipes with ogee joints, where they pass under roads and also on curved pipelines in verges, shall be wrapped with two layers of Hessian soaked in cementitious grout. The wrapping shall be 400 mm wide and placed centrally over each joint.

Unless otherwise stated in the Bill of Quantities or indicated on the drawings, pipes with ogee joints shall be used.

Butt-ended pipes will not be permitted.

Lifting holes should be suitably closed off to prevent the ingress of soil."

PSLE 5.5.6 **Benching**

Delete:

"… granolithic plaster …"

And replace by the following:

"… concrete topping consisting of a 1:2:3 cement, sand and 7 mm stone mix by weight. The sand proportion may be varied between 1,5 and 2,5 to obtain ideal workability."

PSLE 5.8* **Pipes into Manholes / Catchpits**

"Pipes may protrude up to 300 mm into a manhole / catchpit. This relaxation will only be permitted if the pipe does not have to be cut. The 'dead space' formed at the end of a manhole is to be suitably benched off to prevent the collection of silt and rubbish."

PSLE 5.9* **"As-Built" Details**

"The Contractor shall submit "As-Built" levels, distances between manholes and the grades of pipelines for which he requires payment, at the time he submits his monthly payment claim. A sample form can be obtained from the Engineer or his representative."

PSLE 8 **MEASUREMENT AND PAYMENT**

PSLE 8.2.8 **Supply and Install Manholes, Catchpits, etc.**

Delete the words:

"… but excluding excavation and backfilling, which will be measured separately."

And replace with the following:

"… including dealing with any excavation in all materials (including disposal of surplus) which is additional to that measured under the item for pipe trench excavation (see Sub-clause 8.2.3 of SANS 1200DB)."

Add the following sub clause to LE 8.2.8 :

d) Extra-over for construction of new manholes or catchpits on existing pipelines .....
Unit : No

The rate shall include for the additional cost of providing all plant, labour and materials to cut the existing pipe, dealing with water, working around the existing pipe and making good.

PSLE 8.2.14* **Breaking into existing manholes**……..……..……Unit : No

"The rate shall include for all labour and materials required for breaking into the existing structure, cutting to size and laying of pipes, reinstatement and / or new benching – where ordered by the Engineer – making good around the pipe with an approved repair material, and including all necessary reinstatement around the structure on completion of the connection."

PSLE 8.2.15* **Supply and install sluice gates or valves** …….. Unit : No. or Sum

The tendered rate shall cover all costs of supplying and installing the gate or valve in the relevant stormwater structure, including all plant, labour and materials required for the complete and satisfactory installation of the gate or valve specified.

PSLE 8.2.16* **Clean and shape stormwater channel** ……Unit : m

The tendered rate shall cover all costs to remove vegetation, silt and any other debris from the channel and dispose of at the designated disposal site, and shape and compact the in-situ material to the required lines, levels and densities.

PSLE 8.2.17* **Concrete lined stormwater channels** …… Unit : m or m^2

The tendered rate shall cover all formwork, reinforcing steel, concrete supply, placing, finishing and curing, forming of joints, labour, plant and any other items or materials required to construct the concrete stormwater channels in full compliance with the relevant drawing details and specifications.

PSLE 8.2.18* **Headwalls** …… Unit : No

The tendered rate for the construction of in-situ headwalls shall cover all labour plant and material costs for the excavation, levelling and compaction of the in-situ ground, supply and erection or placement of formwork, reinforcing steel and concrete, concrete surface finishing, curing, removal of formwork, construction of brickwork, backfilling, compaction, finishing and tiding of the headwalls all as detailed on the drawings and in the specifications.

Headwalls will be measured separately for each different nominal pipe size.

PSME **SUBBASE** (SABS 1200 ME)

PSME 5 **CONSTRUCTION**

PSME 5.4.1 **Placing**

The subbase and gravel wearing course layers shall be 150mm thick unless shown otherwise on the drawings.

PSME 6 **TOLERANCES**

PSM 6.1 **Dimensions, Levels, etc.**

PSME 6.1.1 **General**

Add to Clause 6.1.1:

"The Contractor shall submit at the time of requesting acceptance of a road layer a record of the surface levels of that section, taken at metreage intervals to coincide with the level pegs. A sample form is obtainable from the Engineer.

For layers, constructed of subbase quality material, on which the bituminous surface will be placed, the tolerance for dimensions and level shall be as set out in SABS 1200 MF Clauses 6.1.2 to 6.1.6 inclusive."

PSME 7 **TESTING**

PSME 7.1 **General**

Add to Clause 7.1:

"The random sampling method of TMH 5, for the spotting of positions, for field density testing will not necessarily be applied by the Engineer's Representative. Density testing shall be carried out where, in his opinion, the density of the compacted layer is suspect. The Contractor shall present the full width of the layer, between the stated linear stake values, for acceptance. Only in exceptional cases will partial widths of layer be accepted for testing."

PSME 8 **MEASUREMENT AND PAYMENT**

PSME 8.1 **Basic Principles**

Add to Clause 8.1:

e) No separate payment will be made for control or density testing, the cost of which shall be covered by the rates for the relevant items in the Bills of Quantities.

PSME 8.3 **Scheduled Items**

PSM 8.3.11 **Rip, shape and compact in-situ layer** ……Unit : m^3

The tendered rate shall cover all plant, labour and materials required to rip the existing layer to a minimum depth of 150mm, work, shape to line and level and re-compact the material to 90% MOD AASHTO density.

C3.6: PARTICULAR SPECIFICATIONS

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

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

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

PARTICULAR SPECIFICATION

PDA : QUALITY CONTROL & QUALITY ASSURANCE SYSTEM

PDA 1 SCOPE:

This specification covers the implementation of a quality control and quality assurance system to ensure full compliance with the specification throughout the duration of the Contract. The quality control program shall further serve to provide the basis of measurement of the quantities to prevent wastage of specialised materials.

PDA 2 DEFINITIONS:

W : Witness Point
H : Hold Point
RD: Record Data
A : Activity
Sign: Signature
Eng: Engineer or Engineer's Representative
Con: Contractor's Quality Control Inspector

PDA 3 QUALITY PLAN:

The quality plan for each specified activity shall be carried out as per the typical sample quality plan schedules given below and shall be controlled and signed off by a person appointed for and dedicated to the implementation of the Quality Plan.

PDA 3.1 Concrete Surface Preparation

Activity	Acceptance Criteria	W	RD	H	Signature	
					Con	Eng
Concrete Surface Preparation	High Pressure Wash Wet / Dry grit abrasive blasting	W W	RD RD	H H		

PDA 3.2 Concrete Repair

Activity	Acceptance Criteria	W	RD	H	Signature	
					Con	Eng
Mark repair zones	Contractor to identify repair zones Record Area	W	RD	H		
Concrete Surface Preparation	High Pressure Wash Saw cut repair perimeter Record length of saw cut perimeter Break out defective concrete to 30 mm behind rebar. No feather edging allowed. Record Depth and calculate Volume	W	RD RD RD			
Reinforce.	Wet abrasive blasting to Sa 2½.	W				

preparation	Remove contamination by washing. Record length and diameter of exposed rebar		RD	H		
Reinforce. priming	Fully coat steel with two coats of approved primer leave to dry 2 to 3 hrs between coats	W				
Concrete Priming	Ensure concrete surface is thoroughly pre-saturated Ensure that latex emulsion bonding slurry is thoroughly scrubbed into damp substrate with short bristle brush	W		H		
Application of Repair Mortar	Concrete bonding slurry to be wet when mortar is applied. Maximum thickness per application to be 30mm Record quantity of mortar used	W	RD RD	H		
Surface Finish and Curing	Record time of each finished repair Fog-spray Curing of finished surface for 48 hrs	W	RD			

PDA 3.3 Scaffolding

Activity	Acceptance Criteria	W	RD	H	Signature	
					Con	Eng
Design of scaffold system	Scaffold system to be designed by a competent person qualified in terms of SANS 10085		RD			
Erection of scaffold	Scaffold including all clamps, supports, footplates, etc. to be erected to design by a competent person in terms of SANS 10085		RD			
Inspection	Weekly or after inclement weather or after moving to a new position on terms of the Construction Regulations 2003		RD			

PDA 3.4 Pipelines & Coupling

Activity	Acceptance Criteria	W	RD	H	Signature	
					Con	Eng
Bedding	To line and level and compacted to specification	W	RD	H		
Pipe jointing	Joint cleanliness, lubrication, insertion depth and squareness to specification		RD			
Pipe Alignment	To line & level		RD			
Bolts	Specified material fitted with washers, threads lubricated and tightened to specified torque		RD			

Haunching to pipeline	Specified granular material to required compaction under and around pipe	W		H		
Backfill	Material, layers and compaction to specification		RD			
Pressure Test	To specification	W		H		

PDA 3.5 Corrosion Coatings

Activity	Acceptance Criteria	W	RD	H	Signature	
					Con	Eng
Preparation	Surface cleaned. De-rusted, keyed and degreased & dried to specification	W	RD	H		
Primer	Applied before flush rust time limitation to coverage and coat thickness specifications		RD			
Intermediate Coats	Prepared and coated to thickness requirements within min. & Max overcoating times		RD			
Top Coats	Prepared and coated to thickness requirements within min. & Max overcoating times	W		H		

PDA 3.5 Concrete Work

Activity	Acceptance Criteria	W	RD	H	Signature	
					Con	Eng
Steel fixing	Rebar to size and shape as per bending schedule	W	RD			
	Rebar fixed as detailed on drawings/schedules	W		H		
	Number of bars correct	W	RD			
	Cover to rebar	W	RD	H		
Formwork	Correct formwork used	W	RD			
	Formwork to line and level	W		H		
	Formwork properly supported	W	RD	H		
	Minimum time before stripping	W	RD			
Concrete	Mix design approved		RD	H		
	Correct concrete grade ordered	W				
	Slump test	W	RD			
	Curing method and time	W	RD			
	Cube results	W	RD			

PDA 4 QUALITY ASSURANCE SYSTEM

The Contractor shall institute a Quality Assurance System to demonstrate compliance with the requirements of the Contract. The Engineer shall be entitled to audit any aspect of the system.

Details of all procedures and compliance documents shall be submitted to the Engineer for information before each design (if specified) and execution stage is commenced. When any document of a technical nature is issued to the Engineer, evidence of the prior approval by the Contractor himself shall be apparent on the document itself.

The Contractor shall:

(i) supply a Quality Plan and Quality Program at the time of tendering, both of which are subject to acceptance by the Engineer,

(ii) maintain Quality Control records in accordance with the Quality Plan during execution of the contract. Such records shall be available to the Engineer or his representative at each Quality Surveillance visit,

(iii) mark or securely label each component with a unique identification; and

(iv) carry out such tests as are required to ensure compliance with the Specification.

Compliance with the Quality Assurance System shall not relieve the Contractor of any of his duties, obligations or responsibilities under the Contract.

Any approval, check, certificate, consent, examination, inspection, instruction, notice, observation, proposal, request, test or similar act by the Engineer (including absence of disapproval) shall not relieve the Contractor from any responsibility he has under the Contract, including responsibility for errors, omissions, discrepancies and non-compliances.

Failure to comply with these requirements shall be just cause for the Engineer to order suspension of the Works without additional remuneration, or for him (Engineer) to recommend termination of the contract to the Employer in terms of the Conditions of Contract.

The Contractor shall supply all items with a guarantee valid for a period of 12 months after final acceptance of the items after installation of such items on site by the installation contractor.

PDA 5 MEASUREMENT AND PAYMENT

PDA 5.1 Quality Control and Quality Assurance System for duration of Contract……..……Sum

The rate shall cover the cost of providing a full-time Quality Control Inspector for implementing and maintaining the Quality Control and Assurance Plan, dealing with quality related administration, preparing Quality Control Schedules, and recording relevant data requested by the Engineer.

Payment shall be made as a scheduled time-related item.

PARTICULAR SPECIFICATION
PBB: CONCRETE BLOCK RETAINING WALLS

PBB 1 SCOPE

This Specification covers the erection of gravity / composite / precast block retaining walls in terms of the latest amended edition of SANS 508/2008.

PBB 2 TYPE OF PRECAST RETAINING BLOCK

Concrete retaining blocks shall comply with the minimum specifications as stated below and in SANS 508:2008, and shall also be erected in accordance with the dimensions shown on the design drawings.

- 21 day crushing strength of blocks:
  - Under full platen contact : Average 13MPa with a minimum of 11MPa
  - Under simulated in-situ point loading: 8 MPa (minimum)
- Coefficient of friction for interlocking sliding: 0,54 (Value at 95%)
- Block dimensional variations (length, width and height) : 3mm
- Block mass variation: Not less than 95% of specified mass.

Tests and associated results, as conducted by an approved authority / laboratory, shall be made available to the Employer or his Agent for approval, e.g.:

- 21 day crushing strength (As specified above)
- Determination of the coefficient of friction for interlocking and sliding between blocks
- Representative pullout resistance (Block and geogrid connection test / determination of pullout resistance of various block types)

PBB 3 MATERIALS

Apart from the specification of concrete mentioned hereafter, all materials shall comply with SANS 508:2008 specifications.

PBB 3.1 Concrete

Concrete used for gravity retaining wall footings shall comply with the requirements of SABS 1200 G.

PBB 4 CLEARING OF RETAINING WALL AREA

Strip clearing for the retaining wall shall be carried out in accordance with SABS 1200 C unless otherwise specified.

PBB 5 INSTALLATION

The gravity / composite retaining wall shall be installed at the positions indicated on the drawings or pointed out on site by the Engineer and shall be erected in accordance with the specifications noted herein, details as per the approved detail design drawings and per the manufacturers specifications and / or installation instructions.

PBB 6 PROFESSIONAL ENGINEER /REGISTERED PERSON / TECHNOLOGIST

All walls exceeding 1200mm in height above the natural ground level, or as determined by the

National Building Regulations at the time and / or the applicable Local Authority, shall be designed and overseen by a professional registered Engineer or Technologist.

Proof of valid Professional Indemnity Insurance shall be submitted with the design for approval by the Engineer.

PBB 7 GEOTECHNICAL REPORT

The Employer shall be responsible to provide the Contractor with a suitable geotechnical report during the design period and the cost thereof shall be borne by the Employer.

PBB 8 GENERAL REQUIREMENTS AND TOLERANCES

The completed retaining wall shall be true to the setting out line and blocks shall be installed horizontally with the use of a line and spirit level (3 blocks will be levelled simultaneously in length and in depth), unless otherwise stated.

The height of the lower block above the final ground level shall not vary by more than 100 mm from that shown on the approved detail drawings.

The Contractor shall, on completion of each section of walling, remove all cut-offs and other loose material so as to leave the wall with a neat and finished appearance.

PBB 9 MEASUREMENT AND PAYMENT

PBB 9.1 General

Items shall be scheduled as given below. The tendered rates shall include full compensation for the necessary plant, labour and material to execute the works as listed, including the spoil of surplus material on site and control density testing. The tenderer shall submit a design of the retaining wall for approval by a Registered Person (Professional Engineer or Technologist), the cost of such design to be included in the rates tendered for the wall.

PBB 9.2 **Scheduled Items**

PBB 9.2.1 **Site clearance and the removal of topsoil** …… Unit: m²

Strip clearing for the retaining wall shall be paid in accordance with SABS 1200 C.

PBB 9.2.2 **Excavate in all materials and dispose of surplus material (on site)** …… Unit: m³

Excavation for the retaining wall foundations shall be paid in accordance with SABS 1200 D.

PBB 9.2.3 **Concrete foundation** ……Unit: m³

Concrete used for gravity retaining wall footings shall be paid in accordance with SABS 1200 G.

PBB 9.2.4 **Approved gravity / composite retaining wall** ……Unit: m²

The tendered rate shall cover the complete wall construction as per the approved detail drawings as supplied by a registered professional Engineer/Technologist, including sand or gravel drainage layer, geotextile, concrete keys, concrete, sand or gravel infill in blocks, and any other items deemed necessary or specified by the Contractor's engineer, to successfully complete the operation.

PBB 9.2.5 **Subsurface drain** …….. Unit: m

The tendered rate shall cover all costs for the supply and installation of the subsurface drain as specified by the wall design engineer.

PBB 9.2.6 **Subsurface drain outlets (Weep holes) including geotextile capped ends** ……Unit: No

PBB 9.2.7 **Approved fill material** …… Unit: m³

The tendered rate shall include for all costs for the selection and / or supply and placement of approved material compacted to 95% MOD AAHSTO density (100% for sand).

PBB 9.2.8 **Steel reinforcing** ……..…….…….…… Unit: Sum

The tendered rate shall cover all costs for the supply and placement of steel reinforcing as specified by the wall design engineer.

PBB 9.2.9 **Density test / Control tests** ……..……Unit: Sum

The tendered rate shall cover all costs associated with the density / control testing by an approved accredited laboratory.

PARTICULAR SPECIFICATION

PDH: PREPARATION OF STEEL SURFACES & APPLICATION OF COATING SYSTEMS

PDH 1 SCOPE

This specification covers the requirements for the surface preparation to all steel surfaces including pipes and specials as well as the application and inspection requirements of a heavy duty corrosion protection coating maintenance system.

This corrosion protection Specification gives details of steel surface preparation and the application of the coatings. The approved heavy duty coating systems applicable to the Works are listed in the Project Specification.

The details specified are minimum guidelines only and the Contractor shall accordingly select an appropriate conforming system, and provide full details to the Engineer for approval. All work will be subject to inspection by the Engineer who shall be given 48 hours notice prior to each component of work commencement.

PDH 2 APPLICABLE SPECIFICATIONS

- SABS 064: 1979 : The preparation of steel surfaces for coating
- SABS Method 141 : Dry film thickness of paints
- SABS Method 159 : Cross cut test to determine sound coating syatem
- SABS Method 769 : Cleanliness of blast-cleaned steel surfaces for painting (assessed by freedom from dust and debris)
- SABS Method 770 : Cleanliness of blast-cleaned steel surfaces for painting
- (assessed by freedom from certain soluble salts)
- SABS Method 772 : Profile of blast-cleaned steel surfaces for painting
- (determined by micrometer profile gauge)
- SABS 763-1988 : Hot-dip (galvanised) Zinc Coatings (other than on continuously zinc coated sheet and wire)
- SABS 1344 : Medium Duty Solvent Detergent
- SABS 1217-1984 : Wet Sponge Pinhole Test to Coatings
- SABS 1641-1995 : High Voltage Continuity Test
- ISO 8501-01 1988 : Preparation of steel substrates before application of paints and related products.
- SIS 05 59 00 Pictoral surface preparation standards for painting steel surfaces
- ASTM 3359 Method A: Determination of sound coating system

PDH 3 MATERIALS

PDH 3.1 Abrasive Media for Cleaning bare steel

Abrasive blast media is required to achieve the specified standard of cleanliness and specified surface profile to the steel structure where complete removal of the existing coating is specified.

The following abrasive media materials are approved:

Blastrite Black granular slag abrasive :

Grade : Fine (0.4 - 1.5 mm) or B90 (0.2 - 1.4mm)

Blastrite Black granular slag abrasive :
Grade : Medium (0.8 - 5.5 mm) or B125 (0.5 - 2.5mm)

PDH 3.2 Abrasive Media for sweep blasting an existing coating system

Abrasive blast media is required to sweep-blast an existing sound coating system for carrying out touch-up repairs to achieve a lightly etched profile key in the existing coating system ensuring strong adhesion between the existing coating and new coating system.

The following abrasive media materials are approved:

Blastrite Black granular slag abrasive :
Grade : X-Fine (0.2 - 0.8 mm) or B60 (0.1 - 0.6 mm)

PDH 3.3 Primer Coat

The approved primer coating systems, where applicable, are as specified in the Project Specification.

PDH 3.4 Intermediate Coat

The approved intermediate coat, where applicable, are as specified in the Project Specification.

PDH 3.5 Top Coat

The approved top coat systems are specified in the Project Specification.

PDH 4 GENERAL WORKMANSHIP

The Contractor shall at all times enforce adequate safety measures in terms of the Occupational Health and Safety Act 1993 (Act 85 of 1993) and the Construction Regulations, 2003.

The Contractor shall furnish all labour, materials, paints and coating components required for adequately preparing surfaces and coating them in accordance with this Specification.

The Contractor shall furnish experienced supervisors and all equipment necessary for measuring wet and dry film thicknesses and for carrying out tests to establish the soundness of existing coating systems as well as holiday detection at the required voltage.

The Contractor shall be responsible for proper calibration and functioning of all testing and inspection equipment at the time of inspection, and he shall ensure that this equipment is being operated by skilled personnel.

All work shall be executed by competent workmen under the supervision of an experienced heavy-duty coating supervisor.

PDH 5 PLANT AND EQUIPMENT

PDH 5.1 Blast Cleaning Equipment

The compressed air supply used for abrasive blast cleaning shall be oil-free, clean and dry. Adequate separators and traps shall be provided and these shall be kept emptied of water and oil. Accumulations of oil and moisture shall be removed from the air receiver by regular purging.

The equipment shall be tested to ensure an oil-free, dry supply before blast cleaning commences.

The compressor volume capacity shall be sufficient to maintain a discharged the abrasive grit at a pressure of 700 kPa at the nozzle while abrasive blasting. The discharge pressure shall be with a measured at the nozzle using a hyperdermic pressure gauge. Under no circumstances shall the pressure at the nozzle fall below 650 kPa. The nozzle pressure shall be checked at least daily. Nozzles shall be discarded before wear reaches 50 %.

Where air operated equipment is being used, the operators head gear shall be ventilated by clean cool air served through a regulator to prevent blasting residues from being inhaled by the operator.

PDH 5.2 Airless Spray Equipment

The airless spray equipment shall meet the recommendations and instructions set out in the manufacture's data sheets. The minimum pressure of the airless spray equipment shall be as specified in the coating manufacturer's Product Data Sheets.

All application equipment shall be maintained in a clean condition and in good working order.

PDH 6 SURFACE PREPARATION

PDH 6.1 Surface Preparation to Bare Steel

PDH 6.1.1 General

All surfaces of welds shall be free from slag, slag inclusions, cracks and holes. Weld profiles shall have a smooth contour, free from irregular projections, any undercut and sharp edges. Areas adjacent to welds shall be free from weld splatter which shall be removed by grinding or scraping.

All burrs and sharp edges resulting from flame cutting, drilling or any other activity shall be ground to a smooth radius of at least 2 mm.

The method of cleaning and preparing the substrate of steel prior to the application of the heavy duty coating systems shall be in accordance with the applicable provisions of SABS 064.

The standard of surface preparation shall meet the following criteria:

- The degree of cleanliness , i.e. the degree to which contamination is removed.
- The anchor pattern, profile limit or peak-to-valley height.

PDH 6.1.2 Removal of contaminants

Prior to abrasive blast cleaning, surfaces shall be inspected for harmful deposits on the surfaces of steel-work, such as oil, grease, chemical deposits, clay bitumen or mud. These harmful deposits shall be removed by an approved water rinse-able solvent degreaser prior to abrasive blast cleaning.

PDH 6.1.3 Dry abrasive blast cleaning

Only dry abrasive blast cleaning techniques shall be used. The abrasive shall be maintained free from dust, salts and any other impurities. The abrasive material shall not be re-cycled or re-used.

Dry abrasive blast cleaning shall be carried out on dry surfaces only. Blast cleaning of all corroded and coated steel surfaces shall be in accordance **with ISO 8501-01 grade Sa 2½ near-white blast** cleaning as summarised below:

- Prior to blast cleaning, all heavy layers of rust shall be removed by chipping operations. Visible oil, grease and dirt shall also be removed. After blast cleaning, the surface shall be cleaned from loose dust and debris.
- When viewed without magnification, the surface shall be free from visible oil, grease and dirt and shall be free from mill scale, rust paint, coatings and foreign matter. All surfaces shall have a uniform metallic colour.
- The photographs in the ISO Standard publication are given as an illustration only. They do not represent the complete preparation degree, which also includes a cleaning operation which is not visible in the photographs.

Structural steel shall be abrasive blast cleaned to bare metal in accordance with Section 4.3 of SABS 064 to achieve both the required degree of cleanliness and surface profile.

Special care shall be taken to clean out any pitting which may have occurred to the steel surfaces. Any deep pitting shall be brought to the attention of the Engineer. Weakened damaged and corroded structural steel sections shall be brought to the attention of the Engineer and if required, shall be strengthened by welding in additional steel plates.

After abrasive blasting, all surfaces shall be cleaned with clean, dry compressed air, or a clean brush before inspection and overcoating.

The permissible blast profile limit shall be as given in Table 1 below.

Any water soluble salts present in the steel after blast cleaning shall not exceed the values given in Table 1 below:

Table 1 - Standards of Cleaning Required

Property	**Not Immersed**	**Immersed**
Residual dust and debris (SABS Method 769)	0.5 %	0.3%
Oil, grease and perspiration	Nil	Nil
Cleanliness to ISO 8501-1 (Minimum)	Sa 2½	Sa 3
Surface Profile : Minimum Maximum (SABS Method 772)	25 μm 75 μm	50 μm 100 μm

Water soluble iron salts • Maximum at any one point • Average of any 250 cm^2 Weber Reilly Test SABS Method 770	 500 mg/m^2 100 mg/m^2	 100 mg/m^2 10 mg/m^2

PDH 6.2 Surface Preparation to Coated Steel

PDH 6.2.1 General

Painted surfaces shall be considered sound if the paint is firmly adherent to the substrate and is free from flaking, checking or cracking. Coatings that can be lifted with a blunt putty knife shall be removed by abrasive blasting before re-coating. Should any doubt exist, adhesion shall be tested by the one of the following two methods:

Thin coating systems (DFT < 150 µm)

Cross cut test as per SABS Method 159. The value obtained by this test shall not be lower than 6 units.

Thick coating systems (DFT > 150 µm)

The rating obtained by ASTM 3359, Method A shall not be lower than 3A.

Chalking to existing sound coating systems shall be removed by detergent washing and abrasion of the surface by sweep blasting.

PDH 6.2.2 Preparation to localised areas to receive touch-up coating

Where localised corrosion exists in areas of otherwise sound paint, the corroded area shall be thoroughly cleaned by abrasive blast cleaning to Sa 2½. After cleaning, tests for the presence of soluble salts using the Weber Reilly reagent shall be carried out by the Contractor. The test values of soluble salts shall not exceed the limits set in Table 1 above. Should values exceed these limits, the prepared surfaces shall be thoroughly washed with clean potable water until the level of soluble salts is within the specified requirements given in Table 1. The surrounding sound paint shall be thoroughly abraded by the abrasive blasting operation and feathered into the bare steel area.

The full coating system shall be applied to the bare steel areas whilst the sound paint shall be coated with the stripe, intermediate and top coats only.

Surface preparation shall comprise detergent wash to remove oily contaminants, water wash to remove detergent, then abrasion by light sweep blasting to the existing sound coating system, to achieve a uniform matt surface. Finally, all dust and debris shall be removed by wiping with a damp clean cloth, or by vacuum cleaning or blowing with clean, dry oil-free compressed air.

PDH 6.2.3 Preparation to areas for over-coating

For all sound existing coats and areas where touch-up coatings have been applied, the entire area shall be light sweep blasted using a fine abrasive media as specified.

The sweep blasting shall achieve a lightly etched profile between the underlying coating and the new over-coating system.

The surfaces shall be free of chalking paint, oil, soluble salts, dust and shall be dry prior to the application of the overcoat.

PDH 6.3 Surface Preparation to Hot-Dip Galvanised Surfaces

Immediately prior to coating, all galvanised surfaces shall be cleaned by brushing vigorously with a medium duty solvent detergent complying with SABS 1344 which shall remain on the surface for 5 to 10 minutes.

The cleaned galvanised surfaces shall be thoroughly washed with clean potable water until all grease and residues have been removed. The surfaces shall then be dried with a clean lint free cloth. The surface shall be water break free. If not, the surfaces shall be cleaned until a water break free surface is obtained.

PDH 7 APPLICATION OF HEAVY-DUTY COATING SYSTEM

PDH 7.1 General

PDH 7.1.1 Environmental conditions

Coating systems shall not be applied in high wind and/or dusty conditions. The maximum relative humidity and the minimum temperature of the steel surfaces above dew point during application of the coating systems shall be as stated in the Project Specification.

Any surfaces to be coated shall be rendered dust and salt free prior to the application of the coating. This shall be accomplished by blowing the surface with clean dry air or by using an industrial vacuum cleaner.

PDH 7.1.2 Mixing of heavy-duty coatings

Before mixing a two-component coating product, the Contractor shall ensure that sufficient areas for reinstatement are prepared and ready to receive coating.

Only clean, uniform cylinders shall be used for mixing of two-pack products. Dented, bent or broken mixing container shall be removed from site.

All two component coating materials shall be thoroughly mixed by suitable power stirrer until completely homogeneous. With two-component materials, each component containing pigments shall first be thoroughly mixed before the two components are mixed together in the proportions supplied by the manufacturer's data sheets until the mixture is completely homogeneous. In the case of solvent based epoxy materials, the mixed material shall be allowed to stand for the required induction period as stated on the manufacturer's data sheets before use.

For two-component materials, the use of part contents (split packs) is strictly prohibited.

No thinning of the components shall be permitted.

PDH 7.1.3 General application procedures

Paint application shall be carried out in accordance with the coating manufacturer's recommendations. Should any conflict between this Specification and the manufacturer's recommendations arise, the conflict shall be resolved by a meeting between the Engineer and the coating manufacturer's representative prior to any application.

No two component application shall be applied when the surfaces are less than 3ºC above dew point, when the relative humidity is greater than 85%, when the air temperature is below 5 ºC, or when there is a likelihood of a change in weather conditions within 2 hours of application which would result in air temperatures below those specified or in deposition of

moisture in the form of rain, snow, condensation, etc. upon the surface. Dew Points shall be determined in accordance with Table 2 below.

Table 2 : Dew Point Determination

Dew Points (ºC) at Various Relative Humidities								
Air temp	30%	40%	50%	60%	70%	80%	90%	100%
-1.0	-	-	-	-	-6.5	-4	-2	-1
4.0	-	-6.5	-4	-2	0.5	1.5	3.5	4.5
10.0	-6.5	-3.5	0.5	2	3.5	5.5	8.5	10
15.5	0	2	4	8	10	11.5	14	15.5
21.0	3	6.5	10	13	15	18	19.5	21
26.5	7	12	15.5	19	21	23.5	25	26.5
32.0	13	16.5	20.5	24	25.5	28.5	30.5	32
38.0	18	22	25.5	29	31	33.5	36	38

Note:

It is essential to ensure that no condensation occurs on blasted steel or between coats during application of two component coating system.

Air at a given temperature can only contain a certain (maximum) amount of water vapour. This proportion is lower at lower temperatures.

The dew point is the temperature of a given air-water vapour mixture at which condensation commences, since at that temperature its maximum water content (saturation) is reached.

In practice, a safety margin must be kept, whereby the substrate temperature is at least 3ºC above dew point.

This restriction shall not apply to the moisture cure urathane coating systems.

Blast cleaned or power-disc ground surfaces shall be coated with the primer within four hours of blasting or other such time limits as may be specified, and prior to sun-set of that day and also before visible rusting occurs. A minimum of 5 cm around the edges of blasted areas shall be left uncoated unless adjoining a coated surface.

Coating over blasted areas shall not be permitted within 50mm of the unblasted areas.

For top coats, the colour identification shall be as given in the Project Specification.

PDH 7.1.4 Contrasting shades

Each coat of the corrosion protection system shall be of a distinctly different colour or shade to ensure correct intercoat coverage. The Contractor shall ensure that the colour selection of the intermediate and stripe protective coating shall be suitable for complete coverage by the top protective coat.

PDH 7.1.5 Overcoating

All coats shall be clean and free from dust, oil, moisture and perspiration before overcoating. All operatives handling blast cleaned or partially painted surfaces shall wear clean gloves to avoid contamination of the surface and to ensure good adhesion between coats.

Each coating shall be allowed to dry thoroughly for at least the specified time prior to application of the succeeding coat.

Overcoating times shall not be less than the minimum nor greater than the maximum specified

in the manufacturer's Product Data Sheets, relevant to the ambient temperature. Strict adherence to overcoating times is particularly important to two-component materials and for coatings which are subsequently immersed.

PDH 7.2 Coating Application

PDH 7.2.1 Spray equipment

Spray equipment used shall meet the paint manufacturer's recommendations for applying each specific coat.

All spray equipment shall be inspected by the Engineer before any application is made. All lines and pots shall be clean before adding new material. An adequate moisture trap shall be placed between the air supply and the pressure pot feed to the gun. The traps shall continuously bleed off water or oil from the air supply. Suitable working and recently calibrated regulators and gauges shall be provided for air supply to the pressure pot, and the air supply to the pressure gun.

Spraying units shall be grounded and non-conductive hoses are to be used. The Contractor shall take further precautions that may be required to avoid the build-up of static electricity.

PDH 7.2.2 Spray application

All lines and pots shall be thoroughly cleaned before the addition of new materials.

The spray gun shall be held at right angles to the surface and shall be held no closer than 450 mm nor more than 600 mm from the surface for the airless spray gun method, or closer than 150 mm nor more than 250 mm from the surface for air spray equipment. Even parallel passes shall be made with the spray gun. In application of material, each spray shall overlap the previous pass by 50%. Large surfaces shall always receive passes in two directions at right angles to each other. Spray width adjustment on the gun shall be made and the readjustment of atomising pressure at the regulators shall be made until the desired spray pattern is achieved.

Each coat is to be applied uniformly and completely over the entire surface. All runs and sags shall be brushed out immediately or the paint shall be removed and the surface re-sprayed.

Before spraying each coat , all areas such as corners, edges, welds, small brackets, bolts, nuts, and interstices shall be pre-coated by brush as specified under stripe coating to ensure that these areas have at least the minimum specified film thickness.

Spraying of coatings from a single boatswain's chair or spider stage shall not be permitted.

A supply of spraying tips with a full range of spray angles and washers, as recommended by the paint manufacturer for each specific steel configuration to be coated, shall be available.

PDH 7.2.3 Brush application

Coatings shall be brushed onto all areas which cannot be properly spray coated for any valid reason.

Surfaces not accessible to brushes shall be painted by other suitable approved means to achieve a uniform paint film of adequate thickness.

Brushes used in brush application shall be of a style and quality that will permit proper

application of the paint coat. Round or oval brushes are generally considered most suitable for rivets, bolts, irregular surfaces and rough or pitted steel.

Wide flat brushes are suitable for large flat areas, but they shall not have a width of over 120 mm. No extending handles shall be permitted on paint brushes.

The brushing shall be done such that a smooth coat, as nearly uniform thickness as possible, is obtained. There shall be no deep or detrimental brush marks. Paint shall be thoroughly worked into all crevices and corners.

Runs or sags shall be brushed out.

In brushing any of the solvent-type coatings, care shall be taken to ensure that no lifting of former coats occurs.

During application of each coat, all areas such as corners, edges, welds, small brackets, bolts, nuts, and interstices shall receive additional coating material as specified under stripe coating to ensure that these areas have at least the minimum specified film thickness and to ensure continuity of the coating.

PDH 7.2.4 Film thickness

All coating dry film thickness (DFT) limits shall be strictly adhered to. These film thicknesses are to be checked with the calibrated film thickness gauges supplied by the Contractor and measured in accordance with SABS Method 141. Where film thicknesses do not meet this Specification, additional material shall be applied. In order to achieve the specified dry film thickness, the Contractor shall carry out frequent wet film thickness checks.

Dry film magnetic type thickness gauges shall be calibrated by the Contractor using foils in the film thickness range being checked and over the type of surface being coated.

Calibration shall be carried out at least twice daily. The completed coating shall be free of defects such as runs, sags, pinholes, voids, bubbles, or other “holidays”.

PDH 8 REPAIR OF DEFECTS

DH 8.1 General

Before the application of any further coat of material, all damage to previous coats shall be repaired.

PDH 8.2 Inadequate Coating Thickness

Areas with inadequate coating thickness shall be thoroughly cleaned and, if necessary, abraded, and additional coats applied until they meet with this Specification. These additional coats shall blend in with the final coating on adjoining areas.

PDH 8.3 Contaminated Surfaces

Surfaces to be overcoated which become contaminated shall be cleaned by lightly sweep blasting the surface free of all contamination immediately prior to the following coats. After sweep blasting, any residual contaminants shall be removed by dry compressed air or wiped by hand with clean dry rags.

PDH 8.4 Coating damage not exposing Steel Surface

Surfaces to be overcoated which become contaminated or damaged shall be cleaned by lightly sweep blasting the surface free of all contamination prior to applying the following coats. After sweep blasting, any residual contaminants shall be removed by dry compressed air or wiped by hand with clean dry rags. The coating around the damaged area shall be chamfered, using an approved method, to ensure continuity of the patch coating. The full coating system shall then be reapplied strictly in accordance with this Specification.

PDH 8.5 Coating damage exposing Steel Surface

The damages area shall be re-cleaned as originally specified for that item and the full coating system shall then be re-applied strictly in accordance with this Specification.

The re-cleaning shall be carried over on to the secure surrounding coating for not less than 25 mm around and the edges shall be chamfered by a method approved by the Engineer.

PDH 9 APPLICATION OF THREE COAT SYSTEM

PDH 9.2 Surface Preparation

The surface shall be dry abrasive blasted as per Specification.

The Contractor shall test the prepared surface for freedom from residual dust and debris, oil, grease, perspiration, cleanliness to ISO 8501-01 as specified, surface profile and water soluble iron salts as per the Test Methods given in Table 1.

The Contractor shall record the test results and the measurement in the relevant Quality Assurance Form.

……Record data
……Hold Point

PDH 9.3 Application of Primer Stripe Coat

The stripe coat shall follow the surface preparation immediately, and shall be completed within the specified coating times to prevent contamination and flash rusting of the prepared steel surfaces. Failing this, the prepared steel surface shall be washed with fresh water to remove surface contaminants and sweep blasted to remove any flash rusting that may have occurred. The 15 mm wide primer stripe coat shall be applied to all welds, edges, corners, cut ends, holes and to all touch up areas including fasteners.

The Contractor shall record wet film thickness readings of the primer stripe coat in the relevant Quality Assurance Form

……Record data
……Witness Point

PDH 9.4 Application of Primer Coat

Immediately following the surface preparation and primer stripe coat application, the bare steel surfaces and stripe coats shall be coated. The primer coat application shall be applied before contamination of the prepared steel surfaces occurs. Failing this, the prepared steel surface shall be washed with fresh water to remove surface contaminants and sweep blasted to remove any flash rusting that may have occurred.

During application of the primer coat, the Contractor shall record wet film thickness readings at regular intervals.

…….Record data

After the primer coating has initially cured, dry film thickness measurements shall be taken and recorded by the Contractor.

PDH 9.5 Application of Intermediate Stripe Coat

A 15 mm wide intermediate stripe coat shall be applied to all welds, edges, corners, cut ends, holes and to all touch up areas including fasteners. The stripe coat application shall follow the primer coating application within the specified over-coating times. The prepared steel surface shall be washed with fresh water to remove surface contaminants before the intermediate stripe coat is applied.

The Contractor shall record wet film thickness readings of the intermediate stripe coat in the relevant Quality Assurance Form.

…….Record data
……Witness Point

PDH 9.6 Application of Intermediate Coat

The intermediate coat application shall follow the within the over-coating times given by the manufacturer. Failing this, the coated steel surface shall be washed with fresh water to remove surface contaminants.

During application of the intermediate coat, the Contractor shall record wet film thickness readings at regular intervals.

…….Record data

After the intermediate coating has initially cured, dry film thickness measurements shall be taken and recorded by the Contractor.

PDH 9.7 Application of Top Coat

The intermediate coat shall be tested for dry film thickness before the application of the top coat. Should the Intermediate coating system be inadequate, an additional intermediate coat shall be applied to bring the coating system up to the specified minimum dry film thickness.

Immediately before application of the top coat, the coated steel surfaces shall be washed to remove all contaminants and dried.

During application of the top coat, the Contractor shall record wet film thickness readings at regular intervals.

…….Record data

After the top coating has initially cured, dry film thickness measurements shall be taken and recorded by the Contractor.

PDH 10 MEASUREMENT AND PAYMENT:

Except where separately scheduled, the heavy-duty corrosion protective coating of pipes and

specials will not be measured and paid separately from the manufacture of pipes and specials.

The rates tendered for the manufacture of pipes and specials shall include all costs for the heavy-duty corrosion protective coating of pipes and specials in the factory and site applied heavy duty corrosion protective coatings to damaged areas and shall include for all materials, equipment, labour, incidentals, inspection and testing as specified.

PARTICULAR SPECIFICATION

PDT: FASTENERS AND ANCHORS

PDT 1 SCOPE:

This specification generally covers the supply and use of fasteners and anchoring systems for use in building and engineering projects.

PDT 2 MATERIALS:

PDT 2.1 General

Contractors are free to select whichever approved fasteners or anchoring system they choose but may not mix fasteners or anchoring systems from different manufacturers.

Only a single type of fastener or anchor shall be used for any single application. No mixing of fastener or anchor type shall be permitted.

Chemical anchors shall only be used with chemical bonding agents manufactured or approved by the manufacturer of the anchors used. Under no circumstances shall chemical bonding agents from any other manufacturer or supplier be used.

All fasteners and anchors shall be carefully selected to ensure they are fit for purpose and are able to withstand all the applied loads with a minimum factor of safety of 2.

PDT 2.2 Certification of Materials

All fasteners and anchors shall be certified as having European Technical Approval (ETA). Non-ETA certified fasteners and anchors shall not be accepted.

PDT 2.3 Chemical Anchors

Chemical anchors are steel anchors bonded to the substrate by means of chemical compounds. These include:

- Epoxy resins
- Vinyl-esters
- Polyester hybrid mortars

in either capsule or injectable form.

Note that vinyl-esters and cementitious mortars are generally not suitable for use in wet conditions and therefore should not be used where water is present or is likely to be present.

Epoxy resins shall be used in cored (diamond cut) holes due to their better adhesion to smooth surfaces than vinyl-esters.

PDT 2.4 Mechanical Anchors

Mechanical anchors are steel anchors that rely on friction or mechanical interlock to hold them in place and resist pulling out of the substrate. These type of anchors typically include but may

not be limited to:

- Tapered bolts
- Undercut anchors
- Push-through anchors
- Sleeve anchors (for non-structural and non-safety critical use)
- Concrete screws

PDT 2.5 Fasteners

Fasteners are typically steel screws used with a nylon plug inserted into the substrate into which the fastener is screwed or driven.

Plugs used with fasteners shall by manufactured from nylon only. Plastic plugs shall not be accepted.

PDT 2.6 Load Charts

Fasteners and anchors are typically subject to tension, pressure, bending and shear forces or any combination of these forces.

Before installing any fastener or anchor, the Contractor shall first provide the Engineer with the load charts for the proposed fasteners or anchors for his approval.

Fasteners and anchors shall not be used without the Engineer's prior approval.

PDT 3 CONSTRUCTION:

PDT 3.1 General

All fasteners and anchoring systems must be selected, installed and used strictly in compliance with the manufacturer's specifications and application instructions and recommendations. Any deviation from the specifications and recommendations shall result in the fasteners or anchors being rejected by the Engineer.

Holes for fasteners or anchors shall be drilled to the correct diameter and depth.

Under no circumstances shall fasteners or anchors be cut to fit into a hole that is too shallow to accept the full length of the fastener or anchor.

Where reinforcing steel prevents holes in reinforced concrete from being drilled to the required depth the hole should be repositioned so as to avoid the steel, if possible. If in any doubt refer to the Engineer for advice.

Packing shall not be allowed for holes drilled over size. In such instances the hole shall be filled with a filer approved by the Engineer and a new hole of the correct diameter drilled.

Drilled holes are preferred over cored (diamond cut) holes due to their rougher internal surfaces that provide better grip to the anchoring system.

PDT 3.2 Positioning of Holes for Fasteners and Anchors

Holes for fasteners and anchors shall be carefully positioned so as to wherever possible avoid the possibility of causing spalling, splitting or cracking of the substrate material.

In order to be able to transfer the necessary load with fixings, the edge distances and axial spacing, and the necessary component width and thickness must be observed as per the specifications.

PDT 3.3 Preparation of Holes for Fasteners and Anchors

Holes for fasteners and anchors shall be properly cleaned of all dust and debris prior to installation of the fastener or anchor.

As a minimum the blow-brush-blow cleaning method shall be employed. Air (compressed or manual pump) shall be used to blow dust and debris from the hole. This shall be followed by using a round wire or nylon brush to clean out the hole followed again by cleaning with air as described above.

In the event that water is used to clean holes, the holes shall be allowed to dry completely before installing chemical anchors when using vinyl-esters and cementitious fillers.

Where possible the sides of cored holes should be roughened prior to insertion of anchors.

PDT 4 TESTING

The Engineer may order sample testing of the proposed fasteners and/or anchors prior to their acceptance. In this instance the Contractor shall install a minimum of three fasteners or anchors of the proposed type and size in similar positions in a sample panel of the same substrate material into which the fasteners and/or anchors will ultimately be installed.

The Engineer may also order random sample testing of installed fasteners and/or anchors.

The Engineer shall either test the fasteners and/or anchors himself or request the Contractor to arrange for such testing to be done.

PDT 5 MEASUREMENT AND PAYMENT:

Fasteners and anchors will not normally be paid for as separate items. The cost of supplying and installing fasteners and anchors shall be included in the rate for the item to be fixed.

In the event that fasteners and anchors are scheduled as separate items they shall be paid for per number for each different type and size.

Where the Contractor arranges for testing he shall be paid the cost to undertake the tests plus a mark-up of 7.5%.

No payment shall be made for the supply and installation of fasteners or anchors used for testing purposed. The costs for these shall be included in the rate for the item(s) to be fixed.

In the event of any test failing, the Contractor shall be liable for all costs associated with the failed testing. These costs shall be deducted from the next payment certificate due to the Contractor.

PARTICULAR SPECIFICATION

PMA: REHABILITATION WORK AT VERULAM WWTW

PMA 1 SCOPE:

This specification generally covers the requirements for the supply of new mechanical equipment or the repair and refurbishment of existing equipment at the Verulam WWTW, as well as for other rehabilitation work required at the WWTW.

PMA 2 DATA TO BE SUPPLIED BY TENDERERS

Full particulars of the materials and equipment offered shall be submitted at the time of tender and all information requested shall be supplied on the Data Sheets in this document. Any additional information shall be given in a covering letter. All equipment drawings, sketches, pamphlets, etc. shall be submitted with the tenders.

Additional information may be requested by the Engineer after award of the contract and the Contractor shall provide shall information within the required time frame.

All new equipment offered shall fit within the existing structures without requiring modifications to the structures.

PMA 3 EQUIPMENT DRAWINGS

Within one month of the Contract Commencement, the Contractor shall provide the Engineer with fully dimensioned drawings of the plant and equipment to be installed under the Contract. The drawings shall also indicate the type and position of all holding down bolts, fasteners, etc.

PMA 4 PLANT AND EQUIPMENT OR WORK REQUIRED

PMA 4.1 INLET WORK SLUICE GATE

PMA 4.1.1 General

A manually operated channel gate is required at the start of the inlet works channel. The channel dimensions are 600mm wide x 1650mm deep. These dimensions must be checked and confirmed on site prior to ordering or manufacturing the sluice gate.

PMA 4.1.2 Technical Specifications

The channel gate, frame and spindle shall be manufactured from Grade 304 stainless steel. The gate shall be designed for both on- and off-pressure sealing.

The design of all structural members shall comply with the requirements of DIN Spec 19704 and under full head conditions there shall be ample margins of safety over the yield and ultimate strengths of the materials used.

Channel gates shall be fitted with neoprene L-type seals on the sides and neoprene rectangular compressive type seal on the bottom. These shall bear against the frame to ensure sealing.

Gates should preferably be drop tight. Permissible leakage rates shall not exceed those given in AWWA Specification C501. These are ± 1,24 l/min per meter of seal for on-seating

pressures and ± 2,48 l/min per meter of seal for off-seating pressures up to 6m.

Low friction HDPE strips shall be fitted to the gate that slide against the frame as the gate moves to ensure low bearing loading and ease of operation.

The spindle shall be of the rising type and the handwheel shall be 900mm above platform level.

PMA 4.2 STONE TRAP SPIRAL CONVEYOR

PMA 4.2.1 General

The Contractor shall design and manufacture or procure, transport to site, install, test and commission a centreless spiral stone trap conveyor that will fit into the existing concrete structure at the inlet works.

The conveyor shall discharge into a standard skip and shall therefor be long enough to achieve this.

The dimensions of the slot into which the conveyor must be install all 3,130mm long x 2,155mm deep x 300mm wide with the floor sloping at approximately 55.5 degrees. All dimensions must however be checked on site and confirmed before design and manufacture of the equipment begins.

It is the responsibility of the Contractor to ensure that the equipment offered fits into the space provided as no payment will be made for altering any equipment that is incorrectly sized and manufactured, neither will any extension of time be granted in this regard.

PMA 4.2.2 General Specifications

The centreless spiral conveyor will remove large grit and stones from the bottom of the screening channel ahead of the mechanical bar screens, and transfer the grit/stone waste to a designated waste bin.

The Stone trap conveyor shall comprise of the following basic components:

- U-shape transport trough, including cover
- Non-segmented Spiral (Shaftless screw) to drive grit and stones
- Support frame.
- Drive assembly, which will provide motive power to the spiral.
- The control and instrumentation required for automated operation (as described in the
- Electrical Specification).

PMA 4.2.2.1 Conveyor Trough

The Conveyor trough shall be manufactured in a “U“shape with a lip on either side to increase stiffness and accommodate covers. The trough is to be bent into shape, not rolled, for optimum lateral strength to specific diameters and clearances. The trough shall be bent in standard length sections that may be bolted or welded together. The trough shall be manufactured from Grade 304 stainless steel of 3.5mm minimum thickness.

PMA 4.2.2.2 Trough Liners

The Conveyor trough will be fitted with replaceable liners.

The replaceable liner will be manufactured from material with a low friction coefficient combined with high resistance to abrasion.

PMA 4.2.2.3 Spiral

The centerless spiral shall be manufactured from Grade 304 stainless steel flat bar, cold formed into a strong, flexible spiral that is resistance to wear. The centerless spirals must be cold formed to accurate diameter and pitch. The spiral is driven by means of a motor-gearbox set, located at the outer end of the trough.

PMA 4.2.2.4 Drive Unit

The drive unit shall suitably sized with an output speed selected to facilitate the load transported. The drive unit is to be a flange mounted Inline Helical Bevelled Geared hollow shaft type to accommodate the drive shaft.

PMA 4.2.2.5 Maintenance, Spares and Refurbishment

The conveyor shall be fully capable of being maintained by a local (South African) company that has a minimum of 10 years' experience in manufacturing and maintaining conveyor equipment of this particular type.

Spare parts shall be manufactured in South Africa by the same company that manufactured the spiral conveyor.

PMA 4.2.2.6 Equipment Supplier

The spiral conveyor manufacturer shall have a minimum of 10 years' experience in manufacturing this particular conveyor type and shall have a dedicated maintenance team (maintenance site crew) to perform maintenance on the equipment.

PMA 4.2.2.7 Corrosion Protection

All painted components to be sand blasted to SA 2½ (DIN 55928) and painted to the relevant tender specifications.

All mild steel components not painted to be sand blasted to SA 2½ (DIN 55928) and Hot Dipped Galvanized to SABS standards

All Stainless steel and 3CR12to be fettled and cleaned. After cleaning Stainless steel and 3CR12 to be pickled & passivated.

Proprietary items, motor/gearboxes/lubricators etc. are supplied in manufacturer's finish.

PMA 4.2.3 Technical Specifications

The following Technical Specifications shall be adhered to. All dimensions given shall be checked and confirmed on site before design and manufacture of the conveyor may commence.

Material thicknesses indicated are the minimum required. The manufacturer shall ensure the

thickness of steel used in the manufacture of the conveyor shall be of sufficient thickness to ensure structural strength without any warping, bending or any other form of structural failure.

Conveyor type	:	Centreless Spiral Conveyor
Number of units required	:	One
Length loading to discharge	:	Approx 6500mm @ a 55.5 deg angle (TBC on site)
Spiral outer body material and thickness	:	305 stainless steel / 3.5mm
Spiral diameter and material	:	285mm / 304 stainless steel
Spiral pitch	:	140mm
Trough liner	:	3CR12 Wear bars
Spiral drive	:	SEW or similar 0,75kW, TEFC, 400V, IP55
Material Conveyed	:	Grit / Stones
Support structure	:	304 stainless steel / 4.5mm
Safety Covers	:	304 stainless steel / 3.0mm
Emergency stop button	:	Required
Electrical control Panel	:	Required
Capacity required (estimated)	:	2 m^3/hr

PMA 4.3 MECHANICAL SCREEN, CONVEYOR AND COMPACTOR WASHER

PMA 4.3.1 General Description of Mechanical Screen, Conveyor and Compactor Washer

The information presented here is given in order to assist the tenderers with their pricing. The accuracy of the information is not guaranteed and tenderers should check the veracity thereof on site.

A single mechanical screen, screw conveyor and screenings compactor washer are installed in the inlet works. These units were damaged when the WWTW was inundated with flood waters.

The mechanical screen can be pivoted into the horizontal position for maintenance and cleaning purposes. The screen has 10mm spacing with an automatically retractable rake.

The screw conveyor is installed on wheels that allows it to be moved out of the way when the screen is pivoted into the horizontal position. The conveyer is fitted with a 1.1 kW motor.

The screenings compactor washer is fixed into position. The end of the discharge chute is able to swivel to discharge into one of two skips. The washer unit is fitted with a 3.5 kW motor and the compactor unit with a 4.0 kW motor.

PMA 4.3.2 Work Required

The scope of work required under this section is the removal of all motors and gearboxes on the screening equipment and the replacement of same with new motors and gearboxes. All seals and bearings shall also be replaced.

The screen, conveyor and screenings compactor washer shall all be fully serviced before being returned to service.

PMA 4.4 VORTEX DEGRITTERS

PMA 4.4.1 General Description

There are two existing vortex degritter units at the Verulam WWTW. These units together with their respective grit declassifiers were damaged when the WWTW was inundated with flood waters.

Details of the existing equipment are provided below. Whilst this information is given in good faith the accuracy of the information is not guaranteed and tenderers should check the veracity thereof on site.

Degritter Paddle Units:

Manufacturer	Lektratek Water Technology
Year of manufacture	2006
Rotational speed	12.3 rpm
Paddle diameter	2410mm
Serial number	MVR0200/1-4

Primary Geared Drive

Manufacturer	Siemans
Model number	ZF48-M90S4
Rated output	1.1 kW
Rated voltage	400V
Rated current	2.8A
Output speed	53 rpm
Serial number	MK2209

Secondary Geared Drive

Manufacturer	Lektratek Water Technology
Ratio	4.304 : 1
Slew gear	Titanus E.505.20.C
Serial number	MVR0200/1-4

Blowers:

Manufacturer	Robuschi
Number of units	3 (2 x duty, 1 x standby)
Model number	ES 15/1C-RVP50-HT Robox Evolution
Speed	2737 rpm
Duty	107m^3 @ 660m
V-belts	2 x SPA 1150

Outlet temperature max	123°C
Serial numbers	0713916 0713917 0713918

Blower Motors:

Manufacturer	Bauer
Frame size	132S
Rated speed	2890 rpm
Rated output	5.5 kW
Rated current	10.3A
Rated voltage	400V

Grit Washers:

Manufacturer	Huber
Model number	RoSF4 size 2
Feed rate	16l/s
Grit discharge	1 ton/hr
Wash water demand	5m³/h @ 500 – 800 kPa
Rated power	2 x 0.55 kW
Serial numbers	287009.290710/1 …/2

Grit Conveyors:

Manufacturer	Bauer
Model number	BF40Z-74W
Rated voltage	400V
Rated power	2 x 1.1 kW
Rated input speed	1400 rpm
Rated output speed	5.6 rpm
Rated current	1.6A
Motorised skip trolley	7.5 kW

PMA 4.4.2 Work Required

The scope of work required under this section is the removal of the motors and gearboxes on all the degritting equipment and the replacement with same new motors and gearboxes. All seals and bearings on all equipment must also be replaced, as must v-belts.

PMA 4.5 PRIMARY SETTLING TANKS

PMA 4.5.1 General Description

There are five identical preliminary settling tanks (PSTs) at the Verulam WWTW. These are of the Dortmund Tank type constructed from reinforced concrete with 200mm diameter mild steel inlet pipes and ± 2,000mm diameter stilling boxes, and 150mm diameter AC sludge draw-off pipes.

The inlet pipework is flanged and a section of it can be removed in each PST. The stilling boxes are fastened to the underside of the access bridges and should be removable.

The tanks have an internal diameter of 9,800mm at the top with 1,350mm vertical side walls forming the launders. The tanks have a conical shaped lower section that tapers at a 60° angle to approximately 750mm diameter at the bottom. Total depth is 8.5m giving a volume of 970m³

per PST.

PMA 4.5.2 Work Required

The five PSTs require removal of sludge and silt, cleaning, removal and disposal of the 150mm diameter AC sludge draw-off pipe and the replacement thereof with mPVC Cl 6 pipes, and cleaning, preparation and application of a corrosion protection coating to the mild steel stilling boxes and 200mm diameter inlet pipes as specified elsewhere in this document.

Pipe brackets to hold the new sludge draw-off pipes shall be manufactured from Grade 304 stainless steel.

PMA 4.6 4ML/DAY BIOLOGICAL REACTOR AND CLARIFIER

PMA 4.6.1 General Description

The circular 4Ml/day biological reactor incorporates a 24m diameter x 3m deep clarifier unit with rotating bridge. The bridge drive is fitted with a torque switch to trip the drive unit in case of overloading.

Details of the existing clarifier equipment are provided below. Whilst this information is given in good faith the accuracy of the information is not guaranteed and tenderers should check the veracity thereof on site.

Settling Tank Mechanism:

Manufacturer	Lektratek Water Technology
Tank diameter	32.7m
Scraper formation	Echelon
No. of scrapers	7
Wheel size	310mm dia x 125mm wide
Wheel bearings	UCPX10
Peripheral speed	1.85m/min
Centre pivot bearing	Slew bearing – Jost – 850N
Serial number	CFE 0155

Drive Unit:

Manufacturer	Flender Himmel
Model	FZA81Z30-MIC4
Rated output	0.37 kW
Output speed	1.9 rpm
Rated voltage	400 V
Rated current	1.2 A
Serial number	002-MI3454/1-/2

PMA 4.6.2 Work Required

The scope of work required under this section includes the removal and replacement of the centre bearing and electrical slip ring on the clarifier.

Also required is the removal of sludge and silt, cleaning, preparation and application of a corrosion protection coating to the mild steel stilling box, as specified elsewhere in this document.

PMA 4.7 SECONDARY SETTLING TANKS

PMA 4.7.1 General Description

The two secondary settling tanks (SSTs) are identical, each having an internal diameter of 21m and a side wall depth of 3m to the overflow launder. The rotating half bridges are supported on the concrete central inlet columns and on the outer walls.

Details of the existing equipment are provided below. Whilst this information is given in good faith the accuracy of the information is not guaranteed and tenderers should check the veracity thereof on site.

Settling Tank Mechanisms:

Manufacturer	Lektratek Water Technology
Tank diameter	21m
Max sludge return	4.25l/s
No. of scrapers	4
Wheel size	310mm dia x 125mm wide
Wheel bearings	UCPX10
Peripheral speed	1.95m/min
Centre pivot bearings	1 x UCP212 1 x UCFX17
Serial number	CFC0107

Drive Units:

Manufacturer	Flender power Transmission
Type	KA48-Z28-M71M4
Serial numbers	MK2206/1 …/2
Ratio	717 : 1
Output speed	2.0 rpm
Rated motor speed	1400 rpm
Rated voltage	400V
Rated output	0.37 kW
Rated current	1.12A
Oil quantity	2.0l and 0.6l
Oil type	VG220

Vacuum Pump:

Manufacturer	Utile
Rated output	0.09kW
Rated voltage	220 – 24V AC

Slip Rings:

Supplier	Automation Products
Contact number	011 333 8705
Type	7-ring

PMA 4.7.2 Work Required

The two SSTs require removal of sludge and silt, cleaning, preparation and application of a corrosion protection coating to the mild steel stilling boxes as specified elsewhere in this document.

The scope of work required under this section also includes the removal and replacement of the centre bearing and electrical slip ring, as well as the drive motor and gearbox on the two SSTs.

PMA 4.8 SLUDGE DIGESTERS AND PUMPS

PMA 4.8.1 General Description

The Verulam WWTW is served by two primary sludge digesters, one secondary digester and one WAS digester.

The primary digesters are the normal egg-shaped digesters, circular on plan with sloping floors forming a conical lower section that is below ground level, each having a volume of 1,800m^3.

The primary digesters are fitted with openings at the top, draft tube mixers and inlet pipes in the roof for sludge mixing. The digesters are served by a Gorman-Rupp sludge mixing pumps fitted with 30 kW motors. The digesters are not heated and do not have gas collection systems.

The secondary digester is a rectangular open concrete structure having dimensions 20m x 10m x 5m depth. The WAS digester is circular with a volume of 600m^3.

Raw sludge is pumped to the primary digesters via the raw sludge pump station fitted with 2 x 11 kW Hidrostal immersible pumps. Supernatant liquor (SNL) is pumped from the secondary digester to the head of works via the SNL pump station also fitted with 2 x 11 kW Hidrostal immersible pumps.

Details of the existing pumps are provided below. Whilst this information is given in good faith the accuracy of the information is not guaranteed and tenderers should check the veracity thereof on site.

Raw Sludge and SNL Pumps:

Manufacturer	Hidrostal
Model number	D100L-DNXB2
Type	Immersible
Seal type	Double mechanical seal with oil lubricant and moisture probe
Impeller diameter	75mm
Duty	35l/s @ 23.4m
Rated voltage	400 V
Rated power	11 kW
Rated speed	2896 rpm
Rated current	23.0 A

PMA 4.8.2 Work Required

Approximately 50m^3 of sludge must be removed from one of the primary digesters and approximately 10m^3 from the secondary digester and disposed of at the Hammersdale solid waste disposal site. Once the sludge is removed the digesters must be cleaned by high pressure washing and returned to service.

A new Gorman-Rupp T10 pump and motor with 300mm diameter x 2m long mild steel goose-neck bend must be supplied and installed. The 2 x raw sludge pumps and the 2 x SNL pumps must all be replaced with new 11 kW Hidrostal pumps.

In the event that the Contractor intends to cut a hole through the wall of the primary digester at or just above ground level in order to remove the sludge, he shall state so in his tender submission.

Should this be allowed, the Tenderer shall on completion of cleaning the digester close the hole by first cutting the edges of the opening formed neat and square, replacing the reinforcing steel ensuring minimum bar overlap of 50 x dimension, erecting internal and external formwork to box the hole and closing the opening with an approved non-shrink grout mix.

The cost of cutting the hole and closing it again as described above shall be included in the tendered rates for the various items to remove and dispose of the sludge as no separate payment will be made for these activities.

PMA 4.9 CHOLRINATION SYSTEM

PMA 4.9.1 General Description

Final clraified effluent passes through a chlorine contact tank of 64m^3 volume before discharging to the river.

PMA 4.9.2 Work Required

Under this contract an approximately 20m long x 600mm diameter mPVC Cl 34 clarified effluent bypass pipeline will be constructed from an existing manhole on the existing 600mm diameter clarified effluent pipeline. The new bypass pipeline will terminate with an outlet headwall into the existing stormwater channel that will be upgraded and concrete lined under this contract.

Two hand sluices must be installed into the existing manhole to allow clarified effluent to be directed either to the chlorine contact tank or into the bypass pipeline.

A chlorine dosing pipeline shall tee off from the existing chlorine dosing pipeline and be laid to the diversion manhole to allow for disinfection of clarified effluent directed into the bypass pipeline.

PMA 4.10 SLUDGE DRYING BEDS

PMA 4.10.1 General Description

There are two rows of sludge drying beds with 10 beds per row giving a total of 20 drying beds. Each drying bed is approximately 20m x 6m in area.

The drying beds were inundated by flood water that deposited silt onto the beds. The flood waters also caused the southern wall of the drying beds to collapse.

PMA 4.10.2 Work Required

The work required at the sludge drying beds includes the removal of all silt, sludge and sand from the beds and removal of the damaged wall section. All material and rubble removed to be disposal of at the Hammersdale solid waste disposal site.

The damaged section of wall (approximately 62m x 1m high) must be rebuilt in 220mm brickwork. New sand must be placed on the drying beds and the inlet valves replaced with manually operated knife-gate valves.

A concrete slab must be constructed on three sides of, and between the two rows of, drying

beds, as shown on the drawings.

PMA 4.11 PERIMETER FENCE

PMA 4.11.1 General Description

A security fence surrounds the Verulam WWTW. Sections of the fence where damaged by the flood waters and must be replaced.

PMA 4.11.2 Work Required

Reinstatement of sections of the perimeter fence to match the existing.

PMA 4.12 STORMWATER DRAINAGE

PMA 4.12.1 General Description

The existing stormwater drainage systems comprises sections of open grassed lined channels linked by underground stormwater pipes.

PMA 4.12.2 Work Required

The open stormwater channels are to be cleared of grass and vegetation, shaped and compacted and then concrete lined. Headwall structures are to be constructed at each pipe inlet and outlet. Gabion erosion protection is allowed for at the final channel outlet.

Existing gabion structures damaged by the flood waters must also be reinstated.

PMA 5 MATERIALS

PMA 5.1 General

All materials used for manufacturing of equipment or supplied on site shall be new and unused. Materials for manufacture of new equipment shall be as specified for the particular equipment.

Where equipment is being replaced the materials of the new equipment shall match that of the equipment being replaced unless otherwise specified.

PMA 5.2 Replacement Equipment

Unless otherwise specified equipment, motors and gearboxes shall be replaced as far as possible with equipment, motors and gearboxes of the same make and model as those being replaced.

PMA 5.2 Bearings

All bearings shall have a design life of at least 100,000 hours. Bearings shall be capable of withstanding all resultant forces imposed on them under normal operating conditions.

PMA 6 MANUFACTURE

All plant and equipment shall be suitably designed and manufactured taking into account the exposure and operating conditions under which they will normally operate.

All manufacture shall be to best standards and quality. Only welders that are certified in the type of welding used in the manufacturing process may be employed.

PMA 7 CORROSION ROTECTION

Where corrosion of metal may be expected from contact with water or sewage or from any other cause, the Contractor shall supply materials which are resistant to corrosion. Any material showing any signs of corrosion, tuberculation or pitting before expiry of the defects liability period shall be replaced by the Contractor at his own expense with materials to the Engineer's approval.

All stainless steel and 3CR12 shall be pickled and passivated.

Unless specified otherwise or measured separately in the Bills of Quantities, no separate payment will be made for the corrosion protection of metal items, the cost of which shall be included in the rates for such items.

PMA 8 ERECTION, ADJUSTMENT AND OPERATION

The Contractor shall make his own arrangements for the handling and transport of all material, plant and equipment to the site of the works in a proper and careful manner so as to avoid damage, and shall be responsible for storing and protecting all materials, plant and equipment against damage by any means before and during erection.

The work of erection of plant and equipment is to be carried out under a skilled and experienced erector. When erected, the plant and equipment is to be of neat and workmanlike appearance, solidly and evenly supported true to line, level and alignment, plumb and in proper working order.

PMA 9 TESTING AND COMMISSIONING

PMA 9.1 Factory Testing

The Contractor shall arrange for factory testing of all plant and equipment before despatch to the site. No plant or equipment that fails the factory testing shall be delivered to site. Plant or equipment that fails the initial factory testing shall be rectified and re-tested. Only once it has satisfactorily passed factory testing may it be delivered to site.

PMA 9.2 Testing after Installation

After completion of erection or installation the Contractor must test and commission the plant and equipment to ensure the operation thereof complies with the specification and performance figures tendered.

The Contractor shall operate his plant or equipment for at least 72 hours, or such longer period as may be necessary, in order to put all plant and equipment into proper adjustment and working order.

Before handing over the plant or equipment, the Contractor is to ensure that every part is operating satisfactorily. The contract will not be considered complete under the Engineer is fully satisfied in this connection.

PMA 9.2 Acceptance Testing

Once the Contractor has tested and commissioned the plant or equipment and has satisfied himself as to the correct operation thereof, he shall arrange with the Engineer to witness a final acceptance test to ensure that the plant or equipment and the operation thereof comply with the specifications.

In the event that such a test fails and re-testing is required at the Engineer's discretion due to non-compliance with the specifications or faulty operation, the full cost the re-test and inspection will be for the account of the Contractor. Such cost shall be recovered from the Contractor by deduction from any payments due to him.

PMA 10 OPERATING AND MAINTENANCE MANUALS

Three (3) hard copies and two (2) soft copies on separate flash drives of comprehensive operation and maintenance instructions shall be provided. Detailed record or as-built drawings shall be included. These shall be in pdf format in the soft copies.

All manufacturer's brochures and details shall also be included.

It is advisable that the Contract submit a draft copy of the manuals for comment before submitting the final manuals. Sufficient time must be allowed for the Engineer to comment and for the Contractor to make changes as required before submission of the final manuals.

Final manuals shall be handed over prior to hand-over / acceptance of equipment. The completion certificate shall not be issued until such time as the Engineer has received and approved all the operation and maintenance manuals.

Operating manuals shall include the following:

- Index
- Pre-start check list
- Step-by-step description of the approved start-up and operation procedures for all modes of operation of the equipment
- Description of required safety checks
- Step-by-step shut down procedures for all shut-down modes of the equipment

Maintenance manuals shall include the following:

- Index
- Details of routine and regular maintenance work which the manufacturer deems necessary to maintain the plant or equipment in good operating order
- Instructions for the repair or replacement of worn or damaged parts
- Spare parts lists
- Particular technical data of the plant or equipment
- Details of oils, greases and other lubricants to be used, including type and quantities
- Preference list including name and contact details of local agents for the servicing and supply and repairs of specific plant or equipment

PMA 11 MEASUREMENT AND PAYMENT

PMA 11.1 General

Payment for any work described in PMA 4 above that falls within the ambit of the SABS 1200 Standardized Specification for Civil Engineering Construction (for example trenching and pipe laying) or any other specification contained in this document shall be measured and paid for

under the relevant standard SABS 1200 or other specification.

PMA 11.3.2 Basic Principles

Items shall be measured and paid for in the units specified in the Bills of Quantities.

Where installation of plant or equipment is scheduled as a separate pay item, the tendered rate shall include for all lifting equipment, labour, plant, materials and consumables required for the full, complete and proper installation of the particular plant or equipment.

Rates for testing and commissioning shall include for all labour, testing equipment, consumables and all other things required to test and commission the plant or equipment successfully.

PMA 11.3 Computation of Quantities

Volumes of material in structures shall be calculated from the internal dimensions of the structures and specified levels within the structures.

Volumes of excavated materials shall be calculated from the dimensions given on the construction drawings. Measurement will be to finished shapes, sections and profiles as shown on the drawings or ordered and no excavation and no embankment formed outside the specified lines and levels will be included in the measurement unless such extra work has been done on the written instructions of the Engineer.

PMA 11.4 Scheduled Items

PMA 11.4.1 **Equipment to allow WWTW to remain in operation** ..... Unit : sum

The rate shall cover all costs to provide, operate, maintain, move from place to place within the WWTW boundary as necessary, and remove on completion of the work, temporary pumping equipment and pipework to allow bypass pumping whilst work is taking place in a particular area or structure in order that the WWTW remains in constant operation for the duration of the contract.

PMA 11.4.2 **Inlet works channel gate** ..... Unit : No.

The rate shall cover all costs to manufacture or procure, deliver to site, install, test and commission the new channel gate at the start of the inlet works. The rate shall also cover all plant, labour, materials, fasteners and consumables required for the complete and proper installation, working in a confined space, safety equipment and precautions.

PMA 11.4.3 **Stone trap spiral conveyor** ..... Unit : No.

The rate shall cover all costs to manufacture or procure, deliver to site, install, test and commission the stone trap spiral conveyor complete with all parts and wall mounted electrical switchboard to be located in the existing blower room, all power and control cables.

The rate shall also cover all plant, labour, materials, fasteners and consumables required for the complete and proper installation, working in a confined space, safety equipment and precautions.

PMA 11.4.4 Mechanical screen, conveyor and compactor washer

PMA11.4.4.1 Remove and dispose of all existing motors and gearboxes from the mechanical screen, conveyor and compact washer …… Unit : sum

PMA 11.4.4.2 Supply, install, connect, test and commission new electric motors same as the existing for:

a) Mechanical screen ……..…….. Unit : sum

b) Conveyor …… Unit : sum

c) Compact washer …….. Unit : sum

PMA 11.4.4.3 Supply, install, connect, test and commission new gearboxes same as the existing for:

a) Mechanical screen ……..…….. Unit : sum

b) Conveyor …… Unit : sum

c) Compact washer …….. Unit : sum

The rates for PMA 11.4.4.2 and PMA 11.4.4.3 above shall cover all costs to procure, deliver to site, install, connect, test and commission the electrical motors and gearboxes.

The rate shall also cover all plant, labour, materials, fasteners and consumables required for the complete and proper installation, safety equipment and precautions.

PMA 11.4.4.4 Service mechanical screen, including replacement of all bearings …… Unit : sum

The rate shall cover all costs to service the mechanical screen including the removal and replacement of bearings and seals, set and tighten drive chains, oils, greases and lubricants, parts, labour, tools and equipment, and consumables.

PMA 11.4.5 Vortex Degritters

PMA11.4.5.1 Remove and dispose of all existing motors and gearboxes from all degritting equipment ……..…….. Unit : sum

PMA 11.4.5.2 Supply, install, connect, test and commission new electric motors same as the existing for:

a) Paddle units …… Unit : No.

b) Blowers ……..…….. Unit : No.

c) Conveyors …… Unit : No.

d) Grit washers ……..……..…… Unit : No.

PMA 11.4.5.3 Supply, install, connect, test and commission new gearboxes same as the existing for:

a) Paddle units (primary and secondary drives) ……..…… Unit : No.

b) Conveyors …… Unit : No.

c) Grit washers ……..…..…….. Unit : No.

The rates for PMA 11.4.5.2 and PMA 11.4.5.3 above shall cover all costs to procure, deliver to site, install, connect, test and commission the electrical motors and gearboxes.

The rate shall also cover all plant, labour, materials, fasteners and consumables required for the complete and proper installation, safety equipment and precautions.

PMA 11.4.5.4 Service paddle units (2 no.) blowers (3 no.), conveyors (2 no.) and grit washers (2 no.) including replacement of all bearings and v-belts …….…… Unit : sum

The rate shall cover all costs to service the equipment including the removal and replacement of bearings and seals, replace and set v-belts, oils, greases and lubricants, parts, labour, tools and equipment, and consumables.

PMA 11.4.6 Primary Settling Tanks

PMA 11.4.6.1 Remove sand and sludge from settling tanks and dispose …….. Unit : m^3

The rate shall include for the provision of all plant and labour to remove water, sand and sludge from the PSTs, loading, carting and disposal at the Hammersdale solid waste disposal site. The rate shall also include for any fees payable at the disposal site.

Payment will only be made on submission of proof of disposal at the Hammersdale solid waste site in the form of official disposal slips issued at the waste site.

PMA 11.4.6.2 Remove AC pipework and dispose ……. Unit : sum

The rate shall cover all costs for removal of the sludge draw-off pipe work in all five PSTs including breaking out, labour, adhering to all asbestos safety regulations including provision of specialised safety equipment and PPE, bagging, transporting and disposal at the Hammersdale solid waste disposal site. The rate shall also include for any fees payable at the disposal site.

Payment will only be made on submission of proof of disposal at the Hammersdale solid waste site in the form of official disposal slips issued at the waste site.

PMA 11.4.6.3 Provision of access …….. Unit : sum

The rate shall cover all costs for the provision of access to the steel inlet pipe and central stilling well in the five PSTs including all plant, labour and materials, erection, dismantling and moving from one PST to the next, final dismantling and removal from site on completion of the work.

PMA 11.4.6.4 Preparation of steelwork for coating

a) Steel inlet pipes ……. Unit : No.

b) Central stilling wells ……. Unit : No.

The rates shall include for all plant, labour and materials, safety precautions and PPE, provision of grit, and the collection and disposal of used grit required to remove all traces of existing coatings from the steelwork and to ensure a surface profile as specified.

PMA 11.4.6.5 Application of corrosion protection coating

a) Steel inlet pipes ……. Unit : No.

b) Central stilling wells ……..…… Unit : m^2.

The rates shall include for all plant, labour and materials, safety precautions and PPE to provide corrosion protection coatings as specified to the steelwork items, all in strict accordance with the manufacturer's specifications. The rate shall allow for all coats to be provided including primer, intermediate and final coats.

PMA 11.4.6.6 Sludge draw-off pipes …… Unit : No.

The rates shall include for all access, plant, labour, materials and safety precautions to supply and install new 160mm diameter mPVC Class 6 sludge draw-off pipes complete with new valves and stainless steel holding brackets in the PSTs, and making good areas where concrete was broken out to remove the original pipes, all as detailed on the drawings.

PMA 11.4.7 <u>4Ml/day Biological Reactor and Clarifier</u>

PMA 11.4.7.1 Remove water, sand and sludge from clarifier and dispose …….. Unit : m^3

The rate shall include for the provision of all plant and labour to remove water, sand and sludge from the clarifier, loading, carting and disposal at the Hammersdale solid waste disposal site. The rate shall also include for any fees payable at the disposal site.

Payment will only be made on submission of proof of disposal at the Hammersdale solid waste site in the form of official disposal slips issued at the waste site.

PMA 11.4.7.2 Provision of access …….. Unit : sum

The rate shall cover all costs for the provision of access to allow the required work in the clarifier to be undertaken safely.

PMA 11.4.7.3 Replace centre bearing and electrical slip ring ……. Unit : sum

The rate shall cover all plant, labour, materials and consumables required to lift the bridge and replace the centre bearing and electrical slip ring as well as the cost of procuring, transporting to site and safe storage of the centre bearing and slip ring until these are installed and the lowering of the bridge back into position.

PMA 11.4.7.4 Test and commission centre bearing and electrical slip ring …….. Unit : sum

PMA 11.4.7.5 Preparation of steelwork to central stilling well for coating ……. Unit : sum

The rate shall include for all plant, labour and materials, safety precautions and PPE, provision of grit, and the collection and disposal of used grit required to remove all traces of existing coatings from the steelwork and to ensure a surface profile as specified.

PMA 11.4.7.6 Application of corrosion protection coating to central stilling well ……. Unit : sum

The rate shall include for all plant, labour and materials, safety precautions and PPE to provide the corrosion protection coating as specified to the steelwork, all in strict accordance with the manufacturer's specifications. The rate shall allow for all coats to be provided including primer, intermediate and final coats.

PMA 11.4.8 Secondary Settling Tanks

PMA 11.4.8.1 Remove water, sand and sludge from SSTs and dispose …….. Unit : m^3

The rate shall include for the provision of all plant and labour to remove water, sand and sludge from the SSTs, loading, carting and disposal at the Hammersdale solid waste disposal site. The rate shall also include for any fees payable at the disposal site.

Payment will only be made on submission of proof of disposal at the Hammersdale solid waste site in the form of official disposal slips issued at the waste site.

PMA 11.4.8.2 Provision of access …….. Unit : sum

The rate shall cover all costs for the provision of access to allow the required work in the SSTs to be undertaken safely.

PMA 11.4.8.3 Replace centre bearings and electrical slip rings ……. Unit : No.

The rate shall cover all plant, labour, materials and consumables required to lift the bridges and replace the centre bearings and electrical slip rings as well as the cost of procuring, transporting to site and safe storage of the centre bearings and slip rings until these are installed and the lowering of the bridge back into position.

PMA 11.4.8.4 Replace drive motors and gearboxes ……. Unit : No.

The rate shall cover all plant, labour, materials and consumables required to support the bridges and replace the drive motors and gearboxes as well as the cost of procuring, transporting to site and safe storage of the motors and gearboxes until these are installed.

PMA 11.4.8.5 Test and commission new equipment install ……..…….. Unit : sum

The rate shall cover all costs for the provision of testing equipment, labour and consumables required for the successful testing and commissioning of the new installed equipment.

PMA 11.4.8.6 Preparation of steelwork to central stilling wells for coating ……..……. Unit : No.

The rate shall include for all plant, labour and materials, safety precautions and PPE, provision of grit, and the collection and disposal of used grit required to remove all traces of existing coatings from the steelwork and to ensure a surface profile as specified.

PMA 11.4.8.7 Application of corrosion protection coating to central stilling wells …….. Unit : No.

The rate shall include for all plant, labour and materials, safety precautions and PPE to provide the corrosion protection coating as specified to the steelwork, all in strict accordance with the manufacturer's specifications. The rate shall allow for all coats to be provided including primer, intermediate and final coats.

PMA 11.4.9 Sludge Digesters and Pumps

PMA 11.4.9.1 Allow for all safety equipment and precautions when working on digesters ……. Unit : sum

The rate shall cover all costs in providing, maintaining and removal on completion of work all safety equipment and PPE and taking all precautions required to allow safe working in the sludge digesters.

PMA 11.4.9.2 Remove and dispose of sludge from primary digester …… Unit : m^3

PMA 11.4.9.3 Remove and dispose of sludge from secondary digester …….…… Unit : m^3

The rates for PMA 11.4.9.2 and PMA 11.4.9.3 above shall include for the provision of all plant and labour to remove sludge from the digesters, loading, carting and disposal at the Hammersdale solid waste disposal site. The rate shall also include for any fees payable at the disposal site.

Payment will only be made on submission of proof of disposal at the Hammersdale solid waste site in the form of official disposal slips issued at the waste site.

PMA 11.4.9.4 High-pressure washing of digesters

a) Primary digester ……..…… Unit : m^2

b) Secondary digester ……..…… Unit : m^2

The rates for PMA 11.4.9.4 a) and b) shall cover all costs for the provision of all plant, labour, materials, consumables and access required to clean the interior surfaces of the digesters by means of high pressure washing and the collection and disposal of the wash water. Wash water may be disposed of into the inlet of the WWTW.

PMA 11.4.9.5 Removal of Raw Sewage and SNL pumps …….. Unit : No.

PMA 11.4.9.6 Removal of Gorman-Rupp pump …… Unit : No.

The pumps removed under the above items are to be handed over to the Client.

PMA 11.4.9.7 New Raw Sewage and SNL pumps ……..…….. Unit : No.

PMA 11.4.9.8 New Gorman-Rupp pump ……..…… Unit : No.

The rates for PMA 11.4.9.7 and PMA 11.4.9.8 above shall cover all costs for the procurement, transport to site, storage, installation, testing and commissioning of the pumps specified and any associated pipework and for all labour, plant, tools and equipment, testing equipment and consumables required for the full and proper installation, testing and commissioning of the pumps.

PMA 11.4.10 <u>Sludge Drying Beds</u>

PMA 11.4.10.1 Remove sand and sludge from drying beds and dispose …….. Unit : m^3

The rate shall include for the provision of all plant and labour to the sand and sludge from the drying beds, loading, carting and disposal at the Hammersdale solid waste disposal site. The rate shall also include for any fees payable at the disposal site.

Payment will only be made on submission of proof of disposal at the Hammersdale solid waste site in the form of official disposal slips issued at the waste site.

C3.7 : CONTRACT AND STANDARD DRAWINGS

C3.7.1 CONTRACT DRAWINGS / DETAILS

AFR2309-SEW-GA-01-TEN-00	LAYOUT PLAN
AFR2309-SEW-GA-01-TEN-00	LAYOUT PLAN
AFR2309-SEW-GA-01-TEN-00	LAYOUT PLAN
AFR2309-SEW-GA-01-TEN-00	LAYOUT PLAN
AFR2309-SEW-GA-01-TEN-00	LAYOUT PLAN
AFR2309-SEW-GA-01-TEN-00	LAYOUT PLAN

C3.7.2 STANDARD DRAWINGS

The Standard Drawings to which these Standard Engineering Specifications refer are listed below.

Dwg No	Description	Date of Issue
38570	Ring Manholes	February 1990
38571	Brick Manhole Details	February 1990
38572	Stormwater Inlet Details	February 1990
38573	Stormwater Inlet Special Details	February 1990
38574	Sewer Manholes: Ramp, Backdrop and Channelling Details	February 1990
38575	Sub-Soil Drain, Pipe Bedding and Pipe Protection Details	February 1990
38576	Headwall Details	February 1990
38577	Kerbing Details	February 1990
38578	Concrete Median Barriers	February 1990
38579	Vehicular and Pedestrian Scoops	February 1990
38580	Concrete Bollard and Steel Guard Rail	February 1990
38581	Retaining Wall, PC Steps, Staircase, Cable Ducts and Headwalls	February 1990
38582	Precast Concrete Fencing and Aluminium Gates	February 1990
38583	Wire Mesh Fence and Gate Details	February 1990
38584	Standard Hydrant Thrust Blocks and Trenches	February 1990
38585	Water Connections, Pipework and Fittings	February 1990
38586	DP & TC Manholes - Rectangular	February 1990
38587	DP & TC Manholes - “L” Shaped	February 1990
38588	DP & TC Manholes - “T” Shaped	February 1990
38589	DP & TC Cable Ducts and Junction Box Details	February 1990
43120	Typical Details of Grid Inlets	February 1990

C3.8 : ANNEXURES

C3.8.1 There are no Annexures

PART C4: SITE INFORMATION

C4.1 LOCALITY PLAN

Locality plan attached herewith

C4.2 CONDITIONS ON SITE

There is no specific geotechnical information or other site information.

C4.3 TEST RESULTS

There are no specific test results.