



Documents may be obtained,  
free of charge, in electronic format, from the  
eTenders website.

**Human Settlements Unit**  
**Housing Engineering Department**

**PROCUREMENT DOCUMENT**  
**INFRASTRUCTURE**

**CONTRACT No.: 1H-18728**

**TITLE: Construction of Bulk Civil Infrastructure, Comprising Roads,  
Water, Sanitation, Stormwater and Attenuation Structures to  
Service a Portion of 976 Low-Cost Top Structures for  
Cornubia Phase 2B-Portion 2**

**Clarification Meeting:** There will be no clarification meeting.

Issued by:

**HOUSING ENGINEERING DEPARTMENT**

**Human Settlements Unit**  
**Housing Engineering Department**

Date of Issue: September 2022

**Document**  
**Version:**  
**01/04/2021**

NAME OF TENDERER: .....

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**PART T1: TENDERING PROCEDURES**  
**T1.1: TENDER NOTICE AND INVITATION TO TENDER**

Tenders are hereby invited for the works to construct bulk civil infrastructure, comprising roads, water, sanitation, stormwater and attenuation structures to service a portion of 976 low-cost top structures for Cornubia Phase 2B, Portion 2.

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(F.1.1.1) The Employer is the eThekweni Municipality as represented by Deputy Head: Housing Engineering

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It is estimated that tenderers should have a CIDB contractor grading designation of 8CE (or higher).

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(F.1.2) Documents can be obtained either in hard copy or electronic format, issued by the eThekweni Municipality:

- Electronically downloaded documentation is obtainable from the National Treasury's eTenders website or the eThekweni Municipality's Vendor Portal. The entire document should be printed and suitably bound by the tenderer.

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(F.2.7) There will be no clarification meeting, but tenderers are to email their queries to the employer's agent representative by 23 September 2022 September 2022.

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(F.2.8) Queries relating to these documents may be addressed to the Employer's Agent's Representative whose contact details are: Lungi Nzuza , 031 311 3280 (t) , Lungi.nzuza@durban.gov.za

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(F.2.13) Tender offers shall be delivered to the Municipal Building, 166 K.E. Masinga Road and placed in the tender box located in the ground floor foyer.

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(F.2.15) Tender offers shall be delivered on or before Friday, 7 October 2022 at or before 11:00

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

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## **PART T1: TENDERING PROCEDURES**

### **T1.2: TENDER DATA**

#### **T1.2.1 STANDARD CONDITIONS OF TENDER**

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

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

#### **T1.2.2 TENDER DATA**

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

<b>F.1: GENERAL</b>
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**F.1.1 The employer:** The Employer for this Contract is the eThekweni Municipality as represented by: Deputy Head: Housing Engineering

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

- 1) This procurement document.
- 2) Drawings, bound in Section C3.4 as an Annexure).
- 3) "General Conditions of Contract for Construction Works – 3<sup>rd</sup> 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) 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 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).
  - The Preferential Procurement Policy Framework Act No 5 of 2000, and the Preferential Procurement Policy Framework Act Regulations (January 2017).
  - SANS 1921:2004 – Construction and Management Requirements for Works Contract, Parts 1-3.
  - The Employer's current Supply Chain Management Policy.
  - Any other eThekweni Policy documents referenced in the Tender Documents.

Electronically downloaded documentation is obtainable from the National Treasury's **eTenders Website**

- <https://etenders.treasury.gov.za/>

The entire downloaded document should be printed and suitably bound by the tenderer.

**F.1.4 The employer's agent:** The Employer's agent is

- A Roopnarain
- Tel: 031 311 6487 (t)
- Email: Ashley.Roopnarain@durban.gov.za

The tenderer's contact details as indicated in the Contract Data under Clause C1.2.2.2 "Data to Be Provided by Contractor" shall be deemed as the only applicable contact details for the tenderer for use in communications between the employer's agent and the tenderer after the closing time stated in the Tender Data.

<b>F.2: TENDERER'S OBLIGATIONS</b>
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**F.2.1 Eligibility:** 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 Part 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) If the tenderer is required by law to prepare annual financial statements for auditing, the tenderer must submit their audited annual financial statements:
  - i) for the past three years; or
  - ii) since their establishment if established during the past three years.If the tenderer is not required by law to prepare audited financial statements, then the tenderer must submit a Public Interest (PI) Score, whereby if the PI score is above 350 points then the bidder must submit audited financial statements.

**F.2.1.1 Eligibility:** Only those tenderers who are registered (as "Active") with the CIDB (at time of tender closing), in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a CE class of construction work, are eligible to have their tenders evaluated.

Joint ventures are eligible to submit tenders provided that:

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

### F.2.1.2 Eligibility: Tenderer's Experience

Only those tenderers who can demonstrate experience, by submission of the specified documentation / information, in works of a similar nature (see Tenderer's Experience table below), within the past 10 years, will be eligible to have their tenders evaluated in terms of Clause F.3.11.

Tenderers having a CIDB Grade of 8CE and above must submit experience gained as Main Contractors.

Where works are still in progress the value of the completed work as detailed on the most recent payment to the Contractor will be used in the experience verification.

Returnable form "Experience of Tenderer" is included in Part T2 should be duplicated for each experience submission, as may be required.

The documentation / information that is required is specified on the Table: "Documentation / Information Requirements" (which includes the Notes below the table) and the Experience requirement is as stated on Table: "Tenderers Experience Requirement".

**Table: Documentation / Information Requirements**

	Proof of Sub-Contract Agreement	Letter of Award or Form of Offer & Acceptance	Most recent payment certificate with quantities summary	Final payment certificate with quantities summary	Completion certificate	NB Scope of Work
	Note 1	Note 2	Note 3	Note 4	Note 5	Note 6
<b>Works as main Contractor</b>						
Completed Contracts		✓		✓	✓	✓
<b>NOTES</b>						
Note 1	Must include the names of the parties, the effective dates and the signature(s) page, all of the agreement.					
Note 2	Issued by the Client / Employer.					
Note 3	Proof of the most recent payment received from the Main Contractor or Client / Employer, with a summary breakdown of quantities.					
Note 4	Proof of the final payment received from the Main Contractor or Client / Employer, with a summary breakdown of quantities.					
Note 5	Issued by the Client / Employer					
Note 6	NB: Without this information the experience submission cannot be considered. <ul style="list-style-type: none"> <li>This submission must indicate how the works was carried out, is similar (see Tenderers Experience table) to the Scope of Works of this specific tender.</li> <li>If executed as a Main Contractor, the overall contract Scope of Works is to be provided.</li> <li>The description of the Scope of Works is to be inserted into the returnable form in Part T2, or if available as hard copy (max 2 pages) attached to the form with other relevant, associated, supporting documentation, applicable to this tender</li> </ul>					
✓	Failure to provide this supporting documentation / information for each submission, will invalidate the submission					

Table: Tenderer's Experience Requirement

#### Civil Engineering Services

- Projects of a similar nature that will be considered shall be one or one with a combination of, earthworks and civil engineering services, e.g. roads, stormwater, water and sewer reticulation, where the value is 70% or above the lowest CIDB Grading value as indicated in this Clause, F .2.1.2
- NOTE: The tenderer must have undertaken and successfully completed a **minimum of 4 projects within the past 10 years** to meet the eligibility experience requirements.

#### Eligibility: Tenderers Key Personnel

Only those tenderers who can demonstrate having the human resources, by the submission of the specified documentation / information, will be eligible to have their tenders evaluated in terms of Clause F.3.11.

Returnable form "Experience of Key Personnel" is included in part T2 should be duplicated for each experience submission, as may be required.

- a) Contracts Manager;
  - 1. Has a minimum of eight (8) years relevant construction related experience, with three years of the experience being post registration.
  - 2. Is registered with ECSA as PrEng or PrTechEng.
- b) Site agent:
  - 1. Must be full time on site for the duration of the contract.
  - 2. Has a minimum of five (5) years relevant construction related experience.
  - 3. Is registered with SACPCMP as a PrCMP or with ECSA as PrTechni Eng.
  - 4. Has a NQF level 5 certificate.
- c) Site Foreman;
  - 1. Must be full time on site for the duration of the contract.
  - 2. Has a minimum of five (5) years construction of township services and infrastructure experience.
  - 3. Has a NQF level 5 certificate.

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

"Documents may be obtained, free of charge, in electronic format, from the National Treasury's eTenders website or the eThekweni Municipality's Vendor Portal. The entire electronically downloaded document should be printed and suitably bound by the tenderer.

A Non-Refundable Tender Charge, as stated in the "Tender Notice and Invitation to Tender", is applicable if hard copies are obtained from the Cashier."

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

"Addenda will be published, in electronic format, on the National Treasury's eTenders website (see F.2.2.2 above). Tenderers are to ensure that the eTenders website is consulted for any published addenda pertaining to this tender until 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 address / fax number / 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:** There will be no clarification meeting, but tenderers are to email their queries to the employer's agent representative by 23 September 2022.

A consolidated response will be issued to all queries received by the above date and time and will be published on the eTenders/Municipal website for the benefit of all tenderers by 29 September 2022.

**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 in electronic format by the eThekweni Municipality.

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

- Contract No. : 1H-18728
- Contract Title : Construction of Bulk Civil Infrastructure, Comprising Roads, Water, Sanitation, Stormwater and Attenuation Structures to Service a Portion of 976 Low-Cost Top Structures for Cornubia Phase 2B-Portion 2

The Employer's address for delivery of tender offers is:  
the Municipal Building, 166 K.E. Masinga Road  
and placed in the **Tender Box** located in the ground floor foyer.

**The tender** offer communicated on paper shall be submitted as an original.

Telephonic, telegraphic, telex, facsimile, posted 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, 7 October 2022
- Time : 11:00

**F.2.16 Tender offer validity:** The Tender Offer validity period is 12 weeks (84 Days) from the closing time 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 Part T2.2 of this procurement document.

**F.2.23 Certificates:** Refer to Part 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.



### **CIDB Registration**

Tenderers are to include with their submission a printout of their registration with the CIDB, 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 above printouts is to be indicated on the printout. Registration with the CIDB must be reflected as “Active” at time of tender closing.

### **Tax Clearance**

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.

### **B-BBEE Status Level of Contribution**

The Amended Construction Sector Code (Government Gazette No.41287) is applicable to the B-BBEE compliance measurement of all entities that fall within the Construction Sector.

The requirements for measurement and verification of entities are contained in the “Amended Code Series CSC000: Framework for Measuring Broad Based Black Economic Empowerment in the Construction Sector”, as published in Notice 931 of 2017, Government Gazette No.41287 of 01/12/2017.

The requirements are summarised in the following table:

Enterprise Type	Total Annual Revenue (R million)	Ownership and Annual Turnover
EME: Built Environment Professional	< R1.8m	May present an <b>affidavit</b> OR a <b>certificate</b> issued by the CIPC OR
EME: Contractor	< R3.0m	authorised <b>B-BBEE verification certificate</b> (as below)
Reference should be made to Cl.3.6.2.4.1 of the Amended Construction Sector Code regarding the above exceptions.		
EME: Built Environment Professional	< R6m	Must present an authorised <b>B-BBEE verification certificate</b> by a SANAS accredited Verification Agency
EME: Contractor	< R10m	
QSE: Built Environment Professional	≥ R6.0m and < R25m	
QSE: Contractor	≥ R10.0m and < R50m	
Large Enterprise	>R50m	

The requirements for measurement of Joint Ventures is described in Cl.2.8 of the Amended Construction Sector Code. The compilation of a consolidated verification certificate is required.

B-BBEE Verification Certificates must be from a Verification Agency accredited by the South African National Accreditation System (SANAS).

**Central Supplier Database (CSD)**

The entities (full) 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.

**Audited Financial Statements (F.2.1(f))**

Latest audited annual financial statements to be provided.

<b>F.3: THE EMPLOYER'S UNDERTAKINGS</b>
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**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 National Treasury’s eTenders website. In the event that the Clarification Meeting is compulsory, Addenda will only be issued to those tendering entities appearing on the Clarification Meeting Register.”

**F.3.4 Opening of Tender Submissions:** Tenders will be opened immediately after the closing time for tenders.

**F.3.11 Evaluation of Tender Offers:** The procedure for evaluation of responsive Tender Offers will be in accordance with the Employer’s current SCM Policy, the Preferential Procurement Policy Framework Act (5 of 2000).

The procedure for the evaluation of responsive tenders is **Method 1** (Price and Preference).

The **80/20** preference points system will be used where the financial value (incl. VAT) of one or more responsive tender offers have a value that equals or is less than R 50,000,000. The Formula used to calculate the **Price Points**, and the **Preference Points** that will be allocated, will be according to the specified PPPFA Regulations.

The **90/10** preference points system will be used where the financial value (incl. VAT) of all responsive tenders received have a value in excess of R 50,000,000. The Formula used to calculate the **Price Points**, and the **Preference Points** that will be allocated, will be according to the specified PPPFA Regulations.

Only locally produced goods, services, or works, or locally manufactured goods, with a stipulated minimum threshold for Local Production and Content will be considered.

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

- (a) The tenderer submits a valid Tax Clearance Certificate OR Tax Compliance Status PIN, issued by the TCS System of the South African Revenue Services, or has made arrangements to meet outstanding tax obligations;
- (b) The tenderer is registered, and “Active”, with the Construction Industry Development Board, at time of tender closing, in an appropriate contractor grading designation;
- (c) The tenderer or any of its directors/shareholders is not listed on the Register of Tender

Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector;

- (d) The tenderer has not:
  - Abused the Employer's Supply Chain Management System; or
  - Failed to perform on any previous contract and has been given a written notice to this effect;
- (e) The tenderer has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process;
- (f) The tenderer is registered and in good standing with the compensation fund or with a licensed compensation insurer;
- (g) The employer is reasonably satisfied that the tenderer has in terms of the Construction Regulations, 2014, issued in terms of the Occupational Health and Safety Act, 1993, the necessary competencies and resources to carry out the work safely.
- (h) If this tender is subject to "Local Content and Production", the tenderer must complete and sign MBD 6.2 and attach Annexure C (of SATS 1286:2011).
- (i) 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.

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

**F.3.17 Copies of contract:** The number of paper copies of the signed contract to be provided by the Employer is ONE (1). Bidders are also requested to submit a SOFT COPY of their complete tender document preferably on a Memory Stick.

**The additional conditions of tender are:**

**ACT.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

**ACT.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.

**ACT.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.

**ACT.4 Subcontracting as Condition of Tender**

For contracts above R30m, the 2017 PPPFA Regulations require organs of State to identify tenders, where it is feasible, to subcontract a minimum of 30% of the value of the contract to the following designated groups:

- (a) an EME or QSE;
- (b) an EME or QSE which is at least 51% owned by black people;
- (c) an EME or QSE which is at least 51% owned by black people who are youth;
- (d) an EME or QSE which is at least 51% owned by black people who are women;
- (e) an EME or QSE which is at least 51% owned by black people with disabilities;
- (f) an EME or QSE which is 51% owned by black people living in rural or underdeveloped areas or townships;
- (g) a cooperative which is at least 51% owned by black people;
- (h) an EME or QSE which is at least 51% owned by black people who are military veterans;  
or
- (i) more than one of the categories referred to in paragraphs (a) to (h).

In addition to the above, the eThekweni Municipal Council has adopted a framework for empowerment strategies for contracts between R5m and R30m.

The list of potential subcontractors, their trades and specialisation and scope shall be approved by the Client Representative post tender closing and prior to contract commencement.

**PART T2: RETURNABLE DOCUMENTS**  
**T2.1: LIST OF RETURNABLE DOCUMENTS**

**T2.1.1 General**

The Tender Document must be submitted as a whole. All forms must be properly completed as required, and the document shall not be taken apart or altered in any way whatsoever.

The Tenderer is required to complete each and every Schedule and Form listed below to the best of his ability as the evaluation of tenders and the eventual contract will be based on the information provided by the Tenderer. Failure of a Tenderer to complete the Schedules and Forms to the satisfaction of the Employer will inevitably prejudice the tender and may lead to rejection on the grounds that the tender is not responsive.

**T2.1.2 Returnable Schedules, Forms and Certificates**

**Company Specific**

Certificate of Authority	14
Declaration of Municipal Fees	15
Compulsory Enterprise Questionnaire	16
Tax Compliance Status PIN / Tax Clearance Certificate	18
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**T2.1.3 Preferential Procurement Schedules and Affidavits**

In the event of the Tenderer not being registered with the eThekweni Municipality, the tenderer must register on the internet at [www.durban.gov.za](http://www.durban.gov.za) by following these links:

- eThekweni Municipality
- City Government
- Administration
  - Administrative Clusters
  - Finance
  - Supply Chain Management
  - Accredited Supplier and Contractor's Database.

#### **NOTES**

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

#### **T2.2: RETURNABLE SCHEDULES, FORMS, AND CERTIFICATES**

The returnable schedules, forms, and certificates as listed in T2.1.2 can be found on the pages 15 to 37.

## **CERTIFICATE OF AUTHORITY**

Indicate the status of the tenderer by ticking the appropriate box hereunder.

COMPANY		CLOSE CORPORATION		PARTNERSHIP		JOINT VENTURE		SOLE PROPRIETOR	
Refer to Notes at the bottom of the page									

I / We, the undersigned, being the Chairperson (Company), Member(s) (Close Corporation), Partners (Partnership), Sole Owner (Sole Proprietor), Lead Partner (JV), in the company / business trading as:

.....

hereby authorise Mr/Mrs/Ms .....

acting in the capacity of .....

to sign all documents in connection with the tender for **Contract No. 1H-18728** and any contract resulting from it on our behalf.

NAME	ADDRESS	SIGNATURE	DATE

## **Notes**

The following documents must be attached to the back inside cover to this procurement document:

If a Company : a "Resolution of the Board" in this regard.

If a Joint Venture : a "Power of Attorney" signed by the legally authorised signatories of all the partners to the Joint venture.

## **DECLARATION OF MUNICIPAL FEES**

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 No.

--	--	--	--	--	--	--	--	--	--	--	--	--

Electricity

--	--	--	--	--	--	--	--	--	--	--	--	--

Water

--	--	--	--	--	--	--	--	--	--	--	--	--

Rates

--	--	--	--	--	--	--	--	--	--	--	--	--

JSB Levies

--	--	--	--	--	--	--	--	--	--	--	--	--

Other

--	--	--	--	--	--	--	--	--	--	--	--	--

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. ATTACHED, to the back inside cover of this document, please find copies of the above account's and or agreements signed with the municipality.

- Where the TENDERER'S place of business or business interests are outside the jurisdiction of eThekweni municipality, a copy of the accounts/agreements from the relevant municipality must be attached (to the back inside cover of this document).
- Where the tenderer's Municipal Accounts are part of their lease agreement, then a copy of the agreement, or official letter to that effect is to be attached (to the back inside cover of this document).

NAME : .....

(Block Capitals)

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

DATE: .....



## **COMPULSORY ENTERPRISE QUESTIONNAIRE**

The following particulars must be furnished. In the case of a joint venture, a separate questionnaire in respect of each partner must be completed and submitted.

- 1) **Name of enterprise:** .....
- 2) **VAT registration number, if any:** .....
- 3) **CIDB registration number, if any:** .....
- 4) **Particulars of sole proprietors and partners in partnerships**

Full Name	Identity number*	Personal income tax number *

\* Complete only if a sole proprietor or partnership and attach separate page if more than 3 partners

### 5) **Particulars of companies and close corporations**

Company registration number, if applicable: .....

Close corporation number, if applicable: .....

Tax Reference number, if any: .....

### 6) **Record in the service of the state**

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

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

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

Insert separate page if necessary

7) **Record of spouses, children and parents in the service of the state**

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

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

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

Insert separate page if necessary

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

- i) authorizes the Employer to obtain a tax clearance certificate from the South African Revenue Services that my/our tax matters are in order;
- ii) confirms that neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercise, 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 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 bidders 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.

Signed ..... Date .....

Name ..... Position .....

Enterprise Name .....

**TAX COMPLIANCE STATUS PIN / TAX CLEARANCE CERTIFICATE**

Reference is made to F.2.23 of the Conditions of Tender.

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.

NAME : ..... (Block Capitals)

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

### **B-BBEE STATUS LEVEL OF CONTRIBUTION CERTIFICATE**

Reference is made to F.2.23 of the Conditions of Tender.

The Amended Construction Sector Code (Government Gazette No.41287) is applicable to the B-BBEE compliance measurement of all entities that fall within the Construction Sector.

The requirements for measurement and verification of entities are contained in the "Amended Code Series CSC000: Framework for Measuring Broad Based Black Economic Empowerment in the Construction Sector", as published in Notice 931 of 2017, Government Gazette No.41287 of 01/12/2017.

The requirements are summarised in the following table:

Enterprise Type	Total Annual Revenue (R million)	Ownership and Annual Turnover
EME: Built Environment Professional	< R1.8m	May present an <b>affidavit</b> OR a <b>certificate</b> issued by the CIPC OR authorised <b>B-BBEE verification certificate</b> (as below)
EME: Contractor	< R3.0m	
Reference should be made to Cl.3.6.2.4.1 of the Amended Construction Sector Code regarding the above exceptions.		
EME: Built Environment Professional	< R6m	Must present an authorised <b>B-BBEE verification certificate</b> by a SANAS accredited Verification Agency
EME: Contractor	< R10m	
QSE: Built Environment Professional	≥ R6.0m and < R25m	
QSE: Contractor	≥ R10.0m and < R50m	
Large Enterprise	>R50m	

The requirements for measurement of Joint Ventures is described in Cl.2.8 of the Amended Construction Sector Code. The compilation of a consolidated verification certificate is required.

NAME : ..... (Block Capitals)

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

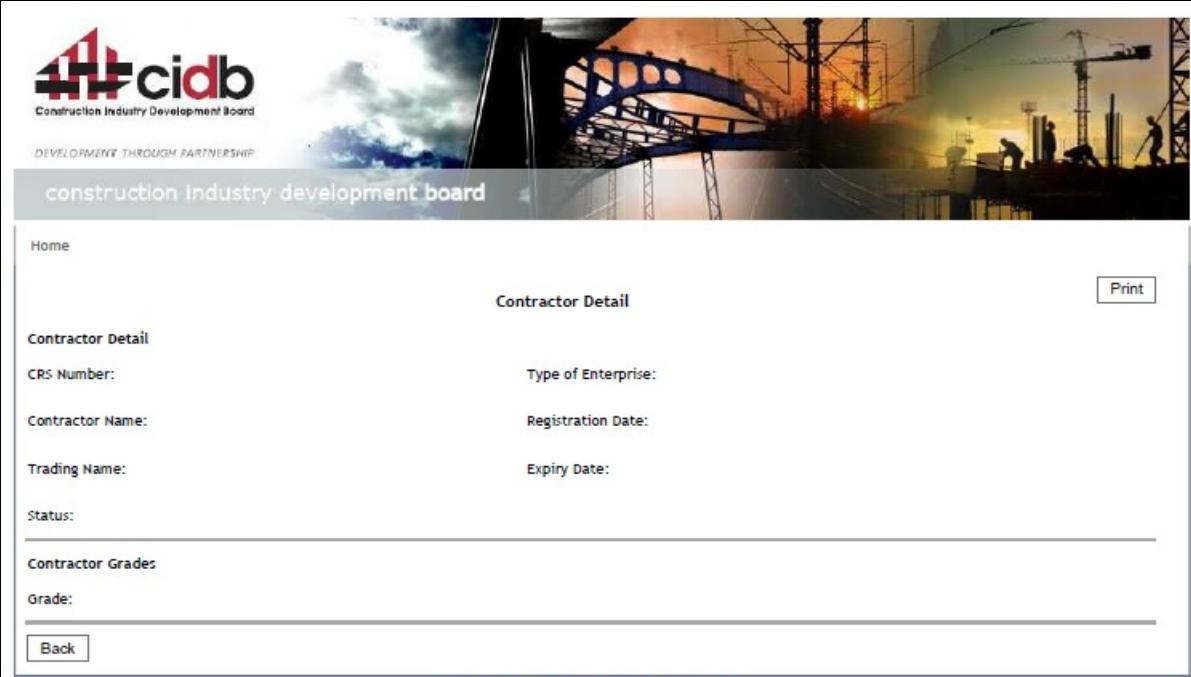
## **VERIFICATION OF CIDB REGISTRATION AND STATUS**

Reference is made to F.2.23 of the Conditions of Tender.

Clause F.2.1.1 of the Conditions of Tender – “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, for a CE class of construction work.

Tenderers are to attach to this page a printout of their registration with the CIDB, as obtained from the CIDB website <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 a printout obtained from the above website.



The screenshot shows the CIDB (Construction Industry Development Board) website header with the logo and tagline "DEVELOPMENT THROUGH PARTNERSHIP". Below the header is a navigation bar with "Home" and "construction industry development board". The main content area is titled "Contractor Detail" and includes a "Print" button. The form contains the following fields: CRS Number, Contractor Name, Trading Name, Status, Type of Enterprise, Registration Date, Expiry Date, Contractor Grades, and Grade. A "Back" button is located at the bottom left of the form. The footer of the printout includes the copyright notice "Copyright © cidb 2011. All rights reserved", a link to "Website technical enquires contact", and the date "01/01/2017".

NAME : ..... (Block Capitals)

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




### **CSD REGISTRATION REPORT**

Reference is made to F.2.23 of the Conditions of Tender.

Clause F.2.1 of the Conditions of Tender – “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.

**Tenderers are to attach to this page a printout of their CSD Registration Report**, as obtained from the National Treasury’s CSD website <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.

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

NAME : ..... (Block Capitals)

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

**AUDITED FINANCIAL STATEMENTS**



## **CONSOLIDATED MUNICIPAL BIDDING DOCUMENTS**

**The following SECTIONS are required to be completed as part of this procurement document**

<b><u>Section</u></b>	<b><u>Description</u></b>	<b><u>Required?</u></b>
<b>A</b>	General Enterprise Information .....	<b>Yes</b>
<b>B</b>	MBD2: Tax Clearance Certificate Requirements .....	<b>Yes</b>
<b>C</b>	MBD4: Declaration of Interest .....	<b>Yes</b>
<b>D</b>	MBD5: Declaration for Procurement Above R10 Million .....	<b>Yes</b>
<b>E</b>	MBD6.1: Preference Points Claim Form ITO the Preferential Regulations .....	<b>Yes</b>
<b>F</b>	MBD6.2: Declaration Certificate for Local Production and Content for Designated Sectors .....	<b>Yes</b>
<b>G</b>	MBD8: Declaration of Bidder's Past SCM Practices .....	<b>Yes</b>
<b>H</b>	MBD9: Certificate of Independent Bid Determination.....	<b>Yes</b>
<b>I</b>	Confirmations, Authorities, Certifications, Acknowledgements and Signatures .....	<b>Yes</b>

### **NOTES**

- MBD4. MSCM Regulations: **"in the service of the state"** means to be:
- (a) a member of –
    - (i) any municipal council;
    - (ii) any provincial legislature; or
    - (iii) the national Assembly or the national Council of provinces;
  - (b) a member of the board of directors of any municipal 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; or
  - (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.
- MBD9. 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.

<u>Ref</u>	<u>Description</u>	<u>Complete or Circle Applicable</u>
------------	--------------------	--------------------------------------

### **SECTION A: GENERAL ENTERPRISE INFORMATION**

1.0 Full Name of bidder or his or her representative

1.1 ID Number of bidder or his or her representative

1.2 Position occupied in the enterprise

2.0 Name of enterprise:

2.1 Tax Reference number, if any:

2.2 VAT registration number, if any:

2.3 CIDB registration number, if any:

2.4 Company registration number, if applicable:

2.5 Close corporation number, if applicable:

2.6 Supplier reference number (PR), if any:

2.7 South African Revenue Service Tax Compliance Status PIN:

2.8 National Treasury Central Supplier Database registration number

3.0 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			

Ref	Description	Complete or Circle Applicable
-----	-------------	-------------------------------

## SECTION B: MBD 2: TAX CLEARANCE CERTIFICATE REQUIREMENTS

It is a condition of bid that the taxes of the successful bidder must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the bidder's tax obligations.

- 1.0 In order to meet this requirement bidders are required to complete the TCC 001: "Application for a Tax Clearance Certificate" form and submit it to any SARS branch office nationally. The Tax Clearance Certificate Requirements are also applicable to foreign bidders / individuals who wish to submit bids.
- 2.0 SARS will then furnish the bidder with a Tax Clearance Certificate that will be valid for a period of 1 (one) year from the date of approval.
- 3.0 The original Tax Clearance Certificate must be submitted together with the bid (attached to the inside back cover of this procurement document). Failure to submit the original and valid Tax Clearance Certificate will result in the invalidation of the bid. Certified copies of the Tax Clearance Certificate will not be acceptable.
- 4.0 In bids where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Clearance Certificate.
- 5.0 Copies of the TCC 001: "Application for a Tax Clearance Certificate" form are available from any SARS branch office nationally or on the website [www.sars.gov.za](http://www.sars.gov.za).
- 6.0 Applications for the Tax Clearance Certificates may also be made via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website [www.sars.gov.za](http://www.sars.gov.za).
- 7.0 Notwithstanding Clauses 1.0 to 6.0 above: Since 18 April 2016, SARS has introduced a new Tax Compliance Status System (TCS). As part of this enhanced system, tenderers can now submit a Tax Compliance Status PIN instead of an original Tax Clearance Certificate (TCC). This TCS PIN can be used by third parties to certify the taxpayer's real-time compliance status. This number, if available, is to be entered in Item 2.7 of Section A of these consolidated Municipal Bidding Documents.  
For further particulars please contact your nearest SARS branch, or call the SARS Contact Centre on 0800 00 7277, or log onto SARS eFiling.

## SECTION C: MBD 4: DECLARATION OF INTEREST

**No bid will be accepted from persons "in the service of the state".** 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. In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

- |     |   |     |    |
|-----|---|-----|----|
| 1.0 | Are you presently in the service of the state?  | YES | NO |
|     | If yes, furnish particulars: .....  |     |    |
| 2.0 | Have you been in the service of the state for the past twelve months?   | YES | NO |
|     | If yes, furnish particulars: .....  |     |    |
| 3.0 | 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: .....  |     |    |
| 4.0 | 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: .....  |     |    |
| 5.0 | Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state?   | YES | NO |
|     | If yes, furnish particulars: .....  |     |    |
| 6.0 | 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: .....  |     |    |
| 7.0 | 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: .....  |     |    |
| 8.0 | The names of all directors / trustees / shareholders / members / sole proprietors / partners in partnerships, their individual identity numbers and state employee numbers are indicated in <b>SECTION A</b> of these Consolidated Municipal Bidding documents. |     |    |

#### **SECTION D: 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.

1.0	Are you by law required to prepare annual financial statements for auditing? If YES, you will be required to submit audited annual financial statements (on request during the tender evaluation period) for the past three years or since the date of establishment if established during the past three years.	YES	NO
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? 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. If YES, provide particulars on a letterhead. (Attach this letter to the back inside cover of this procurement document).	YES	NO
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? If YES, provide particulars on a letterhead. (Attach this letter to the back inside cover of this procurement document).	YES	NO
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? If YES, provide particulars on a letterhead. (Attach this letter to the back inside cover of this procurement document).	YES	NO
5.0	If the tenderer is not required by law to prepare audited financial statements, then the tenderer must submit a Public Interest (PI) Score, whereby if the PI score is above 350 points then the bidder must submit audited financial statements.		

#### **SECTION E: MBD 6.1: PREFERENCE POINTS CLAIM ITO THE PREFERENTIAL REGULATIONS**

Preference points for this tender shall be awarded as per the Tender Data and the Preferential Procurement Regulations (2017).

Failure on the part of a tenderer to submit a B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System (SANAS), or a Sworn Affidavit for an EME, or sworn affidavit for a QSE (in line with the revised BBBEE codes of Good Practice), together with the bid will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

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

1.0	B-BBEE Status Level of Contribution claimed:		
	Will any portion of the contract be sub-contracted?	YES	NO
	If YES, indicate:		
	(i) what percentage of the contract will be subcontracted?		
	(ii) the name of the sub-contractor?		
	Name: .....		
	(iii) the B-BBEE status level of the sub-contractor?		
2.0	(iv) whether the sub-contractor is an EME?	YES	NO

The undersigned, certify that the B-BBEE status level of contribution indicated in paragraph 1.0 above qualifies the company / firm for preference points and acknowledges that the remedies as per Clause 14 of the Preferential Procurement Regulations (2017) shall apply.

#### **SECTION F: MBD 6.2: DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT FOR DESIGNATED SECTORS**

This Municipal Bidding Document (MBD) must form part of all bids invited. It contains general information and serves as a declaration form for local content (local production and local content are used interchangeably).

Before completing this declaration, bidders must study the General Conditions, Definitions, Directives applicable in respect of Local Content as prescribed in the Preferential Procurement Regulations, 2017 and the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:2011 (Edition 1) and the Guidance on the Calculation of Local Content together with the Local Content Declaration Templates [Annex C (Local Content Declaration: Summary Schedule), D (Imported Content Declaration: Supporting Schedule to Annex C) and E (Local Content Declaration: Supporting Schedule to Annex C)].

- 1.0 General Conditions
- 1.1 Preferential Procurement Regulations, 2017 (Regulation 8) makes provision for the promotion of local production and content.
- 1.2 Regulation 8.(1) prescribes that in the case of designated sectors, where in the award of bids local production and content is of critical importance, such bids must be advertised with the specific bidding condition that only locally produced goods, services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.

- 1.3 Where necessary, for bids referred to in paragraph 1.2 above, a two-stage bidding process may be followed, where the first stage involves a minimum threshold for local production and content and the second stage price and B-BBEE.
- 1.4 A person awarded a contract in relation to a designated sector, may not sub-contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.
- 1.5 The local content (LC) expressed as a percentage of the bid price must be calculated in accordance with the SABS approved technical specification number SATS 1286: 2011 as follows:  

$$LC = [1 - x / y] * 100$$
Where: x is the imported content in Rand  
y is the bid price in Rand excluding value added tax (VAT).  
Prices referred to in the determination of x must be converted to Rand (ZAR) by using the exchange rate published by the South African Reserve Bank (SARB) at 12:00 on the date of advertisement of the bid as required in paragraph 4.1 below.  
The SABS approved technical specification number SATS 1286:2011 is accessible on <http://www.thedti.gov.za/industrialdevelopment/ip.jsp> at no cost.
- 1.6 A bid may be disqualified if –  
(a) this Declaration Certificate and the Annex C (Local Content Declaration: Summary Schedule) are not submitted as part of the bid documentation; and  
(b) the bidder fails to declare that the Local Content Declaration Templates (Annex C, D and E) have been audited and certified as correct.
- 2.0 Definitions
- 2.1 "bid" includes written price quotations, advertised competitive bids or proposals;
- 2.2 "bid price" price offered by the bidder, excluding value added tax (VAT);
- 2.3 "contract" means the agreement that results from the acceptance of a bid by an organ of state;
- 2.4 "designated sector" means a sector, sub-sector or industry that has been designated by the Department of Trade and Industry in line with national development and industrial policies for local production, where only locally produced services, works or goods or locally manufactured goods meet the stipulated minimum threshold for local production and content;
- 2.5 "duly sign" means a Declaration Certificate for Local Content that has been signed by the Chief Financial Officer or other legally responsible person nominated in writing by the Chief Executive, or senior member / person with management responsibility (close corporation, partnership or individual).
- 2.6 "imported content" means that portion of the bid price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or its subcontractors) and which costs are inclusive of the costs abroad (this includes labour and intellectual property costs), plus freight and other direct importation costs, such as landing costs, dock duties, import duty, sales duty or other similar tax or duty at the South African port of entry;
- 2.7 "local content" means that portion of the bid price which is not included in the imported content, provided that local manufacture does take place;
- 2.8 "stipulated minimum threshold" means that portion of local production and content as determined by the Department of Trade and Industry; and
- 2.9 "sub-contract" means the primary contractor's assigning, leasing, making out work to, or employing another person to support such primary contractor in the execution of part of a project in terms of the contract.
- 3.0 The stipulated minimum threshold(s) for local production and content (refer to Annex A of SATS 1286:2011) for this bid is/are as follows:
- | Description of services, works or goods | Stipulated minimum threshold |
|---|------------------------------|
| .....                                   | ..... %                      |
| .....                                   | ..... %                      |
| .....                                   | ..... %                      |
- 4.0 Does any portion of the services, works or goods offered have any imported content? 

YES	NO
-----	----
- 4.1 If yes, the rate(s) of exchange to be used in this bid to calculate the local content as prescribed in paragraph 1.5 of the general conditions must be the rate(s) published by the SARB for the specific currency at 12:00 on the date of advertisement of the bid.  
The relevant rates of exchange information is accessible on [www.reservebank.co.za](http://www.reservebank.co.za).  
Indicate the rate(s) of exchange against the appropriate currency in the table below (refer to Annex A of SATS 1286:2011):  
US Dollar: 

--

 Pound Sterling: 

--

 Euro: 

--

 Yen: 

--

 Other: 

--

  
NB: Bidders must submit proof of the SARB rate (s) of exchange used.
- 5.0 Were the Local Content Declaration Templates (Annex C, D and E) audited and certified as correct? 

YES	NO
-----	----
- 5.1 If yes, provide the following particulars:  
(a) Full name of auditor: .....  
(b) Practice number: ..... (c) Telephone number: .....  
Cell number: .....  
(d) Email address: .....  
(Documentary proof regarding the declaration will, when required, be submitted to the satisfaction of the Accounting Officer / Accounting Authority)
- 6.0 Where, after the award of a bid, challenges are experienced in meeting the stipulated minimum threshold for local content the dti must be informed accordingly in order for the dti to verify and in consultation with the Accounting Officer / Accounting Authority provide directives in this regard.

### **LOCAL CONTENT DECLARATION**

(REFER TO ANNEX B OF SATS 1286:2011)

LOCAL CONTENT DECLARATION BY CHIEF FINANCIAL OFFICER OR OTHER LEGALLY RESPONSIBLE PERSON NOMINATED IN WRITING BY THE CHIEF EXECUTIVE OR SENIOR MEMBER/PERSON WITH MANAGEMENT RESPONSIBILITY (Close Corporation, Partnership or Individual)

IN RESPECT OF BID No: .....

ISSUED BY: (Procurement Authority / Name of Municipality / Municipal Entity) .....

NB 1 - The obligation to complete, duly sign and submit this declaration cannot be transferred to an external authorized representative, auditor or any other third party acting on behalf of the bidder.

NB 2 - Guidance on the Calculation of Local Content together with Local Content Declaration Templates (Annex C, D and E) is accessible on [http://www.thedti.gov.za/industrial development/ip.jsp](http://www.thedti.gov.za/industrial%20development/ip.jsp). Bidders should first complete Declaration D. After completing Declaration D, bidders should complete Declaration E and then consolidate the information on Declaration C. Declaration C should be submitted with the bid documentation at the closing date and time of the bid in order to substantiate the declaration made in paragraph (c) below. Declarations D and E should be kept by the bidders for verification purposes for a period of at least 5 years. The successful bidder is required to continuously update Declarations C, D and E with the actual values for the duration of the contract.

I, the undersigned in Section H of these Consolidated MBD returnable questionnaires ( comprising 8 pages), do hereby declare the following:

- (a) The facts contained herein fall within my own personal knowledge.
- (b) I have satisfied myself that:
  - (i) the goods/services/works to be delivered in terms of the above-specified bid comply with the minimum local content requirements as specified in the bid, and as measured in terms of SATS 1286:2011; and
  - (ii) the declaration templates have been audited and certified to be correct.
- (c) The local content percentages (%) indicated below has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 above and the information contained in Declaration D and E which has been consolidated in Declaration C;

..... B	R
id price, excluding VAT (y) .....	
..... I	R
mported content (x), as calculated in terms of SATS 1286:2011 .....	
..... S	%
tipulated minimum threshold for local content (paragraph 3 above).....	
..... L	%
ocal content %, as calculated in terms of SATS 1286:2011 .....	

If the bid is for more than one product, the local content percentages for each product contained in Declaration C shall be used instead of the table above. The local content percentages for each product has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 above and the information contained in Declaration D and E.

- (d) I accept that the Procurement Authority / Municipality /Municipal Entity has the right to request that the local content be verified in terms of the requirements of SATS 1286:2011.
- (e) I understand that the awarding of the bid is dependent on the accuracy of the information furnished in this application. I also understand that the submission of incorrect data, or data that are not verifiable as described in SATS 1286:2011, may result in the Procurement Authority / Municipal / Municipal Entity imposing any or all of the remedies as provided for in Regulation 14 of the Preferential Procurement Regulations, 2017 promulgated under the Preferential Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

### **SECTION G: MBD8: DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES**

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

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; or
- d) been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).

In order to give effect to the above, the following questions must be answered.

1.0	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 ( <a href="http://www.treasury.gov.za">www.treasury.gov.za</a> ) and can be accessed by clicking on its link at the bottom of the home page.	YES	NO
	If yes, furnish particulars: .....		

2.0	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. If yes, furnish particulars: .....	YES	NO
3.0	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? If yes, furnish particulars: .....	YES	NO
4.0	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? If yes, furnish particulars: .....	YES	NO
5.0	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? If yes, furnish particulars: .....	YES	NO

#### **SECTION H: MBD9: CERTIFICATE OF INDEPENDENT BID DETERMINATION**

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).<sup>2</sup> Collusive bidding is a pe se prohibition meaning that it cannot be justified under any grounds.

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:

- take all reasonable steps to prevent such abuse;
- 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
- 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.

The following 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.

In order to give effect to the above, the following Certificate of Bid Determination must be completed and submitted with the bid. The undersigned, in submitting the accompanying bid, in response to the invitation for the bid do hereby make the following statements that I certify to be true and complete in every respect:

- I have read and I understand the contents of this Certificate;
- I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;
- I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
- 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;
- 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:
  - has been requested to submit a bid in response to this bid invitation;
  - could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
  - provides the same goods and services as the bidder and/or is in the same line of business as the bidder.
- 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<sup>3</sup> will not be construed as collusive bidding. (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.
- In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
  - prices;
  - geographical area where product or service will be rendered (market allocation);
  - methods, factors or formulas used to calculate prices;
  - the intention or decision to submit or not to submit, a bid;
  - the submission of a bid which does not meet the specifications and conditions of the bid;
  - bidding with the intention not to win the bid.
- 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.
- 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.
- 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.

**SECTION I: CONFIRMATIONS, AUTHORITIES, CERTIFICATIONS, ACKNOWLEDGEMENTS and SIGNATURES**

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

- 1.0 Confirms that the contents of these Consolidated MBD returnable questionnaires (comprising 8 pages) fall within my personal knowledge and are to the best of my Knowledge and belief, both true and correct;
- 2.0 Confirms that neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercise, 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;
- 3.0 Confirms that no partner, member, director or other person, who wholly or partly exercise control over the enterprise, has within the last five years been convicted of fraud or corruption;
- 4.0 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 bidders or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest;
- 5.0 Certify that the B-BBEE status level of contribution indicated in Section E.1: Item 1.0 qualifies the enterprise for preference points and acknowledges that the remedies as per Clause 14 of the Preferential Procurement Regulations (2017) shall apply. In the event of a contract being awarded as a result of points claimed, the enterprise may be required to furnish documentary proof to the satisfaction of the employer that the claims are correct;
- 6.0 Accept that, in addition to cancellation of a contract, action may be taken against me should these declarations prove to be false.

Signed ..... Date .....

Name ..... Position .....



## EXPERIENCE OF TENDERER

Experience Eligibility are specified in Clause F.2.1.2 of the Conditions of Tender in part T1.2.

This form is to be copied and used for each and every submission of experience, as may be required.

Where options are provided, the selected option should be clearly marked with a “X”

Tenderer's CIDB Grade:	1	2	3	4	5	6	7	8	9	Experience as:	Sub-Contractor	Main Contractor <b>X</b>	
Client / Employer:	Entity name:												
	Contact Name:												
	Contact Tel:												
	Contact Cell:												
	Contact email/other												
Employer's Agent (Engineer) or Main Contractors Details	Entity Name:												
	Contact Name:												
	Contact Tel:												
	Contact Cell:												
	Contact email/other:												
Contract Details	Contract Number:												
	Contract Title:												
	Has this Contract been completed?									Y	N		
Tendered Value (Contract sum) Or Sub-Contract Value:	<b>R</b>									Final Contract Price or Final Value of Sub-Contract:			<b>R</b>

Contract Scope of Work (Description of Works components)	If available in hard copy, the Scope of Works can be attached. Only include the Scope of Work (Contract description). The specification is not required.				
In addition to the Scope of Work (entered above or attached) the following documentation / information is required to be attached to the back of this form					
Contract Type and Contract Status	Proof of Sub-contract Agreement	Letter of Award or Form of Offer & Acceptance	Most recent payment Certificate with Quantities summary	Final payment Certificate with Quantities summary	Completion Certificate
Completed Contract as Main Contractor		X		X	X
Failure to provide this supporting documentation / information, for each submission of experience, will invalidate that submission					

NAME : ..... (Block Capitals)

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

## **EXPERIENCE OF KEY PERSONNEL**

Experience Eligibility are specified in Clause F.2.1.1.2 of the Conditions of Tender in part T1.2.

This form is to be copied and used for each and every submission of experience, as may be required.

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, filed, 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 Contracts Manager, Site Agent and Site 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, organisation and position)
- f) Outline of recent assignments / experience that has a bearing on the Scope of Work

NAME : ..... (Block Capitals)

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

### **RADICAL ECONOMIC TRANSFORMATION STRATEGY**

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

1.0	<b>CONTRACT PARTICIPATION GOAL</b> Refer to Clause C1.2.3.6 for detailed explanation of the Transformation Strategy and CPG:	
	Notes:  1. This declaration is a form of intent to sub-contract the required minimum of 30% as stipulated in C1.2.3.6 and ACT4. the proposed sub-contracting entity need not be specified at this stage as that shall form part of the contract on appointment.  2. Failure to meet the minimum requirements of the Transformation Strategy as stipulated in the specification and / or failure to submit this document at the time of tender will render your tender nonresponsive and will be disqualified.	
	Proposed percentage to be sub-contracted in line with the requirements stipulated in C1.2.3.5	<div style="border: 1px solid black; width: 100px; height: 40px; display: flex; align-items: center; justify-content: center;">           %         </div>
1.1	Proposed work to be performed by the Level 1 BBBEE compliant member/s	

NAME : ..... (Block Capitals)

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

### **JOINT VENTURES AGREEMENTS**

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

## **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.

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

NAME : ..... (Block Capitals)

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

## **AMENDMENTS, QUALIFICATIONS AND ALTERNATIVES**

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

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

### **(a) AMENDMENTS**

<b>PAGE, CLAUSE OR ITEM NO</b>	<b>PROPOSED AMENDMENT</b>

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

### **(b) ALTERNATIVES**

<b>PROPOSED ALTERNATIVE</b>	<b>DESCRIPTION OF ALTERNATIVE</b>

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

### **(c) DISCOUNTS**

<b>ITEM ON WHICH DISCOUNT IS OFFERED</b>	<b>DESCRIPTION OF DISCOUNT OFFERED</b>

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

NAME : ..... (Block Capitals)

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

**PART C1: AGREEMENT AND CONTRACT DATA**

**C1.1: FORM OF OFFER AND ACCEPTANCE**

**C1.1.1: OFFER**

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

Contract No: **1H-18728**

Contract Title: **Construction of Bulk Civil Infrastructure, Comprising Roads, Water, Sanitation, Stormwater and Attenuation Structures to Service a Portion of 976 Low-Cost Top Structures for Cornubia Phase 2B-Portion 2**

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

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

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

R..... (In words .....)

.....)

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

**For the Tenderer:**

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

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

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

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

**Address** : .....

: .....

**Telephone** : .....

**Witness:**

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

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

**Notes:**

**\* Indicates what information is mandatory.**

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

**C1.1: FORM OF OFFER AND ACCEPTANCE**

**C1.1.2: FORM OF ACCEPTANCE**

**This Form will be completed by the Employer**

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

The terms of the contract are contained in:

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

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

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

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

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

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

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

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

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

**Address** : .....

: .....

**Witness:**

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

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



**C1.1: FORM OF OFFER AND ACCEPTANCE**

**C1.1.3: SCHEDULE OF DEVIATIONS**

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

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

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

**FOR THE TENDERER**

**FOR THE EMPLOYER**

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

## **C1.2: CONTRACT DATA**

### **C1.2.1 CONDITIONS OF CONTRACT**

#### **C1.2.1.1 GENERAL CONDITIONS OF CONTRACT**

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

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

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

### **C1.2.2 CONTRACT DATA**

#### **C1.2.2.1 DATA TO BE PROVIDED BY THE EMPLOYER**

1.1.1.13 The **Defects Liability Period**, from the date of the Certificate of Completion, is **1 Year**.

1.1.1.14 The **time for achieving Practical Completion**, from the Commencement Date is **16 months**. The period as stated in 5.3.2, and the 7 days referred to in 5.3.3, are included in the above time for achieving Practical Completion. The special non-working days as stated in 5.8.1 are excluded from the above time for achieving Practical Completion.

1.1.1.15 The Employer is the eThekweni Municipality as represented by:  
Human Settlements Unit : Deputy Head: Housing Engineering .

1.2.1.2 The address of the Employer is:  
Physical: Human Settlements Unit, 20th Floor Embassy Building  
Postal: Human Settlements Unit, P O Box 3858, DURBAN, 4000  
Telephone: 031-311-6487 (t)  
Fax: N/A (f)  
E-Mail: [Ashley.Roopnarain@durban.gov.za](mailto:Ashley.Roopnarain@durban.gov.za)

1.1.1.16 The **name of the Employer's Agent** is A Roopnarain

1.2.1.2 The address of the Employer' Agent is:  
Physical: Human Settlements Unit, 20th Floor Embassy Building  
Postal: Housing Engineering Unit, P O Box 3858, DURBAN, 4000  
Telephone: 031 311 6487 (t)  
Fax: N/A (f)  
E-Mail: [Ashley.Roopnarain@durban.gov.za](mailto:Ashley.Roopnarain@durban.gov.za)

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

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

- 6.3: Council approval in order to authorise any expenditure in excess of the Tender Sum plus **15%** contingencies.

2.4.1 Add the following:

"In the event of any ambiguity, conflict or discrepancy between the various contract documents, lists and schedules, the order of precedence (from highest to lowest) shall be as follows:

1. Form of Offer and Acceptance and Schedule of Deviations
2. Contract Data
3. General Conditions of Contract (2015)
4. Project Specifications
5. Construction Drawings
6. SANS 1200 Standardization Specifications for Civil Engineering Construction
7. Bills of Quantities"

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

- 3.2.1: Nomination of person as Employers Agents Representative.
- 4.7: The issuing of instructions for dealing with fossils and the like.
- 5.7.2: Work at night as well as by day.
- 5.8: Non-working times.
- 5.12: Ruling in terms of Clause 10.1.5 on claims submitted by the Contractor, with the exception of claims relating to Clause 5.12.2.2 (Abnormal climatic conditions).
- 5.12.1: The approval of any extension of time for completion.
- 5.12.4: The issuing of instruction to accelerate progress.
- 5.13.1: The issuing of penalties.
- 5.13.2: The reduction of a penalty.
- 5.14.2: The issue of a Certificate of Practical Completion.
- 5.14.4: The issue of a Certificate of Completion.
- 5.16.1: The issue of a Final Approval Certificate.
- 6.3.2: The issuing of variation orders.
- 6.8.4: The determination of additional or reduced costs arising from changes in legislation.
- 6.11: The agreeing of the adjustment of the sums for general items.
- 8.2.2.2: Order to repair and make good damage arising from any "expected" risk.
- 6.3 : Council approval in order to authorise any expenditure in excess of the Tender Sum plus **15%** contingencies.

4.3.3 Add the following new clause:  
"Contractor's Designer"

The Contractor and his designer shall accept full responsibility and liability for compliance with the Occupational Health and Safety Act, 1993 (Act 85 of 1993) and the Construction Regulations, 2014, for the design of the Temporary Works (sub-clause 6,2 & 12,1) and those parts of the Permanent Works which the Contractor is responsible to design."

For the purposes of this contract, a "competent person" in terms of sub-clause 1 (a) of the Construction Regulations shall be a person who is registered as a PrEng, PrTech Eng or PrTechni Eng with the Engineering Council of South Africa and who has the relevant training

and experience to be able to design the component part of the permanent or temporary works as applicable.

For the purposes of this Contract, "Temporary Works" as defined in the Construction Regulations shall include the following component parts;

1. All Site Camp Structures
2. Hoarding and Barricading
3. Demolition Works (including blasting)
4. Securing excavations from the risk of collapse (Shoring and other measures)
5. Motorised and Non-Motorised Traffic Accommodation
6. Permanent and Temporary Services Relocations and Bypasses
7. Search for, expose, protect and backfill existing services
8. Dealing with Ground Water

The Contractor shall provide the following to the Employer's Agent for retention by the Employer or his assignee in respect of all works designed by the Contractor:

- 4.3.3.1 A Certificate of Stability of the Works signed by a registered Professional Engineer/Technologist/Technician confirming that all such works have been designed in terms of accordance with the appropriate codes of practice.
- 4.3.3.2 Design calculations should the Employer's Agent request a copy thereof.
- 4.3.3.4 Engineering drawings and workshop details (both signed by the relevant professional), in order to allow the Engineer to compare the design with the specified requirements and to record any comments he may have with respect thereto.
- 4.3.3.5 "As-Built" drawings in AutoCAD electronic format after completion of the Works.

Notwithstanding the list of temporary works envisaged on this project, the Contractor shall be responsible for the design of All Temporary Works (including any temporary works required by the EMEs/QSEs (under the contract participation goals) or any sub-contractors.

4.12.2 The contractors appointed Construction Manager shall be on site at all times when work is being performed. The Construction Manager will not be permitted to service any other project during the duration of the Contract.

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

- **Health and Safety Plan (refer to Clause 4.3)**
- **Initial programme (refer to Clause 5.6)**
- **Security (refer to Clause 6.2)**
- **Insurance (refer to Clause 8.6)**
- **Quality Management Plan (Refer Section C3.5.1.4.8 and SANS 1921: Clause 4.4)**
- **Signed agreement in terms of Section 37.2 of the OHS Act, 1993**
- **Proof of registration on the Centralized Electronic Suppliers Database**
- **An approved Construction Work Permit (Refer Clause 4.3)**
- **A valid Letter of Good Standing from the Compensation Commissioner or FEMA**

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

5.3.3 Add the following paragraph:

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

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

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

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

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

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

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

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

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

5.13.1 The **penalty for delay** in failing to complete the Works is **R 15 850.00** (per Day).

5.13.3 Add the following new clause;

“For non-compliance with EME/QSE Contract Participation Goal targets, the penalty will be as follows :

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.

- 5.13.4 Add the following new clause;  
 “For non-compliance with Local Labour targets, the penalty will be as follows:  
 Should the Contractor fail to meet the Local Labour employment target (50%) in line with Clause C1.2.3.2, the Contractor will be penalised at a rate of 100% of the cost for unskilled and semi-skilled labour brought in from outside of **Wards 35, 102, 50 & 106** to a maximum of the Local Labour employment target.”

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

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

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

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

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

- 6.5.1.2.3 The **percentage allowance** to cover overhead charges for daywork are as follows:
- **80%** of the gross remuneration of workmen and foremen actually engaged in the daywork;
  - **20%** on the net cost of materials actually used in the completed work.

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

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

- The proportion not subject to adjustment: **x = 0.10**.
- The base month will be the month prior to the month in which tenders close.
- The Index shall be based on **December 2016 = 100**.

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

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

**Bitumen** - escalation will be calculated using the "Rise and Fall" method as determined by the Employer. The base price for bitumen on this contract shall be the ruling price of 40/50 grade bitumen from the Durban Engen Refinery, seven (7) days prior to the closing date of tenders.

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

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

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

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

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

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

8.6.1.1.3 The **amount to cover professional fees** for repairing damage and loss to be included in the insurance sum: **R500,000-00**.

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

8.6.1.3 The limit of indemnity for **liability insurance**: **R 10m**.

8.6.1.4 **Ground Support Insurance:**

- Minimum amount for any one occurrence, unlimited as to the number of occurrences, against any claim for damages or loss caused by vibration and / or removal of lateral support: **R 1,000,000**.
- Maximum first excess: **R 20,000-00**.

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

**Third Party Insurance (Public Liability)**

- Minimum amount for any one occurrence, unlimited as to the number of occurrences, for the period of the contract, inclusive of the maintenance period: **R 2,000,000**.
- Consequential loss to be covered by policy: **Yes**
- Liability section of policy to be extended to cover blasting: **R 2,000,000**.
- Maximum excess per claim or series of claims arising out of any one occurrence: **R50,000-00**.

**Principal's own surrounding Property Insurance**

- Minimum amount for any one occurrence unlimited as to the number of occurrences against any claim for damage which may occur to the Council's own surrounding property: **R1,000,000**.
- Maximum first excess: **R 20,000-00**.

**Insurance of Works**

- Minimum amount for additional removal of debris (no damage): **Nil**.

- Minimum amount for temporary storage of materials off site, excluding Contractor's own premises: **Nil**.
- Minimum amount for transit of materials to site: **Nil**.

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

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

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

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

10.5.3 The number of members of the Adjudication Board to be appointed: 1 (one)

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



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**C1.2.2.2 DATA TO BE PROVIDED BY CONTRACTOR**

1.1.1.9 The legal name of Contractor is:

.....  
.....  
.....  
.....

1.2.1.2 The Physical address of the Contractor is:

.....  
.....  
.....  
.....

The Postal address of the Contractor is:

.....  
.....  
.....  
.....

The contact numbers of the Contractor are:

Telephone: .....

Fax: .....

The E-Mail address of the Contractor is:

.....

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

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

### **C1.2.3 ADDITIONAL CONDITIONS OF CONTRACT**

#### **C1.2.3.1 COMMUNITY LIAISON OFFICER**

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

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

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

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

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

#### **C1.2.3.2 EMPLOYMENT OF LOCAL LABOUR**

It is a condition of contract that the contractor will be required to employ local labour as specified in eThekweni Council Policy "The use of CLOs and Local Labour". The contractor will be required to ensure that a minimum of 50% of the labour force is made up of local labour. For the purposes of this contract, "Local labour" will be deemed to be any **persons who reside within Ward(s) 35, 102, 50 & 106**. 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 >76% PPG (Priority Population Group) 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

<b>Level 1</b> Unknown	<b>Level 2</b> No Schooling	<b>Level 3</b> Grade 1-3	<b>Level 4</b> Grade 4	<b>Level 5</b> Grade 5-6
<b>Level 6</b> Grade 7-8	<b>Level 7</b> Grade 9	<b>Level 8</b> Grade 10-11	<b>Level 9</b> Grade 12	<b>Level 10</b> Post Matric
<b>Category A:</b> Employed as Local Labour for this contract only <b>Category B:</b> Temporarily employed by the Contractor <b>Category C:</b> Permanently employed by the Contractor				

- Category of Employment

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

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

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

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

#### C1.2.3.5 PERFORMANCE MONITORING OF SERVICE PROVIDERS

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

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

#### **C1.2.3.6 EXCEPTED RISKS (Clause 8.3)**

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

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

## **C2.1: PRICING ASSUMPTIONS / INSTRUCTIONS**

### **C2.1.1 GENERAL**

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

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

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

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

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

### **C2.1.3 QUANTITIES REFLECTED IN THE SCHEDULE**

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

The Works as finally completed in accordance with the Contract shall be measured and paid for as specified in the Bill of Quantities and in accordance with the

General and Special Conditions of Contract, the Specifications and Project Specifications and the Drawings. Unless otherwise stated, items are measured net in accordance with the Drawings, and no allowance has been made for waste.

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

### **C2.1.5 MONTHLY PAYMENTS**

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

### **C2.1.4 PROVISIONAL SUMS / PRIME COST SUMS**

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

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

### C2.1.6 PRICING OF THE BILL OF QUANTITIES

The prices and rates to be inserted by the Tenderer in the Bill of Quantities shall be the full inclusive prices to be paid by the Employer for the work described under the several items, and shall include full compensation for all costs and expenses that may be required in and for the completion and maintenance during the defects liability period of all the work described and as shown on the drawings as well as all overheads, profits, incidentals and the cost of all general risks, liabilities and obligations set forth or implied in the documents on which the Tender is based.

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

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

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

### C2.1.7 "RATE ONLY" ITEMS

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

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

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

Tenderer shall however note that in terms of the Tender Data the Tenderer may be asked to reconsider any such rates which the Employer may regard as unbalanced.

### C2.1.8 PRELIMINARY AND GENERAL

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

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

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

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

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

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

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## **C2.2: BILL OF QUANTITIES**

The Bill of Quantities follows and comprises of 28 pages. The pages are numbered BoQ 1 to BoQ 28

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**PART C3: SCOPE OF WORK**

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### **C3.1: PROJECT DESCRIPTION AND SCOPE OF CONTRACT**

#### **C3.1.1 Description of Works**

The Contract covers the construction of a portion of bulk civil engineering services to service BNG 976 sites. The scope of work further includes 44 sites that would be serviced and are made up of open space network and sites earmarked for medium to high density development, yielding 3 009 units, which will include BNG, Social and Gap housing. Cornubia Phase 2B is situated 20 kms northwest of Durban. Top structures and internal civil infrastructure implementation are by other contracts, still to be procured.

This tender form one of two portions of the works and both combined will deliver the bulk services for the entire Phase 2B. Both contracts are being let out simultaneously and is being so undertaken to accelerate delivery, spread the risk of non-performance and allow more contractors to participate. Portion 2 is defined by the extremities as shown on plan no. BMK-1619-P2-000-000.

The tender comprises of the following disciplines of civil engineering infrastructure to be implemented under this contract:

- Roadworks to municipal standards
- Water reticulation
- Sewer reticulation
- Stormwater reticulation including attenuation structures
- Bulk platforms

This tender is for the implementation of the bulk services only and shall form the spine onto which the internal services shall be connected by other contractors, still to be procured.

During the period of performance of this contract, other internal and top structure tenders will be awarded and shall be implemented in parallel, but with a lag in commencement. The bulk services contractor shall therefore be expected to accommodate other contractors on site, which shall be planned and co-ordinated with the project engineers in a manner that does not hinder delivery.

The scope of the works is generally as listed below but not limited to:

1. Clearing and grubbing the works areas. The farmer would have by this stage cut the cane affected by the works.
2. Removal and stockpiling of topsoil.
3. Bulk earthworks operations.
4. Spoiling of unsuitable material offsite.
5. Importing of suitable material, for bulk earthworks, trench bottom, roadworks and platforms.
6. Proving and locating of existing services and connection points.
7. Trenching of service trenches.
8. Installation of bulk services of water, sewer and stormwater reticulation.
9. Construction of attenuation structures.
10. Installation of cable and service ducts.
11. Construction roadworks and sidewalks.
12. Road marking signage.

### **C3.1.2 Description of Site and Access**

Cornubia is split into 2 main portions, Phase 1 and Phase 2. Phase 2 is further split into 4 sub-phases, called 2A, 2B, 2C and 2D.

Phase 1 implementation is largely completed and 2 668 top structures are occupied. Phase 2 is still predominately greenfield with some development taken place on the private sector partners landholding viz, the Cornubia Mall, and other commercial developments along the N2. Phase 2B is being farmed by the sugarcane farmer and notice of this imminent construction has been issued.

The entire Cornubia Precinct encompasses an area of approximately 1300ha, bounded in the East by the N2 Freeway, generally in the South by the M41 and Flanders Drive, generally in the West by the Main Railway from Durban to Richards Bay and by the Ohlanga River in the North.

Access to the construction locations within Phase 2B shall be via existing farm haul roads as indicated on the sketch plans below. These roads will be used by the farmer to access other portions of Cornubia still under cane, thus maintenance of these roads will be necessary and any new access as deemed necessary will need to be provided, bearing in mind the environmental restrictions as listed in the EMP, attached.

The site is characterised by rolling terrain with some areas in excess of 20% grade and numerous valley lines bisect the works areas.

Refer to section C4.1 for the locality sketch plan for access to the site.

### **C3.1.3 Nature of Ground and Subsoil Conditions**

Refer to section C4.2 for the geotechnical report for an overview of the ground conditions that could be expected.

### **C3.2: PROJECT SPECIFICATION**

#### **PREAMBLE**

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

#### **C3.2.1 GENERAL**

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

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

##### **PS.1.1 Preliminary Programme**

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

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 (refer to Clause 5.12.2.2) and special non-working days (refer to Clause 5.8.1) as specified in the in the Contract Data.

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

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

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

The Tenderer's attention is drawn to the fact that a number of factors will affect the programming of and method of carrying out the works. The more important of these are:

- i) All special non-working days defined in the Contract Data;
- ii) The expected delays defined below;
- iii) The embargo hours and days defined in the Contract Data;
- iv) The restricted working conditions defined in the Contract Data;
- v) Meeting the requirements of the Environmental Management Plan (EMPr);
- vi) The time needed for preparation and approval of the various mix designs specified in the relevant construction sections of the Scope of Works; and
- vii) Leads in times relating to non-standard/off the shelf items.
- viii) Approval of the services by the Municipal Line Departments Clerk of Works, before it can be incorporated into the permanent works.

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.

Should the engineer require an electronic version of the programme for review purposes, the contractor shall supply the programme in a format compatible with the engineer's software, Microsoft Projects.

#### Programme Revisions

The approved Construction programme will be reviewed at the monthly site meetings where the contractor shall provide sufficient detail that will allow the comparison of completed work per activity against the current programme. The contractor shall indicate what resources and programme changes he intends to implement in order to remedy any activity that has fallen behind. The engineer may demand from the contractor a major revision of the programme. Such a revision shall be submitted for comment within 14 days of the demand.

#### **PS.1.2.1 Sharing and maintaining access with current operations**

Allowing for sharing and maintaining access (and permitting access across the site at defined points) and working in close co-operation with the Contractor/s constructing on adjacent sites.

Allowing for sharing and maintaining access (and permitting access across the site at defined points) for any service authority.

#### **PS.1.2.2 Sharing and maintaining access with future operations**

Allowing for sharing and maintaining access (and permitting access across the site at defined points) and working in close co-operation with the Contractor/s constructing on adjacent sites in the near future. Little is known regarding the timeframes; however,

information will be passed on as soon as it is available.

**NOTE:** *It is reiterated and emphasised that the appointed Contractor shall provide reasonable access to the aforementioned Contractors and service authorities when required, and as the Main Contractor in possession of the site, shall induct all the other Contractors' staff and labourers regarding health and safety risks on site.*

### **PS.1.3 Requirements for Accommodation of Traffic**

#### **PS.1.3.1 General**

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

Clause 4.10.4 of SANS 1921-2: 2004 shall be replaced with the following:

"Road signs and markings shall comply with the requirements of "The South African Road Traffic Signs Manual - Volume 2: Roadworks Signing".

#### **PS.1.3.2 Basic Requirements**

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

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

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

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

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

### **PS 1.3.3 Penalties for overloading of Construction/delivery vehicles**

The contractor shall ensure that trucks used to haul bulk construction materials and/or equipment, procured items, deliveries and the like, etc. on public roads are not overloaded and the legal axle loads are not exceeded. Before any construction materials can be transported, the contractor shall provide the engineer with the certified carrying capacity of each truck intended for the purpose of transporting the construction materials. The contractor shall provide the engineer with a weighbridge ticket before discharging/off-loading the materials. Any truck that is overloaded shall not be allowed to discharge/off-load its load and shall return to the depot/batching plant for adjustment of the load. In addition, a penalty shall be applied for the overload

For the purpose of the calculation, the so called 5% grace shall not be used. The following example is provided:

Tare Weight of vehicle certified by a calibrated weighbridge	=	6 tons
Maximum carrying capacity certified by a calibrated bridge	=	8 tons
Gross vehicles mass	=	14 tons
Actual Load (Weighbridge)	=	14.6 tons
Overload factor	=	0.6 tons
Contractors rates tendered under applicable payment item	=	R500/unit
Penalty	=	$2 \times R500/\text{unit} \times 0.6 \times \text{distance (km)}$
	=	$R 600.00 \times \text{distance hauled (km)}$

Penalty payments will be deducted from the front page of interim payment certificates.

### **PS.1.3.4 Traffic Safety Officer**

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

### **PS.1.3.5 Payment**

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

### **PS.1.3.6 Pedestrian movement**

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

### **PS.1.3.7 Temporary Reinstatement**

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

- (a) if the permanent reinstatement of such road or way is to be carried out by the appropriate authority or by some person other than the contractor (or any subcontractor to him), the contractor shall at his own cost and independently of any requirement of or notice from the Engineer be responsible for the making good of any subsidence or shrinkage or other defect, imperfection or fault in the temporary reinstatement of such road or way, and for the execution of any necessary repair or amendment thereof from whatever cause the necessity arises, until the end of the period of maintenance in respect of works beneath such road or way until the authority or other person as aforesaid shall have taken possession of the site for the purpose of carrying out permanent reinstatement (whichever is the earlier), and shall indemnify and save harmless that Council against and from any damage or injury to the Council or to third parties arising out of or in consequence of any neglect or failure of the Contractor to comply with the foregoing obligations or any of them and against and from all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto.
- (b) where the authority or person as aforesaid shall take possession of the site as aforesaid in sections or lengths, the responsibility of the contractor under paragraph (a) of this sub-clause shall cease in regard to any such section or length at the time possession thereof is so taken, but shall during the continuance of the said period of maintenance continue in regard to any length of which possession has not been taken and the indemnity given by the contractor under the said paragraph shall be construed and have effect accordingly.

## **PS.2 SERVICES**

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

### **PS.2.1 Existing Services**

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

Existing bulk sewer outfall lines passes in close proximity to the site boundary as indicated in the existing services plan attached, plan no BMK-1619-P2-006-000 Rev A.

### **PS.2.2 Proving Underground Services**

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

earthworks, in the vicinity of underground services.

It is stressed that all services in a particular area must be proven before commencing work in that area.

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

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 eThekweni 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 eThekweni Electricity's personnel. The cables are usually protected by concrete covering slabs, and therefore if the slabs are inadvertently exposed, excavation work must stop, and the eThekweni Electricity shall be contacted immediately on the above telephone numbers.

Proving of services shall be completed at least two weeks in advance of the actual programmed date for commencing work in the area. The position of these services located must be co-ordinated and levelled by the Contractor, and the information given in writing to the Employer's Agent's Representative.

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

### **PS.2.3 New Services and Relocation of Existing**

This clause shall be read in conjunction with Clause PS.1.

New services are either to be installed by the Contractor as part of the contract or by



others during the contract period. In the latter case excavation and subsequent backfilling of the trench from the top of the bedding layer shall generally be carried out by the Contractor.

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

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

Services affected by the contract are described as follows:

- PS.3: Watermains;
- PS.4: Sewers;
- PS.5: Stormwater;

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

#### **PS.2.4 Accommodation of Services**

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

#### **PS.2.5 LENGTH OF TRENCHES**

When working outside of the defined site of the Works, unless otherwise permitted in writing by the Engineer, the length of trenches excavated in advance of pipe laying operations as specified in the Project Specifications to SANS 1200 DB, shall not exceed the following:

- 100m within the road reserves; and
- 150m within open spaces.

#### **PS.3 WATERMAINS**

##### **PS.3.1 General**

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

The works involves the tie into the existing outfall line from the Blackburn Reservoir which traverses through Phase 2A before it enters Phase 2B. In this regard the contractor with the engineer is liaise with the Phase 2A engineers and/or contractor for the details of the tie-in point,

Particular attention should be paid to tie-ins to the existing live mains which normally have to be done by the Water Supply Branch even if the installation of the new main is included in the contract.

### **PS.3.2 Water Main Valve Access**

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

Whatever method the Contractor chooses to use for this work, the cost of raising the valves from existing level to ultimate level shall be paid only once, irrespective of the number of times the valve is uncovered. Spacer rings required for the height adjustment of valve covers shall be supplied by the Water and Sanitation Unit. 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.

### **PS.3.3 Restriction on Compactive Equipment**

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

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

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

## **PS.4 SEWERS**

The bulk outfall lines are shown on drawing no. BMK-1619-P2-006-000 Rev A and these positions are approximate only, although all care has been taken to show them as accurately as possible. The tie-in manholes are indicated on drawing no. BMK-1619-P2-006-001 Rev A to 002 Rev A and it is important to note that these lines are live and care shall be exercised to keep the service live during the tie-in process. In this regard liaising with the Wastewater Department will be necessary.

### **PS.4.1 Blockage of Foul Water Sewers**

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

## **PS.5 STORMWATER**

Bulk stormwater reticulation shall be so installed that it allows for the connection of the internal reticulation without much damage and rehabilitation of the newly laid services. The bulk lines leads to the attenuation ponds situated on the open spaces of the site and care shall be taken not to encroach onto the environmentally sensitive valley lines and adjacent open space systems.

### **PS.5.1 Blockage Stormwater Sewers**

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

## **PS.6 PAYMENT OF LABOUR RATES**

In order to obviate and eliminate any possible conflict on site during this Contract, the Tenderer is to ensure that his rates include the minimum hourly labour rate promulgated in the Government Gazette and amended from time to time or the similar rate determined by SAFCEC (whichever is the higher rate).

## **PS.7 SUGAR CANE TO BE HARVESTED**

The Employer may wish to have the farmer via Tongaat Hulett Sugar harvest sugar cane before the Contractor clears the site. At the commencement of the Contract, the Contractor shall obtain the Engineer's confirmation of the Employer's decision in this regard. Should this be the case the Contractor shall give the farm manager a minimum of three weeks' notice to harvest the sugar cane. The area to be harvested needs to be clearly demarcated prior to cane cutting.

## **PS.8 MANAGEMENT OF THE ENVIRONMENT**

The Contractor shall pay special attention to the following:

**PS.8.1 Natural Vegetation**

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

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

**PS.8.2 Fires**

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

**PS.8.3 Environmental Management Plan**

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

**PS.9 OCCUPATIONAL HEALTH AND SAFETY**

**PS.9.1 General Statement**

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.

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**PS.9.2 Health and Safety Specifications and Plans to be submitted at tender stage**

**PS.9.2.1 Employer's Health and Safety Specification**

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

**PS.9.2.2 Tenderer's Health and Safety Plan**

At tender stage only a brief overview of the tenderers perception on the safety requirements for this contract will be adequate. This will be attached to Part T2.2: Contractor's Health and Safety Plan.

Only the successful Tenderer shall submit a separate Health and Safety Plan as required in terms of Regulation 7 of the Occupational Health and Safety Act 1993 Construction Regulations 2014, and referred to in Part T2.2: Contractor's Health and Safety Plan.

The detailed safety plan will take into consideration the site specific risks as mentioned under PS.10 and must cover at least the following:

- (i) A proper risk assessment of the works, risk items, work methods and procedures in terms of Regulations 9 to 29;
- (ii) Pro-active identification of potential hazards and unsafe working conditions;
- (iii) Provision of a safe working environment and equipment;
- (iv) Statements of methods to ensure the health and safety of subcontractors, employees and visitors to the site, including safety training in hazards and risk areas (*Regulation 7*);
- (v) Monitoring health and safety on the site of works on a regular basis, and keeping of records and registers as provided for in the Construction Regulations;
- (vi) Details of the Construction Supervisor, the Construction Safety Officers and other competent persons he intends to appoint for the construction works in terms of Regulation 8 and other applicable regulations; and
- (vii) Details of methods to ensure that his Health and Safety Plan is carried out effectively in accordance with the Construction Regulations 2014.

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

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

A generic plan will not be acceptable.

**PS.9.3 Cost of compliance with the OHSA Construction Regulations**

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

Items that may qualify for remuneration will be specified in the Employer's Health and Safety Specification.

**PS.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.

**PS.11 PERFORMANCE MONITORING OF SERVICE PROVIDERS**

The performance of service providers that have been selected to provide assistance in the provision of a municipal service, otherwise than in circumstances where Chapter 8 of the Municipal Systems Act applies, is required, by Section 116 of the Municipal Finance Management

Act, to be monitored and reported on (see Cl.53 of the SCM Policy).

Appropriate key performance indicators (KPIs) for the contract must be set by the Municipality as a yardstick for measuring performance.

The following KPIs will be applicable to this contract:

- (a) Adherence to the latest approved construction programme
- (b) Adherence to within 10% either way of the agreed cashflow programme

### **C3.3: STANDARD SPECIFICATIONS**

**C3.3.1** The Specifications on which this contract is based are the SANS 1200 Standardised Specifications (hereafter referred to as the Standard Engineering Specifications). This document is obtainable separately, and Tenderers shall obtain their own copies of the applicable Sections.

SANS 1200 A	:	General (1986)
SANS 1200 AB	:	Engineer's office (1986)
SANS 1200 C	:	Site clearance (1980)
SANS 1200 D	:	Earthworks (1988)
SANS 1200 DB	:	Earthworks (pipe trenches) (1989)
SANS 1200 DK	:	Gabions and pitching (1996)
SANS 1200 DM	:	Earthworks (roads, subgrade) (1981)
SANS 1200 G	:	Concrete (structural) (1982)
SANS 1200 L	:	Medium-pressure pipelines (1983)
SANS 1200 LB	:	Bedding (pipes) (1983)
SANS 1200 LC	:	Cable ducts (1981)
SANS 1200 LD	:	Sewers (1982)
SANS 1200 LE	:	Stormwater drainage (1982)
SANS 1200 M	:	Roads (general) (1996)
SANS 1200 ME	:	Subbase (1981)
SANS 1200 MF	:	Base (1981)
SANS 1200 MFL	:	Base (light pavement structures) (1996)
SANS 1200 MH	:	Asphalt base and surfacing (1996)
SANS 1200 MJ	:	Segmented paving (1984)
SANS 1200 MK	:	Kerbing and channelling (1983)
SANS 1200 MM	:	Ancillary roadworks (1984)

### **C3.3.2 AMENDMENTS TO THE STANDARD SPECIFICATIONS**

#### **INTRODUCTION**

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

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

SANS 1200 A	:	General (1986)
SANS 1200 AB	:	Engineer's office (1986)
SANS 1200 C	:	Site clearance (1980)
SANS 1200 D	:	Earthworks (1988)
SANS 1200 DB	:	Earthworks (pipe trenches) (1989)
SANS 1200 DK	:	Gabions and pitching (1996)
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SANS 1200 MFL	:	Base (light pavement structures) (1996)
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SANS 1200 MJ	:	Segmented paving (1984)
SANS 1200 MK	:	Kerbing and channelling (1983)
SANS 1200 MM	:	Ancillary roadworks (1984)



**PSA GENERAL**

**PSA 1 SCOPE**

*Replace the contents of sub clause 1.1, including the notes, with the following:*

"1.1 This specification covers requirements, principles and responsibilities of a general nature which are generally applicable to civil engineering construction and building works contracts, as well as the requirements for the Contractor's establishment on the Site."

**PSA 4 PLANT**

**PSA 4.2 CONTRACTOR'S OFFICES, STORES AND SERVICES**

*In addition to the provisions of Clause 4.2 the following shall apply:*

*The contractor's office is to consist of minimum 3 prefabricated, air-conditioned and furnished rooms with telephones, internet connection and name-boards.*

"The Contractor is responsible to provide a suitable site for his camp and to provide accommodation for his personnel and labourers. If the Employer can make any specific site available to the Contractor, such site will be pointed out to the Contractor.

(a) Contractor's Camp Site/ Store Yard

The recommended position of the camp site/store yard will be pointed out by the Engineer. However, the Contractor may, if he prefers to have a camp site at another location of the work site provided that he first obtains the written permission of the landowner, and subsequently the Engineer, as well as the eThekweni Municipality (including complying with all their establishment conditions).

Any clearing or shaping of the site that is necessary and the making good after de-establishment will be the responsibility of the Contractor.

(b) The Contractor's office shall be marked with a legible sign carrying the legend "Works Office". Notices or instruction addressed by the Engineer to the "Works Office" and delivered there by hand, will be deemed to have been received by the Contractor.

(c) The Contractor's office is to include an air-conditioned prefabricated meeting room facility with furniture suitable for holding formal meetings for twenty (20) persons.

(d) The Contractor's designated Site Agent shall be in possession of a cellular telephone which shall be in operation at all times during the normal working hours determined for the Contract. The measurement only in Schedule A. The amount payable in respect of Items in the respective P&G Sections in the Schedule of Quantities shall include for providing the above offices, stores and services."

(e) The Contractor is to make provisions for sufficient shade-cloth covered parking bays.

***Add the following clauses to PSA 4.2:***

**PSA 4.2.1 Accommodation of employees**

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

No housing is available for the Contractors' employees and the Contractor shall make his own arrangements to house his employees and to transport them to site. No informal housing or squatting will be allowed.

The Contractor shall provide the necessary ablution facilities at his camp site and the site of the Works for the use of his employees. Chemical toilets only will be allowed where temporary facilities have to be provided.

**PSA 4.2.2 Power Supply, Water and other Services**

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

(a) Water for Works

The Contractor shall allow in the Bill of Quantities for the provision and adequate storage of potable water at the camp site for use by the Engineer's Representative and Contractor's personnel.

(b) Water for Construction Purposes

The Contractor shall allow as per the item in the Bill of Quantities to obtain water for construction purposes from a suitable source so as to ensure that the quality of the water complies with the requirements of Clause 3.3 in SANS 1200 G or GA. It is the Contractor's responsibility to obtain the written permission from the owner or the relevant authority controlling the water source. Apart from the Sum tendered in the Bill of Quantities, no further payment will be made for the provision of water either for the Works or construction purposes.

(c) Power Supply for Works

The power supply authority is eThekweni Electricity Service Unit. The Contractor will be responsible for arranging for whatever temporary supplies may be required and he will be required to bear all costs involved (including the payment of any connection fee) and to pay the ruling tariffs applicable to such supplies.

**PSA 4.2.3 Telephone**

One telephone shall be installed in the Engineer's Representative's office."

**PSA 5 CONSTRUCTION**

**PSA 5.1 SURVEY**

**PSA 5.1.1 Setting Out of the Works**

*Add the following to the clause:*

"The Contractor shall be responsible for the accurate setting out of all services from the co-ordinates or dimensions shown on the relevant drawings.

The tolerances applicable to some aspects of setting out on this project are unusually high compared to those normally used. Therefore, it is important to adopt methods which will achieve and record the desired results."

***Add the following clauses:***

#### **PSA 5.1.1.1 Setting out Kerb Lines**

The terminals of kerb lines should be set out from the control points and the alignment between terminals set out by theodolite set up at one terminal and sighted on the other. Points on an alignment set out by polar from a control point will only be acceptable if this method has an effective supplementary alignment check. Kerb line stakes must be placed so that they remain in position until the kerb line has been completed.

If cadastral beacons have been set out their positions should be recorded and examined to determine if an adjustment to the kerb lines should be made to refine the relationship with the cadastral boundaries. Details of adjustments to kerb lines are required to be recorded and submitted to the Engineer's Representative for the "As Built" records of the project.

#### **PSA 5.1.1.2 Payment for Setting Out**

The cost of setting out and information to be supplied in terms of Clause 5.1.1 (as amended) shall be deemed to be included in the rates."

#### **PSA 5.1.2 PROTECTION AND PLACEMENT OF LAND SURVEY PEGS**

*Add the following to the clause:*

"Immediately after the site has been handed over, the Contractor shall search for all boundary pegs and identify each peg by knocking in a wooden stake approximately 60 mm dia. and 450 mm long adjacent to the survey peg so that it protrudes approximately 150 mm above natural ground level. Any pegs that cannot be found must immediately be reported in writing to the Engineer who will arrange for the replacement thereof by a Registered Land Surveyor at the Employer's expense.

Thereafter the Contractor shall be solely responsible for the complete protection of the pegs and in event of loss or displacement shall arrange for their replacement by a Registered Land Surveyor at his own cost.

The only exception to this arrangement will be in the event of a peg being displaced or required to be moved in the course of prescribed earthworks operations. In such a case the cost of the replacement will be for the Employer's account."

*Add the following clauses:*

#### **PSA 5.1.3 Establishment of Control Points**

These are to be based on existing control and established at each new road intersection and in some instances between the intersections. Where possible, it would be useful to be able to measure from the control points at right angles across the intersections using a 30m tape. The co-ordinates and elevations of all the points are to be determined by suitable survey methods which shall achieve or exceed the standards of a Class "A" traverse and elevations shall be accurate to the nearest centimetre or better.

Control points are to consist of steel pegs set in concrete in soils, steel pegs driven into asphalt surfacing or holes drilled into hard surfaces such as concrete or rock. They are also to be marked with paint or long painted or flagged wooden stakes so that they can be easily seen. They must also be protected from disturbance or damage.

The calculations and field book pages shall be submitted to the Engineer's Representative on completion of the survey, and will form part of the "As Built" records of the project. Any similar information for supplementary control points which may be

required to extend or replace that originally established shall also be submitted to the Engineer's Representative.

#### **PSA 5.1.4 "As-Built" Information**

The Engineer may appoint an independent Topographical Surveyor to provide "As-Built" information. A stated sum has been included in Section 1 of the Schedule of Quantities for this purpose. (Refer also Clause PSA 11(j)).

Should the Engineer decide to appoint an independent surveyor, the surveyor will be furnished with a specification of the "As-Built" information required. It will be incumbent on the Contractor to give every assistance to the surveyor to enable him to complete his task timeously.

The above in no way relieves the Contractor from his obligation to provide the Engineer's Representative with "As-Built" information. An extra set of plans will be provided to enable the Engineer's Representative to mark up in red all "As-Built" information.

The co-ordinates, (x, y and z) are required for all types of manholes, at the centre of the manhole cover (including invert levels of all incoming and exiting pipes), junction boxes, sewer ramps, sewer back drops, rodding eyes, ends of cable duct crossings (on top of pipe/concrete), vertical and horizontal bends and high and low points of pressure pipelines, fire hydrants, valve covers (including top of pipe at air valves and scour valve tees), scour valve outlet pipe end points, electrical light poles, sign poles, and tree surrounds. Co-ordinates are also required along the centre and edge lines of roads, edges, top and bottom of embankments of roads at 10,0m intervals at the stake/kilometre values.

This information shall be submitted to the Engineer in "DWG" and Model maker format electronically as well as in hard copy drawing.

All information to complete the roads material as built must be provided including layer number or depth, material characteristics, quality and test results.

The cost for this information shall be deemed to be included in the Contractor's tendered rates.

Authorization by the Engineer for payment of the **COMPLETION CERTIFICATE** shall be withheld until all the "**AS-BUILT**" information has been provided to his satisfaction.

#### **IMPORTANT NOTE**

A specific condition of this clause is that the Contractor is to make allowance in his tendered rates to supply (together with each interim/monthly statement for payment – Refer Clause 6.10.1 of GCC second edition 2010) the Engineer with the x, y and z co-ordinates of all ends of pipework (prior to the benching being commenced) as well as the resultant grades between ends of pipework.

From this information the Engineer will confirm whether the pipes comply with the design information (within acceptable tolerances).

Should the Contractor fail to provide this information, payment of monthly certificates will be withheld until the Engineer is in a position to confirm that the pipes have been laid to the correct designed levels and grades."

**PSA 5.2 WATCHING, BARRICADING, LIGHTING AND TRAFFIC CROSSINGS**

*Add the following to the clause:*

“The Contractor shall make adequate provision for the supply of temporary warning signs, barriers, drums, flashers, etc. to the satisfaction of the Engineer for the entire duration of the contract.”

**PSA 5.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES**

*Add the following to the clause:*

“Before commencement of any excavations the Contractor shall ascertain the presence and position of all underground services including any electrical or telephone cables, Water, sewer and stormwater mains on or at the entrances to the site of the Works from the relevant authorities. Payment for the exposing of such services will be made under the relevant items in the Schedule of Quantities.

The cost of liaison with the authorities regarding services, as well as the subsequent protection thereof, must be included in the rates for exposing the services.”

**PSA 5.5 DEALING WITH WATER ON WORKS**

*Add the following to the clause:*

“The Contractor shall take cognizance of the fact that the subsoil conditions on the site can become saturated during the rainy season and that adequate drainage measures shall be taken to deal with subsurface or surface water. Refer also to Project Specification PS 6.5 in this regard.”

**PSA 5.6 POLLUTION**

*Add the following to the clause:*

“If the Engineer’s Representative is not satisfied with conditions with regard to dust nuisance, pollution of streams, and inconvenience to or interference with the public (or others) as specified, he will instruct the Contractor to cease work until the problem has been remedied.

**PSA 5.8 GROUND AND ACCESS TO WORKS**

*Add the following to the clause:*

“Access to the Works will be as set out in Clause PS 1.2. Notwithstanding clause 5.8, the Contractor shall, where practicable, maintain free access for other parties to make use of the site, and in this regard, he may be called upon to carry out special works as itemised in the Schedule of Quantities or under Daywork.

Other parties may include employees of the local authority, other contractors, members of the public who require access to adjoining properties/sites and employees of various departments such as eThekweni Electricity etc.

The Tenderers’ / Contractors’ attention is drawn to the fact that other parties could include Contractors as indicated in Clause PS 2.2.”

**PSA 7 TESTING**

**PSA 7.1 PRINCIPLES**

**PSA 7.1.1 Checking**

*Add the following:*

“The Contractor must provide a minimum of 9 normal working hours’ notice to the Engineer’s Representative when work will be available for testing and allow a further 8 normal working hours for the results to be processed, additional to the normal duration of the test procedure used. “

## **PSA 7.2 APPROVED LABORATORIES**

*Add the following:*

“It is not necessary for the Contractor to erect and equip a laboratory to carry out his check testing, but he shall make arrangements to have the necessary tests carried out in a reputable laboratory to be approved by the Engineer’s Representative. “

## **PSA 8 MEASUREMENT AND PAYMENT**

### **PSA 8.2 PAYMENT**

#### **PSA 8.2.1 Fixed charge and value related items**

*Replace the contents of this*

*clause with:*

“The sum tendered for each fixed-charge and value related item will be paid in two (2) payments. Eighty (80) percent of the sum shall be paid when the contractor has established the facilities on site and in the opinion of the Engineer discharged all his obligations in respect of the item. A second payment of twenty (20) percent shall be made when the contractor has de-established site and removed all structures, foundations plant and equipment and rehabilitated the area including the septic tanks.”

#### **PSA 8.2.4 Withholding payment for time related items**

*Add the following sub-clause:*

*“8.2.4.4 Furthermore should the works be behind schedule; the time related item shall be reduced to be in accordance with the actual progress i.e., if the works is behind program, then the time related payment will be reduced by Actual program progress over actual time elapsed.”*

### **PSA 8.3. FIXED CHARGE ITEMS**

The Contractor is to price all fixed charged items described below in one lump sum under this heading. The contractor is to refer to the payment items and project specific payment items highlighted below in order to assist in pricing this lump sum.

#### **PSA 8.3.2 ESTABLISHMENT OF FACILITIES ON SITE**

*Add the following to sub clause 8.3.2.3:*

The sum shall include for the de-establishment of the site and payment will be made in accordance with PSA 8.2.1”

##### **PSA 8.3.2.1 FACILITIES FOR ENGINEER**

The facilities to be provided for the engineer are to conform to SANS 1200 AB clause 3.2 and the project specific addition PSAB3.2

### **PSA 8.4 TIME RELATED ITEMS**

The Contractor is to price all time related items described below in one lump sum under this heading. The contractor is to refer to the payment items and project specific payment items highlighted below in order to assist in pricing this lump sum.

**PSA 8.4.2 OPERATION AND MAINTENANCE OF FACILITIES ON SITE FOR THE DURATION OF CONSTRUCTION, UNLESS OTHERWISE STATED**

**PSA 8.4.2.3 sub clause 8.4.2.3**

Add the following to sub clause 8.4.2.3

*"Should the works be behind program then the time related item shall be reduced in accordance with clause PSA8.2.4."*

**PSA 8.5 SUMS STATED PROVISIONALLY BY ENGINEER**

The Contractor is to price all sums stated by the engineer for items 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.5, 1.3.6, 1.3.7 and 1.3.8 in one lump sum under this heading. The contractor is to refer to the payment items and project specific payment items highlighted below in order to assist in pricing this lump sum. Individual pricing per line item is required for item 1.3.9, 1.3.10, 1.3.11, 1.3.12 & 1.3.13. and these items should not be added to the lump sum payment item described above.

*Add the following:*

In the relevant sections of the Schedule of Quantities or the Summary thereof, Provisional or Stated Sums or allowance therefore are provided for the following:

- a) Progress Aerial Photography, to cover payments for bi-monthly photography for the full duration of the project.
- b) Engineers Testing, to cover payment for the Engineer's Representative to carry out check tests to verify the Contractors work. This amount is for the sole use of the Engineer's Representative and shall not relieve the Contractor of his obligation to carry out the required process control and routine inspection and testing. The cost for the Contractor's process control and routine inspection and testing shall be deemed to be included in his tendered rates.
- c) Special survey and setting out, as deemed necessary by the Engineer's Representative but which falls outside the scope of the contractor's duties, to cover payment to an independent Topographical Surveyor (appointed by the Engineer) to accurately set out positions of street light poles, electrical cables, water valves, water reticulation, irrigation valves, irrigation mains, landscaping elements and other related fixtures, or any other features.
- d) Provision of "As Built" information, to cover payment to an independent Topographical Surveyor (appointed by the Engineer) for the provision of possible "As Built" information as described in Clause PSA 15 and shall not relieve the Contractor of his obligation, to provide the necessary "As-Built" information to the Engineers Representative during the execution of the works. The Contractor will be required to provide the appointed Surveyor all the necessary assistance in this operation.
- e) 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.
- f) Health and safety. Including:
- Fixed obligations for the preparation of risk assessments, safe work procedures, the project H & S file, the H & S plan and any other H & S matters that the contractor deems necessary. Monitoring of the EMP by the ECO
  - Fixed obligations for completing and checking the Project H & S file and handing over to the Client on completion of the works.
  - Time related obligations for updating and amending the risk assessments, safe work procedures, the project H & S file, the H & S plan and full compliance with all H & S matters during the construction of the works under the contract.

#### **PSA 8.7 DAYWORK**

*Add the following to paragraph 1 after the word hours:*

*"or months"*

*Add the following at the end of the clause:*

No work will be measured under the Daywork Schedule unless:

- (a) it is agreed by the Engineer's Representative to be outside the specified scope of a measured item in the contract;
- (b) it is carried out in response to a written instruction by the Engineer's Representative; and
- (c) the records of plant and labour are submitted daily for the consideration of the Engineer's Representative and duly approved.

The rates tendered in the Daywork Schedule shall be taken to be the full inclusive rates at which the services scheduled are available, including site overheads, supervision, operators, fuel, insurance and setting out.



However, transport to and from the site of any plant not on site, specially required by the Engineer's Representative, will be paid for. A minimum of 9 hours a day will be paid for plant specially ordered onto site.

Where plant has been removed from site at the Contractor's request or where it is listed on the Schedule of Plant available for the Contract in the tender documents, payment for transport to the site will not be made.

The Contractor and the Engineer will agree on the method of recording the working hours prior to the commencement of the work. Any long period of idling at any one time which in the opinion of the Engineer or his representative is beyond that required for normal operating conditions will not be paid for as working time. Non-working hours for any reason shall not be measured for payment.

In the relevant sections of the Schedule of Quantities or the Summary thereof, allowances are provided for the following:

#### Personnel

- (a) Unskilled labour.....hour (hr)
- (b) Semi-skilled ..... hour (hr)
- (c) Skilled labour.....hour (hr)
- (d) Ganger ..... hour (hr)
- (e) Flagmen ..... hour (hr)
- (f) Site Administration Clerk..... month (m)

To cover payment for the sole use of the Engineers Representative, as specified in PSAB 5.6, over the full duration of the contract in monthly instalments.

- (g) Community Liason Officer (CLO).....month (m)

To cover payment for the Contractor to employ the CLO whom has been collectively identified by Ward councillors as specified in Sub clause C1.2.3.1 Local Labour. The Employment will be for the duration of the contract

- (h) Geotechnical Engineer with PrNatSci..... month (m)

o cover payment when required for the Geotechnical Engineer whose services have been requested by the engineer.

- (i) Surveyor ..... month (m)

To cover payment when required for the independent surveyor whose services have been requested by the engineer.

#### Plant

- (a) Bulldozer with rippers (minimum 125kW) ..... hour (hr)
- (b) Front end loader (minimum 60kW) ..... hour (hr)

- (c) Tractor loader backhoe 4 x 4 (50kW) ..... hour (hr)
- (d) Track excavator (125kW) ..... hour (hr)
- (e) Smooth drum roller (12 ton)..... hour (hr)
- (f) Water bowser (10 000 litre).....hour (hr)
- (g) Tip truck 6 m<sup>3</sup> capacity..... hour (hr)
- (h) Tip truck 10 m<sup>3</sup> capacity..... hour (hr)
- (i) LDV (1600cc).....Kilometers (km)
- (j) Tip truck 6 m<sup>3</sup> capacity..... hour (hr)
- (k) Water pump (75mm diameter with 50m hose)..... hour (hr)

**PSA 8.8 TEMPORARY WORKS**

The contractor is to price all temporary works described below in one lump sum under this heading. The contractor is to refer to the payment items and project specific payment items in order to assist in pricing this lump sum.

**PSAB ENGINEER'S OFFICE**

**PSAB 3 MATERIALS**

**PSAB 3.1 NAMEBOARDS**

*Add the following sentence:*

"The Contractor shall obtain the Engineer's written approval in respect of all names, wording and logos to appear on the Contract nameboards prior to ordering or manufacturing any such Contract nameboards."

**PSAB 3.2 OFFICE BUILDING(S)**

*Add the following to AB 3.2 as per the Engineer's requirements:*

*"Two (2) fully furnished offices with sufficient shade cloth covered parking bays are required for the use of the Engineer's Representative and the Client. The offices and furnishings must be as follows:*

*Office size: 1x offices of 15m<sup>2</sup> in size*

*1 x offices of 10m<sup>2</sup> in size*

*Meeting room: The engineer is to share a meeting room with the contractor. This item is described and paid for under item SANS 1200 A8.3.2.2 and is described by PSA4.2*

*Electricity: Single Phase: 14 x Plug Points; and*

*Air-conditioning: Adequate air-conditioning in the meeting room*

*Other: 3x fire extinguishers; and.*

*Parking bays: 3x 3,0x5,0m. shade cloth covered parking bays*

*Floodlighting: Lighting for security purposes..*

*The Contractor must ensure that the access to and within the site camp can be easily traversed by a light passenger vehicle.*

Toilets

Two (2) ablution units are to be provided in the vicinity of the offices and are to be shared between the Engineer and the Contractor's office staff. The ablution unit for the Engineer's personnel may be combined with those provided for the Contractor's office staff in reasonable proximity to the Engineer's office.

All offices and furnishings supplied by the Contractor will remain the property of the Contractor, and must be maintained throughout the duration of occupation. Materials supplied must be neat and in good working order. In addition to the above, the Contractor must provide an ablution structure including a wash hand basin for the sole use of the Engineer and his staff."

***Add the following clause:***

**PSAB 4 PLANT**

***Add the following clauses to AB 4:***

**PSAB 4.2 MULTIFUNCTION APPARATUS**

The Contractor shall provide a multifunction apparatus (including consumables), Telkom line rental and maintenance thereof for the exclusive use by the Engineer's personnel for the duration of the Contract. The multifunction apparatus shall be, as a minimum, an A3 colour copier/scanner which has auto-feed capabilities and can print a minimum of 20 pages per minute.

**PSAB 4.3 SITE INSTRUCTION BOOK**

The Contractor shall keep a triplicate book for site instructions on the Site at all times.

**PSAB 5 CONSTRUCTION**

**PSAB 5.5 SURVEY ASSISTANTS**

*Add the following to AB 5.5 as per the Engineer's requirements:*

"The Contractor shall provide the following survey equipment for the exclusive use of the Engineer and his staff:

- 1 x upright reading automatic level with tripod;
- 1 x metric levelling staff with protective cover bag;
- Ranging rods;
- 1 x 100 metre fibreglass tape measure;
- 1 x measuring wheel;
- 1 x  $\pm 2$  kg hammer; and
- Range of steel pegs."

***Add the following clause:***

**PSAB 5.6 SITE ADMINISTRATION CLERK**

The Contractor shall provide for a Site Administration Clerk (SAC) for the sole use of the Engineer's Representative. The duties of the SAC will be as follows:

- Receptionist;
- Filing;
- Typing: Minutes of meetings, letters, etc. (Word);
- Updating spreadsheets (Excel); and
- Petty Cash.

Ad hoc duties include purchasing of groceries, tea making management (postage & e-mail), faxing and other duties as may be assigned from time to time.

The SAC should be proficient in Microsoft Word and Excel.

The incumbent should have minimum of two years working experience. The salary should range between R6 300 and R7 500 per month dependent on experience with an allowance for an annual salary increase of 7%. "

**PSC SITE CLEARANCE**

**PSC 3 MATERIALS**

**PSC 3.1 Disposal of Material**

*Add the following:*

"Where the Contractor is required to dispose of material and not at the designated Cornubia temporary sites, he shall obtain his own dumping sites for the disposal of material and all transport costs shall be included in the rates tendered for site clearance."

**PSC 5 CONSTRUCTION**

**PSC 5.1 AREAS TO BE CLEARED AND GRUBBED**

*Add the following:*

"Pipeline routes shall be cleared to a distance of 1,5m on both sides of the pipeline centre line unless the clear width is otherwise indicated on the drawings or bill of quantities. Where pipeline routes fall within road reserves no separate payment will be made for clearing pipeline routes and clearing will be paid under clearing of the road reserve. Route pegs, markers or property beacons shall not be destroyed or damaged during clearing operations."

**PSC 5.2 CUTTING OF TREES**

**PSC 5.2.3 Preservation of trees**

**PSC 5.2.3.2 Individual trees**

*Replace the last sentence with the following:*

"An amount of R1,000.00 will be deducted from moneys due to the Contractor as a penalty for every tree that is damaged or removed unnecessarily."

**PSC 5.5 RECLEARING OF VEGETATION**

*Add the following:*

"When areas have to be re-cleared on the written instructions of the Engineer, such re-clearing shall be carried out at the Contractor's own cost and the Contractor is therefore advised not to clear the areas too soon."

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**PSD EARTHWORKS**

**PSD 2 INTERPRETATIONS**

**PSD 2.1 SUPPORTING SPECIFICATIONS**

*Replace sub clause 2.1.2 with the following:*

**PSD 2.1.2 Any of the other SABS 1200 specifications may form part of the Contract documents."**

**PSD 2.3 DEFINITIONS**

*Replace the word and the definition for "Borrow" with the following:*

**"Borrow material:** Material, other than material obtained from excavations required for the works, obtained from sources such as borrow pits or the authorised widening of excavations. 'Borrow' shall have a corresponding meaning."

*Replace the definition for "Specified density" with the following:*

**"Specified density:** The specified dry density expressed as a percentage of modified AASHTO dry density."

*Replace the definition for "Stockpile" with the following:*

**"Stockpile (verb):** The process of selecting and, when necessary, loading, transporting and off-loading and maintaining material in a designated area for later use for a specific purpose."

*Add the following definitions:*

**"Commercial source:** A source of material provided by the Contractor, not the Employer, and including any borrow pit, provided by the Contractor.

**Fill:** An embankment or terrace constructed of material obtained from excavations or borrow pits. In roads it includes the earthworks up to the underside of the selected subgrade level.

**Fill (material):** Material used for the construction of an embankment or terrace.

**Roadbed:** The natural in situ material on which the fill or, in the absence of fill, the pavement layers are constructed."

**PSD 3 MATERIALS**

**PSD 3.1 CLASSIFICATION FOR EXCAVATION PURPOSES**

**PSD 3.1.1 Method of classifying**

*Add the following:*

"The classification of material other than 'soft excavation' shall be agreed upon before excavation may commence.

The Contractor shall immediately inform the Engineer if and when the nature of the material being excavated changes to such an extent that a new classification is warranted for further excavation. Failure on the part of the Contractor to advise the Engineer in good time shall entitle the Engineer to reclassify, at his discretion, such excavated material."

**PSD 3.2.3 Material suitable for backfill or fill against structures**

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

"Material used for backfill behind structures shall generally be the material excavated, subject to the following conditions:

- (a) The material shall not contain an excessive number of stones retained on a 50 mm sieve;
- (b) The material shall not contain large clay lumps that do not break up under the action of the compaction equipment; and
- (c) The liquid limit of the material shall not exceed 40, neither shall the PI exceed 18."

**PSD 3.3 SELECTION**

**PSD 3.3.1 General**

*Replace the second sentence with the following:*

"The contractor is required to carry out excavations carefully and select and stockpile material separately for later reuse. This is particularly relevant to the topsoil, spoil, fill, G9, G7 and G5 type materials."

***Add the following sub clause:***

**PSD 3.3.3 Selection in borrow areas and excavations**

Approval of a borrow area for a certain purpose does not necessarily mean that all the material in that area is suitable for the specified purpose. What it does mean is that the borrow area contains some suitable material. The onus shall rest on the Contractor to ensure that only material that is indeed suitable is removed and used for the specified purpose.

When the Contractor has to select excavated material for a specific purpose, the above provisions relating to borrow areas shall apply *mutatis mutandis* to excavations.

The Contractor shall not waste or contaminate material that has been selected for a specific purpose."

**PSD 4 PLANT**

**PSD 4.4 DETECTORS**

*Replace the contents of sub clause 4.4 with the following:*

"The Contractor shall, for the purposes of detecting and locating underground services in accordance with the provisions of sub clause 5.4 of SABS 1200 A and sub clause 5.1.2 of SABS 1200 D, at his own cost, provide and use detecting equipment which is suitable for the detection of underground cables and pipes without damage."

**PSD 5 CONSTRUCTION**

**PSD 5.1 PRECAUTIONS**

**PSD 5.1.1 Safety**

**PSD 5.1.1.1 Barricading and lighting**

*Replace "Machinery and Occupational Safety Act, 1983 (Act 6 of 1983)" with "Occupational Health and Safety Act, 1993 (Act No 85 of 1993)".*

#### **PSD 5.1.1.2 Safeguarding of excavations**

*Replace "Machinery and Occupational Safety Act" with "Occupational Health and Safety Act, 1993 (Act No 85 of 1993)".*

#### **PSD 5.1.1.3 Explosives**

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

"The Contractor will generally be permitted to use explosives for breaking up hard material during excavations, for demolishing existing structures, and for other purposes where explosives are normally required, subject to the following conditions:

- (a) The Engineer may prohibit the use of explosives in cases where, in his opinion, the risk of injury to persons or damage to property or to adjoining structures is too high. Such action by the Engineer does not entitle the Contractor to additional payment for having to resort to less economical methods of construction;
- (b) The Engineer's prior written approval shall be obtained for each and every blasting operation. This approval may be withheld if the Contractor does not use explosives responsibly and carefully;
- (c) The Contractor shall comply fully with the requirements of the Explosives Act, 1997 (Act No 83 of 1997) and all other legislation and regulations as may be applicable to blasting and the use of explosives; and
- (d) Before blasting is undertaken, the Contractor shall satisfy the Engineer that he has established whether or not the insurers concerned require pre- and post-blasting inspections of buildings and structures within a certain radius of the proposed blasting.

Should such inspections be required, the Contractor shall, together with the Engineer and the insurer, examine and measure the buildings, houses or structures in the vicinity of the proposed blasting site and establish and record, together with the owner, lessee or occupier, the extent of any existing cracking or damage before blasting operations commence.

- (e) When there is a possibility of damage to power and telephone lines or any other services or property, the Contractor shall adapt his method of blasting and the size of the charges and shall use adequate protective measures (e.g., cover-blasting) to reduce the risk of damage.
- (f) All accidents, injury to persons and animals and damage to property shall be reported to the Engineer in detail and in writing as soon as is practicable.
- (g) The Engineer shall be given 24 hours' notice by the Contractor before each blasting operation is carried out.
- (h) When blasting to specified profiles, the Contractor shall so arrange the holes and charges that the resulting exposed surfaces are as sound as the nature of the material permits. The Contractor shall make good, at his own expense, any additional excavation necessitated by the shattering of rock in excess of any



overbreak allowances specified in the Project Specifications or given on any Drawing.

Notwithstanding the Contractor's compliance with the above provisions, the Contractor shall remain liable for any injury to persons and animals and loss of or damage to property occurring as a result of blasting operations."

#### **PSD 5.1.2 Existing services**

##### **PSD 5.1.2.2 Detection, location and exposure**

*Replace the contents of sub clause 5.1.2.2 with the following:*

"The exposure by the Contractor of underground services, as required in terms of sub clause 5.4 of SABS 1200 A (as amended) shall be carried out by careful hand excavation at such positions and to such dimensions as are agreed to by the Engineer.

Unless otherwise instructed or agreed by the Engineer, no service shall be left exposed after its exact position has been determined and all excavations carried out for the purposes of exposing underground services shall be promptly backfilled and compacted to the following densities:

- (a) In roadways: 93% modified AASHTO density; and
- (b) In all other areas: 90% modified AASHTO density.

Where hand excavations to expose underground services have to be carried out in roadways, the Contractor shall reinstate the road layerworks in accordance with the provisions of sub clause 5.9 of SABS 1200 DB.

Payment in respect of exposing the services by means of hand excavation as described above, will be made in accordance with sub clause PSD 8.3.8.1.

Payment in respect of reinstating layerworks in roadways will be made in accordance with sub clause 8.3.6.1 of SABS 1200 DB (as amended)."

##### **PSD 5.1.2.3 Protection of cables**

*Replace sub clause 5.1.2.3 with the following:*

##### **5.1.2.3 Protection during construction**

Further to the requirements of sub clause 5.4.2 of SABS 1200 A (as amended), major excavating equipment and other plant shall not be operated dangerously close to known services. Where necessary, excavation in close proximity to known 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.

Should any service not being a known service be discovered or encountered during the course of the Contract, the Contractor shall, in addition to complying with the requirements of sub clause 5.4.2 of SABS 1200 A (as amended), immediately notify the Engineer thereof and implement such measures as will prevent damage of such service or, if it was damaged in the course of discovery, will prevent and minimise the occurrence of any further damage occurring."

##### **PSD 5.1.2.4 Negligence**

*Add the following:*

The penalty payable by the contractor is to be calculated by the engineer using the contractors tendered rates to replace the damaged service to functional working order. This includes, but is not limited to, excavation, bedding, piping and any other affected manholes, special fittings or ancillaries

**PSD 5.1.3 Stormwater and groundwater**

*Add the following:*

"The Contractor shall, where applicable and at the earliest practicable opportunity, install the permanent drainage specified or shown on the Drawings and shall at his own cost provide the temporary drainage required to protect the works."

**PSD 5.1.5 Reinstatement and maintenance of roads**

*Add the following:*

"Where crossings have been made, the roads shall be reinstated in accordance with the details specified in sub clause 5.9 of SABS 1200 DB."

**PSD 5.2 METHODS AND PROCEDURES**

**PSD 5.2.2 Excavation**

**PSD 5.2.2.1 Excavation for general earthworks and for structures**

*Add the following to paragraph (b):*

"When the nature of the material precludes the above procedure, additional excavations shall be carried out to provide working space for the erection of formwork. The tendered rate for item 8.3.5 will be deemed to include the cost of a working width of 600 mm, but the Contractor may excavate a greater working width at no additional cost to the Employer."

*Replace the first sentence of paragraph (e) with the following:*

"Where excavations have been carried below the authorised levels, the Contractor shall backfill such excavations to the correct level with approved gravel compacted to 90% of modified AASHTO density or to the density of the surrounding material, whichever is the higher density.

Where excavations for structures have been carried out in hard material, the Engineer may direct that over-excavation be backfilled with weak concrete if there is a danger of settlement or differential settlement of the foundations.

Where the sides of excavations against which concrete is to be cast have been over-excavated or have collapsed partially, the Contractor shall re-trim the excavations if necessary and, unless other remedial measures are agreed to by the Engineer, shall cast the concrete for the structure, including the additional concrete that may be required as a result of the over-excavation or partial collapse. The cost of the additional concrete or remedial measures shall be for the Contractor's account."

**PSD 5.2.2.3 Disposal**

*Replace the contents with the following:*

"The Contractor shall not waste, spoil or stockpile material without approval. Provision will be made to dispose of material at spoil sites designated by the Engineer or at sites selected by the Contractor.

The Contractor shall provide all necessary spoil sites for the spoiling of all surplus and unsuitable materials and shall make the necessary arrangements with the owner of the site where the material is disposed of, and pay all charges and levies as may be applicable for the use of such spoil sites.

Every spoil site provided by the Contractor shall be approved by the local authority in whose area it is located, and the spoiling shall comply with the applicable statutory and municipal regulations as well as the requirements of the owner of the spoil site.

Payment to the Contractor in respect of locating and making arrangements for suitable spoil sites and spoiling material at the such sites will be made in accordance with the provisions of sub clause PSD 8.3.15."

***Add the following sub clause in sub clause 5.2.2:***

#### **5.2.2.4 Selection and stockpiling**

Approval or designation of the material in a particular borrow pit or excavation for a particular purpose does not imply that all the material in the borrow pit or excavation is suitable for the particular purpose to which the said approval or designation relates, nor that all material in the borrow pit or source should be used for the particular purpose. The Contractor shall select suitable material from that borrow pit or source, discard unsuitable material and reserve material for other purposes as necessary. Should the topsoil stockpile be contaminated with other material, the contaminated material will be disposed of at the Contractor's expense.

The Contractor shall organise and carry out his operations in such a manner as will prevent the contamination of suitable embankment and backfill material with unsuitable materials. Any excavated material which becomes, in the Engineer's opinion, unsuitable for use in embankments or backfill as a result of contamination, shall be disposed of in a manner acceptable to the Engineer and shall be replaced by the Contractor with materials acceptable to the Engineer, all at the Contractor's cost.

When required, or when ordered by the Engineer, material shall be stockpiled for later use. The additional costs for stockpiling material shall be paid to the Contractor in accordance with the provisions of sub clause PSD 8.3.14."

#### **PSD 5.2.5 Transport for earthworks**

##### **PSD 5.2.5.1 Freehaul**

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

"All material imported from commercial sources or from borrow pits selected by the Contractor will be regarded as freehaul.

The transport of all excavated materials, which both originates and is placed within the Freehaul Boundary, shall be deemed to be freehaul, the cost of which is included in the Contractor's tendered rates and prices for the excavation of the materials.

The freehaul boundary is to be taken as the site boundary, as indicated on drawing no. BMK-1619-P2-000-000."

##### **PSD 5.2.5.2 Overhaul**

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

"Transportation of all material that is not considered freehaul in terms of PSD 5.2.5.1 will be regarded as overhaul.

When transporting material with overhaul, the freehaul distance covered will not be included in the overhaul distance.

The Contractor shall not incur overhaul expenses without prior approval from the Engineer, and the route taken to transport material must be approved by the Engineer."

## **PSD 7 TESTING**

### **PSD 7.2 TAKING AND TESTING OF SAMPLES**

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

"The Contractor shall arrange with the approved independent laboratory engaged by the Contractor in terms of PSA7.2 of the Project Specifications to carry out sufficient tests on a regular basis as agreed between him and the Engineer to determine whether the degree of compaction, and, where applicable, the quality of materials used, comply with the Specifications and shall submit the results of these tests to the Engineer in a form approved by him. The test frequency shall be that specified in SABS 1200DM 7.2 as amended in the Project Specification.

The compaction requirements for fills shall be deemed complied with when at least 75% of the dry-density tests on any lot show values equal to or above the specified density and when no single value is more than five percentage points below the specified value."

## **PSD 8 MEASUREMENT AND PAYMENT**

### **PSD 8.2 COMPUTATION OF QUANTITIES**

#### **PSD 8.2.2**

*Add the following at the end of the first sentence:*

"... or using computer aided design and modelling programs."

### **PSD 8.3 SCHEDULED ITEMS**

#### **PSD 8.3.1 Site preparation**

*Replace sub clauses 8.3.1.1 and 8.3.1.2 with the following:*

"Where site preparation such as clearing, grubbing, the removal of large trees or the removal and stockpiling of topsoil is required, the provisions and scheduled items of SABS 1200 C shall apply."

#### **PSD 8.3.6 Overhaul**

*Add the following:*

Reference is made to clause PSD 5.2.5.2

#### **PSD 8.3.8 Existing services**

##### **PSD 8.3.8.1 Location**

*Replace item 8.3.8.1 with the following:*

##### **PSD 8.3.12 Road traffic signs and markings**

*Replace the word "Separate" in the first sentence of item 8.3.12 with the following:*

"Where the Engineer requires the provision of road traffic signs and/or road markings and/or any other measures additional to those to be provided by the Contractor in accordance with sub clause 5.1.6, separate ...".

***Add the following items in sub clause 8.3:***

**PSD 8.3.15 Extra over items PSD 8.3.2(b) and PSD 8.3.3 for disposing of**

Spoil material on a site provided by the Contractor ..... Unit: m<sup>3</sup>

The unit of measurement shall be the cubic metre measured in accordance with sub clause 8.2 of SABS 1200 D of surplus and/or unsuitable material disposed of, on the instruction of the Engineer, at a spoil site or spoil sites provided by the Contractor.

The tendered rate shall include full compensation for the additional cost of providing a spoil site or other means of disposing of surplus spoil material, for transporting the material regardless of the distance involved, for acceptance charges for such material and for all other incidental costs to dispose of the spoil material."

**PSDA      EARTHWORKS (SMALL WORKS)**

**PSDA 5      CONSTRUCTION**

**PSDA 5.2      METHODS AND PROCEDURES**

**PSDA 5.2.6 Transport for Earthworks**

*Replace the contents of the item with:*

“The transport for earthworks will be as per PSD 5.2.5.”

**PSDA 8      METHODS AND PAYMENT**

**PSDA 8.3      SCHEDULED ITEMS**

**PSDA 8.3.3 Overhaul**

*Replace the contents of the item with:*

“Overhaul will be as per PSD 8.3.6.”

**PSDB EARTHWORKS (PIPE TRENCHES)**

**PSDB 3 MATERIALS**

**PSDB 3.5 BACKFILL MATERIALS**

*Add the following paragraphs to sub clause 3.5:*

"(c) Cement-stabilized backfilling

Backfilling shall, where directed by the Engineer, be stabilized with 5% cement. The aggregate shall consist of approved soil or gravel containing stones not bigger than 38 mm and with a plasticity index not exceeding 10.

The soil or gravel shall be mixed with 5% cement and shall be compacted in layers of 100 mm thick to 90% of modified AASHTO density unless specified otherwise.

(d) Soilcrete backfilling

The aggregate for soilcrete shall be mixed with 5% cement and shall consist of approved soil or gravel containing stones not bigger than 38 mm and with a plasticity index not exceeding 10.

The soil or gravel shall be mixed in a concrete mixer with the cement and enough water to acquire a consistency that allows the mixture to be placed with vibrators to fill all voids between the pipe and the sides of the trench. Shuttering shall be used where necessary."

**PSDB 3.7 SELECTION**

*Replace the first sentence of the second paragraph with the following sentence:*

"The Contractor is required to use selective methods of excavating and if required, shall at his own cost, screen, wash or otherwise treat excavated material in order to produce material suitable for the bedding."

**PSDB 5 CONSTRUCTION**

**PSDB 5.1 PRECAUTIONS**

**PSDB 5.1.5 Removal of existing pipelines**

Where existing pipes have to be removed, they shall be carefully opened up by machine excavation to 300 mm above the pipes after which the whole pipe shall be fully exposed by means of hand excavation. The excavation width shall comply with sub clause 8.2.3.

The pipes shall be removed from the trench in a manner approved by the Engineer, and brought to the surface for inspection by the Engineer.

Pipes that are declared suitable for reuse and pipes declared unfit for reuse shall be dealt with in an applicable manner described in the specifications, or on the Drawings or on the Engineer's instructions, as relevant."

**PSDB 5.2 MINIMUM BASE WIDTHS**

*Replace paragraph (a) with the following:*

"Where two pipes are placed in the same trench, they shall be 300 mm apart or as indicated on the Drawings and the specified side allowance shall still be applicable."

*Add the following after paragraph b)*

"The above is not applicable to trenches for subsurface drains or ducts.

Trenches for subsurface drains shall be excavated to the dimensions and gradients shown on the Drawings or directed by the Engineer.

The specified width of trenches and the width of the excavation measured for payment shall not be less than 0,5 m, but the Contractor may reduce the actual width with the Engineer's permission. For trenches less than 600mm deep the side allowance may be reduced to 150mm."

#### **PSDB 5.4 EXCAVATION**

*Add the following:*

"Except where otherwise specified, trenches shall be of such a depth that the minimum cover over the pipes shall be 800 mm in servitudes, 1000 mm in road reserves and 1200 mm in the roadway itself.

#### **PSDB 5.6 BACKFILL**

##### **PSDB 5.6.3 Disposal of soft excavation material**

*Replace the words "unless otherwise required in the project specification." at the end of sub clause 5.6.3 with:*

"... or to spoil in accordance with the requirements of sub clause PSD 5.2.2.3, as instructed by the Engineer."

*Add the following new sub clauses in clause 5:*

#### **PSDB 5.11 REMOVAL OF EXISTING PIPES**

Where shown on the Drawings or where so instructed by the Engineer, the Contractor shall excavate, expose and remove from the ground, existing water pipelines.

If instructed by the Engineer, the Contractor shall, before commencing with the excavation of the pipeline, expose the pipeline to be removed by means of careful hand excavation at positions agreed with the Engineer, in accordance with the requirements of sub clause PSA 5.4. Measurement and payment for locating the exact positions of the pipelines where required by the Engineer shall be made in accordance with and under item PSD 8.3.8.1.

Thereafter, the existing pipelines to be removed shall be carefully opened up by machine excavation to a depth of not more than 300 mm above the pipes after which the whole pipeline shall be fully exposed by means of careful hand excavation. The excavation width shall comply with sub clause 5.2.

The pipes and all specials encountered (e.g., bends, valves, valve box covers and the like) shall be removed from the trench in a manner as to avoid causing damage and as approved by the Engineer, cleaned sufficiently as to allow inspection of the pipes and specials by the Engineer and stacked in such a manner as will facilitate the inspection of each pipe and special by the Engineer.

Pipes and specials declared suitable by the Engineer for reuse shall be transported to the Contractor's store/yard (for collection by the Employer), where they shall be off-loaded and neatly stacked to the satisfaction of the Engineer. The Contractor shall be responsible for obtaining a written receipt of all pipes so delivered to the Employer's store/yard.



Pipes and specials which are declared unsuitable by the Engineer for reuse shall be transported to a spoil site and covered with spoil material to a depth of not less than 300 mm.

After removal of the pipelines, the trenches shall be backfilled using the excavated material and compacted to 90% modified AASHTO density. The provisions of sub clauses 5.6 and 5.7 shall apply.

#### **PSDB 5.12 REMOVAL OF EXISTING CABLES**

Where shown on the Drawings or where so instructed by the Engineer, the Contractor shall excavate, expose and remove from the ground, existing electrical cables. All cables shall be treated as being live until they have been confirmed by the electrical department as being dead.

If instructed by the Engineer, the Contractor shall, before commencing with the excavation of the cables, locate the cover slabs and expose the cable to be removed by means of careful hand excavation at positions agreed with the Engineer, in accordance with the requirements of sub clause PSA 5.4. Measurement and payment for locating the exact positions of the pipelines where required by the Engineer shall be made in accordance with and under item PSD 8.3.8.1.

Thereafter, the Electrical department is to be called to inspect and confirm the status of the cables. On confirmation that they are not live, the cables to be removed shall be carefully opened up by machine excavation to a depth of not more than 300 mm above the cables after which the whole cable shall be fully exposed by means of careful hand excavation. The excavation width shall comply with sub clause 5.2.

The cable shall be removed from the trench and coiled in a manner as to avoid causing damage and as approved by the Engineer, cleaned sufficiently as to allow inspection by the Engineer and stacked in such a manner as will facilitate the inspection of each cable by the Engineer/Electrical department.

Cables declared suitable for reuse by the Engineer shall be transported to the Local Authority's store/yard, where they shall be off-loaded and neatly stacked to the satisfaction of the Engineer. Cables that are unsuitable for reuse may be cut into suitable lengths and shall be transported to the Local Authority's store/yard. The Contractor shall be responsible for obtaining a written receipt of all pipes so delivered.

#### **PSDB 8 MEASUREMENT AND PAYMENT**

##### **PSDB 8.3 SCHEDULED ITEMS**

##### **PSDB 8.3.2 Excavation**

- (a) Excavate in all materials, for trenches, backfill compact and dispose of surplus material

*Replace "of 1,0 m" in the first sentence of 8.3.2(a) with:*

*"as specified in the Schedule of Quantities."*

*In the third paragraph add the word "shoring" after "...excavation,"*

- (b) Extra over item (a) above for:

*Add the following at the end of the existing subitem 2:*

*"No payments will be made under subitems (1) and (2) in respect of any materials measured and paid for under subitem 3 below."*

**PSDB 8.3.3.4 Overhaul**

*Replace the contents of the item with:*

"Overhaul will be as per PSD 8.3.6."

**"PSDB 8.3.8 Existing Services**

*Add the following*

*Excavate by hand in all materials to expose*

- (a) Stormwater Services ..... Unit: m<sup>3</sup>
- (b) Sewer Services ..... Unit: m<sup>3</sup>
- (a) Water Services ..... Unit: m<sup>3</sup>

The unit of measurement shall be the cubic metre of material excavated by hand at the request of the engineer for the exposure of existing pipelines, measured in place according to the authorised dimensions. Depth shall be measured from the ground surface on the centreline of the pipeline/cable to the invert level of the cable or pipe barrel.

The tendered rate shall include for:

- i) Care in excavation necessitated by the presence of such service.
- ii) Protection and maintenance of such service in operation by means of temporary supports or shoring as necessary
- iii) Delays/disruptions of the progress of the works due to the existence of the service
- iv) Repairs necessitated by damage caused by the contractor
- v) Backfilling and compacting the trench as directed by the engineer and in accordance with SANS 1200 LB Bedding

## **PSDK GABIONS AND PITCHING**

### **PSDK 3 MATERIALS**

#### **PSDK 3.1 GABIONS**

##### **PSDK 3.1.2 Gabion cages**

*Add the following:*

"The applicable specifications shall be:

Wire:	SABS 675 – 1993
Zinc coating:	SABS 675 – 1993
PVC coating:	SABS 1580 – 2001
Wire mesh:	SABS 1580 – 2001"

#### **PSDK 3.2 PITCHING**

##### **PSDK 3.2.1 Stone**

*Replace the contents of table 2 with the following:*

"TABLE 2: SIZE AND MASS OF INDIVIDUAL STONES FOR PITCHING

1	2	3	4
Size/mass of pitching	Thickness of pitching (mm, min)	Least dimension (mm, min)	Mass (kg, min)
Extra heavy	600	300	180
Heavy	400	190	50
Medium	300	150	27
Light	200	110	11

"

## **PSDK 5 CONSTRUCTION**

### **PSDK 5.3 PITCHING**

#### **PSDK 5.3.3 Grouted pitching**

*Replace the words "(table 4)" in the second line of the second paragraph with "(table 2)".*

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**PSDM EARTHWORKS (ROADS, SUBGRADE)**

**PSDM 3 MATERIALS**

**PSDM 3.2 CLASSIFICATION FOR PLACING PURPOSES**

**PSDM 3.2.3 Selected layer**

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

"The following requirements shall apply in respect of the selected layer:

- (a) Maximum particle size: 60% of compacted layer thickness
- (b) Unstabilized selected layer
- (i) Upper selected layer

Minimum CBR at 95% of modified AASHTO density: 15

Maximum PI: 12 (the Engineer has the right to alter this requirement to 3 x the grading modulus + 10)

- (ii) Lower selected layer

Minimum CBR at 93% of modified AASHTO density: 7

Maximum PI: 12 (the Engineer has the right to alter this requirement to 3 x the grading modulus + 10)

**PSDM 5 CONSTRUCTION**

**PSDM 5.2 METHODS AND PROCEDURES**

**PSDM 5.2.2 Cut and borrow**

**PSDM 5.2.2.3 Use of material**

*Add the following paragraph:*

- "(e) Commercial sources

The provisions of sub clause PSD 5.2.2.5 of SABS 1200 D as amended shall apply."

**PSDM 5.2.2.6 Catchwater mounds and channels and mitre banks and channels**

*Add the following sentence:*

"Catchwater mounds and mitre banks shall be compacted to a minimum density of 90% of modified AASHTO density."

**PSDM 5.2.3 Treatment of the road-bed**

**PSDM 5.2.3.2 Removal of unsuitable ground**

*Replace the second sentence of paragraph (a) with the following:*

"The excavated spaces shall then be backfilled with approved imported material compacted to the required density."

*Add the following sentence to paragraph (b):*

"Unsuitable excavated material will be paid for as cut to spoil."

**PSDM 5.2.3.3 Treatment of road-bed**

*Add the following paragraph:*

"(c) Three-pass roller compaction

Any portion of the roadbed that is shown on the Drawings or is specified or is directed by the Engineer to be given three-pass roller compaction because of its inadequate natural density, shall be prepared by shaping where necessary and compacting with a roller, complying with the requirements specified below.

Compaction shall comprise three complete coverages by the wheels of the specified roller over every portion of the area that is being compacted. While it is not the intention that the Contractor should apply water to the roadbed for this type of compaction, and while no rigid moisture control will be exercised during compaction, the Contractor shall nevertheless satisfy the Engineer that everything is being done to take full advantage of favourable soil moisture conditions during the rainy season, and that such compaction is as far as possible carried out when the roadbed is neither excessively dry nor excessively wet.

The Engineer has the authority to decide when conditions are favourable for compaction and where such compaction is to be carried out at any particular time. He has the right to instruct the Contractor to water the roadbed at the Contractor's expense when, in the opinion of the Engineer, the Contractor failed, neglected or refused to make use of the favourable conditions.

The rollers to be used for roller-pass compaction shall conform to the following requirements:

Grid roller: The grid roller shall have a mass of not less than 13,5 t when ballasted, shall be loaded to this mass if required, and shall be moved at a speed of not less than 12 km/h.

Vibratory roller: The vibratory or pneumatic roller shall be capable of exerting a combined static and dynamic force of not less than 120 kN/m width for every metre of loose-layer thickness at an operating frequency not exceeding 25 Hz and shall move at a speed not exceeding 4 km/h."

**PSDM 5.2.4 Fill**

**PSDM 5.2.5 Selected layer**

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

"Except with regard to density, the requirements of sub clause 5.2.4 shall apply. The degree of compaction shall be:

Upper selected\* : 95% of modified AASHTO density

Lower selected\* : 93% of modified AASHTO density."

**PSDM 5.2.6 Gravel surfacing**

*Replace the third sentence of this sub clause with the following:*

"The relevant requirements in sub clause 5.2.4.2 shall apply, except that the material shall be compacted to 93% of modified AASHTO density."

**PSDM 5.2.8 Transport**

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

"The transport for earthworks will be as per PSD 5.2.5."

**Add the following sub clause:**

**PSDM 5.2.9 Maintenance of haul roads**

The Contractor shall maintain the haul roads to a condition that suits the type of vehicle and frequency of use. This shall include the control of dust by means of dust suppression agents (approved by the Engineer) and/or the watering of the road.

Furthermore, the Contractor shall grade/blade the road to restore the crossfall, remove corrugations, etc. The stormwater drainage on the road is to be maintained to drain the road by means of cleaning side and mitre drains and removing any debris in pipes under the roads."

## **PSDM 7 TESTING**

### **PSDM 7.3 ROUTINE INSPECTION AND TESTING**

#### **PSDM 7.3.2**

TABLE 2: DENSITIES

*Replace the contents row for "Selected layer (unstabilized)" with*

"

1	2	3	4	5
Layer	Specified density (% of modified AASHTO density)	Number of tests per lot	Average density, %	Minimum density for any single test, %
Upper selected layer and gravel wearing course	95	3 and 4 5 6	95,1 95,4 95,6	92,4 92,2 92,0
Lower selected layer	93	3 and 4 5 6	93,1 93,4 93,6	89,4 89,2 89,0

"

## **PSDM 8 MEASUREMENT AND PAYMENT**

### **PSDM 8.2 COMPUTATION OF QUANTITIES**

*Replace sub clauses 8.2.1 to 8.2.3 (inclusive) with the following:*

**PSDM 8.2.1** The provisions of sub clause 8.2.1 of SABS 1200 D shall apply.

**PSDM 8.2.2** The provisions of sub clause 8.2.2 of SABS 1200 D shall apply.

**PSDM 8.2.3** The provisions of sub clause 8.2.2 of SABS 1200 D shall apply."

#### **PSDM 8.2.5 Verifying quantities**

*Replace the first sentence with the following:*

"Before any earthworks are commenced but after completion of any site preparation, the Engineer will, upon a written request from the Contractor, provide cross-sections for the purpose of measurement of earthworks quantities.

A survey, which is approved by the Engineer, shall be carried out, at the Contractor's expense, once site preparation has been completed to confirm the volume of topsoil removed and determine measurement of the earthworks quantities."

### **PSDM 8.3 SCHEDULED ITEMS**

#### **PSDM 8.3.2 (a) Preparation & stripping of site/removal of topsoil to stated depth, stockpiling and maintaining**

Remove preparation and stripping of site

*Add the following:*

"The rate shall cover the cost of removing topsoil, together with vegetation and small roots as occur within the specified depth, and of loading, transporting and stockpiling the material within the Freehaul distance. Furthermore, the rate shall include for the selection and removal of

topsoil to a depth of up to 300mm and in isolated areas to a greater depth. Topsoil should be removed in 100mm depth ranges to ensure no contamination of the topsoil with underlying unsuitable material. Any topsoil placed in the designated topsoil sites that is contaminated with other material will be removed and disposed of at a location determined by the Contractor, and at the Contractor's expense."

### **PSDM 8.3.3 Treatment of roadbed**

- (a) Roadbed preparation and compaction of material to

*Add the following:*

"The unit of measurement shall be the cubic metre of material recompacted as specified and the volume shall be determined from levelled cross-sections on which are superimposed the levels to which the roadbed is to be constructed. The roadbed is to include sidewalks. When material is imported to make up the required volume, such material will be paid for as cut or borrow to fill as relevant."

*Add the following:*

- (c) Three-pass roller compaction:

- (i) Grid roller ..... Unit: m<sup>2</sup>  
(ii) Vibratory roller ..... Unit: m<sup>2</sup>

The units of measurement shall be the square metre of roadbed compacted as specified in sub clause PSDM 5.2.3.3(c) for the areas designated by the Engineer.

The tendered rates shall include full compensation for shaping the areas, providing the rollers and compacting the roadbed by means of three roller passes over the entire area."

The engineer may increase or decrease the number of roller passes, in which case, payment will be adjusted in accordance with item PSDM 8.3.20

### **PSDM 8.3.4 Cut to fill, borrow to fill**

*Replace the last sentence of this item with the following:*

"The unit of measurement shall be the cubic metre of fill and the volume will be calculated in accordance with the authorised dimensions of the embankment and levelled cross-sections.

The tendered rates shall include full compensation for excavating the material as if in soft material, for selecting, loading, transporting for the free-haul distance, off-loading, watering, mixing, shaping (including benching) and compacting the material as specified. Borrow to fill in this item relates to material from designated borrow areas (provided by the Employer).

Where it is required that material be obtained from commercial sources, payment for procuring the material will be included in the rate."

*Add the following:*

- (c) Compacted to 93% of modified AASHTO density ..... Unit: m<sup>3</sup>

### **PSDM 8.3.5 Selected layer**

*Add the following:*

"Provision is made for material supplied from the various sources eg excavation, other excavations, borrow or commercial source. Item 8.3.6 shall not apply to material from commercial sources

- (a) Compacted to 93% of modified AASHTO density ..... Unit: m<sup>3</sup>  
(b) Compacted to 95% of modified AASHTO density ..... Unit: m<sup>3</sup>

(c) Compacted to 100% of modified AASHTO density ..... Unit: m<sup>3</sup>

The unit of measurement shall be the cubic metre and the quantity will be calculated from the authorised dimensions of the compacted layer.

The tendered rates shall include full compensation for excavating the material as if in soft material for loading, transporting, off-loading, spreading, watering, mixing, breaking down and compacting the layer."

**PSDM 8.3.3.12 Overhaul**

*Replace the contents of the item with:*

"Overhaul will be as per PSD 8.3.6."

***Add the following sub clause:***

**PSDM 8.3.21 Maintenance of haul roads..... Unit: Sum**

Reference should be made to PSDM 5.2.9. The rate shall be the kilometre of road maintained per month. The rate shall include for all plant, equipment and labour to maintain the road and shall also include for the transport of the water.

Should material be required to reinstate the gravel wearing course, the provision thereof will be paid for under this item."



**PSG CONCRETE (STRUCTURAL)**

**PSG 3 MATERIALS**

**PSG 3.2 CEMENT**

**PSG 3.2.2 Alternative types of cement**

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

"Only CEM I 42,5 (Portland cement) or CEM II/A-V 42,5 (Portland fly ash cement) according to (SANS 50197-1), may be used. The cement may not consist of more than 20% siliceous fly ash blended with the OPC (Ordinary Portland Cement). Should the Contractor wish to use any other type of cement, he shall obtain the Engineer's prior written approval (see 8.1.3.2 and 8.1.3.3)."

**PSG 3.2.3 Storage of cement**

*Add the following:*

"Cement shall not be stored for longer than 12 weeks without the Engineer's permission."

**PSG 3.4 AGGREGATES**

**PSG 3.4.3 Storage of aggregates**

*Add the following:*

"When aggregates of different chloride content are stored on the site, their use in the various classes of concrete shall be strictly controlled."

*Add the following sub clause:*

**PSG 3.4.4 Aggregate of dolomitic origin**

Aggregates for structural concrete shall be of dolomitic origin. The quantity of insoluble matter in respect of concrete made with aggregates of dolomitic origin, determined according to the method described in SABS 677, Appendix C, shall not be more than 15%."

*Add the following sub clauses:*

**PSG 3.11 BUTYL RUBBER OR POLYMER SEALING STRIPS**

The dimensions of the sealing strip for use in the structures are shown on the drawings. The strips shall be permanently bonded to the prepared concrete surface in accordance with the manufacturer's specifications.

The strip shall have a breaking elongation of not less than 300% and a tensile strength of not less than 4 MPa as per manufacturer's specification.

The completed joint shall be guaranteed 100% watertight and resistant to the long-term effects of the retained aqueous liquid."

**PSG 4 PLANT**

**PSG 4.1 GENERAL**

**PSG 4.5 FORMWORK**

**PSG 4.5.1 Design**

*Add the following:*

"All formwork or scaffolding required for any part of the works shall be designed by a Professionally Registered Engineer on behalf of the Contractor, and before commencing with

the erection of any formwork or scaffolding, the Contractor shall submit the methods he proposes to use to the Engineer for approval. The Engineer has the authority to order alterations to the design or the sizes of any part of the formwork or scaffolding. The Contractor shall check the safety and suitability of all such alterations. The fact that the Engineer has approved or altered any part of the formwork or scaffolding shall not be construed as relieving the Contractor of his responsibility with regard to the strength and stability of the formwork or scaffolding."

**PSG 5 CONSTRUCTION**

**PSG 5.1 REINFORCEMENT**

**PSG 5.1.2 Fixing**

*Add the following:*

"The Engineer will inspect the reinforcing after it has been fixed in place, the formwork has been cleaned, cover blocks have been positioned, and before concreting commences.

Welding of reinforcing steel will not be permitted."

**PSG 5.1.3 Cover**

*Add the following:*

"The distance between pipes in the concrete and the reinforcing steel shall nowhere be less than 40 mm or 5 mm plus the maximum size of the coarse aggregate, whichever is the largest, unless otherwise specified on the drawings."

**PSG 5.2 FORMWORK**

**PSG 5.2.1 Classification of finishes**

(c) Special

*Add the following:*

"This finish is obtained by first giving the surface a smooth finish with the joints between formwork panels forming an approved regular pattern suitable for the appearance of the structure. All projections shall then be removed, irregularities repaired and the surface rubbed or otherwise treated until it is smooth with an even texture, appearance and colour.

If the finish of exposed surfaces does not comply with the requirements for uniformity of the texture and appearance, the Contractor shall, when instructed to do so by the Engineer, rub down the exposed surfaces of the entire structure or any part thereof as specified below, entirely at his own cost. All repairs must be completed before the rubbing commences.

The surface shall be saturated with water for at least one hour. The initial rubbing of the face shall be carried out with a medium coarse carborundum stone together with a small amount of mortar of the same cement/sand ratio as the concrete being repaired. Rubbing shall continue until all form marks, projections and irregularities have been removed and a uniform surface has been obtained. The paste produced by the rubbing shall be kept in place. The final rubbing shall be carried out with a fine carborundum stone and water. This rubbing shall continue until the entire surface has a smooth, even texture and is uniform in colour. The surface shall subsequently be washed with a brush to remove surplus paste and powder."

**PSG 5.2.5 Removal of formwork**

*Add the following sub clause:*

**PSG 5.2.5.7 The Contractor shall make provision for the continued support of beams and slabs while the formwork is being removed and/or for back propping of beams and slabs."**

**PSG 5.3 HOLES, CHASES AND FIXING BLOCKS**

*Add the following:*

"Cover blocks for reinforcing and fixtures may be placed into the concrete provided that neither the strength nor any other desirable characteristic (such as the appearance) of the concrete section is affected or impaired in the opinion of the Engineer.

The holes or cavities left by ferrule heads in the concrete of water-retaining structures shall be filled with an approved non-shrink grout applied strictly in accordance with the manufacturer's specifications."

**PSG 5.5 CONCRETE**

**PSG 5.5.1 Quality**

**PSG 5.5.1.5 Durability**

The exposure conditions of the concrete are classified as "severe".

**PSG 5.5.1.7 Strength concrete**

*Add the following:*

"The concrete strength requirement will suffice unless specific concrete characteristics are required e.g. water retaining structures in which case the concrete mixes shall be designed by the Portland Cement Institute or a similar approved laboratory."

**PSG 5.5.3 Mixing**

**PSG 5.5.3.2 Ready-mixed concrete**

*Add the following:*

"Ready-mixed concrete may be used on the Site. The Contractor shall take samples for testing from every load delivered to the Site."

**PSG 5.5.5 Placing**

*Add the following:*

"Concreting of the wall between horizontal construction joints shall be carried out in both directions from a point on the wall in order to close the gap with fresh concrete."

**PSG 5.5.7 Construction joints**

*Add the following:*

"Horizontal construction joints are permitted in structure walls in positions indicated on the drawings or approved by the Engineer. Vertical construction joints in the walls are subject to the written approval of the Engineer and the cost of all such vertical or horizontal construction joints will be deemed to be included in the rates for cast-in-situ concrete. This also applies to the preparation of concrete to form construction joints in flume walls as specified on the drawings.

The construction joints in water-retaining structures shall be made strictly in accordance with the details shown on the drawings. The joints between screeds and concrete floors shall be regarded as construction joints and the surface of the floor shall be prepared as described for construction joints.

Should the Contractor's method of construction necessitate the placing of a construction or other joint in a position not shown on the drawings, such method of construction and position of the joint shall be approved by the Engineer in writing. The cost of such joint shall be included in

the tendered rates and shall include scabbling of the concrete where steel reinforcement is continuous.

The walls shall be cast in lifts of a height that permits each lift to be poured without interruption in one continuous operation during normal working hours.

It is the Contractor's responsibility to ensure that construction joints are watertight. The Contractor's proposed method for ensuring the watertightness of such joints shall be submitted to the Engineer for his approval.

For construction joints at kickers all additional costs for concrete, preparation, etc. will be deemed to be included in the rates tendered for concrete in walls or sides and kicker joints or construction joints will not be measured separately."

#### **PSG 5.5.8 Curing and protection**

*Add the following:*

"The curing methods of retaining the formwork in place or covering with a waterproof membrane are strongly recommended. Concrete will not be paid for unless properly cured and proof of curing is continuously visible on site."

#### **PSG 5.5.10 Concrete surfaces**

*Add the following sub clauses:*

##### **PSG 5.5.10.4**

Where the surfaces of the concrete are to be additionally hardened or protected, the positions of such surfaces and the method to be used will be shown on the drawings and will be scheduled. Materials or products with a ferrous content will not be allowed.

##### **PSG 5.5.10.5 Floor slabs and screeds for settling tanks**

###### **(a) Surface of floor slab below screed**

The top surface of the floor slab is to have a finish which is rough enough for bonding of the screed. This finish and the preparation thereof is to be discussed with the Engineer before the floor slab is cast.

All laitance on the surface of the slab must be removed completely to expose the course aggregate by means of scrubblers, abrasive blasters, hard brooms or a high pressure water jet, immediately after concrete has set.

All joints shall be sealed in the manner shown on the drawings. All dust, debris, etc. must be removed immediately prior to the application of the bonding agent and screed.

###### **(b) Materials**

Only ordinary Portland cement shall be used.

Coarse aggregate maximum size: 10 mm

28-day cube strength: 30 MPa.

A plasticizer approved by the Engineer shall be used to reduce the water content of the mix to an absolute workable minimum.

The mix design shall be submitted to the Engineer for approval.

###### **(c) Placing of screed**

All surface water shall be removed after which Fosroc Nitobond EP slowset bonding agent or similar approved shall be applied strictly according to the manufacturer's specifications. The

screed shall be placed according to the recommendations and/or specifications of the manufacturer of the bonding agent.

The screed shall be placed, spread and compacted in one layer and care shall be taken to obtain maximum compaction. After the screed has been compacted and before the surface is power floated, angle irons fixed to the mechanical equipment shall be used to finish off the screed to the correct levels.

Power floating shall not commence until such time as the screed surface has lost its sheen and barely shows footprints. All laitance on the surface of the screed resulting from compaction shall be struck off prior to power floating. Too much floating causing excessive cement-water paste to surface, shall be avoided.

Curing shall commence as soon as finishing operations have been completed and shall be continued for at least 7 days. The method of curing shall be by means of a peripheral pipe directly next to the inside face of the wall with water running down the slope of the floor to the centre cone. This shall be discussed with the Engineer. Any alternative curing method must be submitted to the Engineer for approval.

(d) Joints

The joints in screeds shall be constructed according to the details shown on the drawings and must in all cases be aligned with the joints in the floor slab below.

(e) Surface finish of screeds

The finishing-off of the screed shall be done in conjunction with the mechanical contractor to ensure that the surface fits the mechanical equipment. The maximum allowable deviation of the floor from the design level is  $\pm 3$  mm."

***Add the following sub clauses:***

**PSG 5.5.16 Applied loads**

No crushed-stone covering or any other loads shall be placed on the roof of the structure before the concrete has attained its design strength, unless approved supports are provided.

**PSG 5.5.17 Pipes and conduits**

All pipes passing through concrete floors, walls or slabs shall be cast into the concrete member simultaneously with the casting of the member. Openings for pipes shall only be left in the concrete members when so directed by the Engineer or when shown on the drawings. Pipes shall be installed in such openings according to the details shown on the drawings.

If watertightness is a requirement where pipes are cast into walls, floors and slabs, the Contractor shall ensure watertightness where smooth-surfaced pipes are used by using an approved method such as tape wrapping the pipes prior to casting in. The cost of such method will be deemed to be included in the rates tendered.

**PSG 5.5.18 Soilcrete**

Where soilcrete is specified for filling under floor slabs, the soilcrete shall comply with the requirements of sub clause PSDB 3.5(d) of section 1200 DB as amended and shall be placed as specified in the sub clause.

**PSG 5.5.19 Brickwork**

Brickwork shall be carried out as specified for manholes in sub clause 5.6.4 of 1200 LD using bricks conforming to the requirements for bricks in sub clause 3.5.1 of 1200 LD.

**PSG 5.5.20 Plasterwork**

Plasterwork shall consist of a single coat, comprising one application of a 1:6 cement:sand mixture with a woodfloat finish. The thickness of the plaster shall be between 13 and 20 mm. All plaster shall be finished smooth, shall be plumb and corners shall be rounded and square."

## **PSG 6 TOLERANCES**

### **PSG 6.2 PERMISSIBLE DEVIATIONS**

#### **PSG 6.2.3 Specified permissible deviations**

*Add the following:*

"Degree-of-accuracy II is applicable.

Every specified permissible deviation is binding in itself. The cumulative effect of permissible deviations will not be considered. The maximum permissible vertical deviation is subject to the other permissible deviations."

*Replace sub clause 6.2.3(d)(5) with the following:*

"Vertically, per metre of height .....  
subject to a maximum of ....."

Permissible deviation		
Degree of accuracy		
III	II	I
mm	mm	mm
5 50	3 30	2 10

“

Add the following:

"(h) Floors

The maximum permissible deviation from a 3 m long straight line connecting two points on the surface of the finished settling tank floor is  $\pm 3$  mm."

## **PSG 7 TESTS**

### **PSG 7.1 FACILITIES AND FREQUENCY OF SAMPLING**

#### **PSG 7.1.1 Facilities**

*Add the following:*

"The Contractor shall provide sufficient storage capacity for the concrete cubes and shall arrange to have them tested by an approved laboratory.

The cost of all testing, including the cost of sampling, storage and transport of samples shall be included in the rates tendered for concrete work."

### **PSG 7.3 ACCEPTANCE CRITERIA FOR STRENGTH CONCRETE**

*Add the following:*

"Test results obtained from the supplier of ready-mixed concrete will not be accepted for evaluation in terms of sub clause 7.3, but samples for testing shall be taken of such concrete at the point of placing."

## **PSG 8 MEASUREMENT AND PAYMENT**

### **PSG 8.1 MEASUREMENT AND RATES**

#### **PSG 8.1.1 Formwork**

*Delete "or splays over 20 mm x 20 mm" from the first line of paragraph 8.1.1.2.*

*Add the following to paragraph 8.1.1.2:*

"Splays up to and including 25 mm x 25 mm will not be measured separately and will be deemed to be included in the formwork costs."

***Add the following paragraphs:***

**PSG 8.1.1.7**

For construction joints at kickers, all additional costs for formwork to edges up to 300 mm high will be deemed to be included in the rates tendered for vertical formwork to sides of walls and will not be measured separately in narrow widths.

**PSG 8.1.1.8**

No formwork will be measured to edges of blinding layers under structures, and the cost thereof (if needed) will be deemed to be included in the rates tendered for concrete in blinding layers.

**PSG 8.1.1.9**

Back-shuttering or formwork to top revealed surfaces of sloping or conical formwork will only be measured to surfaces of over 40° and up to 85° to the horizontal.

**PSG 8.1.1.10**

Formwork to horizontal surfaces in pump stations, valve chambers, manholes or sumps can either be removed through the manhole cover opening or the Contractor may use permanent formwork at his own cost as no claims in this regard will be considered."

**PSG 8.1.2 Reinforcement**

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

"The unit of measurement for steel bars shall be the ton of reinforcement in place, in accordance with the drawings or as authorised by the Engineer.

The unit of measurement for welded steel fabric shall be the kilogram of fabric reinforcement in place, and the quantity shall be calculated from the net area covered by the mesh, excluding overlaps.

Clips, ties, separators, stools and other steel used for positioning reinforcement will not be measured, unless these are shown on the bending schedules.

The tendered rate shall include full compensation for the supply, delivery, cutting, bending, welding, placing and fixing of the steel reinforcement, including all tying wire, stools, supports and waste."

**PSG 8.1.3 Concrete**

*Delete ", or the plan size of the excavation where additional excavation is provided to facilitate erection of forms" from the second line of paragraph 8.1.3.1(c).*

## **PSL MEDIUM-PRESSURE PIPELINES**

### **PSL 3 MATERIAL**

#### **PSL 3.1 GENERAL**

*Add the following paragraphs:*

"Each type of pipe delivered to the Site shall be of a standard length corresponding to the standard lengths offered by the pipe manufacturer in his catalogue, with a maximum permissible variation in length of  $\pm 2\%$ .

A pipe that is shorter or longer than the defined standard will be rejected by the Engineer, except when such non-standard lengths are required in terms of the Contract and have been specifically manufactured or cut as such by the pipe manufacturer or supplier.

The Contractor shall supply and install all pipes and fittings for the works.

All flanges on flanged couplings shall be drilled in accordance with Table 16 of BS4504.

All bends shall be minimum radius bends unless otherwise specified or indicated on drawings. The specials shall comply with the requirements of SANS Specification 719 unless otherwise specified and shall be manufactured with API schedule 40 pipes. Where specials have to be attached by welding the diameters of the specials shall exactly match those of the pipes supplied.

The Contractor shall supply all other flanges on pipes and specials, suitable for the welding of the pipes and specials in accordance with Table 16 of BS 4504.

Bolts and Nuts shall be in accordance with SABS 1700 unless otherwise approved by the Engineer and shall project two threads beyond the run-out of the nuts. All bolts and nuts and washers shall be hot dip galvanised."

#### **PSL 3.4 STEEL PIPES, FITTINGS AND SPECIALS**

##### **PSL 3.4.1 General**

##### **PSL 3.4.3 Pipes of nominal bore over 150 mm**

*Add the following:*

"All steel pipes shall comply with the eThekweni specifications for materials and coatings to protect against corrosion.

Where flanges are required, they shall comply with the pressure rating of the fittings, SABS 1123 table 1600 unless otherwise indicated on the Drawings."

##### **PSL 3.4.4 Fittings and Specials**

*Add the following:*

The lining and wrapping of specials, which are to be butt-welded, is to be terminated 100 mm from the end of the pipe. The lining of specials which are to be sleeve welded shall be taken to the end of the pipe and the wrapping is to be terminated 100 mm from the end. On flanged specials the wrapping and lining is to be taken to the end of the pipe.

Pipes up to and including 500 mm shall be sleeve welded with the sleeve having a width of 100 mm and the internal diameter being the measured outside diameter of pipe plus 3 mm. The ends of pipes shall be plain finished.

All specials shall be protected in accordance with clauses PSL 3.9.2.3. All electrodes used for welding of joints shall comply with SABS 455.



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### **PSL 3.7 OTHER TYPES OF PIPES**

#### **PSL 3.7.1 uPVC/mPVC pipes**

*Add the following:*

"Pipes used in urban development shall be class 12 pipes and transmission pipes shall be class 12."

#### **PSL 3.7.2 Polyethylene pipes**

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

"Polyethylene pipes shall be HDPE type IV pipes with compression fittings and shall comply with SABS ISO 4427 PE 100, PN 20 or as scheduled."

### **PSL 3.8 JOINTING MATERIAL**

#### **PSL 3.8.2 Flexible Couplings**

*Add the following:*

"Where flexible couplings are called for, they shall be the double flanged and sleeve type, manufactured from rolled steel, and fitted with rubber rings suitable for jointing plain-ended pipes. They shall be of the slip-on type coupling and couplings comprising bolt over arrangements shall not be acceptable.

The rubber jointing rings shall be manufactured from first grade natural rubber to B.S. 2494 Class D. All bolts and nuts shall comply with SABS 135 or SABS. 136. Each sleeve shall be fitted with a centre register unless stated otherwise in the Project Specification.

Each coupling shall permit a repeated movement of 10 mm to cater for thermal expansion and contraction of the pipe, and allow for the following angular deflections:

6° up to and including 600 mm diameter;

5° over 600 mm up to and including 750 mm diameter;

4° over 750 mm up to and including 900 mm diameter;

3° over 900 mm up to and including 1 200 mm diameter;

2° over 1200 mm diameter."

#### **PSL 3.8.3 Flanges and Accessories**

*Add the following:*

"Gaskets shall be manufactured from 'Klinger 200' or other approved material which complies with the requirements for Grade B of B.S. 2815.

All gaskets shall be 3 mm thick and cut so that the annular section is completely within the bolt circle, i.e. ring gaskets with no bolt holes.

All gaskets shall be purpose made. Hand cutting and trimming of gaskets on site will not be acceptable.

Care should be taken to ensure that all gaskets are packed properly and are not damaged by bending. For larger sizes the gaskets shall be suitably supported by wooden frames during transit and while in store.

Any item of pipework that is found to have flanges that are incorrectly drilled shall be rejected. Reaming of bolt holes to oversize dimensions in order to make a particular piece fit shall not be permitted."

### **PSL 3.9 CORROSION PROTECTION**

## **PSL 3.9.2 Steel pipes**

### **PSL 3.9.2.1 Steel pipes of nominal bore up to 150 mm**

*Add the following:*

"Steel pipes shall be galvanized where shown on the Drawings.

Concrete lining to steel pipes shall be in accordance with SABS471 and 1083 and the lining thickness shall be 6mm"

### **PSL 3.9.2.2 Steel pipes of nominal bore over 150 mm**

*Add the following:*

"Steel pipes shall be hot-dip galvanized where shown on the Drawings and as specified in sub-sub clause 3.9.2.1.

Concrete lining to steel pipes shall be in accordance with SABS471 and 1083 and the lining thickness shall be:

Diameter between 150mm and 300mm -10mm thick

Diameter 300mm and over - 12,5mm thick."

### **PSL 3.9.2.3 Repairs to Coatings and Linings**

*Replace the clause with the following:*

"FBMDPE, fusion-bonded epoxy coated and solvent free liquid epoxy lined or cement-mortar lined pipe shall be repaired as specified in this clause.

#### **A. External Repairs**

##### **A1. Detection of Defects in Coating by Holiday Tests**

Each pipe length shall first be placed on suitable dunnage adjacent to the trench. The Contractor shall then arrange for Holiday tests to be undertaken on the accessible portion of the pipe coating surface by the non-destructive testing firm appointed in terms of this contract document or the Engineer's representative, whichever is applicable. It shall be a requirement of this contract that the Holiday testing device utilised be calibrated and approved by the Engineer prior to the conducting of any Holiday tests.

##### **A2. Surface Preparation**

###### **a) Defects in epoxy coating detected by Holiday testing**

At each pinhole detected by the Holiday test, the surrounding area shall be abraded to 25 mm beyond the defective area. It is noted that any cluster of pinholes within a radius of 25 mm shall be regarded as one defect. The abrasion shall be carried out with clean emery paper of 80 to 100 mesh so as to provide a suitably rough surface profile without causing the removal of excessive amounts of coating material.

b) Damage to FBMDPE and epoxy coating caused by welding, damage at joints and bends and damage at scour and air valve tees, crotch plates and buried valves.

i) All damaged and blistered FBMDPE and epoxy coating caused by welding shall be removed back to sound epoxy coating by mechanical grinding or other approved means.

ii) The exposed steel surface shall be power or hand wire brushed to remove dirt, scale, rust and other foreign matter to a surface equivalent to a Class 2 finish. Weld spatter shall be removed by chipping or grinding to a smooth surface flush with the surrounding steel. Welds shall have a smooth contour free from sharp edges, protrusions

and undercut. Sharp edges and protrusions shall be removed by grinding to a smooth radius of curvature of not less than 3 mm.

iii) The surrounding sound FBMDPE and epoxy surface shall be abraded to a distance of 50 mm beyond the defective area. The abrasion shall be carried out with clean emery paper of profile without causing the removal of excessive amounts of protective material.

A3. Cleaning of Area to be Repaired

Grease and oil shall be removed with a non-volatile solvent (e.g., "Aquasolve", "Arc Nr.261 Safety Solvent Cleaner" or similar approved). The surface shall then be cleaned with potable water and allowed to dry completely.

A4. Methods of Repair to be Carried Out

A4a) Defects in epoxy coating detected by Holiday tests

i) The roughened area of coating and the defect shall be repaired by the application of a two-part solventless epoxy repair kit (e.g., "Cupon Hycote 151", "Arc 982" or similar approved) to a minimum dry film thickness of 300 microns. The epoxy repair material shall be applied in accordance with the manufacturer's instructions and allowed to dry for 24 hours.

ii) 24 Hours after the application of the epoxy repair material described above, the pipes may be placed in the trench and rotated so that the underside of the pipe, which was not Holiday tested at the side of the trench, may be tested.

iii) The pipe coating any defects detected on the now uppermost surface of the pipe shall be prepared in accordance with the requirements of A.2(a) and A.3 above.

iv) The prepared surface shall then be primed and patched (or wrapped in the case of the coating reinstatement of joints) with Denso Ultraflex System, or similar approved. The following criteria shall be strictly in accordance with the manufacturer's instructions:

- surface preparation
- application of the primer
- application of the tape
- recommended minimum overlap width (where applicable)
- capping of overlap joints (where applicable).

v) Notwithstanding the above, the tape cover strip shall overlap the sound FBMDPE and epoxy coating by at least 50 mm (in the case of patches) and 100 mm (in the case of joint wraps) and shall be applied in layers if necessary to form a final cover patch or strip at least 2,5 mm thick. The tape repair for FBMDPE defects shall be continuously, spirally wrapped around the complete circumference of the pipe with a minimum overlap of 25 mm.

vi) The dielectric resistance of the tape cover strip shall not be less than that of the FBMDPE (10 000 V) or fusion-bonded epoxy coating (3 500 V).

A4b) Defects in FBMDPE coating detected by Holiday tests

Where the repair area is less than 650 mm<sup>2</sup>, the application of a hot spatula shall be used to repair the defect, provided there is a residual layer of polyethylene still adhering strongly to the steel surface.

A4c) Defects in FBMDPE coating other than those detected by Holiday tests

Any single repair area less than 0.1m<sup>2</sup> shall be carried out in accordance with A.4.b above. The number of repairs shall be limited to three per pipe or fitting. The length of such repair shall not exceed the nominal pipe diameter in the circumferential direction, nor twice the nominal pipe diameter in the longitudinal direction.

A4d) Patch Repairs to Pipes Damaged by Welding

Patch repairs to pipes damaged by welding shall be carried out in accordance with the requirements of A.4.a(iv), A.4.a(v) and A.4.a(vi) above.

A4e) Patch Repairs to Pipes that will be Exposed to Ultra-Violet Light

i) Repairs shall be carried out in accordance with the requirements of A.4.a(i) above with due allowance being made for the 24-hour curing period.

ii) The pipe surface shall then be coated with two coats of "ABE Silvakote" or similar approved bitumen base aluminium paint applied with brush or roller to a final minimum dry film thickness of 80 micrometers. The over coating time shall be as per the manufacturer's instructions.

A4f) Joint repairs (including bends) on pipes that are to be buried

i) Repairs shall be carried out in accordance with the requirements of A.4.a(iv), A.4.a(v) and A.4.a(vi) above.

ii) No air-gap will be permitted between the tape and steel surface and tape width and application tension shall be such as to ensure that the tape "dresses down" over steel surface irregularities. This applies particularly on bell-end pipes.

iii) Gusseted bends requiring two or more welded joints shall be fully externally wrapped extending 150 mm outside the two outermost welded joints.

A4g) Scour and air valve tees and crotch plates

i) Scour and air valve tees and crotch plates that are to be buried shall be protected in accordance with the requirements of A.4.a(i) above with due allowance being made for the 24-hour curing period.

ii) Exposed specials in chambers including valves, flanges, crotch plates, flexible couplings etc shall be protected by the application of "Copon Hycote 151", "Arc 982" or similar approved epoxy coating to a minimum dry film thickness of 300 microns. Surface preparation and application shall be strictly in accordance with the manufacturer's instructions.

iii) When coating valves, care shall be taken to prevent the epoxy coating covering the descriptive name plates and flow direction indicators on the valves by masking off these plates.

A4h) Buried Valves

Buried valves or other appurtenances with intricate shapes will be inappropriate for wrapping with a tape system. Such items shall be protected by the application of a zinc-rich epoxy primer such as "Berger Master", "Zinc Anode 304" followed by two coats of a pitch extended epoxy resin coating such as "Fosroc Nitocote ET550", "Epilux 5 Coal Tar Epoxy" or similar approved to a minimum dry film thickness of 250 microns.

Alternatively, a petrolatum system "Denso" type or similar approved may be employed and then wrapped in polythene sheeting to the approval of the Engineer.

A4f) Repair of 3LPE Coating

The Contractor shall submit to the Engineer its methods and materials proposed to be used for executing a coating repair and shall receive approval from the Engineer prior to use. In open storage the repair coating materials must be able to withstand a temperature of at least (+) 80°C without impairing its serviceability and properties. The Contractor shall furnish manufacturer's test certificates for the repair materials clearly establishing the compliance of the repair materials with the applicable coating requirements. All pipes shall have sound external coating with no holiday or porosity on 100% of the surface. Defects, repairs and acceptability criteria shall be as follows:

- i) Pipes showing porosities or very small damage not picked up during holiday test and having a surface less than 0.5 cm<sup>2</sup> or linear damage (cut) of less than 3 cm shall be repaired by stick using material of same quality.
- ii) Damages caused to coating by handling such as scratches, cuts, dents, gouges, not picked up during holiday test, having a total reduced thickness on damaged portion not less than 2 mm and an area not exceeding 20 cm<sup>2</sup> shall be rebuilt by heat shrink patch only and without exposing to bare metal.
- iii) Defects of size exceeding above mentioned area or holidays of width less than 300 mm shall be repaired with heat shrink repair patch by exposing the bare metal surface.
- iv) Defects exceeding the above and in number not exceeding 2 per pipe and linear length not exceeding 500 mm shall be repaired using heat shrinkable sleeves of HTLP 80 or equivalent.
- v) Pipes with bigger damage shall be stripped and recoated.
- vi) In case of coating defect close to coating cut back, CONTRACTOR shall remove the coating throughout the entire circumference of the pipe down to the steel surface and increase the coating cut back length. Now if the coating cut back exceeds 150 mm of linear length of pipe, then the coating shall be repaired by the use of heat shrink sleeves thereby making up the coating cut back length of 130 mm. Notwithstanding the above, under no circumstances, if the defect exceeds 70 mm from the original coating cut back length, the entire coating shall be removed and the pipe shall be recycled through the entire coating procedure. Irrespective of type of repair, the maximum numbers of repair of coating shall be as follows:
  - vii) Holiday repair of size <100 cm<sup>2</sup> attributable to process of coating application shall be maximum one number per pipe.
  - viii) In addition to the above, defects to be repaired by heat shrink patch/sleeve shall be maximum 2 (two) per pipe.

Defects exceeding the above limits shall cause pipe coating rejection, stripping and recoating. The above is exclusive of the repairs warranted due to testing as per this specification. All repairs carried out to coating for whatever reason shall be to the account of CONTRACTOR.

Cosmetic damages occurring in the polyethylene layer only need not be repaired by exposing up to steel surface, as deemed fit by the Engineer's representative. In any case the CONTRACTOR shall establish his material, methods and procedure of repair that result in an acceptable quality of product by testing and shall receive approval from the Engineer prior to use. Testing of repairs shall be in the same form as testing coating. All repairs shall result in a coating thickness no less than the parent coating thickness. CONTRACTOR shall test repairs to coating as and when required by the Engineer.

**B. Internal Repairs – Epoxy Lined Pipes**

**B1. Detection of Defects in Epoxy Lining by Holiday tests**

Each pipe length shall be first placed in position in the trench, welded to the preceding pipe and the lining at the joint reinstated (see B.2.b of this Clause). Once all work is complete in a particular length of pipe, the Contractor shall arrange for the testing of the pipe with a "wet sponge" detector set at 90 Volts in order to detect any electrical insulation defects.

**B2. Surface Preparation**

**B2a) Defects in epoxy lining detected by Holiday testing**

At each pinhole detected by the Holiday test, the surrounding area shall be abraded to 25 mm beyond the defective area. It is to be noted that any cluster of pinholes within a radius of 25 mm shall be regarded as one defect. The abrasion shall be carried out with clean emery paper of 80 to 100 grit so as to provide a suitably rough surface profile without causing the removal of excessive amounts of coating material.

**B2b) Epoxy lining damaged by construction operations, joint repairs (including bends), lining to scour and air valve tees, access openings, stubs and valve bypasses**

i) In order to avoid damage to the pipe lining occurring as a result of construction activities, all possible care shall be exercised during construction, the following procedures being required:

Wet sacking or rubber matting shall be placed on the pipe invert at areas where welding or flame cutting operations are in progress to prevent damage to coating from weld spatter or molten metal. This requirement shall be strictly enforced.

Foam shall be provided for the placing of tools etc. on the internal pipe surface.

Soft-soled shoes shall be worn by all personnel working inside the pipe.

ii) All damaged and blistered epoxy lining shall be removed back to sound epoxy by mechanical grinding or other approved means.

iii) The exposed steel surface shall then be prepared in accordance with the requirements of section A.2.b(ii) and 1.2.b(iii) of the clause.

**B3. Cleaning of Area to be Repaired**

Grease and oil shall be removed with a non-volatile solvent (e.g., "Aquasolve", "Arc Nr.261 Safety Solvent Cleaner" or similar approved). The surface shall then be cleaned with potable water and allowed to dry completely. To this end adequate ventilation shall be provided.

**B4. Methods to Repair to be Carried Out**

**B4a) Defects in epoxy coating detected by Holiday tests**

i) The roughened area of lining and the defect shall then be repaired by the application of a solvent free epoxy repair material (such as "Cupon Hycote 151", "Arc 982", "Arc 855", or similar approved) to a minimum dry thickness of 300 microns.

A "halo" of 1 to 2 mm of the abraded material shall be left uncovered around the repair.

The patch material shall be of a different colour to the pipe lining material.

ii) In the application of the epoxy the following shall be strictly in compliance with the manufacturer's instructions:

- Method of application (type of brush or roller.)

- Over coating time
  - Temperature range for application
  - Mix proportions of activator to base. This shall be strictly enforced, and splitting of manufacturer-supplied packs shall be allowed only if subsequent blending is carried out strictly by mass to the correct proportions.
  - Method of mixing base and activator.
  - Number of coats to achieve the specified thickness.
  - Safety aspects e.g., eye and hand protection, ventilation, fire precautions, etc.
  - iii) After the repair has been adequately cured, the repair and the surrounding 250 mm of epoxy lining shall be tested for electrical insulation defects. No defects will be permitted.
- B4b) Patch Repairs to Pipes Damaged by Construction Operations and Joint Repairs (including Bends)
- i) The roughened area of lining shall be repaired as described in B.4.a (i) above.
  - ii) The requirements of Clauses B.4.a (ii) and (iii) above shall then be complied with.
- B4c) Lining to scour and air valve tees, access openings, stubs and valve bypasses
- i) The repair procedure shall be as described in B.4.a (i), (ii) and (iii) above.
  - ii) The epoxy repair material shall be applied to overlap the existing sound cement mortar lining by 25 mm at access openings, valve bypasses and scour tees.
- C. Internal Repairs – Cement-mortar Lined Pipes
- C1. The internal surface of the bellmouth is to be power or hand wire brushed from the pipe end to the cement mortar lining to remove dirt, scale, rust and other foreign matter.
- C2. Any grease and oil shall be removed from the pipe surface with a non-volatile solvent (e.g., “Aquasolve”, “Arc Nr 261 Safety Solvent Cleaner” or similar approved). The surface shall then be cleaned with water and dried and a 50 mm wide x 20 mm thick band of “Epidermix 338” or similar approved shall be applied internally on the uncoated steel adjacent to the cement lining.
- C3. The plain end of the adjoining pipe shall be pushed into the bellmouth in such a way that the Epidermix band is compressed and makes contact with the transverse face of the concrete lining of both pipes. The excess lining material which is squeezed into the pipe shall be removed by drawing a plug which is 5 mm smaller in diameter than the bore of the pipe, across the joint. The plug shall be so shaped as to apply a smooth even surface to the lining material at the joint.
- C3b) Pipes larger than 500 mm diameter
1. The exposed steel surface shall be power or hand wire brushed to remove dirt, scale, rust and other foreign matter. Burrs, weld spatter etc shall be filed away.
  2. Any grease and oil shall be removed from the pipe surface with a non-volatile solvent (eg “Aquasolve”, “Arc Nr 261 Safety Solvent Cleaner” or similar approved), flushed with potable water and completely dried.
  3. The joint shall then be made good with “Epidermix 338” or similar approved, neatly formed to meet the adjacent cement mortar.

4. The requirements of Clause C (a).4 shall similarly apply to pipes larger than 500 mm diameter."

**PSL 3.9.6 Corrosive soil**

*Add the following:*

"Where shown on the Drawings, steel pipes in contact with corrosive soil shall be wrapped with Denso tape or an equivalent approved product, strictly in accordance with the manufacturer's instructions."

**PSL 3.10 VALVES**

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

"Valves shall comply with the following requirements:

- (a) They shall close clockwise and shall have a non-rising spindle and handwheel.
- (b) They shall be class 16 valves complying with SABS 664.
- (c) They shall comply with the requirements of SABS 1123 table 1600.
- (d) All valves shall comply with eThekweni specifications."

**PSL 4 PLANT**

**PSL 4.1 HANDLING AND RIGGING**

*Add the following:*

"The Contractor shall supply, operate and maintain an adequate fleet of vehicles including cranes to be used for the safe conveyance of the pipes, specials and fittings. The pipes and specials shall be handled with care at all times to avoid damage to them or to the protective coatings. The equipment for the purpose of loading, transporting, unloading and moving and the manner in which they are handled shall be subject to the approval of the Engineer.

During transport, the pipes and specials shall be supported on suitable pipe saddles such that all pipes and specials shall be separated so as not to bear against each other and shall be handled with care at all times to avoid damage to them or to the protective coatings. The equipment for the purpose of loading, transporting, unloading and moving and the manner in which they are handled shall be subject to the approval of the Engineer.

The use of bare cables, chains, hooks or narrow skids will not be permitted and the Contractor shall supply canvas slings and padded skids and ramps of a sufficient width to prevent damage to the protective coating. The dragging or skidding of pipes and specials in contact with the ground shall not be permitted.

When handling 12m pipe lengths the pipes shall be lifted with band slings (minimum 300 mm wide) placed centrally around pipe at two points 6 metres apart."

**PSL 5 CONSTRUCTION**

**PSL 5.1 LAYING**

**PSL 5.1.1 General**

*Add the following:*

"It is of paramount importance that the right type and class of pipe be laid as shown on the engineering drawings. Invert levels shown on the drawings are the levels of the interior surface of the pipes at the lowest point of cross section. However, levels at vertical curves shall be determined when the exact location of pipe joints within the influence of the curve is known.



Pipes and specials shall be lowered gently and carefully into the trench without jarring or bumping by crane, derrick or other approved lifting tackle and care shall be taken not to damage the pipe or its sheathing. Pipes and specials with soft sheathing shall be supported in stout wide canvas slings and no wooden blocks shall be used to support such pipes, either on the side or in the trench. Any supports required shall be formed with fine sand gravel.

The Contractor shall ensure that all pipe barrels are evenly supported over the whole of their length and that no weight is taken by the joints. The trench bottom, shall, where necessary, be accurately trimmed by hand and each pipe shall be firmly bedded down before backfilling is commenced.

The Contractor's special attention is drawn to the requirements for work in confined spaces and for shoring of trenches.

#### **PSL 5.1.2 Damage**

*Add the following:*

##### "Inspection at the Laying Site

All pipes, specials, valves and fittings shall be carefully examined by the Contractor for internal and external damage at the following stages:

- (a) on arrival at laying site;
- (b) prior to laying;
- (c) after laying;
- (d) prior to backfilling; and
- (e) during backfilling.

All damage or defects of any kind shall be repaired by the Contractor in accordance with Clause 3.9.2.3 and to the satisfaction of the Engineer immediately after detection at any of the above inspections. Where, in the opinion of the Engineer, satisfactory repairs are practicable, the damaged materials shall be replaced by the Contractor at his own cost."

#### **PSL 5.1.3 Keeping Pipelines Clean**

*Add the following:*

"Exposed ends of the pipe in the trench shall be tightly closed by a suitable mild steel end cap at all times when pipelaying is not in progress."

***Add the following sub clause:***

#### **PSL 5.1.5 Stacking of Pipes and Specials**

Where a pipeyard is provided, all pipes and specials shall be neatly and methodically arranged on the ground on delivery, as directed by the Engineer. They shall be segregated according to diameters and working pressures and the various stacks shall be arranged and separated in such a way that a pipe of any diameter and working pressure can be located from the stacked position for transportation to its laying position without necessity of moving other pipes."

### **PSL 5.2 JOINTING METHODS**

#### **PSL 5.2.2 Flanges (Steel Pipelines)**

*Add the following:*

"Flanges to fittings or joints will generally be to SABS 1123. Where SABS 1123 does not apply, BSEN:1092 1 2007 will.

Contractors are to allow in the rates for the supply and installation of mild steel pressed washers (two per bolt) for all flanged fittings. The washers shall have an ID of 2 mm greater than that of the bolt. Tenderers are to ensure that the length of the bolt includes allowance for the washers.

All bolts, nuts and washers used are to be electro galvanised and yellow passivated."

### **PSL 5.2.3 Welding (Steel Pipelines of Diameter 600 mm or greater)**

*Add the following:*

#### "Welding Procedures

Prior to the commencement of field welding, welding procedures shall be established and approved by the Engineer and thereafter such welding procedures shall be adhered to during subsequent construction and shall not be altered unless specifically authorised by the Engineer.

Tenderers shall, if required by the Engineer, provide a detailed description of all aspects of the welding technique to be employed both in jointing pipes in assemblies above trench level and in executing in-situ welds whether above or below ground level. The information required shall include a drawing of the prepared end for sleeve or butt-welding of flanges and pipes and shall describe the backing rings which must be removed. Records shall be kept by the Contractor to enable each weld to be subsequently identified with the welder concerned.

#### Procedure Qualification Tests

Before the Contractor commences routine field welding the procedure tests laid down in API 1104 clause 1.4 shall be carried out.

The minimum number of root bead welds, the minimum number of second bead welders and the type of clamp used (internal or external) shall be given in the description of the welding technique as specified above.

The Contractor shall maintain a record of all welders employed on the works giving particulars of each individual welder's qualification tests carried out in terms of API 1104, the cost of which shall be borne by the Contractor. Qualification testing of welders shall be conducted in the presence of the Engineer or his representative.

Before a welder is employed on tack or root welds, he shall carry out a test tack and root weld on a pipe of the same materials and under conditions as close as possible to those experienced on the actual pipeline.

If icicles are present in the bore of the pipes or the weld metal projects more than 5 mm the welder shall not be permitted to undertake tack or root welding. The completed test weld pieces shall be visually examined and then radiographed. Should the weld appear sound it shall be subjected to approved root and face bend tests. Test pieces shall be retained by the Contractor and marked so that they can be identified with the welder carrying out the test.

#### Weather

Field welding shall not be performed when the surfaces to be welded are wet or during periods of high wind unless the operator and the work are properly protected and sheltered in an approved manner.

#### Preparation of Joint

Where scarf cutting of the pipe ends is required in the field the pipe ends shall be prepared by machining or machine flame cutting. Hand flame cutting shall not be permitted except under the following circumstances;

### Field Welding

Steel pipes may be cut by hand flame as follows:

- (a) In the case of cement lined steel pipe, the cement lining shall be chipped back 50 mm after the initial cut and the pipe then re-cut  $\pm 10$  mm from the original cut in order to remove any "blow-back".
- (b) In the case of epoxy lined steel pipe, all damaged lining shall be removed and reinstated in compliance with the Clause 3.9.2.3.
- (c) All flame cuts shall be made good by grinding to form the correct gap between steel sections prior to welding.
- (d) Bevels may be cut by flame provided they are made good by grinding.

When jointing pieces by butt-welding the number of tack welds applied shall be kept to a minimum to be effective in holding the pipe ends securely and to maintain the required root gap prior to welding, but shall in any case be not less than four.

Double ending of pipework shall not be allowed on 12m pipe lengths."

## **PSL 5.3 SETTING OF VALVES, SPECIALS AND FITTINGS**

*Add the following:*

"Valves and fittings shall be installed in accordance with the manufacturer's instructions. Valves shall be enclosed in chambers in accordance with the drawings and specifications and shall be installed with their operating spindles vertical. The Contractor shall supply the insertions and bolts necessary for the installation of the valves.

Jet dispersers shall be of the cone and splitter type cast in iron or steel with heavy zinc galvanising, to the Engineer's approval. Flanges and bolts shall be sealed in mastic after installation.

All air valves shall be set level.

All scour valves shall be installed in such a way that the spindle is vertical.

### The Storage, Commissioning and Installation of Butterfly Valves

Butterfly valves shall be stored, installed and commissioned so that the valve blade seal is protected at all times from oxidation, ozone attack and the ingress of dirt.

#### Storage

- i) It is preferable that the valve is stored in the vertical position.
- ii) The valve should be stored in the cracked position (i.e. not shut).
- iii) The valve should not be stored in the vicinity of electrical equipment.
- iv) The valve should be stored under cover and protected from temperature extremes.

#### Installation and Commissioning

- i) Prior to the installation of the valve, all dust and dirt should be washed off the valve, particularly the seal, seat and any tapped holes in the valve body.
- ii) The seals of all valves shall be checked for complete closure when the valve blade is in the fully closed position. (See seal adjustment below).
- iii) The valve must not be lifted by the hand lever, valve actuator or the handwheel.

- iv) The valve must not be used for lining up the pipework.
- v) The valve should be left in the fully open position after installation and prior to commissioning of the system.

#### Seal Adjustment

To adjust the seal, a 0,004" feeler gauge and an Allen key are required.

With the valve in the fully closed position, it should be possible only with difficulty to introduce the feeler gauge between the valve blade seal and the seat.

If, due to seal movement during storage the feeler gauge can easily pass between the seal and seat, then the clamp ring socket head cap screws in the vicinity of the gap should be finger tightened with the Allen key so as to push the seal out and close the gap.

#### Payment

All costs incurred for the seal adjustment as stipulated above shall be included in the respective rates for installation of the valves."

### **PSL 5.6 VALVE AND HYDRANT CHAMBERS**

#### **PSL 5.6.1 General**

*Replace the words "drawing L-1" in the second line with "the Engineering Drawings".*

#### **PSL 5.6.2 Construction of chambers**

*Replace the words "drawing L-1, L-2 and L-3" in the fourth line with "the Engineering drawing".*

***Add the following sub clauses:***

#### **PSL 5.11 STANDPIPES**

Standpipes shall be erected in the positions and to the details shown on the Drawings.

#### **PSL 5.12 MARKER BLOCKS**

The type of marker blocks shall be manufactured and positioned as shown on the Drawings.

#### **PSL 5.13 PIPELINE ROUTE MARKERS**

Route markers for the various water pipelines shall be erected in the positions and shall be manufactured according to the details shown on the Drawings.

#### **PSL 5.14 PAINTED MARKERS**

Painted markers on the road or kerb surface for the various water fittings shall be painted using propriety brand road paint in the positions and according to the details shown on the Drawings."

### **PSL 7 TESTING**

#### **PSL 7.1 GENERAL**

*Add the following:*

##### "Inspection

Facilities shall be provided to the Engineer so that he may be able to inspect, during the process of welding, any layer of weld metal. The Engineer may require any defective welds either to be cut out and rewelded or repaired at his discretion. The Contractor shall clean thoroughly all welds prior to inspection. The Engineer may require a number of completed joints,

selected at random, to be cut for mechanical tests or to be selected for visual inspection, micro examination or examination by other means. When the Engineer orders the Contractor in writing to cut out and test joints the Contractor shall be paid for such work at daywork rates.

If as a result of inspection and testing, the work of any welder is found to be unsatisfactory, the welder shall not be permitted to continue welding under this contract.

#### Standards of Acceptability

The completed welds shall comply with the requirements of clause 6.0 of API 1104. Work on which unauthorised repairs have been carried out may be rejected.

#### Repairs to Minor Faults

Faulty welds shall be rectified in accordance with clause 7.0 of API 1104.

All costs relative to the repair of faulty joints, including removal and replacement of the backfill and making good the wrapping and lining shall be borne by the Contractor."

### **PSL 7.2 INITIAL TESTS ON WELDED STEEL PIPES**

#### **PSL 7.2.1 Dye-Penetrant Test**

*Add the following:*

"All fillet welds shall be dye penetrant tested. Any reduction in the percentage of welds to be tested shall be at the sole discretion of the Engineer"

#### **PSL 7.2.2 Radiographic Examination**

*Add the following:*

"All butt welds shall be radiographically tested. Any reduction in the percentage of welds to be tested shall be at the sole discretion of the Engineer."

### **PSL 7.3 STANDARD HYDRAULIC PIPE TEST**

#### **PSL 7.3.1 Test pressure and time of test**

*Replace L 7.3.1.1, 7.3.1.2, 7.3.1.3 and 7.3.1.4 with the following:*

##### "Static Test

When the pipeline is filled with water, all scours and hydrants shall be opened fully for one minute or until the water emerges clean.

##### Pressure Test

A suitable pump shall be connected to the pipeline at a mutually agreed point.

The pressure in the pipeline under test shall be raised slowly by means of the pump and measured by a pressure gauge connected to the pipeline.

#### **PSL 7.3.1.2**

The required test pressure for all steel pipework shall be 1800 kPa and for Class 12 mPVC pipeworks it shall be 1500 kPa measured at the lowest point of the pipeline(s)

The hydraulic testing of the pipelines is to be carried out in two stages:

- a) The pressure test as described above is to be carried out with the pipeline fully blanked and all valves in the open position. All costs relating to this work inclusive of scouring, supplying and install blank flanges, spade pieces etc are to be included in the rate for testing. The minimum duration of this test will be 8 hours and 2 hours on non-steel pipelines.

- b) On successful completion of the pressure test as per (a) above, the Contractor is to remove all temporary blank flanges, spade pieces, etc. and pressurise the line to maximum working pressure against closed valves. Should any valve not be drop tight at this pressure the Contractor is to advise the Engineer in writing of all defects encountered. The duration of this test shall be 2 hours. (An item has been allowed for this work in the Schedule of Quantities).

All tests shall be carried out in the presence of the Engineer at such times and in such manner as he may direct.

The hydraulic testing of pipelines against closed valves shall not be allowed and provision shall therefore be made by the Contractor for the supply of all necessary bull-noses and blank flanges.

The Employee shall make allowance in the Bill for the Contractor to arrange for water for the first instance of testing. However, any subsequent tests shall be charged to the Contractor's account.

A water connection will be provided by eThekweni Water for filling the pipeline for testing purposes.

The Contractor shall, at his own cost, provide a suitable means of conveying water from this connection to the mains to be tested, as well as a connection on the new pipeline in order that it may be filled. This connection shall be capped or removed to the satisfaction of the Engineer upon completion of the hydraulic test. Payment of this shall be allowed for under the rates for the hydraulic testing of the pipeline.

For hydraulic testing of the pipes sections after installations, as per Clause 7.3 of SABS 1200L, each test section shall be chosen such that it is subjected to a test pressure not exceeding 250m water head at the lowest point and not less than 180m at the highest point. This pressure shall be obtained by continuous pumping so as to ensure a gradual increase of pressure until the specified value is obtained.

After the entire piping system has been laid and all parts thereof have been tested to the satisfaction of the Engineers or the Engineers Representative and backfilled, the pipe system will be put into operation and the Contractor shall inspect and commission the same in the presence of the Engineer/his representative, to ensure that all valves and other equipment are operating satisfactory and to check that all pipe supports, brackets and the like are capable of withstanding the loads imposed on them.

Any faults or defects which are detected during this inspection shall be repaired by the Contractor, or where necessary, the defective parts or materials shall be replaced by the Contractor, to the satisfaction of the Engineer, all at the Contractors expense.

All items of equipment not specifically mentioned in the Specifications, shall be inspected during the commissioning period for proper operation and to verify that these items comply with the requirements of the Specification."

#### **PSL 7.4 TESTS ON EPOXY COATINGS**

*Add the following:*

- "e) Wet sponge test of SFE lining.

The Employer on submission of the originals of the test results and respective invoices to the Engineer will reimburse the Contractor for the cost of all successful tests.

Holiday testing of the tape wrapping and epoxy coating of the pipeline shall be carried out on site by the Contractor. However, at the Engineer's discretion, quotations may be called for

holiday testing of the epoxy coating of the pipeline for quality assurance purposes, from a reputable non-destructive testing firm. The rate submitted shall be per linear metre.

- i) Notwithstanding the requirements of any other specification contained in or referred to in this document, the holiday testing of the epoxy coating shall be performed with the apparatus set at 10 000V for FBMDPE coating and 3500V for FBE and SFE coating.
- ii) The holiday testing of the tape wrap system shall be performed with the apparatus set at 3 500V.

The non-destructive testing firm approved by the Engineer shall be a nominated sub-contractor to the main Contractor.

It shall be the responsibility of the Contractor to ensure that all test points along the pipeline are individually referenced and that this reference be reflected on the reports. Each test point (e.g., pipeline joints, butt joints in pipe specials, etc.) shall be indelibly marked on the pipe and cross-referenced to the pipeline chainage.

A DCVG survey will be carried out by the Employer after the issue of the Completion Certificate and the Contractor will be required to repair all defects discovered by the survey at his own cost.

The cost shall include excavation, repair materials, bedding, backfill and reinstatement to the satisfaction of the Engineer.

The Contractor shall ensure that the full length of the pipe to be placed in the trench is patched and holiday-tested prior to the pipe being laid in the trench. Holiday testing of the joints in the trench shall be carried out on completion of the welding and the required non-destructive testing by the Contractor."

## **PSL 8 MEASUREMENT AND PAYMENT**

### **PSL 8.2 SCHEDULED ITEMS**

#### **PSL 8.2.11 Anchor blocks/Thrust blocks and pedestals**

*Insert "concrete" before "and" in the last line of the last paragraph.*

*Add the following:*

"The tendered rates shall also include the wrapping of uPVC pipes and fittings with Denso tape or a similar approved material where the pipes and fittings come into contact with concrete."

*Add the following items:*

#### **PSL 8.2.16 Isolation Valves ..... Unit: number**

Isolation valves are to be installed in accordance with the eThekweni standard details and in accordance with PSL 5.3 & PSL 5.6

#### **PSL 8.2.17 Marker blocks**

- (a) The type of marker will be indicated in the scheduled item with reference to drawing e.g., route, fitting or painted).....Unit: number

The tendered rate shall include full compensation for all excavation and backfill, labour, equipment and materials to manufacture and install the blocks as shown on the Drawings.

#### **PSL 8.2.18 Connection to existing main supply pipe ..... Unit: number**

The tendered rate shall include full compensation for the cost of excavation, connection to existing main supply pipe, removal of surplus material, all labour, cutting and trimming of pipes

and equipment necessary to make the connection by an eThekweni approved sub-contractor and all liaisons with the local authorities.

(a) Cut and tie into existing line

#### **PSL 8.2.19 Pressure Testing & Disinfection**

.01 Water Supplied for Testing & Disinfection ..... Unit: Sum

This must be done in accordance with PSL 7.4.

.02 Testing in accordance with PSL 7.4, PSL 7.2.1 & PSL 7.2.2 ..... Unit: m

This must be done in accordance with PSL 7.3.1.2, and will include all costs required to collect the water, transport onto site and fill the pipeline."

#### **PSL 8.2.20 Pipe Sleeves for road crossings ..... Unit: m**

Watermains are to be precast spigot and socket class 100D concrete pipes and are to be excavated in accordance with SANS 1200 DB Earthworks Pipe Trenches. Bedding is to be constructed in terms of SANS 1200 LB Bedding. Sleeves must have a longitudinal fall of 2% and must be adequately drained to the low side of the road. Manholes on the low side of the pipe sleeve are to drain to either the stormwater system or the surface. Markers to show positions of sleeves are to be provided where no manhole is used.

The rate is to include procurement of the sleeve, excavation of the trench, sleeving the water main, bedding the pipe, backfilling and compaction

#### **PSL 8.2.21 Pipe Protection**

*Add the following:*

Pipe Protection concrete cover slab (25Mpa) across roadways where indicated by the engineer, inclusive of Ref 395 mesh as per eThekweni standard details.....Unit: m

#### **PSL 8.2.22 Testing**

Allow provisional sum for Earthworks (Small Works) testing, where ordered by the Engineer (Prov.)..... Unit: Sum

This provisional sum is to cover earthworks required to expose water pipelines deemed to be faulty/leaking by the engineer during testing. Excavation to expose the service is to be in terms of PSDB 8.3.8 Existing Services



**PSLB BEDDING (PIPES)**

**PSLB 3 MATERIALS**

**PSLB 3.1 SELECTED GRANULAR MATERIAL**

Replace the contents of this sub clause with the following:

"Selected granular material shall have a PI not exceeding 6 and shall be free from sharp-edged particles exceeding 19 mm."

**PSLB 3.2 SELECTED FILL MATERIAL**

*Add the following:*

"Selected fill material used for bedding shall, where indicated on the Drawings be stabilized with cement as specified under sub clause PSDB 3.5(c) with the percentage cement as stated in the bill."

**PSLB 3.3 BEDDING**

*Add the following:*

"uPVC and HDPE pipes are deemed to be flexible pipes for the purposes of this sub clause."

**PSLB 3.4 SELECTION**

**PSLB 3.4.1 Suitable material available from trench excavation**

*Delete the word "not" in the third line and replace the words "(but is not required)" in the fifth line with the words "(at his own cost)".*

**PSLB 3.4.2 Suitable material not available from trench excavation**

*Add the following:*

"Where trench bottoms are exceptionally wet the Engineer may instruct the use of 13mm or 19mm single sized crushed stone as a bedding or drainage layer. A geotextile shall be used to wrap around the stone or act as a separation layer as directed."

**PSLB 8 MEASUREMENT AND PAYMENT**

**PSLB 8.1 PRINCIPLES**

**PSLB 8.1.5 Disposal of displaced material**

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

"Material displaced by the pipeline and by imported material from sources other than trench excavation, shall be disposed of at an approved site furnished by the Contractor. No haulage is payable for such material."

**PSLB 8.1.6 Freehaul**

*Replace the contents of the item with:*

"The transport for earthworks will be as per PSD 5.2.5."

**PSLB 8.2 SCHEDULED ITEMS**

**PSLB 8.2.2 Supply only of bedding by importation**

**PSLB 8.2.2.2 From Commercial sources**

*Add the following:*

“(c) Crushed stone (size stated)”

**PSLB 8.2.5 Overhaul**

*Replace the contents of the item with:*

“Overhaul will be as per PSD 8.3.6.”

*Add the following items:*

**PSLB 8.2.6 Extra over items 8.2.1 and 8.2.2 for bedding stabilized with cement ..... Unit: m<sup>3</sup>**

The tendered rate shall include full compensation for selecting of material, cement, mixing, backfilling and compacting the stabilized material to 90% of modified AASHTO density.

**PSLB 8.2.7 Geotextile .....Unit: m<sup>2</sup>**

The rate shall cover the supply and installation of the geotextile.”

## **PSLC CABLE DUCTS**

### **PSLC 3 MATERIALS**

#### **PSLC 3.1 DUCTS**

*Add the following:*

##### **"PSLC 3.1.1 Telkom SA Limited (Telkom) materials**

All material such as PVC or HDPE pipes, screening wire and draw wire will be supplied, free of charge, by Telkom against a receipt signed by the Contractor when the material is collected.

The Contractor shall notify the designated person from Telkom (as confirmed by the Engineer in writing) at least two (2) weeks prior to the date on which the pipes are required.

The Contractor shall use the materials supplied by Telkom in the most economical manner. Materials lost or damaged through neglect on the part of the Contractor or his workmen shall be replaced by the Contractor at his own expense.

It is a condition of this Contract that the Works and all material and equipment handed to the Contractor shall be insured against damage or loss as stipulated in Clause 8.6 of the General Conditions of Contract.

On completion of the work, the Contractor shall deliver all surplus material to the nearest Telkom engineering yard.

##### **PSLC 3.1.2 Split uPVC pipes**

Split pipes shall only be used to provide ducts for existing services that cannot be severed and threaded through the ducts. The pipes shall be cut accurately in the middle, and opposite halves shall be matched as sawn. Split pipes shall be placed around the service, firmly bound by steel straps, and encased in concrete."

#### **PSLC 3.4 CABLE DUCT MARKERS**

*Add the following:*

"Duct markers shall be in accordance with eThekweni specifications as indicated on the drawings."

## **PSLC 5 CONSTRUCTION**

### **PSLC 5.1 EXCAVATION OF TRENCHES**

#### **PSLC 5.1.1 Trench widths and depths**

##### **PSLC 5.1.1.2**

*Add the following:*

"For telephone services the pipe trench shall have a minimum depth to provide a cover of not less than 600 mm between the top pipe and the finished road surface level. Where this depth cannot be maintained due to the nature of the ground, the depth may be altered at the discretion of the Telkom Engineer. When the pipe has less cover than 600 mm it shall be covered by concrete slabs with a minimum thickness of 50 mm and a width equal to 400 mm plus the diameter of the pipe they protect, unless otherwise directed by the Telkom Engineer. The concrete slabs shall be provided by the Contractor."

#### **PSL 5.3 DUCT LAYING**

### **PSLC 5.3.1 Straight laying**

*Add the following:*

"If the trench is to contain more than one pipe exceeding 75 mm internal diameter, the base of the trench shall slope so that water may drain away from the pipes. The level of the bottom of the trench shall fall at least 1%"

### **PSLC 5.3.3 Draw wire**

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

"A length of 3,05 mm diameter galvanized iron wire shall be attached to the cleaning-brush and drawn into the pipe and left for use as a draw wire. Surplus wire at least 2 m in length shall be left neatly coiled at each end of each duct. All open pipe ends must be fitted with an end cap to prevent the ingress of dirt.

In the case of Telkom ducts, nylon ski rope must be used in place of galvanized iron wire."

*Add the following sub clauses:*

### **PSLC 5.3.6 Screening**

#### **PSLC 5.3.6.1 General**

Pipe ducts shall be screened against electrical interference by copper wires. All joints in screen wires shall be soldered.

#### **PSLC 5.3.6.2 Composition of screen for pipe ducts**

The screen shall consist of two strands of 2,50 mm diameter copper wire, bound together by two turns of similar copper wire every 5 m. The binding shall be undertaken by the Contractor. The screen shall be placed approximately 200 mm above the pipe or the top layer of pipes."

### **PSLC 5.6 LAYING OF CABLES WITH OTHER SERVICES**

*Add the following:*

"Trenches for telephone ducts shall be excavated so that pipes can be laid at least 300 mm from power cables. Where this is not possible, pipes shall be separated from power cables by vertically placed concrete or paving slabs."

### **PSLC 5.7 CROSSING OF TELEPHONE AND ELECTRICITY CABLE DUCTS**

*Replace this sub clause with the following:*

#### **PSLC 5.7 CROSSING OF TELEPHONE DUCTS WITH OTHER SERVICES**

When a duct crosses an existing service such as an electricity supply cable, a water supply pipe or a sewerage pipe, the telecommunication duct shall, if possible, be laid not less than 25 mm above the existing service. Where the depth of the existing service is insufficient for this to be done, the telecommunication duct shall be laid to pass not less than 25 mm below the other service."

### **PSLC 7 TESTING**

#### **PSLC 7.1 ACCESS FOR ENGINEER**

*Add the following:*

"The Telkom Engineer shall have free access to the Site at all times. He has the right to inspect work on telecommunication ducts at any stage and may reject any work not executed in an approved, substantial and workmanlike manner and in accordance with the specifications.

No pipes shall be covered before inspection by a Telkom Engineer. Arrangements for inspections may be made by telephoning the relevant Telkom person. At least 24-hour notice is required prior to the inspection."

***Add the following sub clause:***

**PSLC 7.4 FINAL INSPECTION**

A final inspection will take place on completion of the work. The Contractor shall, at his own cost, expose all pipe ends prior to the final inspection, after which they may be finally plugged and closed."

**PSLC 8 MEASUREMENT AND PAYMENT**

**PSLC 8.2 SCHEDULED ITEMS**

**PSLC 8.2.5 Supply, lay, bed, and prove duct**

*Replace the payment paragraph with the following:*

"Separate items are scheduled for each diameter of duct.

The rates shall cover:

- (a) for Telkom ducts, the cost of collecting the ducts, draw wire and screening wire and the cost of laying the ducts and screening wire, installing the draw wire, jointing, bedding and providing all as specified, and
- (b) for all other ducts, the cost of providing all the material and the cost of laying the ducts, installing the draw wire, jointing, bedding and providing all as specified.
- (c) all ducts to be constructed as per the standard details given in the Contract/Construction Drawings."

**PSLC 8.2.9 Overhaul**

Replace the contents of the item with:

"Overhaul will be as per PSD 8.3.6."

**PSLC 8.2.9 Cable Protection**

*Add the following:*

Cable Protection concrete cover slab (25Mpa) across roadways where indicated by the engineer, inclusive of Ref 395 mesh as per eThekweni standard details.....Unit: m

**PSLD SEWERS**

**PSLD 3 MATERIALS**

**PSLD 3.5 MANHOLES, CHAMBERS, ETC**

**PSLD 3.5.2 Precast concrete sections**

*Add the following:*

"Sectional spun-concrete cylinders shall be manufactured from dolomitic aggregate."

**PSLD 3.6 MARKER POSTS**

*Replace the words "Project Specification" with "Drawings".*

**PSLD 5 CONSTRUCTION**

**PSLD 5.6.5 Precast Manholes**

*Replace "profile, where applicable" with "or sidewalk profile or 50 to 100mm above finished ground levels"*

**PSLD 5.9 CONNECTING SEWERS**

**PSLD 5.9.1 Location and details**

*Delete the following from the first paragraph:*

"or required in terms of the Project Specifications."

*Delete the second paragraph.*

**PSLD 8 MEASUREMENT AND PAYMENT**

**PSLD 8.2 SCHEDULED ITEMS**

**PSLD 8.2.3 MANHOLES**

*Add the following:*

Manholes are to be constructed in accordance with the eThekweni typical details inclusive of Light Duty covers and frames

**PSLD 8.2.4 EXTRA OVER**

*Add the following:*

Extra over items PSLD 8.2.3 for Heavy Duty Concrete covers and Frames.....Unit: No

Extra over items PSLD 8.2.3 for Heavy Duty Polymer Concrete covers and Frames.....Unit: No

Extra over items PSLD 8.2.3 for Type A Drop Manholes.....Unit: No

Extra over items PSLD 8.2.3 for Type B Drop Manhole.....Unit: No

Extra over items PSLD 8.2.3 for Type B Benching.....Unit: No

All extra-over items are to be constructed in accordance with the eThekweni typical details.

**PSLD 8.2.13 Pipe Protection**

*Add the following:*

Pipe Protection concrete cover slab (25Mpa) across roadways where indicated by the engineer, inclusive of Ref 395 mesh as per eThekweni standard details.....Unit: m

**PSLE STORMWATER DRAINAGE**

**PSLE 3 MATERIALS**

**PSLE 3.1 CULVERT UNITS AND PIPES**

- (d) Skewed ends

*Add the following:*

"Skewed ends for pipe culverts may be cut on Site and the reinforcing shall be covered with a 1:3 cement: sand mortar at least 30mm thick."

**PSLE 3.4 MANHOLES, CATCHPITS, AND ACCESSORIES**

**PSLE 3.4.1 Bricks**

*Add the following:*

"Bricks shall be engineering bricks complying with the requirements of SABS 227."

*Add the following sub clause:*

**PSLE 3.6 MATERIALS FOR SUBSURFACE DRAINS**

- (a) Pipes and fittings

Pipes for subsurface drains shall be normal duty, perforated or slotted uPVC pipes complying with SABS 791. Fittings shall be heavy duty and shall also comply with SABS 791.

The size of the perforations in perforated pipes shall in all cases be 8 mm in diameter  $\pm$  1,5 mm, and the number of perforations per metre shall not be less than 26 for 100 mm pipes and 52 for 150 mm pipes. Perforations shall be spaced in two rows for 100 mm pipes and in four rows for 150 mm pipes, as shown on the Drawings.

Slotted pipes shall have a slot width of 8 mm with a tolerance of 1,5 mm in width. The arrangement of the slots is subject to the Engineer's approval, but the total slot area shall not be smaller than that specified for perforations.

- (b) Crushed stone

Crushed stone shall be 19 mm single-sized and shall comply with the requirements of SABS 1083.

- (c) Geotextiles

Geotextiles shall be a non-woven, spun or thermic-bonded continuous filament fabric consisting of at least 85% by mass of polypropylene, polyester or other approved material and manufactured for civil-engineering applications by a recognised manufacturer."

**PSLE 5 CONSTRUCTION**

**PSLE 5.2 BEDDING AND LAYING**

**PSLE 5.2.2 Pipe culverts**

*Add the following:*

"The class of bedding required for the various pipe culverts is shown on the Drawings."

*Add the following sub clause:*

**PSLE 5.8 CONSTRUCTION OF SUBSURFACE DRAINS**

After the completion of the excavations, the bottom portion of the trench shall be lined with geotextile sheeting as shown on the Drawings. The top edges of the vertical portions of the geotextile sheeting shall be tacked to the sides of the excavations with nails or by another suitable approved means. An overlap of at least 200 mm shall be provided at each joint. Geotextile sheeting damaged during the installation or construction shall be replaced at the Contractor's cost.

A layer of crushed stone of the thickness shown on the Drawings shall be placed on the geotextile sheeting and lightly tamped and finished to the required gradient.

Pipes of the required size shall be firmly bedded on the permeable material, true to level and grade, and coupled where required. The trench shall then be backfilled with crushed stone to the height above the pipes shown on the Drawings or as directed by the Engineer.

Crushed stone shall be placed in layers of not more than 300 mm at a time and shall be lightly compacted. Care shall be taken to prevent the contamination of crushed stone during construction of the subsurface drains and all material contaminated by soil or silt shall be removed and replaced by the Contractor at his own expense.

Perforated and slotted pipes shall be joined by couplers. Perforated pipes shall be laid with the perforations at the top or at the bottom, as directed. The higher end of subsurface drain pipes shall be sealed off with an end cap, as shown on the Drawings and at the lower end of the pipe shall be built into a concrete head wall providing a positive outlet, or it shall be connected to the stormwater pipes or culverts.

After all the crushed stone filter material and the protruding vertical filter material have been placed, the protruding vertical sections of the geotextile sheeting shall be folded back across the filter material so that the filter material will be completely enwrapped in the geotextile. An overlap of at least 200 mm shall be provided between the portions folded back.

The remainder of the trench shall be immediately backfilled with approved impermeable material preferably obtained from the excavations, in layers not exceeding 150 mm and compacted to 90% of modified AASHTO density, unless otherwise ordered by the Engineer. The trench shall be specially protected against the ingress of water, soil and silt until the backfilling with impermeable material has been completed.

Permeable material in subsoil drains shall not be taken to the surface but shall be discontinued at such heights to suit the level of ingress of water or as will be determined by the Engineer.

Any section of a subsurface drain constructed with pipes without perforations or slots shall be backfilled with impermeable backfill material as described above. Suitable excavated material may be used for backfilling. Payment for excavations as well as for backfilling with impermeable material will be made under SABS 1200 DB. Rodding/cleaning eyes will be installed as shown on the drawings."

## **PSLE 8 MEASUREMENT AND PAYMENT**

### **PSLE 8.2 SCHEDULED ITEMS**

#### **PSLE 8.2.8 Supply and install manholes, catchpits, and the like**

*In paragraph (c) replace "...but excluding excavation and backfilling, which shall be measured separately." with "... and shall include excavation and backfilling."*

Manholes are to be constructed in accordance with the eThekwin typical details inclusive of Light Duty covers and frames

#### **PSLE 8.2.10 Accessories**



*Add the following:*

e) Pipe Protection concrete cover slab (25Mpa) across roadways where indicated by the engineer, inclusive of Ref 395 mesh as per eThekweni standard details.....Unit: m

***Add the following items:***

**PSLE 8.2.14 Subsoil Drainage**

(i) 110mm dia. Slotted unplasticized pvc pipes and fittings, normal duty complete with couplings .....Unit: m

(ii) 110mm x 45deg uPVC bends..... Unit: No

(ii) 110 x 110 x 45 deg. uPVC junctions ..... Unit: No

(iv) Stone – 19mm

The tendered rate shall include full compensation for procuring, supplying, transporting and placing the material as specified. The quantity shall be calculated from the authorised dimensions.

(v) Impermeable backfilling to subsoil drainage system .....Unit: m<sup>3</sup>

(vi) Sand obtained from approved commercial sources .....Unit: m<sup>3</sup>

(i) ..... Rodding  
ng eyes on subsoil drains – complete with concrete slab covers and endcaps Unit:  
number

The tendered sum shall include full compensation for the cost of all labour, plant, materials, excavation, backfilling, compaction and overheads to supply and install Rodding eyes as per the Durban standard drawings/details."

The tendered rates per metre of pipe measured in place along its centre line including the length of fittings shall include full compensation for procuring, furnishing, laying and jointing the pipes as specified.

The tendered rates for fittings shall include full compensation for procuring, furnishing, laying and jointing the fittings as specified, irrespective of the type of fitting.

Subsoil drainage is to be constructed in accordance with the Engineering Drawings

**PSLE 8.2.15 Geofabric (description of type, grade, etc.).....Unit: m<sup>2</sup>**

The filter fabric will be measured in place after installation.

The tendered rate shall include full compensation for procuring, supplying, cutting, overlapping, jointing, placing and protecting the filter fabric as specified, as well as for wastage.

**PSLE 8.2.16 Pipe Protection**

*Add the following:*

Pipe Protection concrete cover slab (25Mpa) across roadways where indicated by the engineer, inclusive of Ref 395 mesh as per eThekweni standard details.....Unit: m

**PSM        ROADS (GENERAL)**

**PSM 7       TESTING**

**PSM 7.2    PROCESS CONTROL**

*Add the following:*

"The process control required of the Contractor shall be carried out by an independent testing laboratory approved by the Engineer."

**PSME SUBBASE**

**PSME 3 MATERIALS**

**PSME 3.2.1 Subbase material**

*Add the following at the beginning of the paragraph:*

“No weathered tillite, shale, siltstone or mud stone may be used”

*Add the following to (a)*

“Where a crushed stone is used the material shall comply with the requirements of SABS1083 and the following grading envelope:

<b>Sieve size</b>	<b>Percentage passing (by mass)</b>
53,00	100
37,50	85 – 95
26,5	70 – 90
19,0	60 – 85
4,75	40 – 65
2,00	30 – 50
0,425	20 – 30
0,075	10 – 15

In the event that the above material is not readily available from a nearby quarry, the Contractor may use a G4 material with the following grading envelope:

<b>Sieve size</b>	<b>Percentage passing (by mass)</b>
37,50	85 – 100
26,5	70 – 95
19,0	60 – 90
13,2	50 – 85
4,75	30 – 65
2,00	20 – 50
0,425	10 – 30
0,075	5 – 15”

***Add the following:***

“Additional requirements to meet eThekweni standards are:

Material prior to stabilisation

<b>Description</b>	<b>C3</b>	<b>C4</b>
Maximum liquid limit	25	30
Maximum Plasticity index	6	10
Maximum CBR swell at 100% modified AASHTO density	0,5%	0,5%
Minimum slake durability index after two wetting /drying cycles	95%	95%

Material after stabilisation

Description	C3	C4
Maximum Plasticity index	NP	NP
Maximum percentage loss of material in the wet/dry durability test (with brushing – 12 cycles)	35%	45%
Maximum CBR swell at 100% modified AASHTO density	0%	0%

### PSME 3.2 PHYSICAL PROPERTIES

#### PSME 3.2.1 Subbase material

*Replace the contents of paragraph (a) with the following:*

"(a) The maximum particle dimension of the gravel shall not exceed 63 mm."

*Replace the contents of paragraph (d) with the following:*

"(d) The CBR at specified density shall be 45 for unstabilized material as well as for stabilized material prior to stabilization."

*Replace paragraph (e) with:*

"After stabilisation the material shall comply with the following:

Description	C3	C4
PI	NP	NP
Swell	0%	0%
Minimum UCS at 95% Mod AASHTO density	1.5MPa	0.75MPa
ITS (minimum)	250kPa	200kPa

#### PSME 3.2.2 Gravel shoulder and gravel wearing course material

Replace the contents of this sub clause with the following:

"The material used for gravel shoulders and gravel wearing course shall comply with the following:

- (a) The PI shall not be less than 6 and not more than  $(3 \times \text{GM}) + 10$ ;
- (b) The maximum particle dimension of the gravel shall not exceed 40 mm; and
- (c) The CBR shall be greater than 15 at 93% of modified AASHTO density."

### PSME 5 CONSTRUCTION

#### PSME 5.7 TRANSPORT

*Replace the contents of the item with:*

"The transport for earthworks will be as per PSD 5.2.5."

*Add the following sub clauses:*

#### "PSME 5.8 WEED-KILLER

The subbase layer shall be treated before compaction by applying and mixing in granular HYVAR X or TENOC X weed-killer in accordance with the manufacturer's instructions. An approved equivalent may be used.

#### PSME 5.9 INSECTICIDE

An insecticide approved by the Engineer shall be applied strictly in accordance with the manufacturer's instructions over the total area of the subbase. The instructions indicate whether the poison is to be applied before or after compaction of the layer."

## PSME 7 TESTING

### PSME 7.2.1 Process control

Replace Table 2 with:

1	2	3
Test	Test frequency	
	Maximum area to which one test applies	Minimum number of tests per lot
Density*	1500 m <sup>2</sup>	7
Indicator test (ie grading analysis and Atterberg limits)	1500 m <sup>2</sup>	2
CBR (unstabilised material)	5000 m <sup>2</sup>	2
UCS (stabilised material)	5000 m <sup>2</sup>	2
Stabiliser agent content	200 m <sup>2</sup>	1 per 200m <sup>2</sup>
ITS test	5000 m <sup>2</sup>	2

### PSME 7.2.2 Routine inspection and testing

Table 3 – Density of subbase

Delete the line Stabilisation and add the following:

"Compaction of the stabilised layer shall satisfy the following density criteria.

$\bar{X} > B + 5,5S$ , where:

$\bar{X}$  is the arithmetic mean of the densities;

B is the specified density; and

S is the standard deviation of the densities.

In addition, any single density test shall not be more than 2% below the specified density"

### PSME 7.3.3 Acceptance control for stabiliser

Replace the contents with:

"The average stabiliser content shall not be less than 60% of the content specified plus twice the standard deviation.

$\bar{x} \geq 0,6\text{specified content} + 2 \times \text{std deviation}$ "

### PSME 7.3.3 Strength tests for stabilised material

At the end of the sentence replace "... and (e)." with "... (e) and (f)."

## PSME 8 MEASUREMENT AND PAYMENT

### PSME 8.1 BASIC PRINCIPLES

Insert a semicolon in the first line of paragraph (b) after the words "will be paid for once only" and delete the rest of the paragraph.

Amend paragraph (d) as follows:

- "(d) that, in the case of material from a commercial source or from borrow pits selected by the Contractor, no additional payment will be made for the class of excavation, method of processing (except stabilizing), or overhaul."

**PSME 8.3 SCHEDULED ITEMS**

**PSME 8.3.3 Construct the subbase course/shoulders/gravel wearing course with material from commercial sources or designated borrow areas**

*Replace the heading of this item with the following:*

**PSME 8.3.3 Construct the subbase course/shoulders/gravel wearing course with material from commercial sources"**

**PSMF BASE**

**PSMF 3 MATERIALS**

**PSMF 3.3 PHYSICAL AND CHEMICAL PROPERTIES**

**PSMF 3.3.1 Natural gravel (stabilized or unstabilized)**

*Replace the contents of paragraph (a) with the following:*

*"(a) The maximum particle dimension of the gravel shall not exceed 37.5 mm."*

**PSMF 5 CONSTRUCTION**

**PSMF 5.9 TRANSPORT**

*Replace the contents of the item with:*

*"The transport for earthworks will be as per PSD 5.2.5."*

**PSMF 7 TESTING**

**PSMF 7.3 ROUTINE INSPECTION AND TESTING**

*Replace table 4 with the following:*

*"TABLE 4 –DENSITY OF BASE*

<b>Specified relative compaction (% of modified AASHTO maximum density)</b>	<b>Number of tests per lot</b>	<b>Minimum average density, %</b>	<b>Minimum value for any single test, %</b>
100	4	100,1	96,7
	5	100,4	96,6
	6	100,5	96,4
	7	100,7	96,3
	8	100,8	96,2
	9	100,9	96,1

**PSMF 8 MEASUREMENT AND PAYMENT**

**PSMF 8.3 SCHEDULED ITEMS**

**PSMF 8.3.3 Construct base with material from commercial sources or designated borrow areas**

*Replace the title of item 8.3.3 with the following:*

**PSMF 8.3.3 Construct base course with material from commercial sources and compact to 100% Modified AASHTO maximum density"**

## PSMH ASPHALT BASE AND SURFACING

This specification covers the manufacture of hot/warm mix asphalt. There are a total of 15 hot/warm asphalt mixes covered in this specification:

- i) 9 Sand Skeleton Mixes
  - a. Designated "SA"
  - b. 3 NMAS mix sizes (10mm, 14mm & 20mm)
  - c. For use in:
    - Standard traffic loading and speed conditions (S)
    - Heavy traffic loading and speed conditions
- ii) 4 SMA (stone skeleton) mixes
  - a. Designated "SMA"
  - b. 2 NMAS mix sizes (10mm & 14mm)
  - c. For use in:
    - Very heavy traffic loading and speed conditions (V)
    - Extreme traffic loading and speed conditions (E)
- iii) 2 EME mixes
  - a. Designated "EME"
  - b. 2 NMAS mix sizes (14mm & 20mm)
  - c. For use in:
    - Extreme traffic loading and speed conditions (E)

Reference to the following standard specifications, guideline documents and codes of practice (Table PSMH1) shall be deemed to be references to the latest issues of the relevant documents:-

SANS 9001	Quality management systems Requirements
SANS 4001-BT1	Penetration grade bitumen
SANS 4001-BT3	Anionic bitumen road emulsions
SANS 4001-BT4	Cationic bitumen road emulsions
SANS 1083	Aggregates from natural sources
SANS 824	Lime for soil stabilization
SANS 50197-1	Cement Part 1:Composition, specification and conformity criteria for common cements
SANS 1491:Part 1	Portland cement extenders - Part 1:Ground granulated blast-furnace slag
SANS 1491:Part 2	Portland cement extenders - Part 2:Fly ash
Act 85 of 1993	Occupational health and safety act
Act 39 of 2004	National environmental management : Air quality act
Sabita Manual 5	Guidelines for the manufacture and construction of hot mix asphalt
Sabita Manual 27	Guidelines for thin hot mix asphalt wearing courses on residential streets
Sabita Manual 32	Best practice guideline for warm mix asphalt
Sabita Manual 33	Interim design procedure for high modulus asphalt
Sabita Manual 35	Design and use of asphalt in road pavements
Sabita TG1	The use of modified bituminous binder in road construction
TRH 21	Hot mix recycled asphalt

Table PSMH1: Reference & Standard Specifications



### **PSMH 3 MATERIALS**

#### **PSMH 3.3 TACK COAT (3.3 AND 5.4)**

*Add the following:*

"The tack coat shall be a spray grade 60% Anionic bitumen emulsion complying with the requirements of SANS 309 (Anionic) respectively."

#### **PSMH 3.4 BITUMINOUS BINDER**

*Add the following:*

Binder selection shall be guided by both the asphalt mix requirements outlined in section 4 and the South African PG Binder Classification System. Straight run bituminous binders shall conform to SANS 4001-BT1 and shall be selected from penetration grades 10/20, 15/25, 35/50 or 50/70. Modified binders shall be selected from A-E1, A-E2, A-P1 A-H1 or A-H2 and shall comply with the requirements of Tables 7 and 9 respectively from the Sabita Technical Guideline TG1. The binder penetration grade, the type of modifier used (as applicable) and the SA PG Binder Classification shall be indicated in the mix design report.

### **PSMH 3.5 AGGREGATES**

#### **PSMH 3.5.1 General**

*Add the following:*

"The requirement for the polished stone value shall apply and for asphalt surfacing at least 95% of all particles shall have at least three fractured faces."

#### **PSMH 3.5.1 Type**

Add the following:

i) Coarse Aggregate:

Coarse aggregate shall comprise single sized, clean, unweathered material and shall be free from organic matter and other deleterious substances. The aggregate shall comply with the requirements of Table 4302/8 of the COLTO Standard Specifications for Road and Bridge Works for State Road Authorities (1998).

ii) Fine Aggregate:

Fine aggregate shall consist of the mineral matter passing the 5,00 mm sieve and retained on the 0,075 mm sieve and shall consist predominantly of freshly crushed aggregate or clean natural hard sand. Fine aggregate shall conform to the requirements of table PSMH2 "Aggregate quality requirements". Material derived from the mechanical crushing or milling of rock shall be well graded between 5.0mm and 0.075mm. The grading and dust content of material derived from the natural disintegration of rock shall comply with the requirements of SANS 1083 Table 1 (Column 2). The use of natural sands is limited or prohibited in certain asphalt mixes. These limitations are 3.2.3. Filler Filler shall comprise the material predominantly passing the 0.0

iii) Filler

Filler shall comprise the material predominantly passing the 0.075 mm sieve and shall consist of either inert material (crushed rock fines) or an approved active filler or a combination thereof.

The permissible active filler content in any asphalt mix shall be no more than 2% by mass of mix aggregates

Aggregates shall be blended in such a manner as to produce an asphalt mix conforming to the requirements of each mix type and nominal maximum particle size. The required aggregate blending will be achieved through the mix design process.

Sieve Size (mm)	Percent Passing					
	Nominal Maximum Particle Size (NMPS)					
	10mm		14mm		20mm	
	Min.	Min.	Min.	Max.	Min.	Max.
37,5	-	-	-	-	-	-
28	-	-	-	-	100	
20	-	-	100	-	80	100
14	100	-	80	100	-	85
10	80	100	-	85	-	-
7,1	-	85	-	-	-	-
5	-	-	-	-	-	-
2	32	67	28	58	23	49
1	-	-	-	-	-	-
0,6	-	-	-	-	-	-
0,3	-	-	-	-	-	-
0,15	-	-	-	-	-	-
0,075	2	10	2	10	2	8

Aggregate gradings are required for 3 nominal maximum particle size (NMPS) mixes (ie. 10mm, 14mm and 20mm). The aggregate grading for these mixes shall be guided by the control points in Table PSMH4.

A maximum of 10% natural sand (by mass of mix aggregates) may be used in sand skeleton mix types of Sa-H, Sa-V and Sa-E. The reclaimed asphalt (RA) content of sand skeleton mixes shall be limited to 50% maximum as noted in Table PSMH3.

Mix Type	Maximum RA Content
Sand Skeleton Mixes	50%
SMA	0%

EME	20%
-----	-----

Table PSMH3: Reclaimed Asphalt content per mix type

a) **Stone Mastic Asphalt (SMA) Mixes**

Stone Mastic Asphalt is a stone skeleton mix type. The aggregate grading for SMA mixes shall be guided by the requirement that the stone skeleton coarse aggregate structure is not dilated by the mastic in the voids of the stone skeleton structure. The use of “natural” sands is not permitted in SMA mixes. The use of reclaimed asphalt (RA) shall not be permitted in SMA mixes.

SMA grading blends are required for two SMA NMPS mixes (10mm & 14mm)

b) **Enrobe a Module Eleve Mixes (EME)**

EME aggregate gradings shall be guided by the requirements outlined in Sabita Manual 33 “Interim Design Procedure for High Modulus Asphalt”. The use of “natural” sands is not permitted in EME mixes. The reclaimed asphalt (RA) content of EME mixes shall be limited to 20% maximum as noted in Table PSMH3.

EME grading blends are required for two EME NMPS mixes (14mm & 20mm)

Aggregate Property		Coarse Aggregate		Fine Aggregate (Crushed Rock)	Fine Aggregate (Natural Sand)1	Combined Total Fine Aggregate	Inert Filler	Active
Parent Material		Clean unweathered crushed rock		Clean unweathered crushed rock	Clean natural fines not obtained from crushed parent rock	-	Unweathered rock dust	Approved commercial non-plastic material
		Sand Skeleton Mixes (Sa, EME)	Stone Skeleton Mixes (SMA)					
Grading		COLTO Standard Speciofications for Road and Bridge Works for State Road Authorities (1998) Table 4302/8		Well graded between 5.0mm and 0.075mm sieves	SANS 1083 Table 1 (Column 2)	Passing 5.0mm sieve	P0.075 > 75%	P0.075 > 75%
ACV (%) (max.)		25	21	25 (Parent rock)	-	-	-	-
10% FACT (Dry) (Min.)		160 kN	210 kN	-	-	-	-	-
10%FACT (Wet) (Min.)		75% of 10% FACT (Dry) Value	75% of 10% FACT (Dry) Val	-	-	-	-	-
Flakiness Index (Max)	20mm & 14mm	35		-	-	-	-	-
	10mm & 7.1mm	30		-	-	-	-	-
	SMA Mixes	20		-	-	-	-	-
Polished Stone Value (Min.)		50		-	-	-	-	-
Water Absorption (%) (Max.)		1		1,5	1,5	1,5	-	-
Sand Equivalent (%) (Min.)		-		40	80 River   50 Pit	50	-	-
Methylene Blue Adsorption Value		-		0,7	0,7	0,7	-	-

(Max.)						
Permissible Content (% by Mass of Mix Aggregates)	-	-	0-10 River   - Pit	-	-	0 2

Table PSMH2: Aggregate Quality Requirements

### PSMH 3.5.6 Grading

*Replace the contents of this clause with:*

Grading shall be as per PS3.5.1 for the various different types of aggregate.

**Add the following new sub-clauses:**

### PSMH 3.5.7 Flakiness Index

The flakiness index of the combined coarse aggregate when determined in accordance with TMH 1 Method B3, shall not exceed 25 for:

- (i) the fraction passing through the 19,0mm sieve and retained on the 13,2mm sieve; and
- (ii) the fraction passing through the 13,2mm sieve and retained on the 9,5mm sieve; and
- (iii) or 30 for the fraction passing through the 9,5mm sieve and retained on the 6,7mm sieve.

### PSMH 3.5.8 Water Absorption

The maximum water absorption of the coarse aggregate = (TMH1; B14) shall be 1% by mass.  
The maximum water absorption of the fine aggregate (TMH1:B15) shall be 1.5% by mass."

## PSMH 4 PLANT AND EQUIPMENT

*Add the following*

Asphalt shall be manufactured through a batch-mixing or drum-mixing plant (approved by the Engineer) such that the requirements of this specification can be met in full.

### PSMH 4.3 MIXING PLANT

#### PSMH 4.3.2.3 DRUM MIXER

*Add the following*

The plant shall be operated and kept in a well-maintained condition as directed by the Quality Management System. Records of such maintenance shall be made available on request.

#### PSMH 4.3.2.3 EQUIPMENT FOR STORAGE OF BITUMINOUS BINDER

*Add the following*

Sufficient binder storage tanks shall be provided to ensure that adequate reserves are maintained for each binder type held without risk of contamination of binders. Binder storage tanks shall be heated in such a manner that the binder is not degraded during heating. The tanks shall also incorporate a circulating system for the binder. The plant control panel shall enable the plant operator to have simultaneous view of the critical components of the plant inclusive of:

- Binder storage temperature
- Cold hopper feed settings

- Hot aggregate bin masses (as appropriate)
- Binder feed rate
- Plant speed (as appropriate)
- Mixing temperature

The plant and its operation shall also conform to the requirements of the following legislation:

- Occupational Health and Safety Act
- National Environmental Management: Air Quality Act

Add the following clauses:

#### PSMH 4.8 QUALITY CONTROL

The Quality Management System (QMS) should include documentation outlining the asphalt mix design process, the annual mix review process and processes pertaining to delivery of the asphalt mix.

The QMS shall also include any agreed frequency of split sampling of either raw mix constituents or asphalt mixes (prepared as agreed) with the Engineer.

The QMS shall also document the processes to be followed whenever a deviation from specifications is identified. The Contractor shall provide full rectification of any work undertaken with such asphalt mix or materials.

Where applicable, testing is to be conducted using the SANS 3001 series of test methods.

In line with these processes, the QMS should include as a minimum per mix design, the material characterisation tests included in Table PSMH21.

Quality Control Tests			Minimum Test Frequency
Binder	Penetration		Every batch delivered
	Softening Point		Every batch delivered
	SA PG Binder Classification		1 per 6 months
Aggregate	Coarse Aggregate	Aggregate Grading	Every batch delivered
		Flakiness Index (Max)	1 per month
		Aggregates BRD, ARD and Water Absorption	1 per month
		ACV, 10% FACT	1 per month
		Polished stone value (Coarse aggregates)	1 every year per stone type and source
	Fine Aggregate	Aggregate Grading	Every batch delivered
		Aggregates BRD, ARD and Water Absorption	1 per month
		Sand equivalent (Fine aggregates)	Every batch delivered
		Methylene Blue Absorption Value	1 per month
Asphalt Mix	Temperature of Mix	In the truck at exit weighbridge	Every load
		In the truck at the point of delivery	Every load
	Bitumen content		1 test per 200 tons of output or part thereof pr day
	Extracted mix aggregate grading analysis		1 test per 200 tons of output or part thereof pr day
	Voids analysis (Bulk relative density and maximum theoretical relative density)		1 test per 200 tons of output or part thereof pr day

Table PSMH21: Test Frequencies

The mix temperature of the mix taken in the truck at the exit to the plant shall not exceed the value stated in the mix design. Furthermore, the temperature of the mix taken in the truck on delivery shall not be less than the value stated in the mix design.

Quality checks on mix production will be based on the Job Mix Formula (JMF) for the approved mix design. Tolerances on variation from the JMF are given in Table PSMH22.

			Permissible Deviation From JMF (%)	
			Individual Results	Average of 3 consecutive results
Aggregate Fraction - Grading	Sieve (mm)on - Grading	28	±5	±3
		20	±5	±3
		14	±5	±3
		10	±5	±3
		7,1	±5	±3
		5	±4	±2,5
		2	±4	±2,5
		1	±4	±2,5
		0,6	±4	±2,0
		0,3	±3	±1,5
		0,15	±2	±1,0
		0,075	±1	±1,0
Voids in the mix (@design compaction)		±1,5	±1,0	
Binder Content		±0,3	±0,2	

Table PSMH22 Mix Production Property Limits

All process control testing undertaken by the contractor shall be signed off by the responsible person identified in the QMS and shall be made available to Engineer

All process control test results shall be referenced back to the unique Mix Design reference number.

Mix extraction gradings shall be made available within 48 hours of the asphalt being manufactured.

Binder content and void content shall be made available by 08:00am on the day following manufacture of the asphalt.

Should the test results not be provided as required or should the results fall outside the applicable specifications, the engineer reserves the right to suspend any supply until the results are produced and the mix is accepted.

The Contractor shall be responsible for rectification of any work completed (or partially completed) with asphalt mix that does not meet the specification to the satisfaction of the Engineer. The processes related to the rectification of such work shall be outlined in the QMS.

#### PSMH 4.9 ACCEPTANCE TESTING

After reviewing the results of the process control testing, the Engineer may elect to conduct their own testing of the binder, aggregates or asphalt mix produced. A copy of test results will be submitted to the Contractor as soon as they are available. Should the acceptance tests indicate

that the mix (or any part thereof) is not to specification, the cost of any re-test by the Engineer shall be to the contractors account and shall be deducted from any payments owed to the Contractor.

#### **PSMH 4.9 ON SITE MIX PROBLEMS**

The contractor shall also make himself available on site should the workability and compaction of the mix during the paving/laying operation be problematic in order to assist in troubleshooting the cause of such problems. If the root cause of the problem is related to the asphalt mix design, the contractor shall re-evaluate his mix design to correct such issues and re-submit his mix design for approval

### **PSMH 5 CONSTRUCTION**

#### **PSMH5.2 PRIME COAT**

*Add the following to the provisions of this clause:*

"Wherever traffic must be accommodated across the newly primed surface, a nominal application of crusher dust shall be applied on the prime coat prior to the traffic being allowed to travel on the prime coat. The crusher dust application shall be 1m<sup>3</sup> per 200m<sup>2</sup> of prime surface.

Prime shall not be applied to a crushed stone base when at any position the moisture content of the base layer is more than 50% of the optimum moisture content as determined by the Engineer's Representative."

#### **PSMH 5.4 TACK COAT**

*Add the following:* "A tack coat is required at all joints and under all asphalt layers."

### **PSMH 5.5 DESIGN OF ASPHALT**

#### **PSMH 5.5.1 General**

*Replace the contents with the following:*

"The design of the asphalt mixes shall be in accordance with the design guidelines of TRH 8.

In addition to the Marshall Criteria set out in 5.5.2, the design of asphalt mixes shall be in accordance with 'Interim Guidelines' for the design of hot mix asphalt in South Africa (June 2003), and appropriate research results. The mix properties, and requirements shall be as specified in these projects specifications."

### **PSMH 5.8 COMPACTION**

*Replace the second paragraph of sub clause 5.8 with the following:*

"The compacted asphalt shall have a density of at least 93% of Maximum Theoretical Relative Density (MTRD) determined according to Rice's Method."

### **PSMH 5.9 JOINTS**

*Amend the third paragraph starting at "before a new layer is placed..." to read:*

"Whenever the paver stops for more than 20 minutes, and the material cools down to below the rolling temperature (125oC), or before a new layer is placed..."

#### **PSMH5.5.10 HOT/WARM MIX ASPHALT MIXES AND DESIGN**

There are a total of 15 mixes required:

- 9 sand skeleton mixes (i.e. continuously graded mixes)
- 4 SMA (stone skeleton) mixes

- EME mixes

The required asphalt mixes are depicted in Table PSMH5. However, traffic condition risk profiles require additional higher levels of design for particular mixes (Table PSMH6).

Sand Skeleton Mixes (Sa)		Nominal Maximum Particle Size		
Traffic Condition Category		10	14	20
S	Standard Conditions	Sa-S10	Sa-S14	-
H	Heavy Conditions	Sa-H10	Sa-H14	Sa-H20
V	Very Heavy Conditions	-	Sa-V14	Sa-V20
E	Extreme Conditions	-	Sa-E14	Sa-E20
Design Level	Mix Types			
Level I	SA-S10, SA-S14			
Level II	SA-H10, SA-H14, SA-H20, SA-V14, SA-V20			
Level III	SA-E14, SA-E20			

Stone Mastic Asphalt (SMA)		Nominal Maximum Particle Size		
Traffic Condition Category		10	14	20
S	Standard Conditions			
H	Heavy Conditions			
V	Very Heavy Conditions	SMA-V10	SMA-V14	
E	Extreme Conditions	SMA-E10	SMA-E14	

Enrobé à Module Élevé (EME)		Nominal Maximum Particle Size		
Traffic Condition Category		10	14	20
S	Standard Conditions			
H	Heavy Conditions			
V	Very Heavy Conditions			
E	Extreme Conditions		EME-E14	EME-E20

Table PSMH5 Asphalt Mix Requirements

Traffic Volume (million E80's)	Traffic Condition Category		
	Traffic Speed (km/h)		
	< 20	20 - 70	> 70
< 3	H	S	S
3 to 10	V	H	H
10 to 30	E	V	V
> 30	E	E	E

Table PSMH6 Traffic Condition Risk Profiles

The typical various mix types and mix NMPS is portrayed in Table PSMH7:

Asphalt Mix Use			Mix Type
Mix Nominal Maximum Particle Size (NMPS)			
10	14	20	
Patching/ Handwork	-	-	Sa
Wearing Course (Paved)		-	Sa, SMA
-	Base Course (Paved)		Sa, EME

Table PSMH7 Typical Mix Use

## PSMH5.5.11 ASPHALT MIX DESIGN



Asphalt mix designs are required for every mix supplied. Mix designs for each mix type are to be conducted in accordance with the guidelines noted in Table PSMH8.

Sand Skeleton Mixes	Sabita Manual 35	Design and use of asphalt in road pavements
Stone Mastic Asphalt (SMA)	Sabita Manual 35	Design and use of asphalt in road pavements (Appendix B)
Enrobé à Module Élevé (EME)	Sabita Manual 33	Interim design procedure for high modulus asphalt

Table PSMH8 Asphalt Mix design Guideline Documents

The mix design process shall consist of a laboratory design, a plant trial and (if required) a paved trial. Once satisfied that the laboratory design and plant and paved trials meet the specified mix requirements, the contractor is to document the final mix parameters (i.e. the Job Mix Formula (JMF)). These parameters will be used for production quality control and acceptance purposes (see Table PSMH9).

Grading
Voids in the Mix (@ design compaction)
Binder Content

Table PSMH9: Parameters for the job mix formula

The contractor shall also include the following “mix characteristics” as part of his mix design submission:

- A unique identification number for every mix design
- The binder storage constraints (e.g. maximum storage times, etc.)
- The type of modifier used and the modified binder characteristics to TG1 (if applicable)
- Binder classification in terms of the SA PG Binder Classification System
- Whether the asphalt mix is using a Warm Mix Asphalt technology/additive. The contractor shall comment on any modifications to the “standard” mix design practice consequential to the use of the Warm Mix Asphalt technology/additive.
- The maximum mix temperature in the truck at the exit from the plant (in line with industry norms)
- The minimum mix temperature in the truck on delivery (in line with industry norms)
- The minimum recommended mix temperature for compaction of the mix on site (in line with industry norms)
- Comment on any asphalt mix characteristics that should be brought to the attention of the asphalt paving/laying team on site (e.g. EME asphalt mix longitudinal joint construction)

Should substantial changes to material types and properties occur, the asphalt mix designs for affected mixes shall be reviewed and where necessary re-constituted and re-submitted for approval.

i) Sand Skeleton Mixes

Designs of sand skeleton asphalt mixes are to be conducted in accordance with the guidelines set out in SABITA Manual 35 “Design and use of asphalt in road pavements”. Designs are to be conducted in accordance with the appropriate level (i.e. I, II and III) as indicated in Table PSMH5.

a) Level I Design

The Level I design is aimed primarily at verification of the mix volumetrics. However, a Level I design is a pre-requisite for the Level II and III designs. Asphalt mixes shall achieve the volumetric criteria noted in Table PSMH11 at the compaction effort noted in Table PSMH10 (or Tables PSMH14 or PSMH17 as applicable) with a design air void content of 4%.

Traffic Condition Category	Marshall	Gyratory
	SANS 3001 AS1	AASHTO T 312
	No. Blows	Ndesign
Standard (S)	75+45	75

Table PSMH10: Volumetric Compaction Requirements (Level 1)

	NMPS		
	10	14	20
VMA (min.)	15	14	13
VFB	65 - 75	65 - 75	65 - 75

Table PSMH11: Mix Design Requirements (Level 1)

Asphalt mixes designed at Level I shall meet the requirements for the empirical performance tests noted in Table PSMH12.

Test	Requirement	Test Method
Modified Lottman (TSR)	0.8 min.	ASTM D 4867 M
Indirect tensile strength (@ 25°C)	900 kPa - 1 650 kPa	ASTM D 6931-07
Dynamic creep (@ 40°C)	10 MPa min.	CSIR RMT 004
Water permeability	0.1mm/s - 4 mm/s	EN 12697-19
Air Permeability (@ 7% Voids) (x 10-8cm2)	1.0 max.	TRH 8 App C
Marshall Stability, Flow and Quotient	Report	SANS 3001-AS2

Table PSMH12: Empirical Performance Tests (Level 1)

#### b) Particular Mix Requirements Mix Sa-S10

Mix Sa-S10 is to be utilized for lightly trafficked residential streets and patching (handwork). Due attention should be paid to the recommendations of Sabita Manual 27 "Guidelines for thin hot mix asphalt wearing courses on residential streets" in the design of mix "Sa-S10". The additional mix characteristics noted in table PSMH13 are also required.

	NMPS
	10
Filler/Binder Ratio (Max.)	1,3
Binder Film Thickness (Min.)	7,5

Table PSMH13: Mix Design Requirements

#### c) Level II Design

The compaction requirements for the Level I design as a precursor to the Level II performance design shall be as noted in Table PSMH14. The design air void content shall be 4%.

Traffic Condition Category	Marshall	Gyratory
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	SANS 3001 AS1	AASHTO T 312
	No. Blows	N <sub>design</sub>
Heavy (H) & Very Heavy (V)	-	100

Table PSMH14: Volumetric Compaction Requirements (Level II)

In addition to meeting the mix requirements outlined in the Level I design, the mix design at Level II shall meet the performance characteristics noted in Tables PSMH15 and PSMH16.

Property	Test conditions	Specification	Test method
Workability	Superpave gyratory compactor - air voids after 25 gyrations (max.)	7%	D 6925 ASTM
Durability	Modified Lottman test conditions (min.)	0,8	ASTM D 4867M
Stiffness/ (dynamic modulus)	Dynamic modulus @ 20°C Loading frequencies of 0.1, 0.5, 1, 5, 10, 25 Hz	Report	AASHTO TP 79
Permanent deformation	HWTT at relevant number of passes	See Table PSMH16	AASHTO T 324
Fatigue	Four-point beam fatigue test @ 10°C, 10Hz to 50% stiffness reduction Strain levels 200,400,600µε	Report	AASHTO T 32

Table PSMH15: Mix Design Requirements (Level II)

Temperature Zone	6mm Rut	Stripping Point
	No. of Passes (Min.)	
PG 58 Zone	16 000	10 000
PG 64 Zone	20 000	10 000

Table PSMH16: Hamburg Wheel Tracking Test Specifications

d) Level III Design

The compaction requirements for the Level I design as a precursor to the Level III performance design shall be as noted in Table PSMH17. The design air void content shall be 4%.

Traffic Condition Category	Marshall	Gyratory
	SANS 3001 AS1	AASHTO T 312
	No. Blows	N <sub>design</sub>
Extreme (E)	-	125

Table PSMH17: Volumetric Compaction Requirements

In addition to meeting the mix requirements outlined in the Level I design, the mix design at Level III shall meet the performance characteristics noted in Tables PSMH15 and PSMH16 with the additional test temperatures for Stiffness and Fatigue as indicated in Table PSMH18.

Property	Test conditions	Specification	Test method
Stiffness (dynamic modulus)	Dynamic modulus @ -5, 5, 20, 40, 55°C Loading frequencies of 0.1, 0.5, 1, 5, 10, 25 Hz	Report	AASHTO TP 79
Fatigue	Four-point beam fatigue test @ 5, 10 and 20°C, 10Hz to 50% stiffness reduction, Strain levels 200,400,600µε	Report	AASHTO T 32

Table PSMH18: Additional Temperatures for stiffness and fatigue tests

ii) Stone Mastic Asphalt Mixes

Stone Mastic Asphalt (SMA) mix designs are to be conducted in accordance with the guidelines set out in Sabita Manual 35 "Design and use of Asphalt in road pavements – Appendix B"

SMA mixes are required for two NMPS (10mm & 14mm)

The mix design should ensure that the fine aggregate mortar should not induce dilation of the coarse aggregate stone skeleton mix after compaction on site thereby ensuring coarse aggregate interlock. Coarse aggregate for both NMPS will be defined as all material retained on the 5mm sieve. The stability of the fine aggregate mortar will require enhancement with either cellulose fibre or through modification of the binder or both.

The compacted mix should form an impervious surfacing meeting the water permeability and air permeability requirements noted in Table PSMH12. The SMA mix shall also conform to the requirements in Table PSMH19.

Design Air Void Content (%)	4
Bitumen Content (Min.)	6
Voids in Mineral Aggregate (VMA) (Min.)	17
Modified Lottman (TSR) (Min.)	0,7
Schellenberg Drainage Test (%) (Max.)	0,3
VCAmix1 (%)	< VCA <sub>dry</sub> 2

Note 1. VCAmix is the voids in coarse aggregate (>5mm) of the compacted mix

Note 2. VCA<sub>dry</sub> is the voids in coarse aggregate (>5mm) of the dry rodded coarse aggregate

Table PSMH19: SMA Mix Specifications

SMA Type "V" and type "E" mixes shall be subjected to and shall conform with the performance test requirements noted in table PSMH15. SMA type "E" mixes shall be subjected to the additional temperature test noted in table PSMH18

The SMA-E10 and SMA-E14 mixes shall conform to the Dynamic Modulus and Fatigue testing requirements noted in Table PSMH20 (EME Performance Criteria). A mix design is required for each SMA mix. The mix design document should clearly document the process followed to meet the desired SMA characteristics.

iii) Enrobé à Module Élevé (EME) Asphalt Mixes

EME mix design are to be conducted in accordance with the guidelines set out in Sabita Manual 33 "Interim design procedure for high modulus asphalt"

EME mixes are required for two NMPS (14mm & 20mm)

Performance criteria should conform to the requirements for a Class 2 EME as depicted in Table PSMH20.

Property	Test	Method	Requirement (Class 2)
Workability <sup>1</sup>	Gyratory compactor (angle 1.25°), air voids after 45 gyrations	ASTM D6926	≤ 6%
Durability	Modified Lottmann, TSR	ASTM D4867	≥ 0.8%
Resistance to permanent deformation	RSST-CH, 55°C, 5000 reps	ASTM T320	≤ 1.1% Strain
Dynamic Modulus	Dynamic modulus at 10 Hz, 15°C	ASTM TP62	> 16 Gpa
Fatigue	Beam fatigue test at 10 Hz, 10°C, to 50% stiffness reduction Strain	ASTM T321	≥ 1x10 <sup>6</sup> 6 reps @ 260µε

	levels 200, 400,		
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#### Eable PSMH20: Performance Criteria

EME type “E” mixes shall be further subjected to and shall conform with the performance test requirements for Stiffness (dynamic modulus), Permanent Deformation and Fatigue noted in Table PSMH15 with the additional temperature test requirements noted in Table PSMH18. A mix design is required for each EME mix. The mix design document should clearly document the process followed to meet the desired EME characteristics.

##### iv) Warm Mix Asphalt

Should a Warm Mix Asphalt be used in the mix, the mix design shall incorporate the use of such a technology/additive in the mix design process. Any consequential deviations from the guidelines set out in Sabita Manual 35 “Design and use of asphalt in road pavements – Appendix B”, Sabita 33 “Interim design procedure for high modulus asphalt”, or standard industry practice shall be brought to the attention of the engineer and shall be documented in the mix design report.

##### v) Mix design Approval

No mixes may be supplied without approval of the mix design by the Engineer. The contractor shall label every mix design with a unique identification number to facilitate traceability of mixes using the mix design.

The contractor shall submit his proposed mix design to the Engineer for acceptance of the mix design at least 2 weeks prior to initial supply of any particular mix. Upon request by the Engineer, the contractor shall also supply samples of raw materials. The minimum sample sizes shall be 50 kg for each aggregate type/size and 5 litres of bitumen/binder. The contractor shall also supply any other relevant information as may be requested. Once satisfied with the content of the mix design, the Engineer will give signed approval for the mix.

##### vi) Mix design Review

Every mix design is to be reviewed at least annually. The review should include verification of the asphalt mix through testing of at least the following characteristics:  
Binder compliance with SANS 4001-BT1

- Modified binder compliance with TG1
- Binder classification in terms of the SA PG Binder Classification System
- Aggregate and filler compliance with Table PSMH2
- Aggregate BRD, ARD and water absorption
- Mix BRD (@ Ndesign) and MTRD
- Particular mix type characteristics

#### **Sand skeleton mixes**

##### Level I design mix volumetric and performance characteristics

- All requirements in Tables PSMH11, PSMH12 and PSMH13 (as applicable) at the appropriate compaction (Table PSMH10 for Level I designs and Table PSMH14 for Level II and III designs.

##### Level II design mix performance characteristics (Table PSMH15)

- Workability

- Durability
  - Level III design mix performance characteristics (Table PSMH15)
- Workability
- Durability
  - a) SMA mixes
- All requirements in Table PSMH19
- SMA mix performance characteristics (Table PSMH15)
- Durability
  - c) EME Mixes
- Mix performance Characteristics
- Workability
- Durability

Should the binder, aggregate or mix characteristics of any mix differ significantly from the characteristics obtained in the initial mix design, then the mix shall be re-designed to meet the relevant volumetric and performance characteristics. In the event of a dispute over the significance of a particular characteristic, the contractor shall undertake the appropriate performance test to prove compliance with the specification.

#### PSMH 7.2.1.2(c) Asphalt Bases and Surfaces

Amend the contents of Table PSMH11 to read as follows:

(The minimum frequency shall be the greater calculated from columns 2 and 3)

1	2	3
Test	Quantity or area to which one test is applied, max	Number of tests per lot, min.
Aggregate grading	100 t	3
Binder content	100 t	3
Density	1 000 m <sup>2</sup> per layer	6
Marshall density, stability, flow and air voids	200 t	1

Table PSMH19: Frequency of Construction Control Testing

#### PSMH 7.2.4 Density Testing

*Replace this clause with the following:*

“Density testing shall be carried out by means of an approved nuclear-gauged testing apparatus, and cores shall be cut from the road only for check densities if ordered by the Engineer.

The statistical judgment plan as set out in Appendix B of SABS 1200 M:1996 Roads (General) shall be used to determine whether the densities achieved comply with the specified density.

All holes left by the coring machine, where used, shall be neatly repaired by the Contractor with hot mix asphalt.”

**Add the following clause:**

#### PSMH 7.4 ADDITIONAL TESTING

The following additional tests shall be carried out on samples obtained from the paver hopper:

- (i) Penetration of recovered binder at 25° C (Method ASTM D5)
- (ii) Binder softening point (Method ASTM D36)

Should the penetration of the recovered binder be less than 35 at 25oC for a 60/70 pen. binder, the asphalt layer shall be deemed to be unsatisfactory and shall be rejected by the Engineer. The above tests will not be carried out as a matter of routine but at the discretion of the Engineer."

## **PSMH 8 MEASUREMENT AND PAYMENT**

### **PSMH 8.1 RATES OF APPLICATION AND BITUMINOUS BINDER CONTENT**

#### **PSMH 8.1.2 Prime**

*Add the following:*

"The prime coat shall be applied at a rate of 0,8 litre/m²."

#### **PSMH 8.1.4 Tack coat**

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

"The tack coat shall be a 30% spray grade emulsion applied at a rate of 0,55 litre/m²."

#### **PSMH 8.1.5 Bituminous binder content**

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

"The bituminous binder content is to be as per PSMH3.4"

**PSMK KERBING AND CHANNELLING**

**PSMK 3 MATERIALS**

**PSMK 3.1 CONCRETE**

*Add the following:*

"The Contractor shall timeously submit the concrete mix design for cast-in-situ kerbing to the Engineer for approval and no kerbing shall be placed before the mix design has been approved."

**PSMK 5 CONSTRUCTION**

**PSMK 5.2 PRECAST CONCRETE KERBING AND CHANNELLING**

*Replace the first sentence with the following:*

"Precast kerbs will be laid on a concrete base as indicated on the drawings. The channel/fillet/set shall be constructed as per the drawings. Construction joints shall be formed in the channel/fillet/set at 2m intervals, by pressing a suitable former into the wet concrete to a depth of at least a third of the total depth of concrete. Expansion joints shall be cast at a spacing of not more than 12m spacing."

**PSMK 5.11 TRANSITION SECTIONS AND INLET AND OUTLET STRUCTURES**

*Delete the words "and with the requirements of the Project Specification" in the second paragraph.*

**PSMK 7 TESTING**

**PSMK 7.2 CAST-IN-SITU AND EXTRUDED KERBING AND CHANNELLING**

**PSMK 7.2.1 General tests**

*Delete this sub clause.*

**PSMK 7.2.2 Alternative tests**

*Replace the heading and contents of this sub clause with the following:*

**PSMK 7.2.2 Tests**

The Contractor shall carry out a minimum of three cube crushing tests per 1 000 m of kerbing placed. The cost of such tests shall be deemed included in the rates tendered for kerbing.

One cube crushing test shall consist of a set of six cubes made with concrete taken from the mixer, the kerbing machine or from any part of the work as ordered.

If, after 28 days in an approved laboratory, after three cubes of any set of six cubes have been tested, the average crushing strength is found to be more than 3 MPa below the specified strength, the kerbing represented by the cubes will be rejected.

The Contractor may apply for resubmission of the rejected section on the basis of cores drilled from this section and tested for the estimated actual crushing strength in accordance with SABS method 865 (excluding Appendix A). The cost of drilling and testing the cores is for the Contractor's account, regardless of the outcome of the tests on the cores. The number of cores required will be determined by the Engineer and the criterion for rejection or acceptance of the section represented by the cores shall be as specified above for cubes."

**PSMK 7.3 RESPONSIBILITY FOR THE COST OF TESTING**

*Delete this sub clause.*



**PSMK 8 MEASUREMENT AND PAYMENT**

**PSMK 8.2 SCHEDULED ITEMS**

**PSMK 8.2.1 Concrete kerbing**

Replace "5.8.2" in the third line of paragraph (e) with "5.8.3".

**PSMK 8.2.3 Variation of tests on extruded kerbing**

*Delete this sub clause.*

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**PSMM      ANCILLARY ROADWORKS**

**PSMM 3      MATERIALS**

**PSMM 3.2      ROAD SIGNS**

**PSMM 3.2.2 Structural steel**

*Delete the words "except that they shall be of D-shape cross-section" in the first paragraph.*

*Add the following:*

"All steel sign supports shall be hot-dip zinc-coated (galvanized)."

**PSMM 3.2.8 Paints and protective coatings**

**PSMM 3.2.8.1 Structural steel sign supports and sign face frames**

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

"The sign supports and the backs of all road sign faces shall be painted grey. The colour code of the paint shall be code No D36 according to the CKS 279 classification.

Newly galvanized surfaces shall be thoroughly scrubbed down with an approved galvanized iron cleaner to remove all traces of the resinous protective coating. The surface shall be washed down and scrubbed to remove all traces of grease, oil, dirt, etc. Two coats of calcium plumbate primer shall be applied to a dry film thickness of not less than 0,028 mm. The undercoat shall follow within one week of the primer."

**PSMM 8.4.1 Proprietary Brand Road-Marking Material**

*Add the following:*

"f)      Application of glass beads ..... Unit: kg"

*Add the following to the last paragraph:*

"The rate for the application of glass beads shall be the kilogram of beads supplied and measured to the nearest 0,1 kilograms. The rate shall be additional to the painting of the road markings."

### **C3.4: PARTICULAR SPECIFICATIONS**

In addition to the Standardized and Project Specifications the following Particular Specifications / Policies shall apply to this contract and are available on web address:

<ftp://ftp.durban.gov.za/cesu/StdContractDocs/>:

- C3.4.1      Part AH - OHSA 1993 Safety Specification (2014)  
(26 Pages) Not included. To be obtained separately.
  
- C3.4.2      Cornubia Mixed-Use Phased Development, Phase 2, Mount Edgecombe, Environmental Management Programme. (Although the report indicates 'Draft', it has been approved and is final.)

### **C3.4 PARTICULAR SPECIFICATIONS:**

**C3.4.2 Cornubia Mixed-Use Phased Development, Phase 2, Mount Edgecombe, Environmental Management Programme. (Although the report indicates 'Draft', it has been approved and is final.), can be downloaded from the following link:**

<https://bit.ly/3bTvHq3>

### **C3.5: CONTRACT AND STANDARD DRAWINGS**

#### **C3.5.1 CONTRACT DRAWINGS / DETAILS**

##### **PORTION 2 EXTENT**

BMK-1619-P2-000-000

##### **ROADWORKS**

BMK-1619-P2-001-021 to 027 Rev A  
BMK-1619-P2-001-000 Rev A  
BMK-1619-P2-001-001 to 002 Rev A  
BMK-1619-P2-007-001 Rev A

##### **SEWER RETICULATION**

BMK-1619-P2-006-000 to 002 Rev A  
BMK-1619-P2-006-021 to 023 Rev A  
BMK-1619-P2-07-040 to 041 Rev A

##### **STORMWATER**

BMK-1619-P2-004-000 to 002  
BMK-1619-P2-004-021 to 023  
BMK-1619-P2-07-020 to 021  
BMK-1619-P2-CIV-P2-007-022

##### **WATER RETICULATION**

BMK-1619-P2-005-000 to 002  
BMK-1619-P2-007-060 to 061

**NOTE:** These drawings are not bound in the tender document but are available for download from the following link:

<https://bit.ly/3bTvHq3>

#### **C3.5.2 STANDARD DRAWINGS**

The Standard Drawings to which these Standard Engineering Specifications refer are listed below.

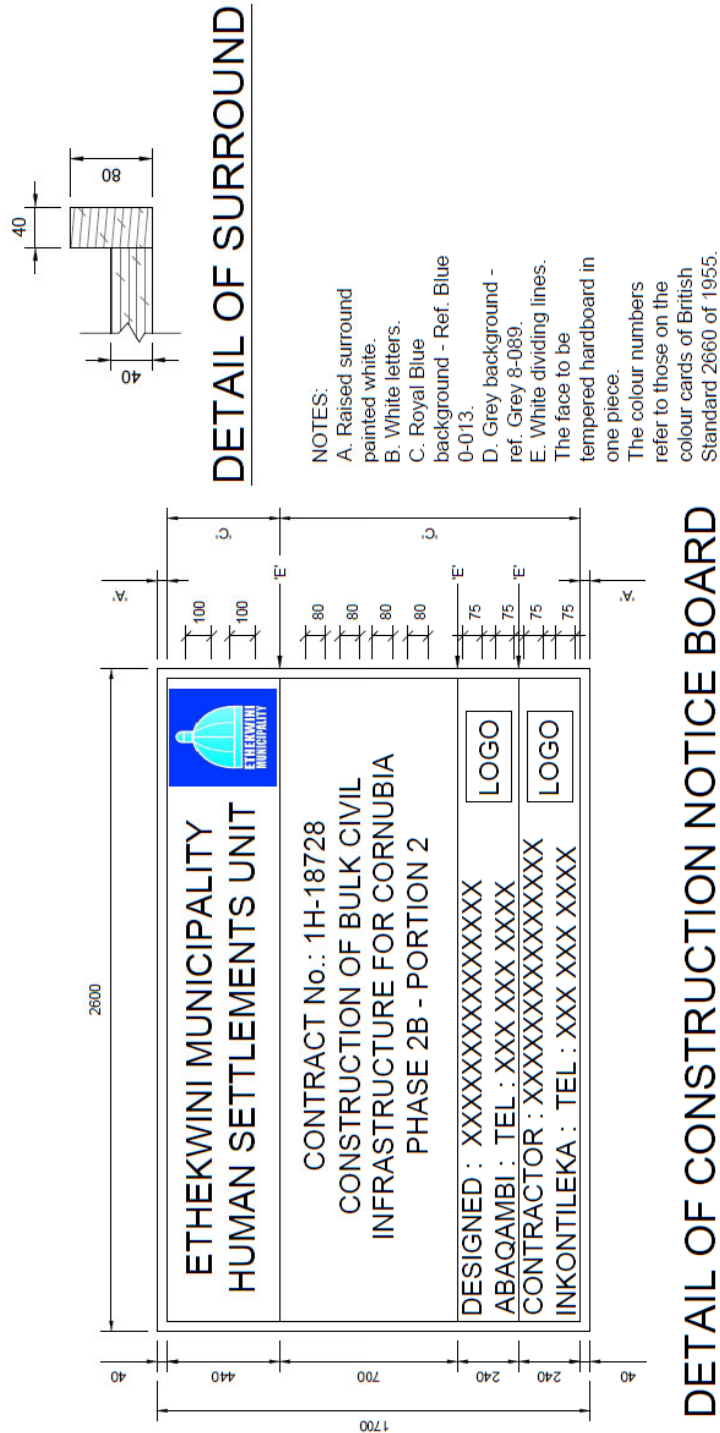
<b>Dwg No</b>	<b>Description</b>	<b>Date of Issue</b>	
38570	Ring Manholes	February	1990
38571	Brick Manhole Details	February	1990
38572	Stormwater Inlet Details	February	1990
38573	Stormwater Inlet Special Details	February	1990
38574	Sewer Manholes: Ramp, Backdrop and Channelling Details	February	1990

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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

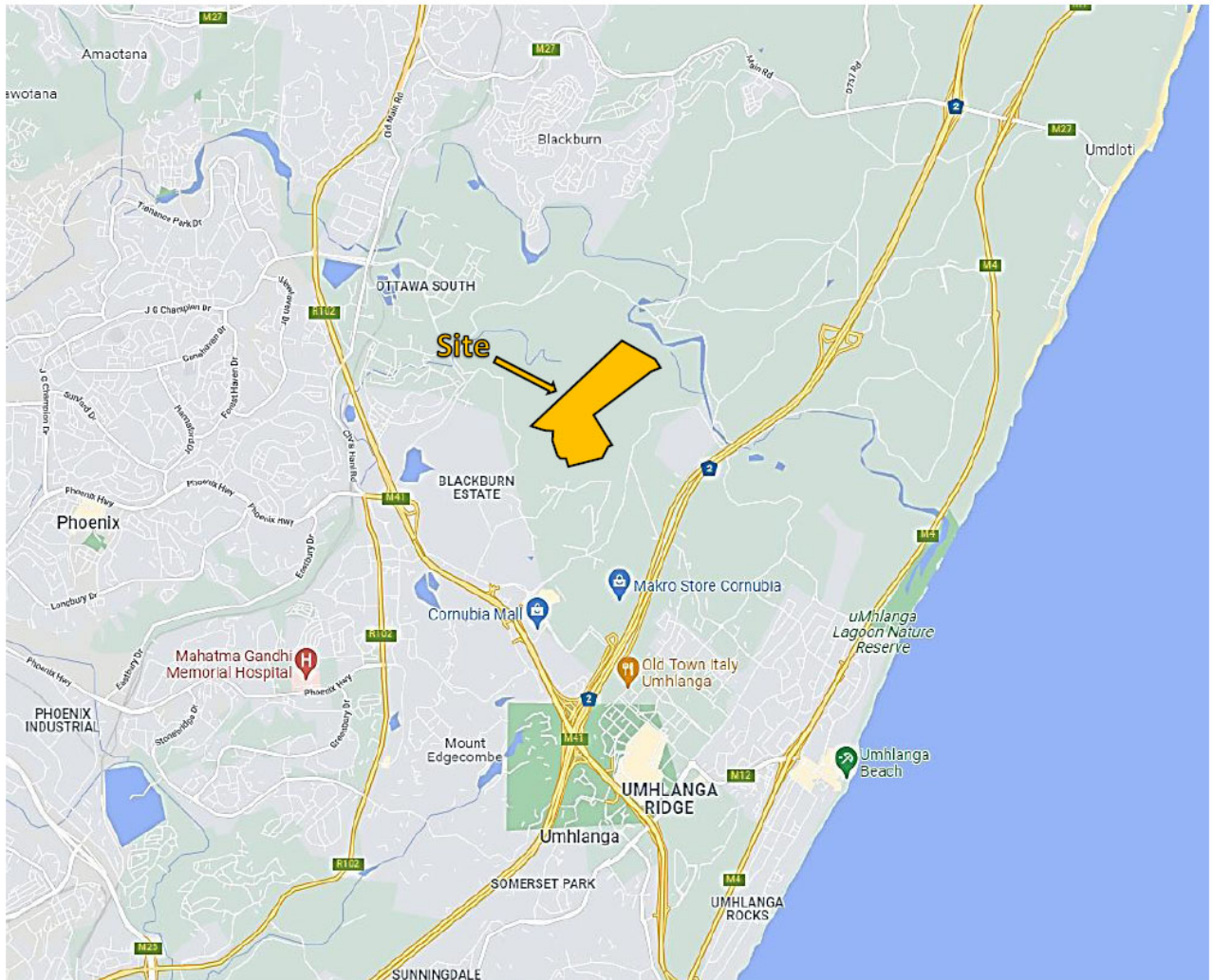
C3.6: ANNEXURES

C3.6.1 “Details of Construction Notice Board



## **PART C4: SITE INFORMATION**

### **C4.1 LOCALITY PLAN**







#### **C4.2 CONDITIONS ON SITE**

The geotechnical report and test results provides an overview of the conditions that can be encountered on site and can be downloaded from the following link:

<https://bit.ly/3bTvHq3>