



CLUSTER
Human Settlement, Engineering, and Transport

UNIT
Transport Authority

DEPARTMENT
Public Transport

PROCUREMENT DOCUMENT
INFRASTRUCTURE

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

Contract No: 29725-1T

Contract Title: Rehabilitation of public transport facilities in the western Region of eThekweni Municipality

Est. CIDB Grade/ Class: 7 CE

CLARIFICATION MEETING AND QUERIES

Clarification Meeting: Compulsory Clarification Meeting

Meeting Location, Date, Time: 30 Archie Gumede Place, ETA Building, 2nd floor, room 213
On 31 January 2025 at 11:00am

Queries can be addressed to: Zama Mgagula
Tel: 031 311 7893
The Employer's Agent's: Queries to be emailed to: zama.mgagula@durban.gov.za
Representative: submitted by 13 February 2025 and consolidated answers to questions will be uploaded 20 February 2025.

TENDER SUBMISSION

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

Delivery Location:

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

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

Closing Date/ Time: Friday, 28 February 2025 at 11h00

FACSIMILE, eMAIL, or POSTED TENDERS WILL NOT BE ACCEPTED

FOR OFFICIAL USE ONLY

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

Issued by:

ETHEKWINI MUNICIPALITY

Deputy Head: Public Transport

Date of Issue: 24/01/2025

Document Version 01/03/2024

FOR OFFICIAL USE ONLY

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

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

Tenders are hereby invited for the works to rehabilitate the public transport facilities within the western region of eThekweni Municipality.

Subject	Description	Tender Data Ref.
Employer	The Employer is the eThekweni Municipality as represented by: Deputy Head: Public Transport	F.1.1.1
Tender Documents	Documents can only be obtained in electronic format, issued by the eThekweni Municipality. Documentation can be downloaded from the National Treasury's eTenders website or the eThekweni Municipality's Website . The <u>entire document</u> should be printed (on A4 paper) and suitably bound by the tenderer.	F.1.2
Eligibility	It is <u>estimated</u> that tenderers should have a CIDB contractor grading designation of 7 CE (or higher). The CIDB provisions in relation to a Contractor's Potentially Emerging (PE) status <u>do not</u> apply.	F.2.1.1
Clarification Meeting	30 Archie Gumede Place, ETA Building, 2nd floor, room 213 On 31 January 2025 at 11:00am	F.2.7
Seek Clarification	Queries relating to these documents are to be addressed to the Employer's Agent's Representative whose contact details are: Zama Mgagula Tel: 031 311 7893 Queries to be emailed to: zama.mgagula@durban.gov.za submitted by 13 February 2025 and consolidated answers to questions will be uploaded 20 February 2025.	F.2.8
Submitting a Tender Offer	Tender offers shall be delivered to: The Tender Box in the foyer of the Municipal Building 166 KE Masinga Road, Durban Bidders are required to also make an electronic submission via SSS. Bidders must ensure that the hard copy and electronic submission are the same, failing which the submission will be deemed invalid. Bidders are responsible for resolving all access rights and submission queries before the tender closing date. SSS Queries Contact: Lindo Dlamini: Tel: 031-3227133/031-3227153 email: supplier.selfservice@durban.gov.za	F.2.13
Closing Time	Tender offers shall be delivered on or before Friday, 28 February 2025 at or before 11h00 .	F.2.15
Evaluation of Tender Offers	The 80/20 Price Preference Point System, as specified in the PPPFA Regulations 2022 will be applied in the evaluation of tenders. Refer to Clause F.3.11 of the Tender Data for the Specific Goal(S) for the awarding of Preference Points, and other related evaluation requirements.	F.3.11

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

T1.1.2: NOTES TO TENDERERS

These Notes are intended to provide guidance to tenderers regarding tendering obligations and requirements. Compliance requirements are stated in the relevant parts of the Tender Data.

eThekwini Supply Chain Management Policy (SCMP)

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

1) Clause 14(4): ETM Supplier Database

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

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

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

The following is to be noted:

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

2) Clause 21(1)(d)(i): Audited Financial Statements

Audited Financial Statements (prepared for auditing) are required to be submitted if the value of the tender offer exceeds R10 million (incl VAT).

3) Clause 21(1)(d)(iii): Contracts Awarded during the past 5 Years

Tenderers are to include with their submission a listing of any contracts awarded to the tenderer during the past 5 years, including particulars of any material non-compliance or dispute concerning the execution of the contracts. Tenderers are referred to Returnable Form T2.2.3.

4) Clause 21(1)(d)(ii), Clause 28(1)(c) and Clause 29(10): Municipal Fees

Tenderers are to be referred to Returnable Form T2.2.12: "Declaration of Municipal Fees", to certify that they have no undisputed commitments for municipal services towards a municipality. Prior to an award, a Tenderer's municipal rates and taxes cannot be in arrears. Should a Tenderer be in arrears with respect to municipal services and has formalised an agreement with the respective municipality to offset the arrears, the agreement must be in place at time of tender closing.

5) Clause 28(1)(d), Clause 28(1)(h) and Clause 29(10): Certifications and Registrations

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

The Tenderer's Tax Compliance Status, CIDB Registration and Status, and B-BBEE Level Status (if required), will be confirmed using the National Treasury Central Supplier Database (CSD). Tenderers are referred to Returnable Form T2.2.1.

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

6) Clause 28(1)(e): Joint Ventures (JV)

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

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

As proof that a JV has been formalised, or that the parties to the JV agree to formalise the JV should they be successful in being recommended for the award of this tender, Tenderers are referred to Returnable Form T2.2.10.

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

CIDB Regulation 25(8)s

7) It should be noted that this contract is not part of a Targeted Development Programme (TDP). The CIDB provisions in relation to a Contractor's Potentially Emerging (PE) status do not apply. Tenderers are referred to CIDB Inform Practice Note #32: "Application of the Potentially Emerging (PE) Status".

Test for Responsiveness

8) In this regard, Tenderers are referred to Clause F.3.8 of the Tender Data.

Tenderer's Experience (Returnable Documents)

9) The requirements for the submission of the Tenderer's Experience are specified in Clause F.2.1.3. Returnable Form T2.2.16 "ELIGIBILITY: EXPERIENCE OF TENDERER" (consisting of 8 pages) is provided for the return of the experience submissions. The number of pages provided corresponds to the minimum number of submissions required in terms of the Clause F.2.1.3.

Should the Tenderer require additional pages, they should include additional copies of the relevant page

PART T1: TENDERING PROCEDURES

T1.2: TENDER DATA

T1.2.1 STANDARD CONDITIONS OF TENDER

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

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

T1.2.2 TENDER DATA

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

F.1: GENERAL

F.1.1 The employer: The Employer for this Contract is the eThekweni Municipality as represented by: Deputy Head: **Public Transport**

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

This procurement document.

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

“COLTO Specifications” hereinafter referred to as the Standard Engineering Specifications. This document is obtainable separately, and Tenderers shall obtain their own copies of the applicable Sections.

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

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

In addition, Tenderers are advised, in their own interest, to obtain their own copies of the following acts, regulations, and standards referred to in this document as they are essential for the Tenderer to get acquainted with the basics of construction management, the implementation of preferential construction procurement policies, and the participation of targeted enterprise and labour.

The Employer’s current (as at advertising date) Supply Chain Management Policy.

The Preferential Procurement Policy Framework Act No 5 of 2000, and the Preferential Procurement Policy Framework Act Regulations (2022).

The Occupational Health and Safety Act No 85 and Amendment Act No 181 of 1993, and the Construction Regulations (2014).

The Construction Industry Development Board Act No 38 of 2000 and the Regulations issued in terms of the Act (July 2013).

SANS 1921:2004 – Construction and Management Requirements for Works Contract, Parts 1-3.

Any other eThekweni Policy documents referenced in the Tender Documents.

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

<https://www.etenders.gov.za/>

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

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

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

Name: **Sihle Mhlongo**

Tel: **0313229307**

eMail: **sihle.mhlongo2@durban.gov.za**

The Employer's Agent's Representative is:

Zama Mgagula

Tel: 031 311 7893

Queries to be emailed to: zama.mgagula@durban.gov.za

submitted by 13 February 2025 and consolidated answers to questions will be uploaded 20 February 2025.

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

F.2: TENDERER'S OBLIGATIONS

F.2.1.1 Eligibility: General

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

- (a) the Tenderer does not comply with the legal requirements as stated in the Employer's current SCM Policy.
- (b) the Tenderer cannot provide proof that he is in good standing with respect to duties, taxes, levies and contributions required in terms of legislation applicable to the work in the contract.
- (c) In the event of a Compulsory Clarification Meeting:
the Tenderer fails to attend the Compulsory Clarification Meeting.
the Tenderer fails to have form "Certificate of Attendance at Clarification Meeting / Site Inspection" (in T2.2) signed by the Employer's Agent or his representative.
- (d) in the case of JV submissions, two or more JV entities have common directors / shareholders or common entities tendering for the same works.
- (e) at the time of closing of tenders, the Tenderer is not registered on the National Treasury Central Supplier Database (CSD) as a service provider. In the case of a Joint Venture, this requirement will apply individually to each party in the Joint Venture.
- (f) The tenderer has not submitted, with this tender, a valid Letter of Good Standing from the Compensation Commissioner as proof of being registered and in good standing with the compensation fund. Reference is to be made to Returnable Document T2.2.13.

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

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

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

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

The following are to be noted:

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

F.2.1.2 **Eligibility: CIDB**

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

Joint ventures are eligible to submit tenders provided that:

Every member of the joint venture is registered (as "Active") with the CIDB (at time of tender closing),
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
The combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations (2013) is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a **CE** class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.

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

F.2.1.3 **Eligibility: Tenderer's Experience**

Only those tenderers that can demonstrate experience, by the submission of the specified returnable document in T2.2 (duplicated for each experience submission), and supply the associated documentation/ information, in works of a similar nature, within the past 10 years, will be eligible to have their tenders evaluated in terms of Clause F.3.11.

Tenderers may submit experience gained as Sub-Contractors or Main Contractors.

Returnable form T2.2.16: “Eligibility: Experience of Tenderer” is to be duplicated for each experience submission, as may be required.

Contact details of the Client or Main Contractor (if experience was gained as a sub-contractor), is required to be provided on the above-mentioned form. The contact details may be used by the Employer to verify the information, pertaining to the experience submission, as provided by the Tenderer. Should the Employer's reasonable attempts to make contact with the Client or Main Contractor, to verify the information provided, fail (for whatever reason), that specific experience submission will be considered invalid.

Where works are still in progress the value of completed work as detailed on the most recent payment to the Contractor / Sub-Contractor is to be used in the experience submission.

In the event of a Joint Venture (JV) tendering for this contract, experience gained by the separate entities making up the JV may be used as experience provided that the experience requirement, as stipulated in **Table 2**, is satisfied, and that the required documentation/ information is provided.

The documentation/ information that is required is specified on **Table 1: “Documentation / Information Requirements”** (which includes the Notes below the table), and the experience requirement is as stated on **Table 2: “Tenderer's Experience Requirement”**.

Table 1: Documentation / Information Requirements

Note: an “X” in this table indicates that the associated documentation must be provided, if applicable.	Proof of Sub-Contract Agreement	Letter of Award OR Form of Offer & Acceptance	Most recent Payment Certificate OR Invoice with Quantities summary	Final Payment Certificate OR Invoice with Quantities summary	Completion Certificate	NB Scope of Work
	Note 1	Note 2	Note 3	Note 4	Note 5	Note 6
Works as Sub-Contractor						
Current Contracts	X	-	X	-	-	X
Completed Contracts	X	-	-	X		X
Works as Main Contractor						
Current Contracts	-	X	X	-	-	X
Completed Contracts	-	X	-	X	X	X
Failure to submit the returnable form T2.2.16, and provide the above supporting documentation/ information, for each submission of experience, will invalidate that experience submission						

Table 1: NOTES	
Note 1	Must include the names of the parties, the managing entity's name, the effective dates, and the signature(s) page, all pertaining to 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, OR most recent submitted INVOICE, with a summary breakdown of quantities.
Note 4	Proof of the final payment received from the Main Contractor or Client/ Employer, OR most recent submitted INVOICE, 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. - This submission must indicate how the works carried out, either as a Sub-Contractor or a Main Contractor, is similar (see Table 2: Tenderer's Experience Requirement) to the Scope-of-Work of this specific tender. - If executed as a Sub-Contractor, the Scope-of-Work should be indicative of only the works carried out by the Sub-Contractor, and not the overall Scope-of-Work of the main contract. - If executed as a Main Contractor, the overall contract Scope-of-Work is to be provided. - The description of the Scope-of-Work is to be inserted into the returnable form in T2.2.16, or if available as a hard copy (max. 2 pages) attached to the form with the other relevant, associated, supporting documentation.

Table 2: Tenderer's Experience Requirement

Projects of a similar nature that will be considered will be one, or a combination of, the following types of projects: Road Rehabilitation Road Widening/Upgrades New Road Construction Special Maintenance Intersection Improvements Access Road Upgrades Major Parking Areas
Each project must consist of at least two of the following elements: Roadway Layer-Works Asphalt Roadway Surfacing Kerbing / Channelling Sidewalk / Walkway Construction Stormwater Drainage Traffic Calming Measures Retaining Structures Dealing With Underground Services (Watermains, Sewers, Electricity, Communication Infrastructure)
• Projects that will be excluded are: The Construction Of Gravel Roads Materials Investigation, Analysis And Pavement Design Experience Road Routine Maintenance Projects

Experience Requirement: Contract(s) with works of a similar nature, within the past 10 years
A minimum of 3 contracts, <u>each</u> with a value of 60% of the tender value submitted for this tender.

Note: The failure to complete the relevant returnable form T2.2.16 for each submission of experience AND supply the associated, relevant, documentation (as specified on Table 1) will invalidate the experience submission.

F.2.1.4 Eligibility: Tenderer's Key Personnel

Only those tenderers that 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. This form should be duplicated for each experience submission, as may be required.

- **Contracts Manager:** with more than 5 years of road construction experience or more than 4 years of experience years road rehabilitation experience on projects of a similar nature; with relevant accredited 3-year diploma / 4 year degree. Also registered with ECSA as a Professional Civil Engineer or Professional Civil Engineering Technologist or registration with SACPCMP as a Professional Construction Project Manager.

- **Construction Manager:** with more than 3 years road construction experience or more than 2 years road rehabilitation experience on projects of a similar nature; with relevant accredited 3 year diploma /4-year degree. Also be registered with ECSA as a Professional Civil Engineering: Engineer, Technologist or Technician or registration with SACPCMP as a Professional Construction Project Manager or Professional Construction Manager.

Note 1: Road rehabilitation experience shall include mill and asphalt inlay, asphalt overlay, and rehabilitation of the base, sub-base or subgrade pavement layers.

Note 2: Road construction experience shall include new road construction, road widening/upgrade projects, intersection improvements, special maintenance and routine maintenance, gravel to surface road upgrades, access road upgrades and parking areas, ancillary/secondary works (kerbing, drainage, sidewalks, road signs, gabions etc).

Note 3: The following is excluded – materials investigation and analysis, and all forms of design experience.

Note 4: For tendering purposes, submission of one (1) contract manager and one (1) construction manager shall be required.

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

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

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

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

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

F.2.7 Clarification meeting:

30 Archie Gumede Place, ETA Building, 2nd floor, room 213
On 31 January 2025 at 11:00am

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

offer.

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

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

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

Contract No. : **29725-1T**

Contract Title : **Rehabilitation of public transport facilities in the western Region of eThekweni Municipality**

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

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

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

SSS Queries Contact: Lindo Dlamini: Tel: 031-3227133/031-3227153 email:

supplier.selfservice@durban.gov.za

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

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

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

Date : **Friday, 28 February 2025**

Time : **11h00**

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

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

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

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

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

Tax Clearance

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

SARS has introduced a new Tax Compliance Status System. Tenderers must submit a **Tax Compliance Status PIN** (TCS PIN) instead of an original Tax Clearance Certificate. This TCS PIN can be used by third

parties to certify the taxpayer's real-time compliance status. This TCS PIN is to be entered on Returnable Document T2.2.1: "Compulsory Enterprise Questionnaire". Separate Tax Clearance Certificates / TCS PINs are required for each entity in a Joint Venture.

Failure to comply will make the tender non-responsive.

Compensation Commissioner

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

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

Failure to comply will make the tender non-responsive.

Central Supplier Database (CSD)

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

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

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

CIDB Registration

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

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

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

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

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

F.3: THE EMPLOYER'S UNDERTAKINGS

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

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

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

F.3.11 Evaluation of Tender Offers:

Eligibility

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

Functionality

Functionality Evaluation is not applicable to this tender.

Preference Point System

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

Price Points

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

Preference Points

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

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

Ownership Goal

Goal Weighting: 75%

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

Ownership Categories	Criteria	80/20
Race: Black (w1)	Equals 0%	0
	Between 0% and 51%	4.8
	Greater or equal to 51% and less than 100%	9.6
	Equals 100%	12
Gender: Female (w2)	Equals 0%	0
	Between 0% and 51%	1.2
	Greater or equal to 51% and less than 100%	2.4
	Equals 100%	3
Maximum Goal Points:		15

The Weightings of the Ownership Categories will be:

- w1 = 75%, w2=25% (where: w1 + w2 = 100%)

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

Companies and Intellectual Property Commission registration document (CIPC)

B-BBEE Certificate of the tendering entity.

Consolidated BBBEE Certificate if the tendering entity is a Consortium, Joint Venture, or Trust (Issued by verification agency accredited by the South African Accreditation System).

Agreement for a Consortium, Joint Venture, or Trust.

RDP Goal: The promotion of South African owned enterprises

Goal Weighting: 25%

The tendering entity's **Address** (as stated on the National Treasury Central Supplier Database (CSD) or on the eThekweni Municipality Vendor Portal) is to be used in the determination of the tenderer's claim for **Preference Points** for this Specific Goal.

Location	80/20
Not in South Africa	0
South Africa	1.25
Kwa Zulu Natal	2.5
eThekweni Municipality	5
Maximum Goal Points:	5

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

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

- (a) The tenderer submits a **valid Tax Clearance Certificate OR Tax Compliance Status PIN**, issued by the TCS System of the South African Revenue Services, or has made arrangements to meet outstanding tax obligations.
- (b) The tenderer is **registered, and "Active", with the Construction Industry Development Board**, at time of tender closing, in an appropriate contractor grading designation.
- (c) The tenderer or any of its directors/shareholders is **not listed on the Register of Tender Defaulters** in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector.
- (d) The tenderer has not:
Abused the Employer's Supply Chain Management System; or
Failed to perform on any previous contract and has been given a written notice to this effect.
- (e) The tenderer has completed the **Compulsory Enterprise Questionnaire** and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the Employer or potentially compromise the tender process.
- (f) The tenderer is **registered and in good standing with the compensation fund or with a licensed compensation insurer**.
- (g) The Employer is reasonably satisfied that the tenderer has in terms of the Construction Regulations, 2014, issued in terms of the Occupational Health and Safety Act, 1993, the **necessary competencies and resources to carry out the work safely**.

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

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

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

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

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

T1.2.3 ADDITIONAL CONDITIONS OF TENDER

T1.2.3.1 Appeals

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

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

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

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

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

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

T1.2.3.3 Code of Conduct and Local Labour

The Tenderers shall make themselves familiar with the requirements of the following policies that are available on web address: <ftp://ftp.durban.gov.za/cesu/StdContractDocs/>:
 Code of Conduct;
 The Use of CLOs and Local Labour.

T1.2.3.4 Targeted Procurement

Not Applicable to this bid.

T1.2.3.5 Functionality Specification

Functionality Evaluation is not applicable to this tender.

T1.2.3.6 Contract and Project Basis

T1.2.3.6.1 Definitions

Contract relates to this Tender Document and is the basis of the Annual Tender evaluation and award.

Project relates to the that work to be undertaken by the successful Tenderer in terms of the Annual Contract together with that as stipulated in the Project Specific Data.

T1.2.3.6.2 Process

Any reference to the "Works" or "Site" are of a hypothetical nature.

The quantities provided in the Schedule of Quantities of this Tender Document are only used for evaluation purposes and the Employer may increase or decrease these quantities to suit the requirements of each "Project".

The execution of any proposed work shall be carried-out as a "Project" by the successful Tenderer(s) having defined "Works" and "Site" parameters.

All contractual issues in this Tender Document shall be the basis of the "Annual Contract" and shall also be applicable to any successive "Projects".

Specific Contract Data relating to each Project shall be stipulated in the "Project Order".

The successful Tenderer(s) shall be obliged to enter into an "Agreement" with the Employer in

conjunction with the “Contract’s:” Part C1.1.2 : “Form of Acceptance”. This “Agreement” is directly linked and is to be read in conjunction with the “Project Order”
For each “Project”, the successful Tenderer(s) shall be obliged sign and conform with the “Project Order” in conjunction with the “Project’s:” Part C1.1 : “Form of Acceptance”.

PART T2: RETURNABLE DOCUMENTS

T2.1 LIST OF RETURNABLE DOCUMENTS

T2.1.1General

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

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

T2.1.2Returnable Schedules, Forms and Certificates

Entity Specific

T2.2.1	Compulsory Enterprise Questionnaire	22
T2.2.2	Certificate of Attendance at Clarification Meeting	24
T2.2.3	Tax Compliance Status PIN.....	25
T2.2.4	Contractor's Health and Safety Declaration.....	26
T2.2.5	MBD 4: Declaration of Interest	28
T2.2.6	MBD 5: Declaration for Procurement Above R10 Million	30
T2.2.7	MBD 6.1: Preference Points Claim Form ITO the Preferential Regulations	32
T2.2.8	MBD 8: Declaration of Bidder's Past SCM Practices	35
T2.2.9	MBD 9: Certificate of Independent Bid Determination	37
T2.2.10	Joint Venture Agreements (if applicable)	40
T2.2.11	Record of Addenda to Tender Documents (if applicable).....	41

Eligibility

T2.2.12	Eligibility: Declaration of Municipal Fees	42
T2.2.13	Eligibility: Registration with Compensation Commissioner	43
T2.2.14	Eligibility: CSD Registration Report	44
T2.2.15	Eligibility: Verification of CIDB Registration and Status	45
T2.2.16	Eligibility: Experience of Tenderer	46
T2.2.17	Eligibility: Experience of Key Personnel	48

T2.2 RETURNABLE SCHEDULES, FORMS, AND CERTIFICATES

The returnable schedules, forms, and certificates, as listed in T2.1.2, can be found on pages [22](#) to [41](#).

NOTE

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

T2.2.1 COMPULSORY ENTERPRISE QUESTIONNAIRE

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

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

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

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

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

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

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

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

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

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

NAME (Block Capitals): _____

Date

SIGNATURE: _____

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

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

This is to certify that:

(entity name):

of (address):

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

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

Particulars of person(s) attending the meeting:

Name:

Name:

Signature:

Signature:

Capacity:

Capacity:

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

Name:

Signature:

Date:

T2.2.3 TAX COMPLIANCE STATUS PIN

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

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

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

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

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

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

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

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.4 CONTRACTOR'S HEALTH AND SAFETY DECLARATION

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

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

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

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

Declaration by Tenderer

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

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

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

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

Circle Applicable	
Yes	NO
Yes	NO
YES	NO

- 4 Details of resources I propose:

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

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

NAMES OF COMPETENT PERSONS	POSITIONS TO BE FILLED BY COMPETENT PERSONS

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

- (i) By whom will training be provided?
(ii) When will training be undertaken?
(iii) Positions to be filled by persons to be trained or hired:

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

Name of proposed subcontractor:

Qualifications or details of competency of the subcontractor:

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

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

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.5MBD 4: DECLARATION OF INTEREST

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

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

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

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

3.1	Name of enterprise	Complete T2.1.2.1 Item 1.1
	Name of enterprise’s representative	Complete T2.1.2.1 Item 1.2
3.2	ID Number of enterprise’s representative	Complete T2.1.2.1 Item 1.3
3.3	Position enterprise’s representative occupies in the enterprise	Complete T2.1.2.1 Item 1.4
3.4	Company Registration number	Complete T2.1.2.1 Item 3.1 or 3.2
3.5	Tax Reference number	Complete T2.1.2.1 Item 3.3
3.6	VAT registration number	Complete T2.1.2.1 Item 1.7
3.7	The names of all directors / trustees / shareholders / members / sole proprietors / partners in partnerships, their individual identity numbers and state employee numbers must be indicated in paragraph 4 below. In the case of a joint venture, information in respect of each partnering enterprise must be completed and submitted.	

3.8 Are you presently in the service of the state?

If yes, furnish particulars:

.....

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

If yes, furnish particulars:

.....

Circle Applicable

YES

NO

YES

NO

3.10 Do you have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and or adjudication of this bid?

YES

NO

If yes, furnish particulars:

.....

3.11 Are you, aware of any relationship (family, friend, other) between any other bidder and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid?

YES

NO

If yes, furnish particulars:

.....

3.12 Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state?

YES

NO

If yes, furnish particulars:

.....

3.13 Are any spouse, child or parent of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state?

YES

NO

If yes, furnish particulars:

.....

3.14 Do you or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract?

YES

NO

If yes, furnish particulars:

.....

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

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

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

NAME (Block Capitals):

Date

SIGNATURE:

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

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

Circle Applicable	
YES	NO
1.0 Are you by law required to prepare annual financial statements for auditing? 1.1 If YES, submit audited annual financial statements for the past three years or since the date of establishment if established during the past three years.	
2.0 Do you have any outstanding undisputed commitments for municipal services towards any municipality for more than three months or any other service provider in respect of which payment is overdue for more than 30 days? 2.1 If NO, this serves to certify that the bidder has no undisputed commitments for municipal services towards any municipality for more than three months or other service provider in respect of which payment is overdue for more than 30 days. 2.2 If YES, provide particulars. 	
3.0 Has any contract been awarded to you by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract? 3.1 If YES, provide particulars. 	
4.0 Will any portion of goods or services be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality / municipal entity is expected to be transferred out of the Republic? 4.1 If YES, provide particulars. 	

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

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

NAME (Block Capitals):

Date

SIGNATURE:

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

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

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

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

1.0 GENERAL CONDITIONS

- 1.1 The following preference point systems are applicable to invitations to tender:
- 1.2 The applicable preference point system for this tender is the 80/20 preference point system.
- 1.3 Preference Points for this tender shall be awarded for:

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

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

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

2.0 DEFINITIONS

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

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

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

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

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

3.0 FORMULA FOR CALCULATION OF PREFERENCE PRICE POINTS

3.1 PROCUREMENT OF GOODS AND SERVICES

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

<u>80 / 20 Points System</u>	OR	<u>90 / 10 Points System</u>
$P_s = 80 \left(1 - \frac{P_t - P_{min}}{P_{min}} \right)$		$P_s = 90 \left(1 - \frac{P_t - P_{min}}{P_{min}} \right)$

Where:

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

4.0 POINTS AWARDED FOR SPECIFIC GOALS

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

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

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

any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system,

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

The Specific Goals to be allocated points in terms of this tender	Maximum Number of points ALLOCATED (80/20 system)	Number of points CLAIMED (80/20 system)
Ownership Goal: Race (black)	11.25	
Ownership Goal: Gender (female)	3.75	
Ownership Goal: Disabilities	5	
Total CLAIMED Points (20 Maximum)		

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

I acknowledge that:

The information furnished is true and correct.

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

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

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

disqualify the person from the tendering process.

recover costs, losses or damages it has incurred or suffered as a result of that person's conduct.

cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation.

recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and

forward the matter for criminal prosecution, if deemed necessary.

NAME (Block Capitals):

Date

SIGNATURE:

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

- 1.0 This Municipal Bidding Document must form part of all bids invited.
- 2.0 It serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.
- 3.0 The bid of any bidder may be rejected if that bidder, or any of its directors have:
- abused the municipal entity's supply chain management system or committed any improper conduct in relation to such system.
 - been convicted for fraud or corruption during the past five years.
 - wilfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years.
 - been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).
- 4.0 In order to give effect to the above, the following questions must be completed and submitted with the bid.

- 4.1 Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector?

(Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer / Authority of the institution that imposed the restriction after the audi alteram partem rule was applied.)

The Database of Restricted Suppliers now resides on the National Treasury's website (www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page.

Circle Applicable	
YES	NO

- 4.1.1 If YES, provide particulars.

.....

.....

- 4.2 Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)?

The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.

YES	NO
-----	----

- 4.2.1 If YES, provide particulars.

.....

.....

- 4.3 Was the bidder or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?

YES	NO
-----	----

- 4.3.1 If YES, provide particulars.

.....

.....

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

YES

NO

4.4.1 If YES, provide particulars.

.....

.....

4.5 Was any contract between the bidder and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?

YES

NO

4.5.1 If YES, provide particulars.

.....

.....

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

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

NAME (Block Capitals):

Date

.....

SIGNATURE:

.....

.....

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

- ¹ Includes price quotations, advertised competitive bids, limited bids and proposals.
- ² Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.
- ³ Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

- 1.0 This Municipal Bidding Document (MBD) must form part of all **bids**¹ invited.
- 2.0 Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or **bid rigging**).² Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.
- 3.0 Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:
- a. take all reasonable steps to prevent such abuse;
 - b. reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and
 - c. cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.
- 4.0 This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of **bid rigging**.
- 5.0 In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid.

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

(Bid Number and Description)

in response to the invitation for the bid made by:

(Name of Municipality / Municipal Entity)

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

I certify, on behalf of:

(Name of Bidder)

that:

1. I have read and I understand the contents of this Certificate.
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect.
3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
 - (a) has been requested to submit a bid in response to this bid invitation.
 - (b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience.
 - (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder.
6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement, or arrangement with any competitor. However, communication between partners in a joint venture or consortium³ will not be construed as collusive bidding.

7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

- (a) prices.
- (b) geographical area where product or service will be rendered (market allocation).
- (c) methods, factors or formulas used to calculate prices.
- (d) the intention or decision to submit or not to submit, a bid.
- (e) the submission of a bid which does not meet the specifications and conditions of the bid.
- (f) bidding with the intention not to win the bid.

8. In addition, there have been no consultations, communications, agreements, or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.

9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.

10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

NAME (Block Capitals): _____

Date

SIGNATURE: _____

T2.2.10 JOINT VENTURES AGREEMENTS

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

T2.2.11 RECORD OF ADDENDA TO TENDER DOCUMENTS

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

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

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

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

NAME (Block Capitals): _____

Date

SIGNATURE: _____

T2.2.12 ELIGIBILITY: DECLARATION OF MUNICIPAL FEES

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

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

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

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

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

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

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

Where the tenderer's place of business or business interests are outside the jurisdiction of eThekweni municipality, a copy of the accounts/ agreements from the relevant municipality are to be provided.

Where the tenderer's Municipal Accounts are part of their lease agreement, then a copy of the agreement, or an official letter to that effect, is to be provided.

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

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

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

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.13 ELIGIBILITY: REGISTRATION WITH COMPENSATION COMMISSIONER

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

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

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

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

Clause 82: Employer to furnish returns of earnings

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

The amount of earnings paid by him to his employees.

Any further information as may be prescribed or as the commissioner may require.

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

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

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

Clause 89: Mandators and contractors

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

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

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

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

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

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.14 ELIGIBILITY: CSD REGISTRATION REPORT

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

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

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

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

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

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

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

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

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.15 ELIGIBILITY: VERIFICATION OF CIDB REGISTRATION AND STATUS

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

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

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

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

Home

Contractor Detail

Print

Contractor Detail

CRS Number:

Type of Enterprise:

Contractor Name:

Registration Date:

Trading Name:

Expiry Date:

Status:

Contractor Grades

Grade:

Back

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[Website technical enquires contact](#)

01/01/2017

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

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

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.16 ELIGIBILITY: EXPERIENCE OF TENDERER

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

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

Where options are provided (*), only one (1) selected option should be clearly marked with an " X ".

Tenderer's CIDB Grade:	1*	2*	3*	4*	5*	6*	7*	8*	9*	Experience as a:	Sub-Contractor*	Main Contractor*
Client / Employer:	Entity Name:											
	Contact Name:											
	Contact Tel:											
	Contact Cell:											
	Contact email / other:											
Client OR Main Contractor's Details Should the Employer's reasonable attempts to make contact, to verify the information provided, fail (for whatever reason) this experience submission will be considered invalid.	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:	R									Final Contract Price OR Final Value of Sub-Contract:		

Contract Scope-of-Work (Description of Works components)	If available in hard copy, the Scope-of-Work can be attached. Only include the Scope-of-Work (contract description). <u>The Specification is not required.</u>

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.					
Contractor Type and Contract Status	Proof of Sub-Contract Agreement	Letter of Award OR Form of Offer & Acceptance	Most recent Payment Certificate, OR most recent INVOICE, with Quantities summary	Final Payment Certificate, OR most recent INVOICE, with Quantities summary	Completion Certificate
Current Contract as Sub-Contractor	X		X		
Completed Contract as Sub-Contractor	X			X	
Current Contract as Main Contractor		X	X		
Completed Contract as Main Contractor		X		X	X
Failure to submit this returnable form, and provide the above supporting documentation/ information, for each submission of experience, will invalidate that experience submission					

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

NAME (Block Capitals):

Date

SIGNATURE:

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

[illegible]

Attach additional pages if more space is required

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

Date

SIGNATURE:

T2.2.17 PROPOSED ORGANISATION and STAFFING

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

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

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

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

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

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

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.18**KEY PERSONNEL**

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

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

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

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

NAME (Block Capitals): _____

Date

SIGNATURE: _____

T2.2.19 EXPERIENCE OF KEY PERSONNEL

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

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

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

Each CV should be structured under the following headings:

- a) Personal particulars
 - name
 - date and place of birth
 - place (s) of tertiary education and dates associated therewith
 - professional awards
- b) Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations)
- c) Skills
- d) Name of current employer and position in enterprise
- e) Overview of post-graduate / diploma experience (year, organization and position)
- f) Outline of recent assignments / experience that has a bearing on the scope of work

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

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.21 CONSTRUCTION APPROACH, METHODOLOGY, AND QUALITY CONTROLConstruction Approach and Methodology

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

Quality Control

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

The tenderer must attach his / her Construction Methodology and Quality Control information to this page.

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

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

T2.2.23 PLANT and EQUIPMENT

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

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

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

Attach additional pages if more space is required

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

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

Attach additional pages if more space is required

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

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

NAME (Block Capitals): _____

Date _____

SIGNATURE: _____

T2.2.24 CONTRACTOR'S HEALTH AND SAFETY PLAN

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

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

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

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

NAME (Block Capitals):

Date

SIGNATURE:

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: **29725-1T**

Contract Title: **Rehabilitation of public transport facilities in the Western Region of eThekweni Municipality**

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

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

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

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

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

For the Tenderer:

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

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

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

Capacity (of Signatory) :

Address :

:

Telephone :

Witness:

Signature : **Date** :

Name (in capitals) : :

Notes:

*** Indicates what information is mandatory.**

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

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

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

The terms of the contract are contained in:

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

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

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

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

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

Signature (person authorized to sign the acceptance) :

Name (of signatory in capitals) :

Capacity (of Signatory) :

Name of Employer (organisation) :

Address :

:

Witness:

Signature : **Date** :

Name(in capitals) : :

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

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

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

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

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

FOR THE TENDERER

FOR THE EMPLOYER

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

C1.2: CONTRACT DATA

C1.2.1 CONDITIONS OF CONTRACT

C1.2.1.1 GENERAL CONDITIONS OF CONTRACT

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

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

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

C1.2.2 CONTRACT DATA

C1.2.2.1 DATA TO BE PROVIDED BY THE EMPLOYER

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

1.1.1.14 The **time for achieving Practical Completion**, from the Commencement Date is **18 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:
Deputy Head: **Public Transport**

1.2.1.2 The address of the Employer is:
Physical: **Ethekweni Transport Authority, 30 Old Fort Road, DURBAN, 4001**
Postal: **Ethekweni Transport Authority, PO Box 680, Durban, 4000**
Telephone: **0313228651**
E-Mail: **bethuel.manthoadi@durban.gov.za**

1.1.1.16 The **name of the Employer's Agent** is **Ms Sihle Mhlongo**
1.2.1.2 The address of the Employer' Agent is:
Physical: **Ethekweni Transport Authority, 30 Old Fort Road, DURBAN, 4001**
Postal: **Ethekweni Transport Authority, PO Box 680, Durban, 4000**
Telephone: **0313229307**
E-Mail: **sihle.mhlongo2@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**.

4.11.1 To carry out and complete the works, the Contractor shall employ a competent Site Agent and Foreman as part of the key staff. It is a requirement for the Contractor's Site Agent and Foreman to each have a minimum of 3 years relevant experience including experience on projects of a similar nature. The CV's of the Site Agent

and the Foreman should be submitted to the Employer's Agent's Representative for acceptance by the Department (reference is made to Cl.5.3.1 of the Contract Data).

Note:

"similar nature" implies projects that were of a value of at least 70% of this tender's value, and had a comparable Scope of Work in terms of technical requirements and operations.

"experience" implies experience on projects of a similar nature.

"accredited degree / diploma" implies a minimum 3-year qualification within the built environment, from a registered University or Institute of Technology.

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

Health and Safety Plan (refer to Clause 4.3)

Initial Programme (refer to Clause 5.6)

Security (refer to Clause 6.2)

Insurance (refer to Clause 8.6)

CV(s) of Key Site Staff (refer to Clause 4.11.1)

CPG Implementation Plan per project order or site instruction

5.3.2 The **time to submit the documentation** required before commencement with Works is **14 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 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 1000, per project order** (per Day).

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

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

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

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

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

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

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

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

The proportion not subject to adjustment: **x = 0.10**.

The base month will be the month prior to the month in which tenders close.

The Index for, **Plant, Materials, and Fuel** shall be based on **2023 = 100**.

The Index for **Labour** shall be based on **2021 = 100**.

	STATS SA Statistical Release	Table	Description	Coefficient
"L" is the "Labour Index"	P0141	Table A	Geographic Indices; CPI per Province; Kwa-Zulu Natal	a = 0.2
"P" is the "Contractor's Equipment Index"	P0151.1	Table 4	Plant and Equipment	b = 0.3
"M" is the "Materials Index"	P0151.1	Table 6	Civil Engineering Material (excluding bitumen)	c = 0.3
"F" is the "Fuel Index"	P0142.1	Table 1	Coke, petroleum, chemical, rubber and plastic products; Coal and petroleum products; Diesel	d = 0.2

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

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

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

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

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

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

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

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

8.6.1.1.2 The **value of Plant and materials** supplied by the Employer to be included in the insurance sum: **Not Required**

8.6.1.1.3 The **amount to cover professional fees** for repairing damage and loss to be included in the insurance sum: **R 5 000 per day**.

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

8.6.1.3 The limit of indemnity for **liability insurance**: **R 10,000,000**.

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.**

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 1,000,000**

Consequential loss to be covered by policy: **Yes**

Liability section of policy to be extended to cover blasting: **Nil**

Maximum excess per claim or series of claims arising out of any one occurrence: **R20,000**

Principal's own surrounding Property Insurance

Minimum amount for any one occurrence unlimited as to the number of occurrences against any claim for damage which may occur to the Council's own surrounding property:

R 1,000,000.

Maximum first excess: **R 20,000.**

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."

10.5.2 Dispute resolution shall be by ad-hoc adjudication

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

C1.2.2.2 DATA TO BE PROVIDED BY CONTRACTOR

1.1.1.9 The legal name of Contractor is:

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1.2.1.2 The Physical address of the Contractor is:

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The Postal address of the Contractor is:

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.....

.....

.....

The contact numbers of the Contractor are:

Telephone:

Fax:

The E-Mail address of the Contractor is:

.....

C1.2.1.2 SPECIAL CONDITIONS OF CONTRACT

These Special Conditions of contract shall amplify, modify or supersede the General Conditions of Contract 2015 to the extent specified, and shall take precedence and shall govern for individual Project Orders issued under this Contract.

5.5 "Time for Practical Completion": delete this clause and all references thereto throughout the General Conditions of Contract.

5.13.1 "Penalty for Delay" : delete the first paragraph and replace with "If the Contractor fails to complete the whole Works specified in the Project Order by the Due Completion Date of the Project Order or as amended, the Contractor shall be liable to the Employer for the sum stated in the Project Order Contract Specific Data as a penalty for every day that elapses after the Due Completion Date or as amended, including non-working and special non-working days".

5.13.2 "Reduction of penalty": delete this clause and all references thereto throughout the General Conditions of Contract.

5.14.1 "Practical Completion": delete this clause and all references thereto throughout the General Conditions of Contract.

1.14.7 "Completion" Delete the words "Contract Data" and replace with "Project Order Specific Contract Data"

6.11 "Variations exceeding 15%": Delete this clause and all references thereto throughout the General Conditions of Contract.

8.3.1.7 "Epidemic famine or plague", add the following, "including the pandemic in relation to Coronavirus Disease 2019 caused by the SARS-CoV-2 virus"

4.4 Subcontracting: Add the following sub-clauses

4.4.8.1 The Contractor shall enter into a written subcontract agreement with the Sub-contractors. The subcontract agreement between the Contractor and the Sub-contractors shall be the standard General Conditions of Subcontract for Construction Works (First Edition, GCSC 2018).

4.4.8.1.1 Each subcontract shall include the provisions:

(a) The Contractor undertakes to make payment within 14 days after the date on which the Sub-contractor has submitted a statement for payment or a claim for payment to the Contractor for work completed or goods delivered in accordance with the contract between the Contractor and Sub-contractor; and

(b) The Contractor undertakes to supply the sub-contractors with the relevant and sufficient data to undertake the works as specified by the Employer's Agent /Employer, which shall include but not limited to the relevant contract data and special and/or additional conditions of contract, standard and/or amended specifications, contract standard and project specific drawings etc.

(c) The training, coaching, guidance or mentoring to be provided to the sub-contractor's workforce (as required and subject to the approval of the Employer's Agent), and an obligation on the subcontractor to participate and co-operate in such support as is provided for in this Contract.

(d) Dispute avoidance and resolution procedures, including any sanctions in the event of failure by the sub-contractor to comply with the terms and conditions of the subcontract agreement.

4.4.8.2 The Contractor shall disclose all subcontracting arrangements to the Employer upon request thereof, within 3 working days.

4.4.8.3 No performance security shall be required for sub-contractors.

4.4.8.4 Delay Damages for sub-contractors shall be limited to 10% of the accepted sub-contract amount.

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) where work is taking place**. The contractor will be required to provide proof of authenticity of local labour. Signed confirmation by the appointed CLO will suffice for this.

The penalty for not employing local labour shall be taken as the number of local labours not employed, multiplied by the number days local labour was not employed, multiplied by the daily wage rate, multiplied by a factor of two (2).

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

C1.2.3.3 CONTRACTOR PARTICIPATION GOAL (CPG)

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

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

C1.2.1.3.3.1 ENTERPRISE DEVELOPMENT & CONTRACT PARTICIPATION GOAL (CPG) OVERVIEW

It is a condition of contract, in line with the Council approved Economic Empowerment Framework as stipulated in the Employers Supply Chain Management Policy, that sub-contracting opportunities are made available.

It is a condition of contract that the Contractor must allow all ancillary work to be sub-contracted

(irrespective of value) to local Business Enterprises. This includes the following type of work, but not limited to:

- Patching
- Raising/lowering of services
- Construction/re-construction of sidewalks
- Laying of kerbs or kerb & channel
- Laying of asphalt haunching
- Laying of subsoil drains
- Laying of service ducts
- Construction of stormwater drainage infrastructure

These Enterprises must be from the ward(s) where work is taking place in the first instance and, if the Contractor cannot procure such enterprises from the ward(s), this may be achieved by sub-contracting with such qualifying Enterprises located within adjacent wards, failing which the subcontractors may be sourced within the jurisdiction of eThekweni Municipality. CPG sub-contracting may be to:

Contractors who are registered with the Construction Industry Development Board in the Categories ranging from 1 to 4

Material and equipment suppliers and who shall also meet the requirements of an EME or QSE as detailed above.

Payment certificates (where applicable), Tax invoices, Proof of payment to the subcontractors and equipment and material suppliers will be required to verify that this has been achieved.

For any work being sub-contracted, documents of the relevant sub-contractor must therefore be submitted to the Employer's Agent in writing for approval well in advance before commencement of any of the activities on the programme.

In addition to this, the sub-contractors must have a, (where applicable):

traceable track record of work undertaken for the past 3 years

must be registered with CIDB category CE and grading equivalent to the work being issued; (not applicable for equipment and materials suppliers);

must have suitable qualified staff and plant to undertake the works

must comply to the OCHSA

must comply to the main contractor's safety plan

must be registered on the eThekweni Municipality Procurement Database.

must be registered on the Central Supplier Database.

Materials suppliers must have proof of necessary permits/licences for the mining and sales of materials, as may be applicable.

The contractor shall be fully responsible for the management of all sub-contractors appointed. The contractor shall therefore ensure that a suitable quality monitoring process is in place for each element of the works and that the appointed sub-contractors is conversant on the requirements thereof.

No additional costs will be entertained due to this Particular Specification.

C1.2.1.3.3.2 Submission of CPG Plan

At the commencement of each Project Order, the Contractor shall provide a Contract Participation Goal Plan (CPG Plan) for the Sub-Contracting using the Scope of Work and its related cost to demonstrate how he shall achieve stipulated CPG targets.

Prior to commencement of works, as per Clause 5.3.1 of the Contract Data, the Contractor shall provide such comprehensive CPG Plan for approval by the Employer's Agent. Should the Sub-contractors be allocated work that exceeds their CIDB grading, then the work allocated to these sub-contractors shall be reduced to the upper limit of their CIDB Grading, and the Main Contractor shall be required to source additional sub-contractors to achieve the tendered Sub-Contract CPG Value. The Primary Contractor shall be required to update the CPG Plan for approval by the Employer's Agent before work commences. This plan may be updated during the contract period but shall still be for the approval of the Employer's Agent. The CPG Plan shall ensure an adequate and acceptable distribution of works across the identified CIDB grading range (viz. 1 CE to 4 CE); the plan shall be subject to approval by the Employer, (taking into consideration the scope of works risk profile and associated allocation of works), and any amendments required to achieve an acceptable distribution of works shall be implemented by the Contractor at no additional cost to the contract.

Rates of works allocated to CPG sub-contractors shall be evaluated to ensure they are market related. The Contractor will be required to demonstrate that the rates provided are fair and reasonable, taking into consideration the limitations that CPG contractors may face to procure materials and equipment at discounted rates. Where it is found that the rates provided are unrealistic/not market related and the CPG contractor cannot undertake the works at the rates tendered by the main contractor, the main contractor will be required to balance his rates, at no additional cost to the contract, to address the non-market related rates tendered by

the main contractor; (market related rates will be based on cost structures applicable to the level of CPG company undertaking the works). The approval of the CPG Plan shall not absolve the main contractor of his contractual responsibility or for any rates dispute that may arise during the implementation of the contract, based on the rates tendered or adjusted during the award process

C1.2.3.4 SUB-CONTRACING OF MAIN WORKS - SURFACING, RECYCLING, GRANULAR, SUBGRADE IMPROVEMENT AND CONCRETE PAVEMENT WORKS

The definitions of all the above rehabilitation categories are as stipulated in Section 1100 of the Project Specifications.

Any work under this item being subcontracted will be subjected to evaluation and must therefore be submitted to the Employer's Agent in writing for his approval well in advance of any project being allocated. Failure to comply will result in termination of the contract.

In addition to this, the sub-contractor(s) must have a:

traceable track record of work undertaken for the past 3-5years

must be registered with CIDB category CE and grading equivalent to the work being issued

must have suitably qualified staff and plant to undertake the works

must comply to the OCHSA

must comply to the main contractor's safety plan

C1.2.3.5 FTE (Full Time Equivalent) EMPLOYMENT INFORMATION

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

Initials (per ID doc)

Last Name (per ID doc)

ID Number

Disability (y / n)

Education Level

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

C1.2.3.6 PERFORMANCE MONITORING OF SERVICE PROVIDERS

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

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

C1.2.3.7 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 because of "Excepted risks" when a written instruction to de-establish is issued to the Contractor.

C1.2.1.3.8 DUTIES AND RESPONSIBILITIES OF A CONTRACTS MANAGER

In addition to requirements laid down in the Code of Conduct for the registered professionals by ECSA or SACPCMP, the Contracts Manager shall undertake the following minimum requirements.

The Contracts Manager shall:

- Always be available during the execution of any Project Orders, and physically available when requested immediately.
- Be the link between the employer's Agent and the Contractor.
- Monitor the contract's progress and performance to ensure goods and services conform to the contract requirements.
- Ensure proper co-ordination of all projects (Project Orders) within the Contract.
- Ensure that sufficient human resources are available to function adequately, for example Construction Managers.
- Ensure that sufficient constructional plant and equipment resources are available to complete all projects allocated.
- Ensure that the proper sub-contracting resources are arranged on time for the timeous completion of all projects.
- Prepare and submit the combined weekly programme of works within the Contract to the Employer's Agent's Representative.
- Prepare and submit the combined monthly cashflow of all projects within the Contract to the Employer's Agent's Representative.
- Prepare and submit the combined weekly progress report of all projects within the Contract to the Employer's Agent's Representative.
- Prepare and submit the combined monthly quality report of all projects within the Contract to the Employer's Agent's Representative.
- Authorize payment claims consistence with the contract terms.
- Always be up to date with the activities and problems on all projects within the Contract.
- Oversee and ensure that construction managers are carrying out all projects to the required specification.
- Ensure that all sites/projects are following the Health and Safety specifications.
- Resolve disputes in a timely manner.
- Establish control of correspondence, data and reports.
- Establish a procedure, identifying a responsible person and establish a timeframe for handling non-compliance

C1.2.3.9 KEY PERSONNEL MANDATORY REQUIREMENTS

The following experience of key personnel is a requirement during the contractual period once awarded to the successful tenderer:

- Contracts Manager: with more than 5 years of road construction experience or more than 4 years road rehabilitation experience on projects of a similar nature; with relevant accredited 3-year diploma / 4 year degree. Also registered with ECSA as a Professional Civil Engineer or Professional Civil Engineering Technologist or registration with SACPCMP as a Professional Construction Project Manager.
- Construction Manager: with more than 3 years road construction experience or more than 2 years road rehabilitation experience on projects of a similar nature; with relevant accredited 3 year diploma /4 year degree. Also be registered with ECSA as a Professional Civil Engineering: Engineer, Technologist or Technician or registration with SACPCMP as a Professional Construction Project Manager or Professional Construction Manager.

Note 1: Road rehabilitation experience shall include mill and asphalt inlay, asphalt overlay, and

rehabilitation of the base, sub-base or subgrade pavement layers.

Note 2: Road construction experience shall include new road construction, road widening/upgrade projects, intersection improvements, special maintenance and routine maintenance, gravel to surface road upgrades, access road upgrades and parking areas, ancillary/secondary works (kerbing, drainage, sidewalks, road signs, gabions etc).

Note 3: The following is excluded – materials investigation and analysis, and all forms of design experience.

C2.1: PRICING ASSUMPTIONS / INSTRUCTIONS

C2.1.1 GENERAL

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

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

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

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

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

C2.1.3 QUANTITIES REFLECTED IN THE SCHEDULE

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

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

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

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

C2.1.5 MONTHLY PAYMENTS

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

C2.1.4 PROVISIONAL SUMS / PRIME COST SUMS

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

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

C2.1.6 PRICING OF THE BILL OF QUANTITIES

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

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

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

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

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

C2.1.7 "RATE ONLY" ITEMS

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

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

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

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

C2.1.8 PRELIMINARY AND GENERAL

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

Part AA: Preliminaries

Part AB: General Specifications

Part AH: Occupational Health and Safety

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

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

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

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

C2.2: BILL OF QUANTITIES

The Bill of Quantities follows and comprises of 24 pages. The pages are numbered [Page 1 of 23 to Page 23 of 23 and Page 1 of 1](#) (Summary of Bill of Quantities)- **The Bill of Quantities is attached.**

PART C3: SCOPE OF WORK

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C3.1: PROJECT DESCRIPTION AND SCOPE OF CONTRACT

C3.1.1 Client's / employer's objectives

The purpose of this Annual Contract is to provide a sound mechanism for the implementation of rehabilitation work to the public transport facilities located within the western region of the eThekweni Municipality's.

To provide a contractual framework for the implementation of this work and to facilitate the management of the individual contractual issues, the concept of "Contract" versus "Project" has been adopted. This concept is described as follows:

- **Contract:** This document forms the basis for the tendering procedure, evaluating the tenders and ultimately the awarding of the Annual Contract to the successful Tenderer(s). Once the Employer accepts the Tenderer's offer, an Agreement will be signed by both parties and all the conditions pertaining to the Contract are binding.
- **Project:** The Annual Contract provides a vehicle for individual Projects to be carried-out by the Employer varying in complexity and magnitude and where the quantities will also vary. Each Project is to be executed in terms of the Project Order and Agreement signed by both parties forming part of the Project Document which shall inter-alia include the relevant schedule of quantities, specifications, and standard details. Provided that the Projects are awarded within the period of validity of the Contract, the completion dates for the Projects may be extended beyond the contract completion date provided that the Project itself may not exceed three years.

C3.1.2 Description of Works

This contract is intended to cover the rehabilitation of the public transport facilities within the western region of the eThekweni Municipality.

The works are classified as follows:

"Surfacing Works" - Projects which include the construction of new pavement layers which are all asphalt layers, or layers which may be described as bituminous surfacing such as slurries, single seals, micro surfacing etc shall be classified under "Surfacing Works".

"Recycling Works" - Projects which include construction of BSM (Bitumen Stabilised Material) layers shall be classified under "Recycling Works". This category shall include for in-plant recycling. This category shall also include cement or lime stabilization of pavement layers, and the construction of asphalt layers.

"Granular Works" - Projects which include the construction of new granular pavement layers above the formation level (i.e. Base and/or Subbase) shall be classified under "Granular Works". These works shall include construction of layers using both virgin materials and reuse of existing granular materials. This category shall also include the construction of BSM layers and asphalt layers.

"Subgrade Improvement Works" - Projects which include improvements/re-construction of the subgrade layers below the formation level of the pavement shall be classified under "Subgrade Improvement Works". This shall only be applicable to projects where greater than 25% of the length of the road requires subgrade improvements. These works shall also involve reconstruction of the layers above formation and the construction of all types of layers shall be covered by this category of rehabilitation.

"Ancillary Works" - Projects where the scope of works is not rehabilitation of pavement layers shall be classified under "Ancillary Works". Examples of the projects this category is intended to cover include raising/lowering of services, construction/re-construction of sidewalks, laying of

kerbs or kerb & channel or asphalt haunching, repairs or reconstruction of sidewalks and laying of sub-soil drains.

C3.1.4 Description of Site and Access

The public transport facilities subjected to the rehabilitation works are located within the eThekweni Municipal boundary, specifically in the Western Region. The Municipal wards forming the Western area of the eThekweni Municipality is detailed in part C4.1 of this document.

The Municipal wards forming the Western area of the eThekweni Municipality is detailed in part C4.1 of this document. The table below lists some of the public transport facilities located within the western region:

Public Transport Facilities	Co-ordinates	Wards
1. Richmond Rd	-29.813833, 30.845126	Ward 15
2. Hillcrest	-29.779722, 30.765077	Ward 7
3. Hillcrest Holding	-29.779725, 30.765068	
4. Anderson Taxi rank	-29.814209, 30.854307	Ward 18
5. Ntshongweni	-29.837786, 30.685533	Ward 7
6. Kwa Nyuswa Taxi rank	-29.718911, 30.740793	Ward 103
7. KwaNdengezi	-29.851886, 30.769363	Ward 12
8. Hillstreet bus Taxi rank	-29.814612, 30.854887	Ward 18
	-29.814612, 30.854887	
9. Inchanga	-29.724456, 30.650542	Ward 4
10. Dassenhoek	-29.854480, 30.808746	Ward 15
11. Tshelimnyama	-29.839344, 30.817187	Ward 15
12. Clermont Taxi rank	-29.794641, 30.892883	Ward 21
13. Hillstreet / Clermont	-29.815766, 30.855252	Ward 18
14. Ximba Taxi rank	-29.664675, 30.636827	Ward 1
15. Nqetho Taxi rank	-29.713985, 30.820981	ward 8
16. Molweni Taxi rank	-29.732957, 30.860980	ward 9
17. Klaarwater (Santi)	-29.873618, 30.828545	ward 17
18. Kwadabeka taxi rank	-29.779855, 30.899319	Ward 20
19. Hammersdale Taxi (KwaMcoyi)	-29.804577, 30.619016	
20. Mpumalanga (Kwabhaya)	-29.797112, 30.657523	Ward 91

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 and the COLTO Specifications Section 1200**

PS.1.1 Preliminary Programme

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

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

The Contractor shall be deemed to have allowed fully in his tendered rates and prices as well as in his programme for all possible delays due to normal adverse **weather conditions (refer to Clause 5.12.2.2)** and special non-working days (**refer to Clause 5.1.1.1**) as specified in the in the Contract Data.

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

It is essential that the construction programme, which shall conform in all respects to **Clause 5.6 of the General Conditions of Contract**, be furnished within the time stated in the Contract Data (**refer to Clause 5.3.1/2**). **The Works shall be considered complete when the permanent road marking has been completed, temporary signs have been removed and all the lanes are open to public traffic.**

The Contractor shall submit weekly labour and plant returns during the duration of the Contract. Should the Contractor fail to keep up to the submitted programme, then a revised programme shall be submitted at the discretion of the Employer's Agent.

When preparing the programme and method statements the Contractor shall take cognizance of the following matters which may impact on progress:

- Existing covers and frames, which will need to be dealt with prior to resurfacing.
- Work will have to be done under traffic, partially during the wet season and at Night

due to the public transport operations

- Work on the category C & D streets, will only be allowed between the hours of 08h00 and 16h00, and work on category A & B roads, will only be allowed between the hours of 8h30 and 15h30 to avoid peak traffic periods, including erection and removal of traffic control facilities. A Contractor may seek approval for working outside these times, at his cost, in writing to the Employer's Agent.
- The Contractor shall timeously submit samples of specified materials, together with test results, which must be approved by the Employer's Agent prior to any material being delivered to site.
- Correlation with the proposed Cash Flow.

The programme shall show at least the following information:

- (a) A description of each of the various activities that are to be carried out during the contract and the sequence in which the items will be done.
- (b) The programmed time for carrying out each activity.
- (c) The dependencies that exist between the various activities given and whether these are time related, or resource limited or both.
- (d) Time required for the preliminary establishment on site of camps etc. prior to the commencement of permanent work.
- (e) Timing for the activities or items of work in each construction work area of the Site.

The following details shall also accompany the programme :

- a) Proposed number of working hours per day, working days per week and of any proposed holiday or other shut down periods.
- b) Schedule of proposed weekly labour resources (giving a separate breakdown of Employer's agents, foremen, supervisors, tradesmen and unskilled labour) for each construction activity or item of work as well as for the project as a whole.
- c) Schedule of proposed weekly plant resources (giving a separate breakdown of description, number of units, make/model/type) for each construction activity or item of work.
- d) Schedule of proposed lane closures (giving breakdown of lengths, number, timing) on each carriageway for each work area within each roadwork section.

It should be noted that where lists are given of activities that the Contractor is required to indicate on the various programmes, these lists shall not be considered as being comprehensive but rather as the minimum information required by Employer's Agent.

It is in the Contractor's interest to give as much information as possible about times allowed for construction as well as resource or other limitations on programme times, since this programme will form the basis for any contractual negotiations about extensions of time once the Project has commenced.

Once approved by the Employer's Agent in writing, this programme shall be known as the Project Programme. The contractor shall take such steps as are necessary at all times to ensure that the work is carried out and controlled in such a way that the Contract is completed within the time stated in the Tender and/or as extended by the Employer's Agent in writing.

Should the Employer's Agent require a revision to the Programme for whatever reason, four paper prints of the revised Project Programme, shall accompany each approval request.

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 5.1.1.1) as specified in the in the Contract Data.

1.1.2 Continuity of Works

As a result of the need to accommodate heavy traffic and to relocate to a number of work zones there will be disruption to the continuity of the works. Tenderers must make allowances in both programme and tendered rates for delays and costs respectively, incurred as a result of the effects of the above on his operations and those of any sub-contractors.

PS.1.1.3 Programme in Terms of Clause 5.6 of the General Conditions of Contract

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

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

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

- (1) Time allowances to be made for the ordering of special items.
- (2) Notification required by service organisations.
- (3) Any special sequence in which work must be carried out. Must certain areas of work be finished before work commences on others?
- (4) If delays are anticipated with service relocations the contractor should be asked to allow time.
- (5) Is work required out of normal hours? (eg. to accesses)
- (6) Vehicular access to private property is to be maintained.
- (7) Traffic restrictions.

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

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 and COLTO specification Section 1500 and the Amendments to the Standard Specification PS1500.**

The Contractor shall obtain this specification from Standards South Africa if accommodation of traffic will be involved on any part of the construction works.

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

“Road signs and markings shall comply with the requirements of the **“SADC Road Traffic Signs Manual - Volume 2: Roadworks Signing”.**

The contractor is to provide a traffic management/accommodation plan to the Employer's Agent for approval prior to commencement of works.

PS.1.3.2 Basic Requirements

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

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

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

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

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

PS.1.3.3 Traffic Safety Officer

Where warranted by traffic conditions on or near the site, the Contractor shall nominate a suitable member of his staff as traffic safety officer to be responsible for the arrangement and maintenance of all the measures for the accommodation of traffic for the duration of the project. Duties of the traffic safety officer shall be in compliance with the Occupational Health and Safety Act 1993 and the Construction Regulations 2014 and as described in the COLTO Specification Clause 1502 and the Amendments to the COLTO Standard Specification PS1502.

PS.1.3.4 Payment

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

PS.1.3.5 Pedestrian Movement

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

PS.1.3.6 Temporary Reinstatement

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

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

PS.2 SERVICES

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

PS.2.1 Existing Services

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

All known existing services and those services which require relocation and protection, will be available on service plans which can be obtained from the relevant service provider (it is the Contractor's responsibility to obtain the services drawings prior to works commencement on-site, the cost of which is deemed to be included in the tendered construction rates). The Contractor's attention is drawn to the fact that such services information is based on information supplied by others, and the accuracy and completeness of this information has not been confirmed. The Contractor will therefore be required to proceed with extreme caution in order to avoid damage to existing services. Before commencing any work in the vicinity of services, the Contractor shall contact the relevant service authorities for assistance in locating the exact position of the services and where necessary the Contractor shall accurately locate the services by careful hand excavation.

In general, the Employer's Agent may call upon the Contractor to re-excavate trenches previously dug and backfilled by others where in the opinion of the Employer's Agent such work is necessary to ensure the stability of any other works over such trenches. This in no way relieves the Contractor of his responsibilities in terms of the works.

PS.2.2 Proving Underground Services

This clause must be read in conjunction with **Clause DB.5.1.2** and PS1202 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.

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;**
- **PS.6: Electrical Cables / Lighting;**
- **PS.7: Telkom / Neotel;**
- **PS.8: CCTV;**

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

PS.2.4 Accommodation of Services

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

PS.3 WATERMAINS**PS.3.1 General**

Tenderer's attention is drawn to the following points regarding the watermains to be installed as part of this 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**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**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 ELECTRICAL PLANT**PS.6.1 General**

Various types of electrical cables including high voltage, low voltage, street lighting and domestic connection cables are affected by the contract. The laying, relocation and jointing of all cables will be carried out by eThekweni Electricity's work gangs, or agents appointed by them, whilst the excavation and backfilling forms part of this contract. Close liaison will therefore be necessary with eThekweni Electricity throughout the contract.

PS.6.2 Street Lighting

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

PS.6.3 MV / LV Cables

Certain MV / LV cables are to be replaced within the contract area (see drg xxxxxxxxA0). The actual cable work associated with this relocation and / or replacement of these cables will be carried out by eThekweni Electricity and it is stressed that the **two** week period referred to in Clause PS.2 is the minimum period required to enable eThekweni Electricity to be on site timeously.

PS.6.4 Relocation of Existing Services

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

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

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

PS.8 CCTV PLANT

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

PS.9 MANAGEMENT OF THE ENVIRONMENT

The Contractor shall pay special attention to the following:

PS.9.1 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.9.2 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.9.3 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.10 OCCUPATIONAL HEALTH AND SAFETY**PS.10.1 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 OHS Act 1993 Construction Regulations 2014 issued on 7 February 2014 by the Department of Labour.

For the purpose of this contract the Contractor is required to confirm his status as mandatory and employer in his own right for the execution of the contract by entering into an agreement with the Employer in terms of Section 37(2) of the Occupational Health and Safety Act.

PS.10.2 Health and Safety Specifications and Plans to be submitted at tender stage**PS.10.2.1 Employer's Health and Safety Specification**

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

PS.10.2.2 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 **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 **T2.2: Contractor's Health and Safety Plan**.

The detailed safety plan will take into consideration the **site specific risks as mentioned under PS.10.1** and must cover at least the following:

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

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

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

A generic plan will not be acceptable.

PS.10.3 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.11 OCCUPATION OF THE SITE

The Site will be handed over to the Contractor on or before the Project Commencement Date. The Employer may from time to time be carrying out routine maintenance in the immediate vicinity of the Works. The Contractor shall therefore liaise closely with the Employer in this regard and shall ensure that their adjacent operational requirements and activities are catered for in the programming of the work. No claims for delay or additional payments will be entertained, if, in the

opinion of the Employer's Agent, claims are due the Contractor's failure to liaise with and plan for the adjacent activities of the Employer.

The site includes public transport facilities (i.e taxi ranks and bus ranks) and also connector roads, which will remain in use during the course of the work. The Contractor shall note that no public transport facilities or roads or traffic lanes, other than sections being rehabilitated, may be closed to traffic without the prior written permission of the Employer's Agent. Every effort shall be made by the Contractor to keep the disruption of existing traffic and pedestrian flows to a minimum during construction. The Contractor shall, as far as possible confine his operations to within the limits of the site or the land provided by the Employer, but if this is inadequate for his purpose, he shall make all arrangements for any further land he may require in accordance with the specifications and shall pay all costs and charges in this connection.

PS.12 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.

There shall be no separate payment for this item and shall be deemed to be included in the Contractors time related obligations costs.

PS.13 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).

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

PS.14 RISKS ASSOCIATED WITH THE WORKS

In addition to traffic related risks as stipulated in Section 1500, the Contractor is advised on some other risks associated with different treatments applicable in this contract in order to make allowances for such in the Health and Safety Plan.

- Working with hot poured bitumen that could cause skin burn when mishandled or poured on water.
- Exposure to dust during the pressure cleaning operation that could have an effect on labourer's respiratory systems if proper protection is not provided, and other significant safety risks.
- Working with hazardous materials that can cause harm on both the skin and the respiratory system i.e. lime
- Exposure to fumes from hot asphalt.
- Nature of work requires specialized skills and knowledge,
- Use of heavy specialized equipment,

- Handling and utilization of specialized and hazardous (combustible) materials i.e. hot bitumen etc.
- Construction under live heavy traffic conditions,
- Need to provide continuous access to general public transport facility users, businesses and residents,
- Due to works requiring a number of labourer's, the potential of transmission of bacteria/viruses due to close proximity with one another. The Contractor is to further note the risks involved in the planning processes, including production rates, as well as health and safety compliance where multiple activities are being undertaken concurrently on a number of roads, as may be the Project Order as issued by the Employers Agent.

PS.15 CONSTRUCTION AND MANAGEMENT REQUIREMENTS

Quality Assurance (QA)

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

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

PS.16 CONTRACTORS RESOURCES (KEY PERSONAL, STAFFING AND PLANT)

It is the intention of the Employer that each Project Order issued is adequately resourced in terms of personnel and equipment. The minimum requirement for projects issued in terms of human resource shall be an adequately qualified and experienced Contracts Manager, and a dedicated Construction Manager for each project. Failure to provide the required resource will delay the Project Order issuing, with a possibility of Contract termination should it be proven that the Contractor lacks capacity to timeously execute issued Work.

PS.17 CONTRACTORS PLANT

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

PS.18 VARIATIONS FROM SPECIFIED NOMINAL RATES OF APPLICATION OR NOMINAL MIX PROPORTIONS

The various sections of these specifications specify nominal rates of application or nominal mix proportions for materials such as bituminous materials, aggregates, fillers, stabilizing agents, paint and the like. Tenderers shall base their tenders on these nominal rates of application and mix proportions. Where such nominal rates of application or mix proportions are specified, provision is made for deviations in quantities of material due to amendments to nominal rates or

mix proportions as ordered by the Employer's Agent in writing from time to time.

These changes may be necessitated by varying site conditions or availability of materials. Where actual rates of application or mix proportions are varied, adjustment of compensation will be made - (a) as a payment to the Contractor in respect of any authorised increase in quantities which exceed those specified, where such increase is as a result of a written order by the Employer's Agent ; or

(b) as a refund to the Employer in respect of a decrease in quantities which are less than those specified, irrespective of whether such decreases result from an authorised decrease in the rates of application or mix proportions, or from unauthorised reductions on the part of the Contractor.

Payment for a prescribed rate of application or mix proportion shall be based on the actual rate of application or mix proportion used, if this does not exceed the prescribed rate of application or mix proportion, plus any allowable tolerance.

If the actual rate of application or mix proportion exceeds the prescribed rate of application or mix proportion, payment shall be based on the prescribed rate of application or mix proportion plus any tolerance allowed. If the actual rate of application or mix proportion is below that prescribed, payment shall be based on the actual rate of application or mix proportion regardless of any tolerance allowed.

Notwithstanding the above, the Employer's Agent shall be fully entitled to reject work, which has not been constructed in accordance with the specifications or the rates of application, or mix proportions prescribed.

The Employer shall be refunded for any decrease in the specified rate of application or mix proportion at the same rate per unit measurement as that tendered by the Contractor for additional materials required by an increase in the rates of application or mix proportions.

PS.19 OVERLOADING OF TRUCKS

Trucks must have a mounted plate depicting the allowed mass allowed to be carried. Failure to have this in place will result in that truck being barred from delivering to any of the Sites within this Contract. Overloading will not be entertained, and the following penalty shall be implemented: The amount overweight will be multiplied by a factor of 2. This total will then be multiplied by the supply and application rate most applicable in the bill of quantities, which total will be subtracted from the invoiced amount.

For which the formula is = Invoiced amount - [(supply load – legal load) x2 x (Rate of supplying and laying the material)]

PS.20 REMOVAL OF CONSTRUCTION RUBBLE

Material removed or excavated from the public transport facility rehabilitation construction shall not be left on site for more than two days (48 hours). Cost of removing or hauling this material shall be included in the breaking or excavation rate for the relevant item and no extra cost shall be paid for this item. Failure or refusal on the part of the contractor to remove rubble within two days or 48 hours shall be sufficient cause for the Employer's Agent to apply penalties as follows:

A fixed penalty of R5000 per day shall be deducted for non-compliance immediately after the Employer's Agent has given an instruction to this effect. The Employer's Agent's instruction shall state the time of incidence, Should the Contractor fail to adhere to this instruction within two hours, the time-related penalty of R500 per hour shall be applied from the time the instruction was given.

PS.21 PRE-CUTTING OF PAVEMENT SURFACINGS

Due to the deterioration of pavement materials caused by water ingress into the pavement layers, the Contractor, and Sub-Contractors, where applicable, shall not be permitted to pre-cut the pavement surfacing, for the following activities, but not limited to:

- i. Patching works,
- ii. Raising/Lowering services within the pavement structure,
- iii. Works related to the construction of kerbing or kerb-channel combinations,
- iv. Construction of sub-soil drains which require cutting of surfaced sidewalks,
- v. Speed-hump construction works,
- vi. Milling of asphalt material.

All work activities that require saw-cutting or milling (which exposes granular base layers) of any kind shall be planned and programmed in sections such that these works activities shall be completed within that day. Non-compliance to this specification shall result in a penalty imposed which shall be calculated as follows: $\text{Penalty} = 2 \times \text{quantity of incomplete work for that day} \times \text{tendered rate of that works activity}$.

PS.22 DETERMINATION OF QUANTITIES IN RESPECT OF MATERIALS DELIVERY NOTES

Material delivery notes supplied by the Contractor and submitted to the Employer's Agent shall be for purposes of confirming the type of material supplied and date of delivery to site. The delivery notes shall also be used as a basis for rejecting any materials to be used for the works that may have exceeded the materials shelf-life as prescribed by the materials supplier data sheets. Unless specified by the Employer's Agent, the quantities to be certified shall be based on the approved and authorized dimensions of the works, multiplied by the relevant material bulking/conversation factors where applicable.

PS.23 UNDERTAKING OF CONSTRUCTION ACTIVITIES OUTSIDE THE SPECIFIED AND AGREED WORKING HOURS

Unless specified and agreed by the Employer's Agent in writing, all construction activities are to be carried out within the working hours as stipulated in Clause PS1.1 of Part A: General, of this section. The penalty for non-compliance to this specification shall be as follows:

Penalty (per road) = R 5000 (fixed) + R 500 per hour (time related for every hour until the works are complete)

The Employer's Agent shall, at his discretion, upon written explanation from the Contractor within 3 working days after the event, evaluate whether the reasons for working outside the specified hours are within the Contractors control. Circumstances beyond the Contractors control shall not result in any penalties being imposed. Poor planning in respect of delivery of materials to site does not absolve the penalty.

PS.24 MATERIALS**PS.23.1 Material and Borrow Pits**

The gravel material to be used under this contract shall comply with the requirements as per TRH

20. The material will be confined to zone E and the upper portion of zone B of TRH20 for re-gravelling. The material to be used for the rehabilitation of public transport facilities shall comply with the requirements as per Layer works table attached to this document.

All material shall be from approved sources. Should the tenderer enter into any special agreements with any landowner for the acquisition/procurement of material, same shall comply with all statutory requirements pertaining to extraction of such material. A test certificate of all material to be used will be required.

All costs associated with procuring/supply of material from an approved source, shall be built into the tender rates for supplying the different materials.

All material other than suitable for re-use shall be disposed of at an approved tip site.

No burning of vegetation will be permitted.

PS.25 WEATHER LIMITATIONS

The work shall not be permitted to continue, if in the opinion of the Engineer or his representative, the weather is such that it may adversely affect the roadwork operations.

PS.26 SITE CONDITION

No additional payment shall be made due to the nature of the site conditions, including the extent of work in a defined area. All costs associated with carrying out the works are deemed to be included in the tendered rates for the items in the Schedule of Quantities.

The public transport Facilities (Taxi and Bus Ranks) are located within the Western region of eThekweni Municipality within the various wards. The public transport facilities have a high number of minibus taxis from different taxi associations operating within them. The tenderer is required to take due note of this when pricing the bill of quantities.

C3.3: STANDARD SPECIFICATIONS

C3.3.1 The Specifications on which this contract is based are the eThekweni Municipality's (City of Durban) Standard Engineering 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.

Part	Description	Date of Issue	
AB	General Specifications	July	1992
B	Site Clearance	March	1990
C	Concrete Work	February	1987
DA	Earthworks: Bulk	January	1985
DB	Earthworks for Pipe Trenches	July	1992
EA	Lime Stabilisation		
EB	Graded Crushed Stone	December	1988
EC	Cement Treated Graded Crushed Stone	December	1988
ED	Road Asphalt	July	1992
EF	Kerbs and Haunches	July	1992
EG	Sidewalks, Footpaths and Median Areas	July	1992
EH	Steel Guardrails & Conc. Median Barriers		
EJ	Concrete Interlocking Block Surfaces		
EL	Dumprock Subgrade Improvement		
EM	Concrete Surface to Roads		
EP	Single Seal Surface Treatment		
F	Protection Works	July	1992
K	Bearings		
L	Structural Work		
PB	Pavement Layers of Gravel Material		
PC	Stabilisation of Gravel Base		
PD	Surface Treatment: Modified Binder		
PH	Manholes and Appurtenant Drainage Works	July	1992
S	Reinstatement	March	1993
TA	Road Signs	October	1989
TB	Road Markings	October	1989

STANDARD SPECIFICATIONS**PART ED : ROAD ASPHALT****ED.1 SCOPE****ED.1.1 Bituminous Base Course**

The base course shall consist of a specified number of consolidated layers of hot continuously graded asphalt laid by an approved spreading and finishing machine. The minimum and maximum single layer thickness shall be 60 and 100 mm respectively. A tack coat is required between layers unless otherwise specified by the Engineer.

ED.1.2 Wearing Course

The wearing course shall consist of a consolidated layer of either hot continuously graded asphalt or hot semi-gap graded asphalt laid by an approved spreading and finishing machine. The minimum single layer thickness shall be 40mm. A light tack coat shall be used between the previous course and the wearing course unless otherwise specified by the Engineer.

ED.2 INTERPRETATIONS**ED.2.1 Definitions**

Definitions for this specification are included in Part AB : General Specifications.

ED.2.2 Supporting Specifications

The following standards are referred to in this specification:

S.A.N.S. 307	- Penetration grade bitumen
S.A.N.S. 309	- Anionic bitumen road emulsions
S.A.N.S. 548	- Cationic bitumen road emulsions
S.A.N.S. 1083	- Aggregates from natural sources

all as published in General Notice 463 dated 9 July 1982.

Asphalt Paving Manual (M.S. 8) or Sabita Manual 5 (March 2008, 3rd Edition) : Guidelines for the Manufacture and Construction of Hot Mix Asphalt.

ED.3 MATERIALS**ED.3.1 Tack Coat**

The tack coat shall be a spray grade 60% cationic or anionic emulsion conforming to S.A.N.S 548 or 309 respectively.

ED.3.2 Bituminous Binder

The binder shall conform to S.A.N.S. 307 and have a penetration of 35/50 (Heavy trafficked roads) or 50/70 (Light trafficked roads). Modified binders shall comply with TG1 Technical Guideline (2nd Edition, November 2007).

ED.3 MATERIALS (CONTINUED)**ED.3.3 Course Aggregate****ED.3.3.1 Continuously Graded Asphalt**

- (a) **Wearing Course** - clean, hard, unweathered Natal sandstone conforming to S.A.N.S. 1083, Table 5 and having a Los Angeles abrasion test value of 40 maximum.
- (b) **Base Course** - either Natal Sandstone or grey/blue Dwyka Tillite, both conforming to S.A.N.S. 1083, Table 5 and having a Los Angeles abrasion test value of 50 maximum.

ED.3.3.2 Semi-Gap Graded Asphalt

Course aggregate shall be clean, hard, unweathered Natal Sandstone, conforming to S.A.N.S. 1083, Table 5 and having a Los Angeles abrasion test value of 40 maximum.

ED.3.4 Fine Aggregate**ED.3.4.1 Continuously Graded Asphalt**

Fine aggregate shall be all the mineral matter passing the 2,36 mm sieve and retained on 0,075 mm sieve, shall consist of freshly crushed grey/blue Dwyka Tillite and shall be well graded throughout the range with a minimum sand equivalent of 40.

ED.3.4.2 Semi-Gap Graded Asphalt

Fine aggregate shall be all the mineral matter passing the 2,36 mm sieve and retained on the 0,075 mm sieve and shall consist of a clean, natural hard sand with a minimum sand equivalent of 50. Clean freshly crushed grey/blue Dwyka Tillite screening as specified in ED.3.4.1 may be added to the sand to ensure that the stability of the asphalt meets the specification.

ED.3.5 Filler**ED.3.5.1 Continuously Graded Asphalt**

Filler shall consist of finely ground particles of natural freshly crushed stone or other approved commercial non-plastic material having not less than 75% passing a 0,075 mm sieve.

ED.3.5.2 Semi-Gap Graded Asphalt

Filler shall consist of natural filler from the sand plus crushed limestone or Portland Blast Furnace Cement. The mix shall contain 1% commercial filler irrespective of natural filler.

ED.3 MATERIALS (CONTINUED)**ED.3.6 Modification of Wearing Course Mixes**

Where required by the Engineer, modifiers shall be added to the asphalt mixes specified in clause ED.5.1 of Part ED of the Departmental Specification. The mixes shall be in accordance with Tables 7 and/or Table 9 of TG1 (2nd Edition, November 2009): Technical Guideline for the use of Modified Bituminous Binders in Road Construction.

The unit of measure shall be tonnes (t) and shall be measured as an extra over for each tonne of asphalt wearing course containing the modifier. The rate shall include for supply of the modifier and for any additional work required in the mixing and laying process.

ED.3 MATERIALS (CONTINUED)**ED.3.3 Course Aggregate****ED.3.3.1 Continuously Graded Asphalt**

- (a) **Wearing Course** - clean, hard, unweathered Natal sandstone conforming to S.A.N.S. 1083, Table 5 and having a Los Angeles abrasion test value of 40 maximum.
- (b) **Base Course** - either Natal Sandstone or grey/blue Dwyka Tillite, both conforming to S.A.N.S. 1083, Table 5 and having a Los Angeles abrasion test value of 50 maximum.

ED.3.3.2 Semi-Gap Graded Asphalt

Course aggregate shall be clean, hard, unweathered Natal Sandstone, conforming to S.A.N.S. 1083, Table 5 and having a Los Angeles abrasion test value of 40 maximum.

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Filler shall consist of natural filler from the sand plus crushed limestone or Portland Blast Furnace Cement. The mix shall contain 1% commercial filler irrespective of natural filler.

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The unit of measure shall be tonnes (t) and shall be measured as an extra over for each tonne of asphalt wearing course containing the modifier. The rate shall include for supply of the modifier and for any additional work required in the mixing and laying process.

ED.4 PLANT

ED.4.1 Mixing Plant

Either an approved mechanical batch-mixing or drum-mixing plant shall be used.

If a drum-mixing plant is used, all cold aggregates shall be stockpiled separately on concrete slabs and shall be covered with a waterproof reinforced plastic cover at all times when mixing is not in progress. Natural sand aggregates shall be pre-screened through a 13 mm screen before being fed into the drum-mixer. Each feed from a cold aggregate hopper must be calibrated so that the plant controller can see at any time on gauges in the control cabin, the mass of each cold aggregate falling onto the main aggregate conveyor. All thermometric equipment shall be clearly visible to the plant operator. At no time shall the mixing temperature exceed 170 °C.

ED.4.2 Laying

The asphalt shall be laid by an approved self-powered, mechanical paving machine correctly adjusted.

ED.4.3 Rolling

The asphalt shall be rolled with a minimum of two approved steel wheel rollers of which one shall be a three wheel type.

ED.5 CONSTRUCTION

ED.5.1 Mix Requirements

ED.5.1.1 Refer to the Ethekweni Asphalt Mix Specifications included at the end of this Section.

ED.5.1.3 Mechanical Properties

The asphalt shall be tested by the Marshall method and shall have values within the following limits:

Stability of between 10 - 16 kN

Void 3 - 6% (for hot continuously graded asphalt)

Void 4 - 8% (for hot gap-graded asphalt)

Flow 2 - 3 mm

Stiffness : Stability flow 3 - 6 kN/mm

ED.5.2 Trial Mixes

The Engineer may require the Contractor to supply and place in an approved portion of the roadway (i.e. public transport facility) one or more of the mixes. In such a case approximately 25 tons of the mix shall be laid and shall be paid for at the rates in the Schedule of Quantities.

After the Engineer has approved a mix design, the type of mix, shape of grading curve and source of the aggregate used in that mix shall not be changed without the prior approval of the Engineer.

ED.5.3 Tack Coat

The approval of the surface of the underlying layer, and immediately before laying asphalt, a tack coat shall be applied by approved means at the rate of 0,3 l/m² if required by the Engineer.

The Contractor shall take whatever measures are necessary to protect concrete kerbs and channels and other street furniture from overspray. Failure to comply will result in the contractor remedying the situation at his cost.

ED.5.4 Delivery

The asphalt shall be transported to the site in vehicles having bins consisting of metal sides and bottoms. The insides of the bins shall be free of all foreign matter and be lightly oiled to prevent adhesion of asphalt. The opinion of the Engineer regarding the amount of oiling necessary shall be final. The bins shall be covered with tarpaulins or other suitable material when loaded to protect the asphalt from inclement weather and to prevent loss of heat during transportation. The temperature of asphalt on arrival on site shall be between 130 °C and 170 °C for mixes not containing Latex and between 140 °C and 170 °C for mixes containing Latex.

ED.5.5 Placing

The temperature of the asphalt shall be not less than 130 °C when delivered to the paver.

The laid widths of wearing course shall be so arranged that longitudinal joints shall coincide with future lines marking traffic lanes in the roadway.

ED.5.6 Joints and Compaction

The preparation of joints and the compaction of asphalt shall be done in accordance with methods described in the latest edition of the Asphalt Paving Manual (M.S.8) relating to joints and compaction. Rolling shall commence before the temperature of the asphalt falls below 100 °C.

Where the new surfacing is required to tie into the existing road surface the joint shall depend on the class of road.

Generally joints shall consist of one of the following types which shall be billed separately in the Schedule of Quantities:

- (a) Transverse Joint: The joint is to be formed by milling out an area 3 m wide over the full width of the existing roadway, the area to be tapered from 0 to -40 mm in depth.
- (b) Longitudinal Joint: The joint is to be formed by cutting into the existing road surface by 150 mm wide to a depth of 40 mm where the new surfacing is to be tied longitudinally into the adjacent existing pavement.
- (c) Feathered Transverse Joint: The joint shall be formed by cutting a 50 mm wide by 30 mm deep key into the existing surface. The new wearing course shall be tapered over to tie in at the key a distance of not less than 1,0 m.

The position of the joint shall be indicated by the Engineer on site.

After cutting/milling the joint shall be swept of all loose material and painted with a tack coat.

Cutting of the joints shall only take place immediately prior to the laying of the wearing course.

ED.5.7 Minimum Lengths to be placed

Where possible a minimum length of 100 m of base course or 200 m of wearing course shall be placed at any one time. The delivery shall be at a uniform rate and shall be within the capacity of the paver and compaction equipment to ensure that the paver works continuously.

ED.6 TOLERANCES**ED.6.1 Bituminous Base Course**

The base course layer shall be tested to comply with the following requirements:

(a) Thickness

The average thickness of completed base course layer in any section, as determined from a minimum of five test holes, shall not be less than the thickness specified. The allowable tolerance at any one test hole shall be $\pm 10\%$ of the specified thickness.

(b) Smoothness

The maximum number of surface irregularities permitted with a 3 m rolling straight edge shall be as follows:

- (i) In any 300 m
- (ii) In any 75 m

4 mm and above - 40
 7 mm and above - 4
 19 mm and above - None

4 mm and above - 18
 7 mm and above - 2
 10 mm and above - None

(c) Accuracy of Levels

The elevation tolerance shall be as specified under Part "DA" Earthworks Bulk - clause DA.6(d) except that the standard deviation of the differences between the actual and design levels shall not be greater than 6 mm.

ED.6.2 Wearing Course

The wearing course shall be tested to comply with the following requirements:

(a) Thickness

A tolerance of 5 mm will be allowed above or below the design levels for any single reading.

(b) Smoothness

The maximum number of surface irregularities permitted with a 3 m rolling straight edge will be as follows:-

	CATEGORY A ROADS		CATEGORY B ROADS		CATEGORY C ROADS	
LENGTH	300 m	75 m	300 m	75 m	300 m	75 m
4 mm and above	10	4	20	9	40	18
7 mm and above	1	1	2	1	4	2
10 mm and above	Nil	Nil	Nil	Nil	Nil	Nil

The category of the roads in this contract will be as described in Part AA : Project Specification.

ED.6.3 Rectification

The full depth of the layer shall be removed and replaced with fresh material laid and compacted to specification.

Where the surface level is too high or too low the area rectified shall be not less than one lane wide and at least 5 m long for base course and 15 m long for wearing course.

Where the number of surface irregularities exceeds the specified limits the area to be rectified shall be 300 m long and not less than one lane wide.

ED.7(a) PROCESS CONTROL TESTING

The Contractor shall carry out his own process control testing in the form of Troxler Density testing daily, which must be made available to the Engineer. The cost of such testing will be deemed to be included in the rates for paving. The Engineer will determine if further acceptance testing is required.

ED.7(b) ACCEPTANCE CONTROL TESTING

The following minimum tests shall be carried out by the Engineer or by an independent materials testing laboratory employed by the Engineer:

- (a) When requested by the Contractor; or
- (b) At the discretion of the Engineer after reviewing the results of the process control testing.

Should the acceptance tests indicate that the work is not to specification, the cost of any retest by the Engineer shall be to the Contractor's account and shall be deducted from any payments due to the Contractor.

NATURE	FREQUENCY OF TESTING
(a) Penetration and softening point of binder	1 test per day
(b) Temperature of mix in °C	Every load as it arrives on site

(c) Marshall density (C.D.M.)	1 test per 200 tons of output or part thereof per day
(d) Marshall stability in kN	1 test per 200 tons of output or part thereof per day
(e) Marshall flow in mm	1 test per 200 tons of output or part thereof per day
(f) Bitumen content in % by mass of mix	1 test per 200 tons of output or part thereof per day
(g) Mixed aggregate grading analysis	1 test per 200 tons of output or part thereof per day
(h) Density of laid asphalt using a Nuclear Testing Device	As per Colto

The density of the layer shall satisfy the following:

As per Colto, with the following amendment

* $L_s = 93\%$ of Maximum Theoretical Density (Table 8206/3. Note 1(a))

A copy of the test results will be handed to the Contractor as soon as they are available but not later than 48 hours after the asphalt is laid.

ED.8 MEASUREMENT AND PAYMENT

ED.8.1 Asphalt Base Course

Measurement shall be tons (t) as recorded on printed weigh-bridge tickets.

The rates tendered for the asphalt shall cover all materials, storage, handling, mixing, transporting, sweeping the previous surface where necessary, spreading, jointing, compacting, protection to adjacent concrete kerbing and street furniture, paving, and testing other than those tests carried out by the Engineer in accordance with the specification.

ED.8.2 Asphalt Wearing Course

The unit of measure shall be tons (t) as recorded on printed weigh-bridge tickets. Item coverage shall be as specified in ED.8.1.

ED.8.3 Tie in Joints

ED.8.3.1 Transverse Joint

The unit of measurement shall be the linear metre (m). The rate tendered shall cover the neat cutting of the joint, removal of the old premix to tip off site.

ED.8.3.2 Longitudinal Joint

The unit of measure is the linear metre (m) with the item coverage as detailed in ED.8.3.1.

ED.8.3.3 Feathered Transverse Joint

The unit of measure is the linear metre (m) with the item coverage as detailed in ED.8.3.1.

ED.8.4 Tack Coat

The unit of measurement shall be square metres (m²). The rate tendered shall include for sweeping the previous surface where necessary, protecting the adjacent concrete kerbing, inlet covers and street furniture and testing in accordance with the specification. The application rate shall be 0,3 l/m².

C3.3.2 AMENDMENTS TO ETHEKWINI 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 (for ethekwini standard specifications) and prefix B (for COLTO specifications) 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.

PROJECT SPECIFICATIONS – ETHEKWINI SPECIFICATIONS

PART A: AMENDMENTS TO THE ETHEKWINI SPECIFICATIONS

SECTION 1: PRELIMINARY AND GENERALS

SECTION 1: PRELIMINARY AND GENERAL

PS.AA.12 Contractors Fixed Obligations

This item covers all the necessary initial fixed obligations of the contractor including but not limited to insurances, sureties, offices, office equipment, office furniture etc.

Payment will be made as follows:

20% of the tendered sum for this item will be paid on the first payment certificate.

20% of the tendered sum for this item will be paid after a period on 3 months

20% of the tendered sum for this item will be paid after a period on 9 months

20% of the tendered sum for this item will be paid after a period on 12 months

20% of the tendered sum for this item will be paid on the final payment certificate

PS.AB.8 Contractors superintendence including transport and communication

The tendered rate shall include full compensation for the provision of continuous site supervision (qualified site agent, foremen, etc.), transportation, and communication requirements. The unit of measurement shall be per month.

PS.AB.9 Provision for a Community Liaison Officer

As per C1.2.3.1. Payment shall be processed upon submission of the time sheet/register that has been signed and indicating hours worked by the CLO or submission of proof of payment to the CLO for hours worked.

PS.AB.10 Accommodation of traffic

This item shall cover the accommodation of traffic as per the Southern African Development Community Roads Traffic Manual Volume 2 and in accordance with RTI at all times. The tendered

rate shall include full compensation for the provision of all signs, traffic cones, delineators and flagmen as required for each worksite. The unit of measurement shall be per month.

PS.AB.11 Penalty for failure to comply

In the event that clause PS.AB.10 and clause (AH.14.2) are not adhered to, the stipulated rates shall be deducted from the payment certificate for each occurrence.

PS.AB.12 Re-establishment for Public Transport Facility rehabilitation

This item shall cover for the establishment and de-establishment on site for each public transport Facility. The unit of measurement shall be per No.

SECTION 2: CLEARING AND GRUBBING

PS.B.8.23 Removal of Fencing

Where instructed by the engineer, the contractor will be required to remove fencing along the public transport facility being rehabilitated.

The tendered rate shall include the cost of up rooting the fencing, loading, transporting, offloading and backfilling of cavities left as a result of the removal of the fencing.
The unit of measurement shall be in metres (m).

PS. ED ROAD ASPHALT

PS.ED.1. Supply of Asphalt From Commercial Plant

Asphalt supplied from commercial asphalt plant shall be in accordance with the requirements of Clause AA.ED.5 of the Project Specification. Measurement and payment items under "Asphalt from Commercial Plant" shall include supply, collection and paving of the asphalt.

PS.ED.2 ASPHALT OVERLAYS AND REPLACEMENT LAYERS

Continuously graded asphalt overlays or replacement layers supplied from a commercial asphalt plant shall comply with the requirements in Clause AA.ED.5 of the Project Specifications.

The Engineer shall select the source of asphalt for the continuously graded asphalt overlays or replacement layers.

Separate items have been scheduled for overlays and replacement layers and measurement and payment for BOTH shall be governed by Clause ED.8 of Departmental Specification Part ED : Road Asphalt.

PS.ED.3 ASPHALT WEARING COURSE SUPPLIED FROM A COMMERCIAL ASPHALT PLANT.

PS.ED.3.1 Scope

This specification covers all the work in connection with the construction of continuously graded asphalt overlays or replacement layers supported from a commercial asphalt plant.

PS.ED.3.2 Materials

(a) Bituminous binders

The road grade bituminous binder shall be 35/50 or 50/70 penetration grade bitumen and shall comply with the SANS 4001-BT1:2012 specification. The required penetration grade bitumen will be specified by the Engineer per road.

(b) Aggregates

Course and fine aggregates shall be clean, unweathered Natal Sandstone conforming to SABS 1083 and having a Los Angeles abrasion test value of 40 maximum, and be free from decomposed materials, organic matter and other deleterious substances.

1. Resistance to crushing

The aggregate crushing value (ACV) of the aggregate shall not exceed 25. The minimum dry 10% FACT values of the -13.2mm + 9,5mm fraction shall be 160kN. The wet/dry ratio shall not be less than 75%.

2. Shape of aggregate

The flakiness index shall not exceed 25.

3. Polishing

The polished stone value of the aggregate shall not be less than 50.

4. Grading

The grading of the combined aggregate including filler added shall be within the limits stated in clause ED5.1.1 of the Departmental Specifications, Part ED: Road Asphalt.

Grading Envelope	
Sieve Size	Percentage Passing By Mass
13,2	100
9,5	82-100
4,75	54-75
2,36	35-50
1,18	27-42
0,06	18-32
0,30	11-23
0,15	7-16
0,0075	4-10

5. Fine aggregate

Fine aggregate shall be all the mineral matter passing the 2,36 mm sieve and retained on 0,075 mm sieve, shall consist of freshly crushed grey/blue Dwyka Tillite and shall be well graded throughout the range with a minimum sand equivalent of 40.

6. Absorption

The maximum bituminous binder absorption of both the coarse and the fine aggregates determined in accordance with TMH1 Method C4 (8), shall be 0,5% by mass.

(c) Filler

If the grading of the combined aggregates for the continuously graded asphalt surfacing layer show a deficiency in fines, an approved filler may be used to improve the grading.

Filler shall consist of finely ground particles of natural freshly crushed stone of the same type and source as the fine aggregate having not less than 75% passing a 0,075mm sieve.

The continuously graded asphalt-surfacing layer shall include an active filler to improve the adhesion properties of the aggregate. The active filler shall be hydrated lime.

PS.ED.3.3 COMPOSITION OF ASPHALT SURFACING LAYER

The given nominal mix proportions of bituminous binder, aggregates and fillers given in Table AA.ED.5.1 shall be used for tendering purposes only. The actual proportions to be used shall be determined to suit the materials and conditions prevailing during construction. Any approved variation on the nominal mix in the bitumen content and active filler content shall be subject to an adjustment in payment for binder and active filler variations.

Before production or delivery of the asphalt the contractor shall submit samples of the materials he proposes to use in the mix, together with the proposed mix design as determined by an approved laboratory, to the

engineer at least 2 weeks prior to the required approval. The contractor shall provide the engineer with a minimum of 50 kg of each of the stone to be used.

As soon as the materials become available the contractor shall produce a working mix in the plant in accordance with the design mix. The working mix shall again be tested by him for compliance with the design requirements. Samples of the working mix and the test results shall also be made available to the engineer, who will authorize the use of the working mix proportions approved for use in the trial section. Final approval of the working mix will be subject to the approval of the trial section.

Table PS.ED.4.1 : Nominal Mix Proportions

NOMINAL MIX PROPORTIONS BY MASS	
DESCRIPTION	% BY MASS
Aggregate	94,0%
Bitumen	5,0%
Active Filler	1,0%

The asphalt mix shall comply with the Marshall design criteria shown in Table AA.ED.4.2 below.

Table PS.ED.4.2 : Marshall Mix Design Criteria

MASHALL DESIGN CRITERIA (75 BLOWS/SIDE)			
ASPHALT PROPERTY	UNIT	MINIMUM	MAXIMUM
Marshall Stability	kN	7,0	12,5
Marshall Flow	mm	2,0	4,0
Stability/Flow Ratio	KN/mm	3,0	4,5
Filler/bitumen Ratio		1,0	1,5
Voids in Mix	%	3,0	6,0
Voids in mineral aggregate (VMA)	%	15,0	
Binder Film thickness	Microns	7,0	
Air Permeability	cm ²	-	1 x 10 ⁸
Immersion Index	%	80	
Dynamic Creep Modulus @ 40°C	Mpa	15	
Indirect Tensile Strength @ 25°C	Kpa	1000	
Resilient Modulus @ 25°C	Mpa	2500	

PS.ED.3.4 PRODUCING THE ASPHALT MIXTURE

(a) Mixing and storage temperatures of binder

Bituminous binders shall be stored at temperatures not exceeding those given in Table AA.ED.5.3 and the aggregate and bituminous binders shall be heated at the mixing plant to such temperature that the mixed product shall have a temperature within the range given in Table AA.ED.5.3.

(b) Production of the mixture

1. Using batch plants

(i) Heating the aggregate

The aggregate shall be dried and heated so that, when delivered to the mixer, its temperature shall be between 0°C and 20°C lower than the maximum temperature indicated in Table AA.ED.5.3 for the mixture. The moisture content of the mix shall not exceed 0,5%.

(ii) Batching

Each fraction of the aggregate and binder shall be measured separately and accurately in the proportions by mass in which they are to be mixed. If filler is used, it shall be measured separately on a scale of suitable capacity and sensitivity. The error in the weighing apparatus used shall not exceed 2% for each batch.

(iii) Mixing

The aggregate, filler and binder shall be mixed until a homogeneous mixture is obtained in which all particles are uniformly coated. Care shall be taken to avoid excessively long mixing times which can cause hardening of the binder.

2. Using drum-type mixer plants

The aggregate and filler shall be accurately proportioned and conveyed into the drum-mixing unit. The calibrated amount of binder shall be sprayed onto the aggregates at the correct position so that no hardening of the binder shall take place. A homogeneous mixture and uniform coating of binder must be achieved and the moisture content of the asphalt mixture shall not exceed 0,5%. Once the final mix temperature has been agreed upon it may be altered without the prior consent of the engineer.

The moisture content of the asphalt mixture shall be tested according to method C11 of TMH1

Table AA.ED.5.3

Material	Maximum Storage Temperature of Binder (°C)		Temperature range of mix (°C)
	Over 24 hrs	Under 24 hrs	
35/50 Penetration Grade (B24 Road-Grade)	145	175	140-165
50/70 Penetration Grade (B12 Road-Grade)	135	170	135-155

NB: Details of the source of supply and name are required by the Engineer before asphalt is laid.

PS.ED.3.5 SPREADING THE ASPHALT LAYER

AA.ED.3.5.1 Paver Laid

The mixture shall be delivered to the paver in such a manner that the paver will never be forced to stop for lack of asphalt. The temperature of the mixtures shall be controlled by measuring in a random pattern in the truck immediately before emptying, and shall not be more than 10°C below the minimum temperature specified for mixing in Table AA.ED.5.3. The adjustment of the screed, tamping bars, feed screws, hopper feed, etc, shall be checked frequently to ensure uniform spreading of the mix. If segregation or tearing occurs, the spreading operations shall immediately be suspended until the cause is determined and corrected.

Only minimal hand-working of the open graded asphalt shall be permitted after discharge from the paver and before rolling and shall only be carried out with wooden spreaders. Operatives shall not be permitted to walk on uncompacted open graded asphalt.

Paving shall, if possible, commence at the bottom of the grades and the lower edges of super elevated curves. Paving shall be done upgrade on grades steeper than 5%.

Spreading shall be so arranged that longitudinal joints do not coincide with joints in lower layers of asphalt base, paver laid crushed stone bases or surfacing.

Unless otherwise specified in the project specifications the paver shall be equipped to provide automatic control of levels and cross section. In the case of asphalt base construction, automatic control shall be run off guide wires or levelling beams and in the case of surfacing and overlays skids, levelling beams or guide wires shall be used.

On restricted areas, inaccessible to the paving equipment used, the mixture may be placed by hand or other means to obtain the specified results. Paving shall be carried out in a manner which will avoid segregation and which will allow control of levels.

The mixer capacity and the operating speed of the paver are to be so co-ordinated as to ensure continuous laying and to avoid intermittent stopping of the paver.

Paving shall cease when rain starts falling or when the surfaces to be paved are visibly wet.

In the case of overlays, guide wires will normally not be required during the placing of the mix unless specified in the project specifications. In all cases, including levelling courses, the paver shall be provided with approved skid beams with electronically controlled equipment or levelling beams, which can ensure a constant crossfall and can even out local irregularities.

Asphalt shall be placed in restricted areas with the aid of smaller specially equipped pavers, hand tools, or other approved equipment. The space concerned shall be properly filled with asphalt, without leaving any gaps between the fresh asphalt and the existing pavement layers.

PS.ED.3.5.2 Hand Laid

Hand laid operations will only be permitted if instructed by the Engineer.

PS.ED.3.6 COMPACTION

The asphalt shall be rolled in accordance with the method described in chapter VI of the Asphalt Institute Paving Manual (MS-8) or Sabita Manual 5 (March 2008, 3rd Edition) : Guidelines for the Manufacture and Construction of Hot Mix Asphalt. A final density is required as per Colto, with the following amendment

* $L_s = 93\%$ of Maximum Theoretical Density (Table 8206/3. Note 1(a)).

The contractor shall utilize a calibrated nuclear gauge for process control during compaction operations. Notwithstanding this requirement, the acceptance control carried out for compaction by the engineer, shall still be based on cores taken from the compacted layer or nuclear gauge testing by the Ethekwini Municipality Laboratory or a private laboratory (to be approved by the Engineer).

PS.ED.3.7 TRIAL SECTIONS

Before the contractor commences with the construction of any asphalt base or surfacing, he shall demonstrate, by laying a trial section of between 300 m² and 600 m² in area, as specified, depending on the required layer thickness, that the equipment and processes that he proposes to use, will enable him to construct the particular asphalt course in accordance with the specified requirements.

Only when such a trial section has been satisfactorily laid and finished, and complies with the specified requirements, will the contractor be allowed to commence with construction of the permanent work.

If the contractor should make any alterations in the methods, processes, equipment or materials used, or if he is unable to comply consistently with the specifications, the engineer may require that further trial sections be laid at the contractor's cost before allowing the contractor to continue with the permanent work.

The intention of this clause is to avoid any experimentation by the contractor on the permanent work.

The trial sections shall be laid where indicated by the engineer. The contractor shall prepare the surface on which to lay the trial section and shall also, if required, remove the trial section after completion and restore the surfaces on which it was constructed, all at the contractor's cost.

Provision is made for payment of the first approved trial section of any particular mix type, but subsequent trial sections with the same mix type shall be at the contractor's own cost. Payment will be made for the specified area of each approved first trial section for any particular mix type.

The construction equipment and techniques as well as the mix properties applicable to the approved trial section shall not be changed without prior approval by the engineer.

PS.ED.4 ADDITION OF MODIFIER TO WEARING COURSE MIXES

Where required by the Engineer, modifiers shall be added to the asphalt mixes specified in clause ED.5.1 of Part ED of the Departmental Specification. The mixes shall be in accordance with Tables 7 and/or Table 9 of TG1 (2nd Edition, November 2009) : Technical Guideline for the use of Modified Bituminous Binders in Road Construction.

PS.ED.5 SMOOTHNESS APPLICABLE TO WEARING COURSE (CLAUSE ED.6.2)

The smoothness applicable to the wearing course shall be that specified in Clause ED. 6.2 (b).

Further to Clause ED. 6.2 (b), the Tenderer is to note that "The minimum number of surface irregularities should read : "The maximum number of surface irregularities.."

PS.ED.6 JOINTS

Clause ED.5.6.(C) of the Standard Departmental Specifications shall be replaced with the following:

Feathered Transverse Joints

The joint shall be formed by saw cutting a 0.5m by 30mm deep key into the existing surface. The new wearing course shall be tapered over to tie in at the key a distance not less than 1m.

The rate shall include for all temporary measures required to maintain this joint until the rehabilitation operation is completed.

Notwithstanding the provisions of Clause ED.7 of the Standard Departmental Specifications, Acceptance Control Testing as specified in Clause ED.7 on all asphalt supplied by the Contractor, shall be carried out by the Contractor. Should the asphalt be supplied from the EM Asphalt Plant, the Contractor will only be expected to carry out checking and keeping records of the temperature of the mix and of the densities of the laid asphalt. In addition to the tests specified in Clause ED.7 the void content of the mix shall also be determined for every 200t of output or part thereof per day. The record of temperatures of the asphalt must include temperature as it arrives on site and temperatures as it is being paved (ie. In the paver's bin).

Tests on asphalt laid by the Contractor must be made available within 48 hours of the asphalt being laid except for bitumen content and void content which must be made available by 08h30 am of the morning following the paving or by the time the first load arrives on the morning following the paving. Should the test results not be provided as required or should the results fall outside the specifications, the Engineer reserves the right to suspend any paving until the results are produced and accepted.

PS.ED.6.1 CORING FOR DENSITY TESTING

The Engineer may instruct that cores are taken to test the density of the asphalt paved. Cores shall then be taken, using the Stratified Random Method (as per TMH5/TRH5) to locate the position of the tests, and tested with 48 hours of instruction.

The unit of measurement shall be number (No.), of the following specified core depths:

(6.4) 0 – 50mm

(6.5) 0-100mm

and shall be per core taken, the rate shall include for getting a coring machine onto and off site, coring, filling in core holes with asphalt, marking of cores, testing and provision of test results.

Extra over Item (i) or (ii) will be paid for every 10mm of asphalt depth cored. The unit of measurement will be millimetre (mm).

PS.ED.6.2 NUCLEAR TESTING

The Engineer may instruct that Nuclear Testing take place to test the density of the asphalt paved. Testing shall then be taken, using the Stratified Random Method (as per TMH5/TRH5) to locate the position of the tests, and tested within 48 hours of instruction.

The unit of measurement shall be number (No), and shall be per test taken, the rate including for getting a private Materials Laboratory's testing station onto and off the site, testing and provision of test result.

PS.ED.7 PATCHING OF EXISTING SURFACE

Prior to resurfacing existing roads, those areas of the existing asphalt pavement which require patching will be marked by the Engineer.

PS.ED.7.1 Patching (Surface : Asphalt wearing course)**(a) Deep Patching (0-100mm) – Category C Roads**

In the areas to be deep patched the in-situ asphalt laid sides shall be cut vertically to a depth of 100mm, shall be swept of all loose material, a 60% anionic stable emulsion grade tack coat applied at an application rate of 0,3 l/m² to the bottom and the sides and then patched with asphalt wearing course in two layers of 50 mm thick each. After compaction the surface of the patch shall be flushed with the adjacent road surface.

(b) Shallow patching (0-50mm)

In areas to be shallow patched, the in-situ asphalt surface layer shall be removed to a depth of 50mm. The sides shall be cut vertically with the edges square. The exposed surface shall be swept of all loose material, a 60% anionic stable emulsion grade tack coat applied at an application rate of 0,3 l/m² to the bottom and the sides and then patched with asphalt wearing course. After compaction the surface of the patch shall be flush with the adjacent road surface.

PS.ED.7.2 Patching (Structural – Various road categories)

(a) Category C

The existing wearing course (80mm) and crusher run(150mm) layer to be cut vertically and removed to spoil, a fresh layer of crusher (G2) shall be laid and compacted to 98% Mod AASHTO to a final thickness of 150 mm (ie compacted thickness).

The surface of this newly laid crusher layer to be swept of all loose material, a 60% anionic stable emulsion grade tack coat applied at an application rate of 0,3l /m² to the bottom and the sides and then patched with a 80 mm layer of asphalt wearing course. After compaction the surface of the patch shall be flushed with the adjacent road surface.

(b) Category D

The existing wearing course (50 mm) and crusher run(150 mm) layer to be cut vertically and removed to spoil, a fresh layer of crusher (G2) shall be laid and compacted to 98% Mod AASHTO to a final thickness of 150 mm (ie compacted thickness).

The surface of this newly laid crusher layer to be swept of all loose material, a 60% anionic stable emulsion grade tack coat applied at an application rate of 0,3l /m² to the bottom and the sides and then patched with a 50 mm layer of asphalt wearing course. After compaction the surface of the patch shall be flushed with the adjacent road surface.

PS.ED.7.3 MATERIALS

The asphalt base course to be used shall comply with the requirements of Part ED : Road Asphalt and Clause AA.ED.3 of the Project Specification.

The asphalt wearing course to be used shall comply with the requirements of Part ED: Road Asphalt, and Clause AA.ED.4 of the Project Specifications.

The Graded crushed stone to be used shall comply with COLTO Section 3600 Table 3602/1. This is a G2 quality material.

PS.ED.7.4 MEASUREMENT AND PAYMENT

PS.ED.7.4.1 Deep/Shallow Patching

Shall include for removal of the in-situ layers to spoil, trimming the sides, compaction, application of the tack coat, supply and laying of the asphalt, loading and haulage to the tip of excess material. Provision has been made in the schedule of quantities for measurement and payment for deep patching, shallow patching and variation items to allow for depth variation.

PS.ED.7.4.2 Patching on the various road categories

Shall include for removal of the in-situ layers to spoil, trimming the sides, compaction, application of the tack coat, supply and laying of the crusher run and asphalt layers, loading and haulage to the tip of excess material. Provision has been made in the schedule of quantities for measurement and payment for the various road categories.

PS.ED.8 VARIATION IN AGGREGATE / ACTIVE FILLER / MODIFIER / 40/50 OR 60/70 PEN BITUMEN IN ASPHALT

The unit of measurement shall be tonnes (t).

PS.ED.9 VARIATION IN QUANTITY OF EMULSION

The unit of measurement shall be litres (l).

PS.ED.10 APPLICATION OF WEEDKILLER

Where directed by the Engineer, the Contractor will apply a weed killer to the road surface prior to commencing asphaltting operations. The rate of application shall be as recommended. The weed killer to be used is "Tricate S"

The unit of measurement shall be metre (m) and the rate shall include for all labour, plant, equipment, transport and materials required for the application of the weed killer.

PS.ED. 11 ESTABLISHMENT OF PAVING EQUIPMENT

The unit of measurement shall be the number (No.) of times to establish all the necessary paving plant and equipment on site. The rate shall include for loading and transporting all the necessary paving plant and equipment from site to site within 1KM radius, as agreed and instructed by the Engineer.

PS.ED.12 PATCHING or RECONSTRUCTING OF EXISTING ASPHALT SIDEWALK/DRIVEWAY ACCESS SCOOPS

Those areas of the existing asphalt sidewalk/access scoops which require patching or requiring reconstruction will be marked by the Engineer.

The existing wearing course (25 mm) and crusher run(100 mm) layer to be cut vertically and removed to spoil, a fresh layer of crusher (G2) shall be laid and compacted to 98% Mod AASHTO to a final thickness of 100 mm (ie compacted thickness).

The surface of this newly laid crusher layer to be swept of all loose material, a 60% anionic stable emulsion grade tack coat applied at an application rate of 0,3l /m² to the bottom and the sides and then patched with a 20 mm layer of mix A asphalt wearing course. After compaction the surface of the patch shall be flushed with the adjacent sidewalk/access surface.

PS.ED.12.1 MATERIALS

The asphalt wearing course to be used shall comply with the requirements of Part ED: Road Asphalt, and Clause PS.ED.4 of the Project Specifications.

The Graded crushed stone to be used shall comply with COLTO Section 3600 Table 3602/1. This is a G2 quality material.

PS.ED.12.2 MEASUREMENT AND PAYMENT

Shall include for removal of the in-situ layers to spoil, trimming the sides, compaction, application of the tack coat, supply and laying of the crusher run and asphalt layers, backfilling as required, loading and haulage to the tip/stockpile of excess material.

The unit of measurement shall be square m of sidewalk/access scoops repaired or reconstructed.

SECTION 3: DRAINS AND SUBSOIL DRAINAGE**PS.AB.13 Repairing of existing services**

This item covers all necessary excavations, repairs to existing water reticulation pipes damaged while executing the works and backfilling as required.

Trenches must be 400mm wide and a minimum of 800mm below the finished road level. The pipe bedding (river sand) to be 300mm thick.

The tendered rate shall include the supply of all materials as required and the repairs to damaged pipes.

PS.AB.14 Lowering of existing services

This item covers all necessary excavations, lowering of existing pipes and backfilling of the trenches, for existing water reticulation pipes that require lowering.

Trenches must be 400mm wide and a minimum of 800mm below the road. The pipe bedding (river sand) to be 300mm thick.

The tendered rate shall include supply of all material required and the repairs to damaged pipes.

PS.GM.4 Supply and construct subsoil drainage

The tendered rate shall include for the supply of all necessary material and construction of the subsoil drain as per attached drawing (Drawing No. 38575).

The unit of measurement shall be in metres (m).

PS.C.8.4 Concrete lined open drains

Refer to clause C.8.1 of EThekweni Municipality Civil Engineering specifications, with the grade being 20/19.

PS.C.8.5 Expansion Joints

The tendered rate shall include for the supply of all necessary material, labour and construction of expansion joints.

The unit of measurement shall be in metres (m).

SECTION 4: STORMWATER STRUCTURES**PS.PH.10 Clearing and grubbing at inlet and outlet of existing Stormwater structures:**

Upon instruction from the engineer, the existing inlet and outlet areas to existing stormwater pipe crossings shall be cleared to ensure smooth and uninterrupted flow of stormwater. The tendered rate shall include full compensation of removal to spoil of all excess material, trimming and shaping of the inlet and outlet area.

The unit of measurement shall be the number (No.) of inlet and outlet areas cleared.

PS.PH.11 Removal of silt and sand by excavation at inlet and outlet Stormwater structures:

Upon instruction from the engineer, the contractor shall remove all silt and sand build up at the existing inlet and outlet areas to existing stormwater pipe crossings, by excavation, to ensure smooth and uninterrupted flow of stormwater. The tendered rate shall include full compensation of all excavation and removal to spoil of all excess material, trimming and shaping of the inlet and outlet area.

The unit of measurement shall be in cubic metres (m³) removed and disposed of.

PS.PH.12 Unblocking and cleaning of existing stormwater pipe crossings:

Upon instruction from the engineer, the existing stormwater pipe crossings (all sizes) that are blocked with sand and debris shall be cleared and cleaned thus ensuring smooth, uninterrupted flow of stormwater. The rate tendered shall include the disposing of the excavated material to spoil.

The unit measurement shall be the length (m) of pipe cleared.

PS.PG.8.14 Lower existing stormwater pipes: All sizes

The tendered rate shall include full compensation for all excavation, removing existing pipes, storing existing pipes, and relaying the pipes as per Engineer's instruction including for the backfilling thereof.

The unit of measurement shall be per meter (m).

PS.C.8.5 Expansion Joints

The tendered rate shall include for the supply of all necessary material, labour and construction of expansion joints.

The unit of measurement shall be in metres (m).

PS.C.8.6 Construction Joints

The tendered rate shall include for the supply of all necessary material, labour and cutting of construction joints.

The unit of measurement shall be in metres (m).

PS.C.8.7 Blinding Layer

The tendered rate shall include full compensation for supplying and casting grade 15/19 blinding layer up to 50mm.

PS TA ROAD SIGNS**PS.TA.1. MATERIALS**

1. Only new material shall be used.
2. The backing shall be 1.4mm chromadek sheeting
3. Preparation and painting shall be carried out in accordance with CKS 193-1977 and the paint system shall be as follows:-
 - 3.1 PVC plastical system having a 150 micron min.dry film thickness on each side of the sheet.
 - 3.2 The coat on the back face of the sign sheeting shall be grey in colour G29 to SABS 1091 or similar.
 - 3.3 Where sign backings are to be faced with retro-reflective background material, application shall be carried out as per the manufacturer's instructions.
 - 3.4 When tested with a straight edge the flat surface of the sign shall not deviate from a true plane by more than 0.25% of the test length. The min test length shall be 1m.
 - 3.5 Bolts washers and nuts shall be stainless steel grade 304 bolts manufactured to SABS 136.Nuts shall be locking 'nyloc' or equally approved.
 - 3.6 Blind rivets shall be 48mm diameter and non-corrosive.
4. All steel sections shall be hot dip galvanised in accordance with SABS 763.

PS.TA.2. MANUFACTURE OF SIGNS**Retro-reflective Sheeting**

- 2.1 All sheeting used in the manufacture of signs must be approved by the South African Bureau of Standards
- 2.2 All Class 1 sheeting used the manufacture of the signs shall carry an identifying mark and shall be Class 1, 7 year engineer grade retro-reflective material and shall comply with the minimum standards for Class 1 sheeting. Where Class 3 sheeting is specified, it shall comply with the minimum standards for Class 3 sheeting.

2.3 This Department will only accept tenders from manufacturers who will supply signs manufactured from the following sheeting:

KIWALITE - Class 1

3M - Classes 1 and 3

SYNCHROLITE - Class 1

Adcolite - Class 1

Should tenderers intend using other retro-reflective sheeting not stated above, and then the tenderer must produce the SABS certificates showing that the sheeting complies with the relevant codes of the SABS.

2.4 The application of all retro-reflective sheeting shall be carried out as per the manufacturers' instructions.

2.5 The entire sign, except where otherwise specified, shall be manufactured using 7 year engineer grade retro-reflective material, i.e. the background, border and symbol shall be reflective except where the symbol is black semi-matt. Silk screening with inks shall not be permitted on any signs. The signs shall be manufactured using a single piece of retro-retro-reflective sheeting for the background and symbols as necessary.

PS.TA.3. SIGN BACKING MATERIAL

3.1 The backing material of all signs shall be 1,4mm thick Chromadek (Iscor) sheeting or otherwise specified.

3.2 All sheeting used for signs shall be new, and refurbished backings shall not be accepted.

3.3 The cut edges shall be true and smooth and free from burrs or ragged breaks.

3.4 All triangular backings for standard traffic signs are to have the corners shaped to comply with the latest edition of the SADCRTSM ie. The corners shall be rounded to the radius as specified in the manual.

3.5 The colour on the back of all signs shall be grey except for STOP signs where the colour shall be white semi-matt, in accordance with the SADCRTSM

3.6 Drilling of Signs and Fixing of Uni-struts to Signs

3.6.1 All signs shall be drilled, or fitted with uni-strut channels, as shown on the attached annexures. Regulatory and warning signs shall be drilled on the vertical centre line as shown.

3.6.2 The diameter of the holes shall be 12mm. All holes must be drilled prior to the application of retro-retro-reflective sheeting. All holes shall be perpendicular to the principal surface and free from burrs. Holes shall not be drilled in such a manner as to distort the metal.

3.6.3 Drilling details for sign backings are attached. Dimensions are given to the centre of the drilled holes.

3.7 Samples

3.7.1 Prior to the closing of tenders. The tenderer shall deposit samples of :-

a) A STOP sign (R1 - 600mm)

b) A children ahead warning sign (W 308 - 900mm)

All samples shall be deposited at the offices of the Engineer, at the ETA Building :Ground Floor , 30 Archie Gumede Place. Samples shall be clearly marked with the name of the tenderer.

3.7.2 The DH: Public Transport reserves the right to subject samples to such tests as may be deemed reasonable and necessary.

3.7.3 Unsuccessful tenderers shall collect and remove their samples within one month of being notified that their tenders have not been successful, failing which they will be deemed to have waived all rights to the samples.

3.7.4 The samples of the successful tenderer will be retained for comparison with the goods supplied.

3.7.5 Failure to submit samples will invalidate tenders.

3.8 Tenderers Details on Sign

The successful tenderer will be required to affix a sticker to the back of every sign that he manufactures. The sticker must be durable and last as long as the guarantee on the signs and shall bear the name of the tenderer and the month and year of manufacture.

3.7 Double Sided Signs

Double sided signs will have identical details on both faces of the chromadek sheet. It will be clearly indicated in the schedule of quantities which signs are double sided.

3.8 Exclusive Secondary Message Sign

The regulatory sign and the exclusive secondary message sign shall be incorporated onto a single chromadek backing. The bottom corners of the sign backing shall be rounded to the radius as specified in the SADCRTSM.

3.9 One Way Roadway Sign

Backings for this type of sign shall have four 12mm diameter holes drilled as shown on the drilling detail. The corners of all one way roadway sign backings shall be rounded to the radius as shown in the SADCRTSM.

3.10 Specification for W407 to W410

Signs 407 to W410 shall be manufactured with a 1mm chromadek backing, white class 1 retro-retro-reflective background and red class 3 chevrons. The signs shall be rivetted onto a hot dipped galvanised frame manufactured 32mm square tube (2mm wall thickness). Mounting hooks shall be welded onto the frame and drilled prior to galvanising. Mounting hooks shall be 30 x 5mm thick flat bar.

3.11 Temporary Signs

This contract may also be used for the supply of a limited quantity of temporary regulatory and warning signs, as required by this Department.

3.12 Manufacture of Flat Sheet Signs

This Department will also require signs with an area of around 1-2m² and manufactured from flat 1,4mm chromadek sheeting with a class 1 Engineer grade background, borders, arrows, symbols and legend and stiffened and erected by the use of uni-strut channels riveted to the backs of the signs. Rates quoted shall be per square metre (m²).

3.13 Manufacture of Frame Signs

This Department may also require signs with an area of between 1 - 5m² and manufactured from flat 1mm chromadek sheeting with a Class 1 Engineer grade background, borders, arrows, symbols and legend. The Chromadek sheeting shall be riveted onto a hot dipped galvanised frame manufactured from 32mm square tubing (2mm wall thickness), with uni-strut channels welded onto the frame for

mounting purposes, and the panel sizes of the square tube frame shall be approximately 1m². Rates quoted shall be per square metre (m²).

PS.TA.4. TRANSPORT AND PACKAGING OF SIGNS

The contractor shall ensure that all signs are properly packaged and protected against damage during transportation. Any damaged signs shall be returned to the contractor for repairs/replacement.

PS.TA.5. EXCAVATION AND BACKFILLING FOR ROAD SIGN SUPPORTS

The unit of measurement shall be the number (no) of excavation measured in place according to the neat dimension of the footings or excavations as shown on the drawings or directed by the Engineer. In the case of timber or aluminium posts not in concrete, the plan area of the excavated hole shall be taken as 0,15 m² irrespective of the actual size of the excavated hole. All excavation shall be carried out by hand with the contractor exercising due care when working near underground services. If any service is damaged, the contractor shall bear the cost of the repair to such service. The contractor shall ensure that the work site is safe before leaving it. All holes excavated for post planting shall be backfilled at the end of the working day and all spoil shall be removed from site. Where excavation is required to be done in a hardened sidewalk, items for these are included in the bill of quantities. The re-instatement of sidewalks has also been included in the bill of quantities.

The rate shall be in full compensation for excavating, backfilling and compacting the backfill material, for the disposal of all surplus excavated material, and for providing the backfill material and mixing it with cement. The supply of the cement will be measured extra over to this payment Item.

PS.TA.6. RE-INSTATEMENT SIDEWALKS

All sidewalks to be re-instated to match existing and the re-instatement of sidewalks must comply with Part EG of the City Engineers' standard specifications.

PS.TA.7. SUPPLY OF TRAFFIC SIGNS

This contract will require that signs are to be supplied, installed on new posts by various methods as outlined in PS.TA.1 - PS.TA.6 and PS.TA.9.

The unit of measurement should be in no.

PS.TA.8. SUPPLY, TRANSPORT AND INSTALLATION OF POSTS

This contract will require the installation of posts as specified below:-

- 8.1 Wooden creosote posts of varying diameters and lengths
- 8.2 Posts shall be soilcreted into position
- 8.3 Posts shall be placed into position and the backfill earth compacted
- 8.4 Posts shall be placed in position, in the case of sleeves at the end of traffic islands, and the sleeve shall then be backfilled with river-sand or the post may be secured in position with the use of polystyrene wedges.
- 8.5 The post shall be set to a depth of 600-700mm. The minimum distance between the ground and the lowest portion of the sign shall be 2100mm, and a maximum distance of 2500mm, unless otherwise specified.

- 8.6 Soilcrete shall consist of 1 part cement and 12 parts granular sand such as river sand and adequate water to cause the materials to react and set.
Excess lengths of the posts to be cut off.

PS.TA.9. INSTALLATION OF SIGNS

Signs may be installed on new posts With the use of uni-strut clamps (two pairs)

PS.TA.10. SUPPLY OF FASTENERS

Uni-strut clamps shall be galvanized and shall be supplied in pairs, in various sizes as required. Bolts (M8x45), washers (x2) and nuts used to fasten the uni-strut clamps shall be stainless steel grade 304.

SECTION 10: DAYWORKS

PS.AB.9.1 Provision of labour

The contractor shall be required to provide labour resources (skilled, unskilled, ganger and flagmen as per the bill of quantities) upon instruction from the engineer. The tendered rate shall include full compensation for the cost of employment to the contractor.

The unit of measurement shall be hours (hr).

PS.AB.9.2 Provision of Equipment

The tendered rate shall include for full compensation for provision of equipment and machinery as per the bill of quantities, upon instruction from the engineer.

The unit of measurement shall be hours (hr).

C3.3: STANDARD SPECIFICATIONS

C3.3.1 The Standard Specifications on which this contract is based are the COLTO Standard Specifications for Road and Bridge Works for State Road Authorities 1998 edition excluding Section 4200 (Asphalt Base and Surfacing) which has been replaced by the new specification as included in Section PS 4200.

The Project Specification, consisting of two parts, forms and integral part of the Project and supplements the Standard Specifications.

Part A contains a general description of the works, the site and the requirements to be met (Part C3.2 – Project Specification).

Part B contains variations, amendments and additions to the Standardised Specifications and, if applicable, the Particular Specifications.

In the event of any discrepancy between part or parts of the Standardised 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.

The Standard Specifications, which form part of this contract, have been written to cover all phases of work normally required for road contracts, and may therefore cover items not applicable to this particular contract.

C3.3.2 PART B: AMENDMENTS TO THE STANDARD SPECIFICATIONS PROJECT SPECIFICATIONS RELATING TO THE STANDARD SPECIFICATIONS AND OTHER ADDITIONAL SPECIFICATIONS

In certain clauses in the COLTO Standard Specifications, allowance is made for 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 alternatives or additional requirements applicable to this Contract are contained in this part of the Project Specifications. It also contains the necessary additional specifications required for this Contract.

The clauses and payment items dealt with in this part of the Project Specifications are numbered 'PS' with a number corresponding to the relevant clause or item number in the COLTO Standard Specifications.

New clauses and payment items not covered by clauses or items in the COLTO Standard Specifications have been included here and have also been designated with the prefix 'PS'. Such clauses and items have been given a new number following upon the last number used in the particular section referred to in the COLTO Standard Specifications.

SECTION 1100: DEFINITIONS AND TERMS

Add the following definitions:

“commercial source” - a source of supply of materials chosen by the Contractor. The Contractor shall take full

responsibility for the quality of all materials and services supplied from commercial sources.

“sand” - sand is defined as a non-plastic material that conforms to the HRB classification for an A3 material as follows :

% passing 5 mm sieve 95 min

0,425 mm sieve 50 min

0,075 mm sieve 10 max

“process control” - process control means all testing required to be carried out by the Contractor at his cost in order ensure that the completed permanent works comply with specifications and drawings. All such testing will be subject to inspection and approval by the Employer's Agent.

“acceptance control” - acceptance control means whatever testing the Employer's Agent carries out over the above the process control testing already carried out by the Contractor in order to decide on acceptability of any work submitted by the Contractor. Such testing will be carried out at the cost of the Employer in either the Employer's Agent's laboratory or one approved by him.

“work in restricted areas” - no additional or extra over payment will be made for work in restricted or confined areas, unless the items of work to which it will apply and the pay items under which payment will be effected, are explicitly specified in these Standard Specifications or in the Project Specifications and included in the Schedule of Quantities.

Road Categories

“Category A” – Major Arterials or Freeways

“Category B” – Urban Arterials, Major Bus Routes, CBD and Industrial Roads

“Category C” – Minor Bus Routes and Collectors

“Category D” – Residential Streets

Rehabilitation Categories

“Surfacing Works” - Projects which include the construction of new pavement layers which are all asphalt layers, or layers which may be described as bituminous surfacings such as slurries, single seals, microsurfacing etc shall be classified under “Surfacing Works”.

“Recycling Works” - Projects which include construction of BSM (Bitumen Stabilised Material) layers shall be classified under “Recycling Works”. This category shall include both in-situ recycling and in-plant recycling. This category shall also include cement or lime stabilization of pavement layers, and the construction of asphalt layers.

“Granular Works” - Projects which include the construction of new granular pavement layers above the formation level (i.e. Base and/or Subbase) shall be classified under “Granular Works”. These works shall include construction of layers using both virgin materials and reuse of existing granular materials. This category shall also include the construction of BSM layers and asphalt layers.

“Subgrade Improvement Works” - Projects which include improvements/re-construction of the subgrade layers below the formation level of the pavement shall be classified under “Subgrade Improvement Works”. This shall only be applicable to projects where greater than 15% of the length of the road requires subgrade improvements. These works shall also involve reconstruction of the layers above formation and the construction of all types of layers shall be covered by this category of rehabilitation.

“Ancillary Works” - Projects where the scope of works is not rehabilitation of pavement layers shall be classified under “Ancillary Works”. Examples of the projects this category is intended to cover include raising/lowering of services, construction/re-construction of sidewalks, laying of kerbs or kerb & channel or asphalt haunching, repairs or reconstruction of sidewalks and laying of sub-soil drains

“Contracts Manager” A competent person responsible for managing the Contract, including all the Projects within a Contract. The responsibilities include Contract administration, works programming, Contract cashflow and managing all the Construction Managers and other resources within a contract.

“Business Enterprise”: A sole trader, partnership or legal entity which adheres to statutory labour practices, is registered with the South African Revenue Services and is a continuing and Independent Enterprise for profit, providing a Commercially Useful Function.

“Business Enterprise”: A sole trader, partnership or legal entity which adheres to statutory labour practices, is registered with the South African Revenue Services and is a continuing and Independent Enterprise for profit, providing a Commercially Useful Function.

PS1115 GENERAL CONDITIONS OF CONTRACT

Replace clause 1115 with the following:

“The General Conditions of Contract for Construction Works 3rd edition 2015 published by the South African Institution of Civil Engineering (SAICE), together with the Special Conditions of Contract form part of the contract.

All references in the COLTO Standard Specifications for Road and Bridge Works are to the COLTO General Conditions of Contract for Road and Bridge Works for State Road Authorities. Consequently, all references in the COLTO Standard Specifications must be amended accordingly to reflect the appropriate General Conditions of Contract relevant to the Contract. The COLTO Standard Specifications have been scrutinized and the clauses, which refer to the COLTO General Conditions of Contract, identified. Each COLTO clause reference is tabulated in Table PS1115 below (context of reference is also given) together with the relevant equivalent clause in the SAICE General Conditions of Contract for Construction Works 3rd edition 2015 applicable for this Contract.

Whereas every effort has been made to include all of the affected clauses in the table, there may be some omissions. In every case, however, the SAICE General Conditions of Contract for Construction Works 3rd edition 2015 reference, as amended by the Special Conditions of Contract in the Contract Data, shall apply and the Contractor shall be responsible for interpretation of the equivalent clause.

TABLE B1115: REFERENCES IN COLTO STANDARD SPECIFICATIONS TO THE COLTO GENERAL CONDITIONS OF CONTRACT AND RELEVANT SAICE GENERAL CONDITIONS OF CONTRACT FOR CONSTRUCTION WORKS 2nd EDITION 2010

COLTO Standard Specification		COLTO General Conditions of Contract 1998		SAICE General Conditions of Contract for Construction Works 2 nd edition 2010	
Clause No	Page No	Clause No	Description or Reference	Clause No	Description or Reference
1202	1200-2	15	Programme	5.6	Programme of the Works
1209(e)	1200-5	52:		6.9 & 6.10 :	
		52(1)(e)	Monthly payments (documentary evidence of ownership of materials)	6.9	Vesting of materials
		52(2)	Valuation of material brought onto Site	6.10	Valuation of material brought onto Site
1210	1200-5	54:		5.14:	
		54(1)	Certificate of practical completion	514.1	Certificate of Practical Completion
		54(2)		514.2	
		54(3)		514.3	
1212(l)	1200-7	49:		6.8:	
		49(2)	Contract Price Adjustment Factor	6.8.2	Contract Price Adjustment Factor
1215	1200-9	45	Extension of time for completion	5.12	Extension of time for completion
1217	1200-10	35	Care of the Works	8.2	Care of the Works

COLTO Standard Specification		COLTO General Conditions of Contract 1998		SAICE General Conditions of Contract for Construction Works 2 nd edition 2010	
Clause No	Page No	Clause No	Description or Reference	Clause No	Description or Reference
1303	1300-1 and 1300-2	49 & 53: 49(2) and 49(3) 53	Contract Price Adjustment Factor and special materials Variations exceeding 20%	6.8 & 6.11: 6.8.2 and 6.8.3 6.11	Contract Price Adjustment Factor and special materials Variations exceeding 15%
1303	1300-2	12 & 45: 12 45	Commencement of Works and Commencement Date Extension of time for completion	5.3 & 5.12: 5.3.1 5.12	Commencement of the Works Extension of time for completion
1403 (c)(ii)	1400-4	40(1)	Valuation of variations	6.4.1	Valuation of variations
1505	1500-3	40: 40(1)	Valuation of variations	6.4 6.4.1	Valuation of variations
1507 Items: 15.08 15.09 15.11	1500-8	48: 48.1	Provisional Sums	6.6: 6.6.1	Provisional Sums
3108 Note (2)	3100-4	40: 40(1)	Valuation of variations	6.4: 6.4.1	Valuation of variations
3204 (b)(iii)	3200-2	40: 40(1)	Valuation of variations	6.4: 6.4.1	Valuation of variations
3303(b)	3300-2	2	Engineer and Engineer's Representative	3	Engineer and Engineer's Representative
5803(c)	5800-3	40: 40(1)	Valuation of variations	6.4: 6.4.1	Valuation of variations
5805(d)	5800-4	40: 40(1)	Valuation of variations	6.4: 6.4.1	Valuation of variations
5809 Item 58.10	5800-10	48: 48.1	Provisional Sums	6.6: 6.6.1	Provisional Sums
8103(c)	8100-1	40: 40(1)	Valuation of variations	6.4: 6.4.1	Valuation of variations
8117 Item 81.03	8100-26	22	Clearance of site on completion	5.15	Clearance of site

SECTION 1200: GENERAL REQUIREMENTS AND PROVISIONS PS1202 SERVICES

Delete the following:

- (i) The second paragraph of this clause entirely.
- (ii) The second sentence of the second last paragraph starting with: "Details regarding the state" and ending with : ".....made available to tenderers".

Add the following at the end of clause 1202:

Before work begins on site, a meeting is to be convened with the Contractor and affected service owners to discuss the relocation of any services. The relevant Service Provider shall furnish the Contractor with drawings indicating the services positions for each Project. Subsequently, the Contractor shall verify the actual position of each service and bring to the attention of the Employer's Agent any service that is not recorded. As the Contractor is not authorized to remove or replace these facilities he shall:

- (i) Give preliminary notice in writing to the relevant service provider, that the services on the site will require removal or protection prior to works being carried out in the vicinity of each facility. The Contractor shall advise the service provider of: a) The number of services and their locations and b) The proposed dates when works will commence in the vicinity of each service
 - 1) (ii) In addition to the above preliminary notice, give the service provider reasonable notice in writing of the intention to commence work in the vicinity of each facility.
 - 2) (iii) Upon completion of the work in the vicinity of each facility, the contractor shall notify the service provider, in writing, that work is complete, and the service may be reinstated.

Any cost of repairs, replacement and/or installation of the services resulting from the Contractor's negligence or unauthorised action shall be to the Contractor's account.'

PS1205 WORKMANSHIP AND QUALITY CONTROL

Add the following paragraph to the end of clause 1205: "Testing for quality control shall be conducted in accordance with the requirements of Section 8200 for Quality Control (Scheme 1)."

PS1206 THE SETTING-OUT OF WORK AND PROTECTION OF BEACONS

Delete the first paragraph of clause 1206 in its entirety and replace it with the following: "The contractor shall comply with all legal provisions in regard to surveying and setting out work."

Revise the second last paragraph as follows:

Replace the word "fill" with "subbase"

Add the following paragraph to the end of clause 1206: "It may become necessary to construct level and coordinate new survey beacons during the course of the contract, or to protect existing survey beacons. A Provisional Sum is included in the Schedule of Quantities to cover the costs of such work."

PS1209 PAYMENT**(a) Contract rates**

Add the following new paragraph at the end of subclause PS1209(a):

"All rates tendered are to be exclusive of VAT."

PS1215 EXTENSION OF TIME RESULTING FROM ABNORMAL RAINFALL

Extension of time resulting from abnormal rainfall shall be calculated according to the requirements of Method (ii) (Critical-path method). The Contractor shall be entitled to claim for the tendered time related pay items for any extension of time approved by the Employer's Agent.

Method (ii) (Critical-path method)

Add the following to the end of Method (ii):

"The value of "n" working days expected delay caused by normal rainy weather as referred to in Method (ii) shall be as given in Table PS1215 below for each respective calendar month of any year:

Table PS1215

<i>Month</i>	<i>Expected delay of "n" working days due to normal rainy weather</i>	<i>Month</i>	<i>Expected delay of "n" working days due to normal rainy weather</i>
<i>January***</i>	<i>4</i>	<i>July</i>	<i>1</i>
<i>February</i>	<i>3</i>	<i>August</i>	<i>1</i>
<i>March</i>	<i>3</i>	<i>September</i>	<i>2</i>
<i>April</i>	<i>2</i>	<i>October</i>	<i>3</i>
<i>May</i>	<i>2</i>	<i>November</i>	<i>3</i>
<i>June</i>	<i>1</i>	<i>December***</i>	<i>1</i>

Refer to Clause 5.12.2.2 of the Contract Data for detailed specification.

PS1224 THE HANDING-OVER OF THE ROAD RESERVE

Add the following paragraph to the end of clause 1224:

"The handing-over of the road reserve for each Project shall be subject to the following restriction:

The Contractor shall be required to accommodate public traffic, businesses and pedestrians as well as any service providers in the execution of their duties."

PS1229 SABS CEMENT SPECIFICATIONS

Add the following paragraphs to the end of clause 1229:

"All cement used for each Project shall comply with SANS 50197-1: Cement Part 1: Composition, specifications and conformity criteria for common cements.

Where reference is made in these Project Specifications or in the COLTO Standard Specifications to the former SABS cement specifications (e.g., SABS 471, SABS 626, SABS 831, SABS 1491), such reference shall be replaced with the new specification:

- SANS 50197-1: Cement Part 1: Composition, specifications and conformity criteria for common cements.

The blending of cements on site shall not be permitted."

Add the following new clauses at the end of Section 1200:

PS1230 COMPENSATION FOR OCCUPATIONAL INJURIES AND DISEASES ACT, 1993

All labour employed on the site shall be covered by the Compensation for Occupational Injuries and Diseases

Act, 1993, as amended. The Contractor shall pay in full, including the payment of the necessary levies, such amounts as are due in terms of the Act. The way compensation in terms of this Act shall be handled shall be resolved by the Contractor at the commencement of each Project.

PS1231 COMPLIANCE WITH THE ROAD TRAFFIC ACT

When vehicles or plant are travelling or working on a public road, the following shall apply:

- The vehicles and plant shall be licensed in terms of the National Road Traffic Act 1996 (Act No. 93 of 1996) as amended.
- Every driver and operator of a vehicle or an item of plant shall be in possession of a valid permit in respect of the class of vehicle or item of plant he / she is driving or operating

The Contractor shall provide, erect and maintain sufficient road signs, barricades, fencing and guarding as may be necessary or required by the Employer's Agent or by any act, regulation or statutory authority in order to minimise the danger and inconvenience caused to vehicle and pedestrian traffic. The Contractor by accepting this contract shall be deemed to have indemnified the Employer and the Employer's Agent against any claims, damages and / or costs that may arise in this regard.

The Contractor's acceptance of this Contract shall also indemnify the Employer and the Employer's Agent against any claims that may arise as a result of works done not to specification until the End of Maintenance period.

PS1232 ENVIRONMENTAL IMPACT CONTROL

In addition to aspects of the design which are intended to avoid or reduce environmental impact, and in addition to normal good construction practice expected of the Contractor, the following requirements shall also be observed:

- (a) The Contractor shall comply with the requirements of Part C: Environmental Management, Specification contained in section C3.4.2 Particular Specifications.
- (b) Clearing shall be limited to the road prism.
- (c) No littering by construction workers shall be allowed. A refuse control system shall be established for the collection and removal of refuse to the satisfaction of the employer's Agent.
- (d) Adequate provision shall be made for temporary toilet requirements in construction areas. Use of the veld/bush for this purpose shall not be allowed under any circumstances.
- (e) Streams, rivers and dams shall be protected from direct or indirect spillage of pollutants, such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate tailings, wash water, organic materials and bituminous products. In the event of spillage, prompt action shall be taken to clear the affected area. Emergency measures in the event of spillage shall be set out and the responsible person shall be made aware of the required action.
- (f) Bituminous and / or other hazardous products shall not be spoiled on site and shall only be disposed of at licensed authorised disposal facilities.
- (g) Provision shall be made to prevent excessive erosion and siltation throughout the Contract and in particular on adjacent land. Should excessive erosion and / or siltation take place outside the road reserve as a direct result of the Contractor's construction activities, the Contractor shall be responsible for making good the erosion / siltation to the satisfaction of the landowner and the Employer's Agent.
- (h) Invader species of plants shall be controlled.
- (i) As the works are in a peri-urban business and residential environment, dust and noise pollution shall be monitored and restricted to acceptable levels.

No separate payment shall be made for observing these requirements as such payment shall be deemed to be included in the amount tendered for item 13.01(c) (The Contractor's General Obligations: Time-related Obligations). Any avoidable non-compliance with these requirements shall be considered sufficient grounds for withholding payment of part or all the amounts to be paid for the above item in order to pay for the repairs to any damages.

PS1233 CONTRACTOR'S CAMP SITE

The Contractor shall make his own arrangements regarding the acquisitions and location of the camp site/store yard. The proposed location of the camp site must be approved by the Employer's Agent and the landowner concerned. If the Employer can make any specific site available to the Contractor, such site will be pointed out to the Contractor.

All necessary toilet/ablution facilities, suitably screened, shall be provided by the Contractor to the satisfaction of the Health Department. The provision of portable chemical toilets is advised.

The Contractor shall make his own arrangements with Ethekewini Municipality's Water Department for the necessary water connections he requires for the execution of the works. Applications for a metered water connection must be made timeously to Ethekewini Municipality's Water Department.

The Contractor shall make his own arrangements with Ethekewini Municipality's Electricity Department for the necessary power connections he requires for the execution of the work under this contract. Again timeous applications must be made for this connection.

In addition, the following requirements are to be observed:

- (a) The ground levels of the camp site must not be altered without the permission of the employer's Agent.
- (b) The Employer is indemnified in all respects through the occupation and use of the land including all claim by third parties.
- (c) The site must not be used for the accommodation of staff employed by the Contractor other than a night watchman for security purposes.
- (d) No housing is available for the Contractor's employees and the Contractor shall make his own arrangements to house his employees and to transport them to site.
- (e) No informal housing or squatting will be allowed.
- (f) The Contractor shall provide the necessary ablution facilities at his campsite 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.
- (g) When the land is vacated it must be left in a clean and tidy state, which is acceptable to the Employer's Agent.
- (h) The campsite/store yard shall be cleared and vacated by the Contractor no later than 14 days after the date of completion of the Project unless written permission from the Employer's Agent is obtained to occupy the site for a longer period.

PS1234 CONTRACTOR'S SERVICES CONNECTION FEE

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

PS1235 PUBLIC AWARENESS NOTICE BOARDS

The Contractor shall arrange for pre-made Notice Boards (refer to Section C3.5, standard drawing – Typical Notice Board for Engineering Unit, Road Rehabilitation), which are to be erected on site (strapped to ELPs, etc) at least at every 50m spacing (in both directions of travel) together with the delivery of the "Notice to Residents" to all the affected residents well in advance of the work commencing. The cost thereof and for the removal of the boards shall be deemed to be included in the rates and amounts tendered for the various items of work for each Project. The Contractor shall remove the Notice Boards within 14 days upon completion of works on that particular road.

Photographs supplied to the Employer's Agent for the installation and removal of the Notice Boards shall be deemed to satisfy the requirements and serve as evidence of meeting such requirements. Note that the Employer's Agent may determine in instances where such notice to residents are not appropriate/required such as the rehabilitation of Major Freeways.

The Employer's Agent shall impose a penalty for non-compliance to the requirements of this section, which

shall be calculated as follows:

Penalty for installation of Notice Boards (per road) = R 1000 per day, effective until compliance to this specification

Penalty for removal of Notice Boards (per road) = R 1000 per day, effective until compliance to this specification

It is a condition of this contract that this works shall not be sub-contracted to local enterprises who are undertaking ancillary works. The Contractor shall remain responsible for the installation and removal on the Notice Boards. Any penalties imposed onto the Contractor for non-compliance shall not be transposed onto the sub-contractors. In the event of such penalties being transferred onto the sub-contractors, the Employer reserves the right to apply Clause 1.2.3.8 of the Additional Conditions of Contract.

No additional payment will be made for this item and will therefore be deemed to be included in the construction rates.

PS1236 TESTING

PS1236(a) Process Control Testing

The Contractor must have his systems in place to undertake process control testing, which must be approved and made available to the Employer's Agent as and when requested. Cost to undertake this type of testing must be included in the rates and no additional payment will be made. Failure to comply will result in the Employer's Agent requesting for acceptance testing at the Contractors cost.

PS1236(b) Acceptance Control Testing

Acceptance testing is undertaken by the Employer or approved independent laboratory:

(a) When requested by the Contractor; or

(b) At the discretion of the Employer's Agent after reviewing the results of the process control testing.

Should the acceptance tests indicate that the work is not to specification, the cost of any retest by the Employer's Agent shall be to the Contractor's account and shall be deducted from any payments due to the Contractor.

PS1237 OCCUPATIONAL HEALTH AND SAFETY

General Statement

It is a requirement for each Project 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 OHS Act 1993 Construction Regulations 2014 issued on 18 July 2003 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 the Occupational Health and Safety Act in the form as included in Returnable Schedule (Occupational Health and Safety Questionnaire).

The Employer's Health and Safety Specification has been included in this document as part of the Particular Specifications.

(b) Tenderer's Health and Safety Plan

The Contractor's Health and Safety Plan will be subject to approval by the Employer's Agent, or amendment if necessary, before commencement of any 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.

PS1238 SITE DIARY AND OTHER SITE RETURNABLES

The Contractor must keep a triplicate site diary on site, which must record the daily site activities, plant, site supervision, rainfall, site visitors, incidents and accidents. This diary must be filled in daily and signed by the Contractor's Representative.

The Contractor must in addition to the site diaries, provide to the Employer's Agent on a daily basis where applicable, daily construction works checklists, plant and equipment pre-start checklists, traffic accommodation reports, quality control test reports, foremans reports, paving spreadsheets, timesheets for local labour employed, construction and traffic accommodation daily photographs and all other requirements as detailed in the Contractors Quality Control and Quality Management Plans and required by the Employers Agent.

The requirement for compliance to this specification shall be deemed to be included in the Contractors time related obligations.

PS1239 APPROVED SPOIL/TIP SITE

The approved tip sites for this contract are as follows in accordance with the Ethekeeni Regions :

- North and North Central Regions : Buffelsdraai (Verulam) and Bisasar (Springfield)
- West and West Central Regions : Marianhill and Bisasar (Springfield)
- South and South Central Regions : Bisasar (Springfield)

Haulage shall only be to the above tip sites based on the regional boundaries. Should the Contractor wish to dispose the material outside the Contract's region then, prior approval shall be obtained from the Employer's Agent which it shall not be unreasonably withheld.

All haulage to these tip sites shall be free haul, ie. tendered rates shall include for any haulage to the tip site. Unless otherwise specified or agreed to by the Employer's Agent in writing all material to spoil shall be disposed of at this tip site.

Only material which can be used as cover at this tip will be accepted free of charge being: sand, clay and builders' rubble less than 500 mm in diameter, all other material shall be subject to a tariff charge, which will be to this Departments cost. Contractors are required to make request in writing to this branch well in advance of this activity taking place.

PS1240 MEASUREMENT AND PAYMENT

Item	Unit
PS12.01 Relocation and protection of existing services	
(a) Protection, removal, re-alignment and replacement of services	Provisional Sum (Prov. Sum)
(b) Handling cost and profit in respect of subitem	Percentage (%)
PS12.01(a) above	

Expenditure under this item shall be made in accordance with clause 6.6 of the General Conditions of Contract 2015.

The tendered percentage is a percentage of the amount of expenditure approved by the Employer's Agent under subitem PS12.01(a), and shall include full compensation for the handling costs of the Contractor and the profit in connection with the relocation and / or protection of the relevant services.

PS12.02 Construction of new survey beacons and protection of existing survey beacons

(a) Provisional sum for new survey beacons to be constructed or for existing survey beacons to be protected during construction	Provisional Sum (Prov. Sum)
(b) Handling cost and profit in respect of subitem PS12.02(a) above	Percentage (%)

Expenditure under this item shall be made in accordance with clause 6.6 of the General Conditions of Contract 2015.

The tendered percentage is a percentage of the amount of expenditure approved by the Employer's Agent under subitem PS12.02(a), and shall include full compensation for the handling costs of the Contractor and the profit in connection with the construction of new survey beacons or the protection of existing survey beacons, including construction setting out with level control."

PS12.03 As-builts Data

(a)	Capturing of as-built data at the completion of the project	Number (No.)
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The unit of measurement shall be the number (No.) of as-builts captured (one per public transport facility), submitted in full to the Employers Agent Representative and as approved.

The rate shall cover full compensation for capturing a full material and layer as-built data which shall include layer thickness, levels, compaction, asphalt delivery and material quality for each layer. The completed file must be submitted to the Employer's Agent within at least two (2) weeks after the completion of each project. The template for capturing the as-built data will be obtained from the Employer's Agent's Representative.

The capturing of as-built data is compulsory on all projects

SECTION 1300: CONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS**PS1301 SCOPE**

Delete the first sentence and replace with the following:

"This section covers the establishment of the contractor's organization and camp".

NOTE: Establishment of constructional plant including the respective teams (human resources) and removal on completion of the project shall be priced separately and covered under Section 10300.

Add the following:

Rehabilitation Categories

For each project order issued, a category of rehabilitation will be assigned dependent on the scope of works. The following five categories shall apply to the Contract:

• Surfacing Works

Projects which include the construction of new pavement layers which are all asphalt layers, or layers which may be described as bituminous surfacings such as slurries, single seals, microsurfacings etc shall be classified under "Surfacing Works".

• Recycling Works

Projects which include construction of BSM (Bitumen Stabilised Material) layers shall be classified under "Recycling Works". This category shall include both in-situ recycling and in-plant recycling. This category shall also include cement or lime stabilization of pavement layers, and the construction of asphalt layers.

• Granular Works

Projects which include the construction of new granular pavement layers above the formation level (i.e. Base and/or Subbase) shall be classified under "Granular Works". These works shall include construction of layers using both virgin materials and reuse of existing granular materials. This category shall also include the construction of BSM layers and asphalt layers.

• Subgrade Improvement Works

Projects which include improvements/re-construction of the subgrade layers below the formation level of the pavement shall be classified under "Subgrade Improvement Works". This shall only be applicable to projects where greater than 15% of the length of the road requires subgrade improvements. These works shall also involve reconstruction of the layers above formation and the construction of all types of layers shall be covered by this category of rehabilitation.

• Ancillary Works

Projects where the scope of works is not rehabilitation of pavement layers shall be classified under "Ancillary Works". Examples of the projects this category is intended to cover include raising/lowering of services, construction/re-construction of sidewalks, laying of kerbs or kerb & channel or asphalt haunching, patch work and laying of sub-soil drains.

PS1302 GENERAL REQUIREMENTS**(a) Camps, constructional plant and testing facilities**

Delete the entire sub-clause and replace with the following:

The Contractor shall establish his construction camps and stores on the site. The exact location of these facilities shall be approved beforehand by the Employer's Agent. Ablution and other facilities for site staff shall also be provided as required and the location of all facilities shall comply with the requirements of the authorities concerned and those of the Employer's Agent.

Prior to starting with construction, the Contractor shall also move all constructional plant and personnel to the site. On completion of the work, all constructional plant, buildings, fencing and other temporary structures shall be removed, and the camp site be restored to its original condition and left neat and tidy.

Accommodation, workshops and testing facilities are not required in this contract. Separate provision has been made in the Schedule of Quantities for the pricing of the Contractor's general obligations with regard to offices.

(c) Legal and contractual requirements and responsibility to the public

Add the following paragraph to the end of subclause 1302(c):

"The Contractor's general obligations shall also include the training of temporary labour, the management of labour enhanced work and ABEs, the application of the Compensation for Occupational Injuries and Diseases Act, 1993, and compliance with the requirements of Part C: Environmental Management Specification and Part E: OHSA 1993 Safety Specification and further referenced in section C3.4.2 Particular Specifications."

PS1303 COMMUNITY LIASON 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 (in accordance to the Basic Conditions of Employment Act No.75, 1997, Clause No.9) 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 local 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.

Note: The Employers Agent shall determine, based on the extent of works issued in the Project Order(s), the number of CLO(s) required to ensure successful operations of the works

Note: Should the Contractor request for permission to work on non-working or special non-working days or any other overtime, this shall be at the Contractors cost, and such request be approved by the Employer's Agent in writing. The Contractor shall be liable to make payment to the CLO for these working hours/day including any overtime or other benefits as provided by the Contractor. Such request must be submitted to the Employer's Agent at least 3 working days prior to the day/s for which permission is being requested. All overtime and benefits shall not be re-imbursed by the Employer, i.e.at the Contractors cost.

PS1304 OFFICES

Offices shall only be required, and therefore paid for, when specifically requested by the Employer's Agent in the Project Order. The offices shall be for the joint use of the Employer's Agent and the Construction Manager.

The office shall be a minimum size of 4m x 6m with a minimum height to ceiling of 2.5m. It shall be provided with an air conditioner whose capacity is acceptable by the Employer's Agent as reasonably adequate for the size of the office actually provided and shall have adequate fluorescent lighting. It shall be furnished with two desks, each having a size of at least 1.5m x 0.9m with a lockable drawer. At least 4 (four) suitable chairs shall be provided.

The offices shall be sited in a position agreed upon between the Employer's Agent and the Construction Manager. Each office shall be weather-proof, shall have a wooden boarded floor that is at least 150mm above ground and shall be provided with a ceiling and lining to the walls or equivalent insulation, with an approved type of door with a secure lock and 4 keys and two opening windows of glazed area at least 3m²

Each office shall be well ventilated and shall be so insulated as to provide comfortable working conditions.

The Contractor shall provide for the duration of the project period proper maintenance of the offices and its approach. Daily cleaning shall be completed by 08h00.

The Contractor, upon completion of the project, shall arrange for the complete removal of the offices together with the disconnection of all services.

PS1305 PAYMENT

Delete payment subitem 13.01(b) and revise item with the following:

Item Unit

PS13.01 The contractor's general obligations:

(a) Fixed obligations..... Percentage (%)

(c) Time related obligations..... Project Month

NOTE: The value-related obligations shall be included in the construction rates.

Delete the sixth paragraph in its entirety:

Starting with "Should the final value of the work" and ending with: "which is in excess of twenty (20) percent of the tendered amount."

Delete the seventh paragraph in its entirety with all its related sub-paragraphs:

Starting with "Payment of the lump sum" and ending with: "has fulfilled all the requirements of this section".

Separate provision has been made in the Schedule of Quantities for the pricing of the Contractor's general obligations with regard to Health and Safety.

Refer to the second sentence of the fourth last paragraph of Clause 1303, page 1300-2 of the COLTO Standard Specifications and delete the words "from the date on which the contractor has received the letter of acceptance in terms of Clause 12 of the General Conditions of Contract" and replace these words with the following:

"from the Commencement Date in terms of Clause 5.3.1 of the General Conditions of Contract (2015), as specified in the Project Specific Data Sheet".

Add the following at the end of clause 1303:

"The amount payable to the Contractor for time-related obligations arising from extensions of time per "Project" granted by the Employer, where the Contractor is fairly entitled to such compensation in terms of clause 5.12 of the General Conditions of Contract 2015, shall be calculated as follows:

(i) The Contractor shall apply for the extension of time in terms of the number of working days delay incurred per "Project".

(ii) The number of working days extension of time finally granted shall then be added to the "Project" by the Employer, commencing on the first working day after the day of the original completion date. Special non-working days as defined in the contract data shall not be counted as working days in calculating the extended completion date.

(iii) The number of calendar days extension of time granted from the original completion date to the extended completion date as calculated in (ii) above shall then be calculated, commencing on the first calendar day after the day of the original completion date.

(iv) The number of days extension of time granted calculated as in (iii) above shall be the number of additional days measured for payment for time-related obligations under item 13.01(c) as a result of the extensions of time granted.

Note: The number of days extension of time granted calculated as in (iii) above shall also be included in the measurement of any other items scheduled under Sections 1300, 1500 or elsewhere in the Schedule of Quantities that involve the unit of measurement "month" and that were provided on site for the full duration of the extended period. Where such items were provided for a portion of the extended period only, a pro rata payment shall be made, based on the number of calendar days the item was provided on site after the original completion date divided by the number of calendar days as calculated in (iii) above for the extension of time granted."

Revise the following pay items:

Item	Unit
PS13.01(c) Principal Contractor(s) Time-related obligations for the following Rehabilitation Categories, for all road categories.	
Project Month shall mean a calendar month as applicable for each project allocated.	
Note: Supervision of sub-contractors are not factored into the construction rates, but rather factored into the Principal Contractor(s) time related cost. The time related obligation cost shall also include all handling, overheads, profit, risk and other obligations and for all other incidentals necessary for the completion of the subcontractors work and maintenance during the period of maintenance.	
Note: Time-related obligation costs for sub-contractors shall not be measured for and paid separately. Provision of time-related obligation costs payable to local ward-based enterprises/sub-contractors undertaking works shall be factored into the tendered rates for items payable to these sub-contractors.	

Item	Unit
PS13.02	
Principal Contractor(s) Health and Safety	
(a) 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 for the project.	Sum
(b) Time related obligations for updating and amending the risk assessments, the safe work procedures, the project H & S file and the H & S plan, and for full compliance with all H & S matters during the construction of the Works under the project.	Project Month

Note: Costs associated for health and safety compliance (fixed or time-related in nature) for sub-contractors shall not be measured for and paid separately. Provision of costs payable to local ward-based enterprises/subcontractors undertaking works shall be factored into the tendered rates for items payable to these subcontractors.

Project Month shall mean a calendar month as applicable for each project allocated.

- Rate tendered under subitems PS13.02(a) and the rate per month for subitem PS13.02(b) shall, for the two subitems together, include full compensation for all the Contractor's and Sub-Contractor's costs in respect of compliance with the OHS Act and Construction Regulations.
- Payment of the lump sum tendered under subitem PS13.02(a) shall be made once off at the beginning of the project, subject to the Contractor delivering the plan and it is approved by the Employer's Agent.
- And payment for the tendered rate for subitem PS13.02(b) shall be paid per month or part thereof for the duration of each project.

Item	Description	Unit
PS13.03	(a) Project signboards	Number (No)
	(b) Re-using of existing signboards	Number (No)

The unit of measurement shall be the number of contract signboards erected as instructed by the Employer's Agent or Employer's Agent Representative.

The tendered rate under subitem PS13.03 (a) shall include full compensation for providing and erecting each Project signboard complete including for timber poles and fixings, excavation and backfill, and for dismantling and removing the signboard structures and reinstating the signboard area on completion." The Project Board shall be priced based on a sign face area of 3.2m²

The tendered rate under subitem PS13.03 (b) shall include full compensation for erecting existing/re-usable Project signboard complete including for the alteration of Project Description, for timber poles and fixings, excavation and backfill, and for dismantling and removing the signboard structures and reinstating the signboard area on completion."

PS13.04 Community Liaison Officer

(a)	Allow for a CLO to be appointed and paid for on a monthly basis	Provisional Sum
(b)	Handling and profit in respect of sub Item PS13.04 (a)	Percentage (%)

Expenditure under these items shall be made in accordance with Clause 6.6 of the General Conditions of Contract 2015. The cost of providing a CLO paid for on a monthly basis as described in PS1303 and shall be subject to the approval of the Employer's Agent or Employer's Agent Representative.

The tendered percentage is a percentage of the amount of expenditure approved by the Employer's Agent under subitem PS13.04 (a) and shall include full compensation for the handling costs of the Contractor and the profit in connection with the provision of the CLO.

Add the following Specification:

SECTION PS10300: SPECIFICATION FOR ESTABLISHMENT OF CONSTRUCTION PLANT

PS10301 SCOPE

This section covers establishment at the commencement of work and de-establishment on completion of the work, of all the construction plant and teams (human resources) that is necessary for the construction or deconstruction of any pavement layers to the required specification. The layers and operations which may need construction plant may include but not limited to the following:

- Paving of asphalt layers or application of surfacing seals
- Milling out of existing road layers
- Construction of layerworks using in-plant BSM
- Construction of granular layers.
- Construction due to subgrade improvements i.e. undercut
- Construction of ancillaries

The use of all hand-operated constructional equipment, or in other words construction equipment which does not require a driver, shall be included in the respective rates of the items for which this equipment is used. i.e. Wacker, Jack-hammer, etc.

The establishment and de-establishment of any equipment shall be agreed with Employer's Agent or Employer's Agent's Representative in writing before doing so. The Contractor may not remove construction plant from the site without the written consent of the Employer's Agent. Should the Contractor remove any plant from the site without the permission of the Employer's Agent, the contractor shall be liable to a fine of R2000 per item of construction plant and may be required to re-establish the construction plant at the cost of the Contractor.

The construction plant covered under this section is the plant that is normally included in the fixed obligations of Section 1300, Contractor's Establishment on site and General Obligations of the COLTO Specifications.

Note: Storage of construction plant on the roadway outside of the permitted working hours is strictly prohibited, unless approved in writing by the Employer's Agent. The Contractor shall factor into his establishment rates the necessary movement of plant in terms of storage so as not to constitute a safety hazard to the public and travelling motorists. The Employer's Agent may, at his discretion, suspend all works for the non-compliance to this requirement.

PS10302 MEASUREMENT AND PAYMENT

PS10302.01

The unit of measurement shall be the number of establishments and de-establishments of all the construction plant required to complete an operation to specification. Establishment and de-establishment shall form a combined quantity of one.

The tendered rate shall include full compensation for establishing and de-establishing, loading and transporting all the necessary plant and equipment that the contractor deems necessary in order to complete an operation to the required specification.

The responsibility shall rest with the Tenderer to identify such plant and price accordingly as plant will not be paid for individually but for the successful completion of an operation to specification. i.e. if the operation requires the construction of an in-situ BSM layer, then the plant required to complete the operation would be:

- The recycler
- The water tanker
- The bitumen tanker
- The grader

- The pad-foot roller
- The smooth-drum roller

The above is only an example which should not be taken as binding or the actual requirement. The cost of carrying out the actual work by the plant shall be included in the construction rates, as stated in the COLTO specifications.

Establishment of:

- | | |
|--|-------------|
| (a) Plant necessary for paving asphalt layers | number (No) |
| (b) Plant necessary for milling operations | number (No) |
| (c) Plant necessary for constructing in-plant BSM layers by
(Excl. KMA plant covered by sub-item(h)) | |
| (i) Paver | number (No) |
| (ii) Grader | number (No) |
| (e) Plant necessary for constructing granular layers | number(No) |
| (f) Plant necessary for completing subgrade improvements (undercuts) | number (No) |
| (g) Plant necessary for carrying out the required ancillary works | |

Note: payment for this item shall be effected per sub-contractor undertaking the works as agreed and approved by the Employers Agent.

- | | |
|---|-------------|
| (i) Pre-treatment (plant for excavation and compaction) | number (No) |
|---|-------------|

This includes activities to be undertaken prior to the main rehabilitation works such as patching, construction of sub-soil drains or stormwater drains etc. that requires the establishment of plant for excavation and compaction activities. The Contractor is to programme the works such that the plant may have a continuous flow of work and only de-establish once all pre-treatment works are complete.

- | | |
|---|-------------|
| (ii) Post-treatment (plant for excavation and compaction) | number (No) |
|---|-------------|

This includes activities to be undertaken upon completion of the main rehabilitation works such as construction of sidewalks and kerbing or kerbing-channelling combination etc. that requires the establishment of plant for excavation and compaction activities. The Contractor is to programme the works such that the plant may have a continuous flow of work and only deestablish once all post-treatment works are complete.

- | | |
|--|-------------|
| (h) Static Plant Recycler – KMA or similar | number (No) |
|--|-------------|

- | | |
|-------------|-------------|
| (i) Crusher | number (No) |
|-------------|-------------|

- | | |
|---|-------------|
| (j) Screen (26.5/19mm max particle stone size), as specified by the
Employer's Agent | number (No) |
|---|-------------|

The tendered rate for subitem PS10302.01(h), the establishment of Static Plant Recycler (KMA or similar) shall cover full compensation for preparing the platform where the Plant and the stockpiling area will be kept, setting up the KMA plant, establishing and de-establishing, loading and transporting all the necessary plant and equipment that the contractor deems necessary in order to complete an operation to the required specification

SECTION 1500: ACCOMMODATION OF TRAFFIC**PS1501 SCOPE**

Add the following to the end of clause 1501:

“Throughout the course of each project, the Contractor shall ensure that the works do not prevent service owners from gaining access through/to the site.

All work shall be assumed to be constructed under traffic with no deviations permitted unless authority has been obtained from the Employer’s Agent. The public has the right to use the public transport facility and connector roads and therefore the safety of the traveling public pedestrians and commuters shall take precedence in the accommodation of traffic.

In this regard, the contents of Clause PS1231 (Compliance with the Road Safety Act) are to be complied with.”

PS1502 GENERAL REQUIREMENTS**(b) Providing temporary deviations**

Delete the second paragraph and replace with the following:

“No road deviations have been specifically called for in tender documentation, however, should the Contractor require such deviations, then the following requirements apply:

(a) Deviations required by the Contractor shall comply with the requirements of the Standard Specifications. Details shall be submitted to the Employer’s Agent for approval at least two weeks in advance of the date on which it is anticipated that work on the deviation will commence.

(b) On all deviations the Contractor shall ensure that all times and during all weather conditions that all temporary surfaces that are intended to carry traffic are in fact trafficable with regard to reasonable standards of safety and comfort. No additional payment shall be made to the Contractor for compliance with this Clause.

(c) Unless indicated otherwise over the entire length and for the duration of the Project, traffic is required to be accommodated in both directions at all times. The Contractor shall ensure that the full width of the road is available for traffic outside the working hours.

(d) At all times signposting shall be in accordance with the latest edition of the South African Road Traffic Signs Manual (SARTSM), volume 2, chapter 13 of the June 1999 edition. The Ethekeweni Transport Authority “Roadworks Signing” Manual may be used as a guideline.

(e) Should the Contractor arrange with a landowner for road deviations to traverse private property, the Contractor shall supply the Employer’s Agent with written proof of this arrangement which outlines the measures to be taken to reinstate the land affected by the deviation.

(g) The contractor shall submit sketches of his proposed accommodation of traffic facilities for each work section to the Employer’s Agent for his approval one week prior to commencement of that section of work.

(h) Contractor shall ensure that adequate signage is in place after any part of the works has been completed until such time that the work site is deemed to be safe, can it be removed. Delete the second paragraph and replace with :

“Should the Project effect any designated bus-routes then the Contractor shall identify an alternative route and in liaison with the public transport authorities, make due allowance for a deviation.”

(e) Access to properties

Add the following:

“As Projects will be undertaken in both CBD and residential areas, the Contractor shall make due allowance in the traffic accommodation measures for the provision of access to private properties and deliveries to businesses.

(i) Traffic Safety Officer

Add the following to the end of the second paragraph:

“The contractor shall submit a CV of the candidate to the Employer’s Agent or Employer’s Agent Representative for approval before the candidate is appointed as the traffic safety officer.

Insert the following as the opening phrase to subclause (i)

“make himself available to discuss road safety and traffic accommodation matters whenever required by the employer’s Agent and shall be responsible...”

Delete subclause (iii) and replace with the following

- (iii) Personally inspect the position and condition of each traffic accommodation feature on the whole site of works twice each day by 9h30 and by 14h00, to record all irregularities discovered and the remedial action taken, and to sign off as correct and submit to the Employer’s Agent or Employer’s Agent Representative such record sheets by midday of the next working day. The traffic safety officer shall keep a duplicate book for this specific purpose.

The traffic safety officer shall also submit with this report the daily labour returns of flagmen employed.

Add the following subclauses:

- (ix) The traffic safety officer shall be equipped with a cellular telephone and shall have a vehicle and sufficient labour at his disposal 24 hours a day, including all prescribed non working days, and shall not be utilised for other duties. He shall be directly answerable to the contractor’s Construction Manager.

The traffic safety vehicle shall be equipped with a high visibility rear panel in accordance with the requirements of the SARTSM. The words TRAFFIC CONTROL shall be written on a warning sign in highly legible letters, not less than 150 mm high, and the sign shall be mounted on the vehicle at least 1,5 m above ground level. The proposed sign and letter dimensions shall be submitted to the Employer’s Agent for his approval.

The vehicle shall also be equipped with an amber-coloured flashing light of the rotating parabolic reflector type with a minimum intensity of 100 W. The warning light shall be switched on at all times and the sign shall be displayed when the vehicle is used on site.

The traffic safety officer shall have a direct line of communication at all times with the police and traffic officers responsible for the area within limits of the contract. The provision of the road safety vehicle, driver, labourers and the cost of the cellular telephone shall be deemed to be included in the rates tendered for the contractor’s establishment on site

- (x) Ensure that all obstructions related to the contractor’s activities be removed before nightfall where applicable as instructed by the Employer’s Agent and that the roads are safe for night traffic.
- (xi) The traffic safety officer shall, in addition to the duties listed in paragraph 1502 (i), also be available to assist in the removal of broken down vehicles off the roadway and implementing actions requested by the traffic authorities with regard to the work to be carried out, be responsible for the erection and maintenance of all traffic signs necessary for the accommodation of traffic.
- (xii) In the event of an accident the traffic officer shall record in a written report the details of the accident, record the position of all temporary road signs, barricades, delineators, flagmen and any other devices used for traffic accommodation. In addition, the report shall include a neat dimensional sketch, photographs, identifiable permanent features, and any other relevant information.”

(j) Failure to comply with provisions

Failure or refusal on the part of the Contractor to take the necessary steps to ensure the safety and convenience of the travelling public, accommodation of traffic, plant and personnel in accordance with these specifications or as required by statutory authorities or ordered by the Employer's Agent, shall be sufficient cause for the employer's Agent to apply penalties as follows:

A fixed penalty of R5 000.00 per occurrence shall be deducted for each and every occurrence of non-compliance with any of the requirements of Section 1500 of the standard specifications and section PS1500 of the project specifications.

In addition, a time-related penalty of R500.00 per hour over and above the fixed penalty shall be deducted for non-compliance to rectify any defects in the accommodation of traffic immediately after the Employer's Agent has given an instruction to this effect. The Employer's Agent's instruction shall state the time of incidence, Should the Contractor fail to adhere to this instruction within 10 minutes, the time-related penalty shall be applied from the time the instruction was given.

PS1503 TEMPORARY TRAFFIC-CONTROL FACILITIES

Replace the first sentence of the first paragraph of Clause 1503 with the following:

"The Contractor shall provide, erect and maintain the necessary traffic-control devices, road signs, channelisation devices, barricades, warning devices and road markings (hereinafter referred to as traffic-control facilities) in accordance with these project specifications and deemed necessary by the Contractor for the execution of each Project in conjunction with the latest edition of the South African Road Traffic Signs Manual (SARTSM), volume 2, chapter 13 of the June 1999 edition and shall remove them when no longer required.

The Contractor shall replace at his own cost any traffic-control facilities that have been damaged, lost or stolen. The Contractor shall also remove all bituminous or other foreign material from the traffic-control facilities in order to keep them clean and visible at all times. Traffic-control facilities that can no longer be cleaned effectively shall be replaced with new ones at the cost of the Contractor."

Replace the first sentence of the third paragraph of clause 1503 with the following:

"The type of construction, spacing and placement of traffic-control facilities shall be in accordance with the latest edition of South African Road Traffic Signs Manual (SARTSM), volume 2, chapter 13 of the June 1999 edition, these project specifications and the road category for each Project. The Ethekweni Transport Authority "Roadworks Signing" Manual may be used as a guideline to assist the Contractor with the traffic accommodation proposal for each of the road categories, viz. A, B, C or D.

(b) Road signs and barricades

Add the following to the end of subclause 1503(b):

"The Contractor shall be responsible for the protection and maintenance of all signs, and shall at his own cost replace any that have been damaged, lost or stolen.

Where temporary signs such as delineators are mounted on portable supports, the only permitted method of ballasting such sign supports shall consist of durable sandbags filled with sand of adequate mass to prevent the signs from being blown over by wind. The cost of the sandbags shall be included in the tendered rates for the applicable types of temporary road signs.

The covering of permanent road signs, if applicable, shall be carried out by utilising a hessian bag which shall be pulled over the sign in the form of a hood and fastened to the sign posts using wire ties. Plastic bags or other materials, and fastening by means of adhesive tape, shall not be permitted for this purpose. The cost of covering permanent road signs shall be deemed to be covered by the tendered rates.

No work may proceed on any section where accommodation of traffic is required until such time as the relevant requirements are met and the written approval of the employer's Agent has been obtained. The Contractor shall keep sufficient surplus signs, delineators and barricades on the site to allow for the replacement of damaged or missing items immediately upon discovery, or within three hours of instructions to such effect having been given by the Employer's Agent. Delineators shall be of the flexible plastic / rubber reversible variety and not of the rigid metal variety."

(c) Channelization devices and barricades

Add the following paragraphs at the end of subclause 1503(c):

"Delineators shall be manufactured from plastic / rubber materials and shall be adequately ballasted with sand bags to prevent the signs from being blown over by wind or wind turbulence from moving traffic.

Traffic cones shall be manufactured from fluorescent orange or red plastic material, and shall be used only at short term lane deviations during daylight hours. All traffic cones used on deviations shall be 750 mm high. Lane closures which continue into the nighttime shall be demarcated by delineators only.

The use of steel drums as channelization devices shall not be allowed on this Contract. Channelization shall be affected by the use of delineators or cones as detailed in the South African Road Traffic Signs Manual (SARTSM), volume 2, chapter 13 of the June 1999 edition."

The safe channelization of pedestrians (where necessary) is to be carried-out by the utilization of portable pedestrian barricades. The Contractor shall identify the need and make due allowance in this regard for each Project.

(e) Warning devices

Add the following to subclause 1503(e):

"All construction vehicles and plant used on the works shall be equipped with 200mm diameter rotating amber flashing lights and with "Construction Vehicle" warning signs. All vehicles and plant shall obtain a clearance permit from the Employer's Agent before being allowed onto the site.

(i) Vehicle mounted flashing lights

Rotating lights shall have an amber lens of minimum height of 200mm and shall be mounted to ensure clear visibility from all directions. The lights on construction vehicles shall be switched on as the vehicles decelerate to enter a construction area, while construction vehicles are operating within the accommodation of traffic area, and as the vehicles accelerate to the general speed when entering the road from a construction area. Lights on plant shall operate continuously while the plant is working alongside sections of road open to public traffic.

All LDVs and cars operating on site shall also be equipped with rotating amber flashing lights which shall be placed so as to be clearly visible and shall be operated continuously while the vehicles are manoeuvring in or out of traffic or while the vehicles are travelling alongside or parked alongside roads open to public traffic.

Rotating lights and the "Construction Vehicle" warning signs on the Contractor's vehicles and plant shall not be paid for separately but shall be included in the rates covering the use of the vehicles.

The Contractor shall apply and maintain to the approval of the Employer's Agent such rotating amber lights and warning signs, together with any temporary mounting brackets. Vehicles and plant that do not comply with these requirements shall be removed from the site."

(ii) Sign mounted flashing lights

Where sections of road cannot be opened to traffic at night, two amber flashing lights shall be vertically mounted on top of the road closure barricades at each end of the section in question, and a Stop Go Flagmen must be provided to control traffic through the construction site. Also if street lighting is not sufficient, arrangements must be made to light up the site so is visible to motorists approaching it.

Add the following new subclauses to clause 1503:

(g) Other traffic control measures ordered by the Employer's Agent

"The Employer's Agent may instruct the Contractor to provide any other road sign, reflective tape, etc not provided for and for which the Contractor shall be compensated. Such road signs shall conform to the requirements of the SARTSM, or specification provided by the Employer's Agent. Similarly, in order to ensure that the travelling public is kept fully informed and warned on matters relating to the accommodation of traffic, construction sign posting and the effect of the construction on the free flow of traffic through the site, the Employer's Agent may arrange for advertising in the press and/or for other forms of publicity.

(h) Flagmen

Flagmen shall be adequately trained in the standard flagging techniques as described in the SARTSM (refer to figure 13.23 of detail 13.23.1) and be provided with conspicuous clothing such as safety jackets utilizing retroreflective and / or fluorescent panels in red, yellow and / or white.

Flagmen shall have in their possession, at all times, certification that they have attended and passed an accredited course in flagging techniques before being allowed onto the construction site.

Flagmen shall be rotated every 2 to 3 hours in order to ensure that there is always a fresh person holding the flag to counter fatigue. At no point should the flagmen leave their posts unattended, the flagman shall ensure that he/she leaves someone to control the traffic at his/her post if he wishes to go somewhere.

Flags shall be made from bright red or red-orange material and shall be square with a minimum side length of 600 mm. The flag shall be attached to a staff at least 1,0 m in length.

In terms of lateral clearance and safety, flagmen shall stand on the shoulder of the lane of traffic that is being controlled and under no circumstances shall flagmen be permitted to stand within the traffic lane. In order to obtain maximum visual impact for the travelling public, flagmen shall stand-alone.

Failure to comply with this specification will lead to the Contractor being penalized in terms of PS 1502(j).

(i) Public traffic

The Contractor must plan and conduct his activities so as to bring about the least possible disruption to the traffic on the road. All halting of traffic will require the prior approval of the Employer's Agent and must be pre arranged with the appropriate traffic authorities.

In all dealings with the public the Contractor shall bear in mind the public's right to enjoy the use of the road, and the Employer's desire to interfere as little as possible with this right. At all points of contact with the public, the Contractor shall deal with deliberate courtesy and understanding in any discussions or disputes.

(k) High visibility safety vests and hard hats

The Contractor shall ensure that all his own personnel, excluding those who are permanently office bound, all other construction workers on the site (including CLO and local labour), staff of the Employer's Agent and visitors are equipped with high visibility reflective safety vests and hard hats. High visibility reflective safety vests shall be worn at all times when working on or near to the travelled way and hard hats shall be worn at all times when working on or near to the bridges or box culvert construction areas. High visibility reflective safety vests and hard hats shall be kept in good condition and any such safety vests and hard hats that are, in the opinion of the Employer's Agent, ineffective shall be replaced immediately by the Contractor."

Add the following new Clause:

PS1518 LIGHTING REQUIREMENTS DURING NIGHT WORK

Where night work is deemed necessary and approved by the Employer's Agent, the following specification shall be complied with:

The Contractor shall provide sufficient lighting for night work to ensure that all inspection and work areas are illuminated to a minimum average of 100 lux at an overall uniformity of 0.33. The illuminance for active work areas shall comply with the OHS Act 1993 (as amended) requirements and all lighting shall be subject to a minimum glare control of 5. Luminaries mounted on masts shall have a minimum mounting height of 5 m. The Contractor shall ensure sufficient backup lighting to replace faulty lighting.

The lighting shall be positioned so as not to cause a hazard to the travelling public using the road. Should the Employer's Agent be of the opinion that the lighting is insufficient or that it is a hazard to the road users, the Contractor will be instructed to stop work immediately.

Mobile lighting units, including a towing vehicle and operators shall be made available on request to the Employer's Agent for nighttime inspections.

The Contractor shall submit his lighting operational plan to the Employer's Agent for approval and demonstrate the effectiveness of the lights before the commencing of any night work. The Employer's Agent shall also inspect and approve all lighting equipment prior to the commencement of the night work. A trial set up of the lighting equipment shall be made at an appropriate site. The Contractor shall arrange for the measurement and certification of the lighting adequacy by a reputable service provider. Once the lighting plan and equipment has been approved, the Contractor shall not deviate from it unless agreed to by the Employer's Agent. If lighting requirements are not met for any particular activity, the Employer's Agent may order that activity to be stopped until the required lighting has been re-instated.

Add the following clause:

PS1519 NIGHT WORK AND WEEKEND WORK

Where night work has been approved by the Employer's Agent, the following specification shall be complied with:

Road closures can only commence at 18:00 until 06:00, where the road shall be open to traffic. The road shall not be closed off to traffic before 18:00, unless permission to do so has been granted by the Employer's Agent.

For night and weekend work, the contractor must ensure that he:

- Makes arrangements for all the necessary testing required.
- Undertakes all checks for all activities and populates the necessary checklists.
- Submits all the necessary documents to the Employer's Agent's Representative on the very next working day.
- Submits the traffic report and site diary to the Employer's Agent's Representative on the very next working day.
- Site safety and traffic signage is monitored even outside working hours, as the Contractor is responsible for the site safety 24/7.

No additional payment will be made for this item and will therefore be deemed to be included in the construction rates.

PS1520 NOTICE TO RESIDENTS

Should it be necessary to temporarily close any part of any road to vehicular traffic, suitable notice shall be given to the affected residents and/or property owners. The duly completed "Notice to Residents" provided in Section C3.6 shall be distributed at least 48 hours prior to the closure, indicating the date on which and the period of time for which the road will be closed.

No additional payment will be made for this item and will therefore be deemed to be included in the construction rates. Refer to PS1235 for detailed requirements regarding public awareness notice boards.

PS1521 SUB-CONTRACTING OF TRAFFIC ACCOMMODATION

Due to the nature and risks involved with working under live traffic conditions, it is of paramount importance to maximize safety of road users, general public and the labour force. It is therefore a condition of this contract that traffic accommodation shall not be sub-contracted to local enterprises. The Contractor shall remain responsible for the traffic accommodation designs in accordance to the relevant specifications, provision of traffic accommodation devices, supervision and all other requirements in relation to this specification. Any penalties imposed onto the Contractor for non-compliance to the approved traffic accommodation plans on-site shall not be transposed onto the sub-contractors. In the event of such penalties being transferred onto the subcontractors, the Employer reserves the right to apply Clause 1.2.3.8 of the Additional Conditions of Contract.

The Employers Agent, may at his discretion, permit the sub-contracting of traffic accommodation upon written request from the Contractor. The Contractor is to include in his motivation the skills, competencies and resources that the sub-contractors possess to adequately and safely undertake the works to a standard or better as if the Contractor was undertaking the traffic accommodation himself.

No additional payment will be made for this item and will therefore be deemed to be included in the construction rates.

PS1517 MEASUREMENT AND PAYMENT

Project Month shall mean a calendar month as applicable for each project allocated.

Replace item 15.01 to read as follows:

Item	Description	Unit
PS15.01	The provision of temporary traffic control facilities (Except traffic lights and amber flicker lights for the supervisory staff) for the following road categories: (a) All rehabilitation categories: (2) Category B: Urban Arterials, Major Bus Routes and Industrial Roads Project Month	

(i) Extra-over for Night Work	Project Month
(3) Category C: Minor Bus Routes and Collectors	Project Month
(4) Category D: Residential Streets	Project Month

The unit of measurement shall be per month for the duration of the works of each Project for the provision of temporary traffic accommodation and control facilities within the public transport facility on which such control facilities has to be provided irrespective of the number of lanes used by traffic or it being single or double isle, width of the isle or the number of road areas on which the contractor elects to work at any one time or the number of relocations of such facilities during the contract period. It shall also include the entire public transport facility where construction is done in half widths.

The tendered monthly rate shall include full compensation for accommodating traffic on the existing public transport facility or diversions alongside work areas where required including the provision of a traffic safety officer, adequate road signs, delineators, traffic cones, pedestrian barricades, plant, labour, transport, communication equipment, amber rotating lights, safety clothing, etc. required to install, maintain, relocate and monitor traffic control facilities as specified and to the satisfaction of the Employer's Agent or Employer's Agent's Representative. The rate shall exclude the provision of traffic lights where the road is constructed in half widths and amber rotating lights for use by the supervisory staff."

Note: The Principal Contractor(s) remain fully responsible for the accommodation of traffic of work done by the sub-contractor(s) and this requirement is to be factored into the tendered rate.

The requirements and provisions shall be as deemed necessary for each type of rehabilitation work and respective public transport facilities.

The tendered sum for the extra-over item shall include for all the additional measures deemed necessary for the safe execution of the work at night such as lighting for all activities and any additional personnel deemed necessary, etc.

Payment for the tendered rate for subitems of PS15.01 shall be paid per month or part thereof for the duration of each Project

PS15.02 Facilitation of Public Transport Operations

(a)	Allow for Facilitation of Public Transport Operations on a monthly basis	Provisional Sum
(b)	Handling and profit in respect of sub Item PS15.02 (a)	
	Percentage (%)	

The cost of providing for the facilitation of Public Transport Operations on a monthly basis as shall be subject to the approval of the Employer's Agent or Employer's Agent Representative. This includes but is not limited ensuring smooth and efficient functioning of public transportation operations during the construction project. It involves incorporating meaningful stakeholder involvement at every stage of construction project.

The tendered percentage is a percentage of the amount of expenditure approved by the Employer's Agent and shall include full compensation for the handling costs of the Contractor and the profit in connection with the provision of facilitation of Public Transport Operations.

PS15.03 Public Transport Stakeholder Engagement

(a)	Allow for Public Transport Stakeholder Engagement as and when required	Provisional Sum
(b)	Handling and profit in respect of sub-Item PS15.03 (a)	Percentage (%)

The cost of providing Public Transport Stakeholder Engagement services as and when required shall be subject to the approval of the Employer's Agent or Employer's Agent Representative. Identify Key Stakeholders within the respective public transport facilities, Consider Environmental and Social Impacts and develop mitigating action plan and hold regular meetings to discuss project progress.

The tendered percentage is a percentage of the amount of expenditure approved by the Employer's Agent and shall include full compensation for the handling costs of the Contractor and the profit in connection with the provision of Public Transport Stakeholder Engagement services.

SECTION 1600: OVERHAUL

PS1602DEFINITIONS

(a) Overhaul material

Add the following to the end of subclause 1602(a):

"Overhaul shall not be measured separately for payment for materials obtained from commercial sources, and the rates tendered for such materials shall be fully inclusive of all haul required."

(b) Overhaul

Delete sub-clause 1602(b) second paragraph and replace with the following:

"Restricted overhaul shall not apply to any material. Ordinary overhaul only shall apply."

(d) Free-haul distance

Amend the last sentence to read:

"The distance shall be 10,0 km radius in the case of all overhaul materials"

Add the following Specification:

SECTION PS10400: SMALL CONTRACTOR DEVELOPMENT

PS10401 SCOPE

This section covers construction aspects relating to the processes by which the construction industry develops contractors. This includes training, coaching, guidance or mentoring which may be required by the local ward based emerging sub-contractors.

Definitions

(i) Training:

Training refers to the process of teaching a learner – usually in a classroom or simulated work environment situation. Training usually takes place with one teacher/trainer and several learners. Principles and theory are taught. Demonstrations are given. Assignments are then set to ensure that the learner is able to apply what has been taught. Training is done by a specialist in the subject, who is also qualified to train.

Example: use of a dumpy level

Training would involve the theory of how a dumpy level works and how to calculate levels. A demonstration of how to set up and read a level could be given.

(ii) Coaching:

Coaching refers to hands-on training and is mostly on a one-on-one basis of tangible and measurable skills. It is typically on-site training, or learning-on-the-job. Coaching is training by the process of “watch-do-correct-practice”. The coach does the task while the learner watches and asks questions. Then the learner does the same task while the coach watches. The learner is corrected until the coach feels that he has gained competence in the function. The learner is then left to practice the task or skill, which the coach oversees. Coaching is imparting a skill – usually manual or physical. A coach is usually a person doing the same type of work on a higher or more competent level, or has a mastery of the skill/task. While training gives the theory or shows/explains the principles, coaching helps the learner become competent and master a skill. A coach is often in the direct reporting line, i.e. someone in authority. Coaching could be part of the management function and would make the job run more smoothly.

Example: Use of a dumpy level

Coaching would involve taking the learner onto site, setting up a dumpy level, reading levels. Then the coach would get the learner to do the job, while the coach checked setting up and reading. Once the learner understands and can do the tasks, the coach checks periodically to ensure the learner is still doing the job properly. The desired outcomes of coaching are for the learner to “fit-the-mould”, or do things the same standard as the coach.

(iii) Guidance:

Guidance is anticipating where one might go wrong, or where one is doing a task in a complicated, inefficient or ineffective way, and giving advice as to how to achieve a better result. Guidance is mostly given by a person in the direct reporting line but can be given by anyone. Guidance is not imparting skills, but suggesting ways to improve performance.

Example: Use of a dumpy level

A person who knows how to use a dumpy level would be given guidance as to where he would next set up the level to limit the number of set-ups. Guidance could be an extension of coaching.

(iv) Mentoring:

Mentoring is developing a person on a long-term career path. It is mostly about imparting skills that are often intangible and non-measurable. A mentor is seldom anyone in the direct reporting line –although he could be a person several levels higher in that reporting line. Mentoring is more about developing a relationship and taking a personal interest in an individual. A mentor looks out for that individual and gives him advice that

cannot be found in a book or in the normal course of business. The sort of issues a mentor discusses with the protégé is company politics, how-to pick-up work before others get wind of it, how to position ones company to get a better competitive advantage, how to tender such that the tender is lowest, but the profit is as good or better than the next person, how to determine and assess risk. Mentoring helps the protégé think strategically, sharpen entrepreneurial skills and grow – both personally and in terms of the company. A mentor helps the protégé to develop insight and shrewdness. It is more about business skills to survive long-term than the technical, tactical or day-to-day activities of doing business. The desired outcome for mentoring is for the protégé to develop his own style, i.e. to shape his own “mould”.

s(v) Supervision

Supervision is instruction regarding the work to be performed, and ensuring it is carried out to specification and to the satisfaction of the supervisor. It is not instruction on how the work is to be performed, but rather on what work has to be performed, and usually has specific time frames.

PS10402 GENERAL RESPONSIBILITIES FOR DEVELOPMENT

The Contractor may request, or the Employer's Agent may determine, where applicable, the need for developmental assistance for the sub-contractors, where such sub-contractors experience and competencies are limited and require training, coaching, guidance and mentorship, to ensure successful completion of the allocated project/s.

The Contractor shall appoint a dedicated Senior Foreman or Clerk of Works (internally or externally sourced) or Site Technician (hereafter referred as Service Provider) whose sole responsibility shall be to assist with the execution of its responsibilities towards the training, coaching, guidance, mentoring, development and/or support of the local ward based sub-contractors.

The qualifications and experience of the Service Provider shall be relevant and of a suitable level to enable them to supervise the level of the sub-contractors. The minimum requirements thereof being:

- i. Minimum ten (10) years' experience in the type of works being undertaken,
- ii. Relevant trade-test certification (where applicable).

The Service Provider shall evaluate whether the local sub-contractor(s) would require assistance in form of training, coaching, guidance and/or mentoring and subsequently develop and establish a Support Development Programme, which shall be approved by the Employers Agent prior to implementation.

a) General Obligations of Service Provider

The Service Provider shall comply with the following minimum obligations:

- (i) Assist the local sub-contractors in instituting a quality assurance system;
- (ii) Provide adequate training, coaching, guidance, mentoring or any other identified and approved assistance.
- (iii) Provide support and any other identified and approved assistance to ensure that the Contractors meet their obligations and commitments with respect to their subcontracts, and
- (iv) Assist the local sub-contractors planning of construction activities (programming), and required production rates in order to achieve a positive cashflow
- (v) Assist the local sub-contractors with all health and safety and environmental requirements in relation to the project specifications, and the relevant acts or guidelines
- (vi) Assist the local sub-contractors with the procurement of plant, materials and human resources, where applicable.

b) Quality of Work and Performance of Sub-contractors

The Contractor shall closely monitor and supervise all sub-contractors and where requested and approved by the Employer's Agent, shall appoint a Service Provider to train, coach, guide, mentor and assist subcontractor's

in all aspects of management, execution and completion of its subcontract. This shall typically include assistance with planning of the works, sourcing and ordering of materials, labour relations, monthly measurements and invoicing procedures. The extent and level of such training, coaching, guidance, mentoring, and assistance to be provided shall be commensurate with the level of subcontract applicable and shall be directed at enabling the sub-contractor to achieve the successful execution and completion of its subcontract. The Contractor shall give reasonable warning to the sub-contractors when any contravention of the terms and conditions of the subcontract have occurred or appears likely to occur. The Contractor shall, whenever feasible, give the sub-contractors reasonable opportunity to make good any such contravention, or to avoid such contravention, and shall render all reasonable assistance to the sub-contractors in this regard.

c) Dispute Avoidance and Resolution Procedures for sub-contractors

When any disputes arise as provided for in the subcontract, the Contractor shall explain fully to the sub-contractor that such actions are provided for in the subcontract. If such action is contemplated it shall be discussed with the Employer before any action is taken.

If the sub-contractor, in the opinion of the Employer, fails to comply with any of the criteria listed below, the Employer shall issue a written warning to the Contractor, stating all the areas of non-compliance. The criteria are as follows:

- (i) Acceptable standard of work as set out in the specifications;
- (ii) Progress in accordance with the time constraints in the construction programme;
- (iii) Punctual and full payment of the workforce and suppliers;
- (iv) Site safety; and
- (v) Accommodation of traffic.

The sub-contractor shall have 21 days from the date of receipt of the letter of warning by the Contractor to address and rectify the issues raised by the Employer, except for sub-clauses (iv) and (v) above, for which the reaction time shall be in accordance with the relevant specifications for those aspects of the Works, but which shall not be longer than 24 hours. Failure by the sub-contractor to comply with a deadline, will be sufficient grounds for the Contractor to apply a penalty or terminate the subcontract provided that the Employer is satisfied that the Contractor has made every effort to correct the performance of the sub-contractors.

The sub-contractor shall have the right to dispute any ruling given or deemed to have been given by the Contractor or Employer. Provided that, unless the sub-contractor shall, within 21 days after his receipt of a ruling or after a ruling shall have been deemed to have been given, give written notice (hereinafter referred to as a Dispute Notice) to the Contractor, referring to the relevant clause(s) in the subcontract agreement, disputing the validity or correctness of the whole or a specified part of the ruling, he shall have no further right to dispute that ruling or the part thereof not disputed in the said notice.

PS10403 TRAINING, COACHING, GUIDANCE, MENTORING OR ASSISTANCE

(a) Purpose of the Support Development Programme(s)

Skills development forms an integral part of the Employer's Transformation and Community Development Policies and hence, it is important to the Employer that Targeted Enterprises (local ward based subcontractors) be equipped with skills that can be used to gain meaningful future employment and secure subcontracting opportunities.

It is, therefore, a requirement of this Contract that adequate Training, Coaching, Guidance, Mentoring and assistance be provided, to ensure skills development within the Construction Industry.

(b) Skills Audit and Gap Analysis

Prior to establishing the Support Development Programme(s), the Contractor shall conduct a Skills Audit and Analysis of the Subcontractors to determine their levels of skills sets in undertaking the works allocated to

them. The outcome of the Skills Audit and Analysis shall be used to compile the Support Development Programme(s).

The Contractor shall be paid separately in the Bill of Quantities for compliance to this required specification.

(c) Developing the Support Development Programme(s)

The Employer shall be involved in the decision making and quality control pertaining to the development and implementation of the Support Development Programme(s) facilitated through this Contract.

The Support Development Programme shall address two elements, namely:

- (i) The skills gap identified during the skills audit and analysis as referred to in PS10403 (b), and,
- (ii) The general obligations of the Service Provider as referred to in PS10402 (a).

The complete Support Development Programme shall be approved by the Employer before any training commence, and shall include the following, but not limited to:

- (i) specify the development needs of each sub-contractor contracting entity – the systems the entity lacks,
- (ii) specify the development needs of the individuals comprising the entity – the skills the individuals within the entity lacks,
- (iii) the level to which that activity will be developed within the period of the contract
- (iv) whether training, coaching, guidance and/or mentoring is to be given in each activity, and
- (v) the person/s responsible for each activity.

The Contractor shall be paid separately in the Bill of Quantities for compliance to this required specification.

An example of what the Support Development Programme(s) could entail includes the following, but not limited to:

- (i) Understanding and interpreting drawings
 - Understanding the cross referencing to drawings from the contract documents and the bill of quantities,
 - Understanding the layout of the drawings,
 - Understanding the plan view, elevations and cross sections, and
 - How to interpret, accurately layout and construct the details
- (ii) Setting out construction works

This skill requires an understanding of the function and use of instruments such as the dumpy level, the theodolite, and procedures such as stringing a line.
- (iii) Technical know-how of activities.
- (iv) Task organization

This activity involves the correct supervision of labour and organisation of tasks to ensure that labour is utilised most effectively. This includes the following:

 - Allocation of the appropriate number of people for the task,
 - Availability on site of the correct type and amount of material and equipment at the point of use, and
 - Planning tasks ahead so that labour does not stand idle.
- (v) Task prioritization

Task prioritization must cover an understanding of critical paths, including identifying which tasks can be postponed and which are urgent. It includes planning and monitoring so that time targets are achieved. It must also cover gaining an understanding of the penalties applicable to late completion of tasks.
- (vi) Works schedule

This is the ability to produce daily work plans and will assist with task organization. Daily work plans need to be developed into monthly work plans and vice versa. These plans assist in material

ordering, plant scheduling, labour allocation, timeous completion of the work, and keeping track of profit/losses.

(vii) Quality Control

Quality control requires knowledge of specifications and tolerances and ensuring that the work adheres to these, as well as understanding the requirements of the client.

(viii) Measuring work done for payment certificates

This is the ability to measure actual work done and to translate these measurements into a payment certificate. Knowledge must be gained on how to calculate escalation, how to claim for VO's and how to handle other claims.

(ix) Handling site instructions and VO's

This is the ability to distinguish between site instructions and variation orders and how to respond to such instructions.

(x) Materials planning

- Determining the quantity of materials required for each task and planning ordering,
- Determine appropriate lead times to ensure that everything required to do a job is on hand, and
- Quantity take-offs for pricing a bill at higher levels of development.

(xi) Receiving, storing and handling materials

Receiving includes checking materials delivered against the delivery note and the order placed.

Storage involves knowing what quantities and type of materials to store, planning accessibility, and safety of materials from inter alia theft and weather. Handling of materials needs to be carried out to ensure no wastage or damage.

(xii) Machine analysis

This is the analysis of the use of equipment. It includes calculating fuel and hourly costs. This will enhance an understanding of the effective use of equipment, how to reduce costs and provide a background for pricing of equipment for tenders.

(xiii) Maintenance schedule

This covers the importance of maintenance of equipment and how to schedule this so that there is minimal disruption in day-to-day work.

(xiv) Construction programme/work plan

Knowledge of how to develop a construction programme/work plan, monitor and assess the production, and corrects the programme where necessary.

(xv) Understanding tests

Understanding what tests are required, reading and interpreting results relating to specifications and quality, and how to make the corrections required.

(xvi) Cash Flow

The concept of cash flow, as well as the development of cash flow projections and monitoring of the cash flow are vital aspects of running a business. Included under this topic is knowing how long it takes from placing an order for material until payment is due, and time lags between ordering the materials and using materials and receiving payment for work done. The concept of sufficient working capital also needs to be imparted.

(xvii) Risk Assessment

This involves learning how to assess the financial risks associated with the job in terms of his performance and profitability and the management of these risks. This becomes increasingly important as the sub-contractor company grows.

(xviii) Insurance

This includes an understanding of why insurance is required, how to obtain insurance, the benefits and costs, insurance providers and what can be claimed from different types of insurance. The different types of insurance to be included are Short Term insurance, Public Liability and Contractors All Risk insurance.

(xix) Sureties

This involves understanding what sureties are, why and when they are needed, how they can be obtained, what they cost and how they can be redeemed.

(xx) Procurement of plant and equipment

The difference between purchasing, leasing, hire purchase and hiring plant needs to be understood. Also included is gaining knowledge of all aspects of these options as well as the benefits and implications for the business for each option.

(xxi) Employee Records

This involves knowing and applying with legislation for conditions of employment. Employment contracts must be in place for all labour employed and a formal system of keeping employee records must be established. Employee records must be in line with legislation including recording of employee details and copies of identification documents, termination of service procedures, and certificates of service.

(xxii) Record Keeping

This activity involves developing knowledge of what records need to be kept and how best to keep them.

(xxiii) Good housekeeping

Good housekeeping is about developing a work approach of keeping the site tidy, cleaning and putting away tools, and working in an orderly way. Developing good housekeeping assists a company in working efficiently and improving profit margins.

(d) Portfolio of Evidence

The Service Provider is to develop and maintain a portfolio of evidence for each sub-contractor. The Portfolio of Evidence is a collection of proof of the training, coaching, guidance and mentoring inputs provided to these entities. It is a living document which records the development progress of and will need to be updated continually throughout the duration of the project.

The Portfolio of Evidence should include the following documentation:

- a) Training courses completed by each sub-contractor,
- b) Hours of guiding, coaching and mentoring received for each activity listed in the development plan,
- c) Monthly progress reports on the development provided (inputs) versus the actual progress made (output) by the local sub-contractors, and
- d) List of competencies.

Whenever required, the Contractor via the Service Provider shall provide copies of such portfolio of evidence records to the Employer.

The Service Provider shall be paid separately in the Bill of Quantities for compliance to this required specification.

(e) Learning Material

Learning material may be required for the support development programme(s). Each Trainees shall receive a copy of the learning material to learn the contents and to use it as reference source for future works. Learning material shall include all technical specifications or best practice guidelines, manuals, literature papers, acts or policies etc as deemed necessary. The cost of procuring and furnishing such materials to the trainees shall be included in the rate for the provision of training facilities as specified below. The Contractor shall be required to submit tax invoices or receipts of purchase of such learning materials.

(f) Training Facilities

Where necessary, in such cases where on-site training is not practical, the Contractor shall be

responsible for providing everything necessary to offer the various training workshops including:

- (i) a suitable venue with sufficient furniture, lighting and power,
- (ii) all necessary stationery consumables and study material,
- (iii) transport for attendees.

The Service Provider shall be paid separately in the Bill of Quantities for compliance to this required specification.

PS10404 MEASUREMENT AND PAYMENT

ITEM

UNIT

PS10404.01 Provision of key personnel

(a) Senior Foreman or Clerk of Works or Site Technician..... Person-Month

The tendered monthly rate for the provision of the required key personnel (Service Provider) shall cover all costs related to establishing a dedicated Senior Foreman or Clerk of Works or Site Technician for the duration of the project as necessary, insurances, profit, overheads and any other day to day costs. Transport for this service and accommodation and subsistence, where applicable, shall be included in this rate. It must be noted that the key personnel provided is specific and dedicated to this Project Order and such resource shall not be permitted to be shared with other Project Orders/Contracts.

The unit of measurement shall be the person-months

ITEM

UNIT

PS10404.02 Training, coaching, guidance, and mentoring

(a) Conducting a skills audit and gap analysis..... Provisional (Prov) sum
 (b) Preparing Support development programme(s)..... Provisional (Prov) sum
 (c) Implementing Support development programme(s)..... Provisional (Prov) sum
 (d) Portfolio of evidence..... Provisional (Prov) sum
 (e) Training facilities..... Provisional (Prov) sum
 (f) Remuneration for workers undergoing training..... Provisional (Prov) sum
 (g) Handling costs and profit in respect of payment associated
 with sub-item PS10404.02(a) to PS10404.02(f)..... Percentage (%)

Measurement and payment shall be in accordance with the provisions of subclause 6.6 of the General

Conditions of Contract for Construction Works, 2015.

Payment under subitem PS10404.02 (a) shall be full compensation for the Service Provider conducting the skills audit and gap analysis for the Contractor (Pool A) or each sub-contractor, where applicable, in respect of the works allocated to them.

Payment under subitem PS10404.02 (b) shall be full compensation for the Service Provider in preparing the Support Development Programme(s) for the Contractor (Pool A) or each sub-contractor, where applicable.

Payment under subitem PS10404.02 (c) shall be full compensation for the Service Provider for costs arising from implementing the Support Development Programme(s) which shall include elements of training, coaching, guidance and mentoring, where necessary, of the Contractor (Pool A) or each sub-contractor, where applicable.

Payment under subitem PS10404.02 (d) shall be full compensation for the Service Provider for preparing and maintaining a portfolio of evidence for the Contractor (Pool A) or each sub-contractor, where applicable, in terms of any training, coaching, guidance and mentoring activities conducted.

Payment under subitem PS10404.02 (e) shall be full compensation for the Service Provider for the provision of the training venue, for all necessary lighting, power, furniture, stationery, consumables and study material and for transportation of the trainees to and from the training venue.

Payment under subitem PS10404.02 (f) shall be the daily wage in normal work hours of the individual workers whilst they are away from their normal duties and at training.

The tendered percentage for subitem PS10404.02 (g) is a percentage of the amounts actually spent under subitems PS10404.02 (a) to PS10404.02 (f), which shall include full compensation for handling costs, overhead charges and profit of the Contractor in appointing the Service Provider.

SECTION 1700: CLEARING AND GRUBBING
PS1702 DESCRIPTION OF WORK

Add the following descriptions:

(a) Light Cleaning

Light cleaning shall consist of the removal of material within the public transport facility which only requires the use of hand tools i.e. spades and brooms, etc. all which shall be necessary as deemed by the Employer's Agent. Normal cleaning for activities such as paving shall be deemed to be covered in the tendered rates for those respective activities.

(b) Heavy Cleaning

Heavy cleaning shall consist of the removal of material within the public transport facility which has been washed into the road or otherwise and will requires the use of machinery i.e. TLB and payloader, etc. all which shall be necessary as deemed by the Employer's Agent.

PS1704 MEASUREMENT AND PAYMENT**PS17.07 Road edge definition and cleaning**

The unit of measurement for clearing and grubbing shall be square meter. The quantity shall be taken as the area in square meters designated by the Employer's Agent and cleared and grubbed in accordance with these specifications.

Add the following to the end of the first paragraph of item 17.01:

"Only clearing and grubbing necessarily required for road works within the public transport facility and road reserve shall be measured for payment. Payment for clearing and grubbing for the construction of campsites shall be regarded as being included in the rates tendered for item 13.01 for the contractor's general obligations, and shall not be measured separately."

SECTION 2200: PREFABRICATED CULVERTS

PS2201 SCOPE

Add the following:

This section also covers the possible improvements to the existing drainage systems together with the raising or lowering of manhole or catchpit covers for stormwater drainage or utility services.

PS2203 MATERIALS

(a) Prefabricated concrete pipe culvert units

Delete last sentence of Clause 2203(a), "Pipes with ogee joints shall be provided, unless otherwise specified."

Add the following to Clause 2203(a):

"All pipes will be spigot and socket pipes with rubber rings to the manufacturer's specification".

(j) In-plant foamed BSM for backfilling

Add the following Clause:

The in-plant foamed BSM backfill material shall conform to Section PS10200 of the Project Specification. This material shall be compacted to a density of 100% Mod AASHTO.

PS2204 CONSTRUCTION METHODS

Add to Clause 2204 the following:

Generally, prefabricated stormwater drainage pipes and rectangular culverts will be installed using the 'trench method'.

PS2218 MEASUREMENT AND PAYMENT

Add the following payment item:

Item	Description	Unit
PS22.02 Backfilling:		
(d)	Using the in-plant foamed BSM from Ethekeeni Municipality's Asphalt Plant or Malacca Road stockpiles or other cubic	metre (m3)

The unit of measurement shall be the cubic metres of the material in place after compaction. The Quantity shall be calculated from the leading dimensions of the backfilling as specified or authorised by the Employer's Agent or Employer's Agent's Representative.

The tendered rate shall include full compensation for backfilling under, alongside or over conduits, for watering, and for compacting the backfill material to the specified density. The rate shall also include full compensation for supplying (including transporting) the in-plant foamed BSM material from Ethekeeni Municipality's Asphalt Plant stockpile but shall exclude mixing/processing of the in-plant BSM, provision and addition of the stabilizing agents, screening and crushing which all shall be paid for under the respective items in Section PS10200.

Add the following payment item:

Item	Description	Unit
PS22.03	Concrete pipe culverts :	
	(d) On sand bedding metre (m)	
	(e) On 19 mm crushed stone bedding metre (m)	

The unit of measurement for the concrete pipe culverts shall be the linear metre of pipe laid

In the second paragraph replace the words “selected granular material” and replace with:

Either “sand” or “19 mm crushed stone” as specified.

PS22.30 Repairs to drainage structures Provisional Sum (Prov Sum)

The provisional sum given for repairing or replacing existing drainage systems shall be expended in terms of Clause 6.6 of the General Conditions of Contract, 2015.

PS22.31 Raising or lowering of various drainage or service structures No.

The unit of measurement shall be the number of drainage or service structures to be raised or lowered. Type of structure and depth range indicated in the schedule of quantities.

The tendered rate shall include for all work necessary for the breaking-down or removal of brickwork or making good where necessary, re-setting of cover frames and the reinstatement of the surrounding roadway or sidewalk. This rate shall also be deemed to include for all labour and material costs including any finishes such as plastering or rendering of brickwork. It should also be noted that the roadway is to be opened to traffic as soon as possible and therefore the Contractor is to ensure that the concrete has set sufficiently. This will involve the use of rapid curing cement. Failure to use the prescribed cement will result in the work being rejected and the Contractor being instructed to re-do this work

SECTION 2300: CONCRETE KERBING, CONCRETE CHANNELLING, CHUTES AND DOWNPIPES, AND CONCRETE LININGS FOR OPEN DRAINS

PS2301 SCOPE

Add the following :

This section also covers the removal, repairs and reinstatement of the following elements:

- kerbs, channels, sidewalks, medians, islands, pedestrian and vehicular scoops and driveways.

PS2304 CONSTRUCTION

(j) Protection

Add the following :

The condition of all kerbs, channels and inlets on affected roads will be assessed prior to commencement of any Project. All damage to kerbs and channels caused thereafter by construction operations shall be made good by the Contractor at his own expense.

Tenderers are therefore advised to assess whether their anticipated method of construction will damage kerbs and channels and make allowances for the repair thereof in their unit rates.

The Contractor must take due precautions to protect kerbs, channels, guttering, manholes, guardrails, bridge railings, walls, poles and any other structures against soiling from bituminous binders during operations. Any soiling that does occur must be completely removed so as not to show any stains. The Contractor shall replace at his own cost any items that cannot be cleaned entirely.

The painting of soiled surfaces will not be acceptable as a suitable remedy.

Add the following new Sub-clauses to Clause 2304:

(l) Shrinkage joints for cast in-situ concrete work.

Unless shown otherwise on the drawings, cast in situ channels shall be provided with shrinkage joints spaced a maximum of 2m apart. Shrinkage joints shall be constructed so that shrinkage cracks are generated at the joints. Sections of channel which have cracked between shrinkage joints shall be removed and replaced by the contractor at his own cost.

(m) Formwork and finish

All visible edges of cast insitu channels shall be rounded with a rounding tool.

2307 MEASUREMENT AND PAYMENT

Add the following new pay items:

Item	Description	Unit
PS23.17	Repairs to kerbs	Provisional Sum (Prov Sum)

The provisional sum given for repairing damaged kerbing systems shall be expended in terms of Clause 6.6 of the General Conditions of Contract, 2015. Any damage to kerbs caused by poor workmanship shall be repaired at the Contractor's cost.

Item		Unit
PS23.18	Break-out and remove the following concrete roadway elements and cart to spoil	
	(a) Kerbs	metre (m)

(b) Kerb and channel	metre (m)
(c) Medians square	metre (m ²)
(d) Sidewalks square	metre (m ²)
(e) Driveways square	metre (m ²)
(f) Extra-over for selection of concrete for recycling cubic	metre (m ³)
(g) Extra-over for selection of re-usable kerbs metre	(m)
(h) Extra-over for haulage of suitable material	cubic metre (m)kilometer (km)

The unit of measurement shall be either the metre, square metre, cubic metre or cubic metre-kilometer as stated.

The tendered rate shall include full compensation for the breaking-out, removing, loading and carting to an approved spoil/tip site. The Employers Agent may instruct the Contractor to cart the material to a stockpile site with a freehaul distance of 10 km

The extra-over rate (f) shall include the cost of selection of concrete larger than 50 mm (nominal size) without reinforcing and stockpiling within 10 km.

The extra-over rate (g) shall include the cost of selection of concrete kerbs that can be re-used and stockpiling within 10km.

The extra-over rate (h) shall cover items PS23.18 (a), to (g) for hauling of suitable material as directed, in excess of 10km freehaul.

SECTION 2400: ASPHALT AND CONCRETE BERMS**2407 MEASUREMENT AND PAYMENT**

Add the following new pay items:

Item	Description	Unit
PS24.01	Asphalt berms	
	(c) Placed where specified by the Employers Agent using mix Sa-H10 (50/70) – Standard drawing no. 38577	
	(i) Type G: Extruded barrier kerb	metre (m)
	(ii) Type H: Extruded mountable kerb	metre (m)

The unit of measurement shall be the metre of asphalt berm placed as specified.

The tendered rates shall include full compensation for procuring, furnishing, mixing and placing the material, and all other work necessary for completing the asphalt berms as specified.

Item	Description	Unit
PS24.05	Removal of asphalt berm to:	
(a)	Spoil	metre (m)

The unit of measurement shall be the metre of asphalt haunching/berm removed.

The tendered rate shall include full compensation for the breaking-out, removing, loading and carting to an approved spoil/tip site.

(b)(i)	Stockpile	metre (m)
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The unit of measurement shall be the metre of asphalt haunching/berm removed.

The tendered rate shall include full compensation for the breaking-out, removing, loading and carting the material to a stockpile site within a freehaul distance of 10 km

(b)(ii)	Extra-over for haulage of suitable material	cubic metre (m). kilometer (km)
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The unit of measurement shall be cubic metre-kilometer of asphalt haunching/berm removed and carted to stockpile.

The extra-over rate (b)(ii) shall cover item PS24.05 (b)(i) for hauling of suitable material as directed, in excess of 10km freehaul

SECTION 3300: MASS EARTHWORKS**3312 MEASUREMENT AND PAYMENT**

Revise the following pay items:

Item 33.01

Amend the item description to read :

“Cut and borrow to fill including free-haul up to 10 km:”

Delete the fourth paragraph and replace with: “The tendered rates shall include full compensation for procuring furnishing and placing the material, including excavating as if in soft excavation, the cutting of benches, for transporting the material for a free-haul distance of 10km; for preparing, processing, shaping, watering, mixing, and compacting the materials to the densities or in the manner specified herein and for removing and disposing of up to 5% oversize material from the road after processing, including transport for a free-haul distance of 10 km.”

Item 33.07

Amend the item description to read :

“Removal of unsuitable material (including free-haul of 10 km):”

Delete the fourth paragraph and replace with: “The tendered rates shall include full compensation for the removal of all classes of unsuitable material and shall distinguish only between stable and unstable material and layer thicknesses of less than and exceeding 200 mm. It will also include compensation for free-haul of 10 km.

SECTION 3400: PAVEMENT LAYERS OF GRANULAR MATERIAL**3407 MEASUREMENT AND PAYMENT**

Add the following new pay items :

Item		Unit
PS34.01	Pavement layers constructed from granular material taken from commercial sources	
	(a) Gravel selected layers compacted to	
	(ii) 95% of modified AASHTO density	
	(1) Lower selected layer (G9) 150mm thick	cubic metre (m3)
	(2) Upper selected layer (G7) 150mm thick	cubic metre (m3)
	(c) Gravel subbase (unstabilized gravel) compacted to	
	(ii) 97% of modified AASHTO density	
	(1) G5 150mm thick cubic	metre (m3)
	(2) G4 150mm thick cubic	metre (m3)
	(3) G5 200mm thick cubic	metre (m3)
	(4) G5 300mm thick cubic	metre (m3)
	(5) G4 200mm thick cubic	metre (m3)
	(6) G4 300mm thick cubic	metre (m3)

The unit of measurement shall be the cubic metre of compacted pavement layer, and the quantity shall be calculated from the authorized dimensions of the completed layer.

The tendered rates shall include full compensation for procuring the material from commercial sources, placing and compacting the material, including the cost of transporting the material to site, and the protection and maintenance of the layer and the conducting of control tests, all as specified

SECTION 3500: STABILIZATION**PS3502 MATERIALS****(a) Chemical stabilizing agents**

Delete sub-sub clause 3502(a)(ii); (iii); (iv); and (v) and replace with the following:

The new SABS ENV 197-1 standard specifications for cement will be applicable to this Contract (Refer to Clause PS1229 in the Project Specification).

Delete subclauses (ii) Ordinary Portland cement and (iii) Portland blast-furnace cement and replace with the following:

"Cement shall comply with the relevant requirements of EN 197. The use of strength classes greater than 32,5 shall not be permitted."

PS3503 CHEMICAL STABILIZATION**(h) Curing the stabilized work**

Add the following after the second paragraph:

The curing method for the stabilised subbase shall be as follows:

Method 3503(h)(i) shall apply for the first 24-hour period, thereafter method 3503(h)(ii) shall apply meaning that the asphalt paving shall be undertaken before the 24-hour period has expired. During this curing period the stabilized layer shall have limited access to light vehicles only. All heavy vehicles are to be diverted during this period.

Alternatively, the Contractor shall be permitted to cure the stabilized layer for seven (7) days but shall be responsible for the diversion of all traffic over this period and all costs for the related traffic accommodation measures.

PS3506 TOLERANCES

Delete item b (ii) in its entirety and replace with the following:

b(ii) the Unconfined Compressive Strengths and the Indirect Tensile Strengths required to be met on a project will be specified in the Project Brief.

PS3510 MEASUREMENT AND PAYMENT**Payment Item 35.02 Chemical stabilising agent**

Add the following note to this payment item:

The notation used for Portland cement and Portland blast-furnace cement corresponds with the notation specified in SABS ENV 197-1.

SECTION 3600 : CRUSHED STONE BASE**PS3602 MATERIALS****(a) Requirements for crushed aggregate**

Amend the second sentence as follows:

“Sampling shall be in accordance with Section 8100. The aggregate shall not contain more than 0,1% by mass of unwanted material such as wood, coal or similar organic material. Aggregate shall not contain more than 2% by mass of free mica especially muscovite, obtained by visually separating the particles, or more than 4% by volume obtained from microscope slices. Only aggregate containing mica, such as granite, gneiss, mica schist, pegmatite or sandstone or mica intrusions need to be evaluated. Soft or weathered particles must be controlled by the Durability Mill Index values specified in table 3602/1 under Durability.”

Add after the last sentence the following:

“Rocks containing easily detectable quantities (more than 1%) of olivine, serpentine and sulphide minerals, such as pyrites and marcasite, must be considered with caution, and may warrant additional evaluation to the satisfaction of the Employer’s Agent.”

(c) Grading Requirements

Add the following new subclause:

“Ethylene glycol durability index

The ethylene glycol durability index shall not exceed the value of 4.”

Table PS3602/1

Durability

Add the following:

“For Basic crystalline rocks, Arenaceous rocks, Argillaceous rocks and Diamictites the Durability Mill Index (DMI) shall be less than 125. For all other rock types the Durability Mill Index (DMI) shall not be more than 420 subject to the % passing the 0,600mm sieve not increasing by more than 8 percentage points during the Durability Mill test.”

Add the following:

“The grading of the crushed aggregate for the crushed stone G2 base shall conform to the grading limits given in table 3602/1 for nominal 37.5mm size aggregate and the material shall conform to the target grading within the tolerances given in table 3602/4 for nominal 37.5mm size aggregate, and in reference to table PS4302/13.”

PS3604 CONSTRUCTION

Add the following subclause

(j) The construction of the crushed rock subbase

The dump rock layer shall be placed by end tipping to a thickness as instructed by the Employer’s Agent. After spreading it shall be given a 6 pass compaction using a 3 tonne vibratory roller and the rock surface then inspected for any isolated loose rock particles. The layer must then be compacted using a further 2 passes of the vibratory roller after the repositioning, by hand, of any replaced rock particles. The layer must then be blinded with 10 mm evenly graded aggregate placed by an end tipping operation and spread. The blinding material will then be subjected to sufficient passes of a vibratory roller to fill the voids in the rock layer. Additional material shall then be added until the blinding process has been completed.” The alternative of placing synthetic-fibre filter fabric as opposed to the 10mm evenly graded stone will be considered subject to motivation being supplied to the Employer’s Agent Representative for consideration. This synthetic-fibre filter fabric shall be of grade A7 or similar.

PS3607 QUALITY OF MATERIALS AND WORKMANSHIP

Delete the second paragraph and add the following:

Test results and re-measurements shall be assessed in accordance with the provisions of Section 8200: Quality Control (Scheme 1) of the standard specifications, as amended in these project specifications.

PS3608 MEASUREMENT AND PAYMENT

Add the following to sub pay item PS36.01

Item	Description	Unit
PS36.01	Crushed rock subbase and blinding of layer	
	(g) Crushed dump rock subbase	tonnes (t)
	(f) 10mm evenly graded stone	tonnes (t)

The unit of measurement shall be the tonnes of crushed dump rock subbase delivered to site and tonnes of 10mm evenly graded crushed aggregate required to blind the dump rock and constructed in accordance with the method specification as specified in Section PS3604(j) above. The quantity shall be calculated from the delivery notes of the layer as specified or prescribed by the Employer's Agent.

The tendered rate shall include full compensation for procuring, furnishing and placing all materials, and for hauling the material over an unlimited free-haul distance from a commercial source.

(h) Synthetic-fibre filter fabric **square metre (m2)**

The unit of measurement for sub item PS36.01(h) shall be the square metre of filter fabric supplied and installed as specified by the Employer's Agent. Type of filter fabric as specified in the schedule of quantities.

The tendered rate shall include full compensation for procuring, furnishing, cutting, overlapping, jointing, placing and protecting the filter fabric as specified as well as wastage

SECTION 3800: BREAKING UP EXISTING PAVEMENT LAYERS

Amend the following, wherever found in this section, to read:

Freehaul of 1.0km to read Freehaul of 10km

PS3805 CONSTRUCTION**(b) Milling****(iii) Asphalt**

Add the following new paragraph:

"The material originating from the milling of the existing asphalt layers shall become the property of the Employer and the transport thereof to a designated stockpile site shall be the responsibility of the Contractor. The cost for stockpiling of the milled material, inclusive of loading and haulage to a freehaul of 10.0km radius, shall be deemed to be included in the tendered rates for the milling of the asphalt layers."

(vi) General

Add the following:

"Where milling is to be done at existing structures, care shall be exercised to avoid damage to concrete elements, expansion joints, nosing to expansion joints, manholes, catch pits etc. Damage caused to any element forming part of the permanent works shall be repaired at the Contractor's cost.

The floor of the milled excavation shall be cleaned out of all loose material by brooming. The exposed floor of the excavation shall be lightly sprayed with water to identify cracks. The Employer's Agent's Representative shall be given the opportunity to inspect the milled surface for cracks and loose patches and any cracks or loose patches shall be repaired in accordance with the relevant sections of the specification." Finally the cut should be blown using a blower or compressor such that no dust or loose stone is visible. The Employer's Agent's Representative shall be given the opportunity to inspect and approve the cut such that the subsequent operation can follow.

PS3807 MEASUREMENT AND PAYMENT**(b) Overhaul**

Delete and replace with the following:

"Overhaul shall be paid on material milled of the existing asphalt layers and hauled in excess of 10km radius from the site of origination. Irrespective of whether the Employer intends to utilise the material for recycling or reworking or whether the material is transported to a stockpile or dump site. The contractor shall include for the freehaul of 10km in the rates tendered."

Item	Description	Unit
PS38.02	Milling out existing bituminous material with an average milling depth:	
	(a) Not exceeding 30m	cubic meter (m3)
	(b) Exceeding 30mm but not 60mm	cubic meter (m3)
	(c) Exceeding 60mm but not 120mm	cubic meter (m3)
	(d) Exceeding 120mm	cubic meter (m3)
PS38.16	E.O 38.02 (a), (b), (c) and (d) hauling of material in excess of 10km radius cubic metre. kilometer	

Delete the third paragraph in the description of payment and replace with the following:

"The tendered rate shall also include full compensation for loading and unloading irrespective of method, transporting and stockpiling of the material, to a free haul distance of 10km radius from site of origination." Amend the following pay item.

PS38.15	Moving the milling machine from site to site by lowbed as agreed with the Employer's Agent or Employer's Agent's Representative for the following size machines:	
	(i) 0,0 m to 1,0 m	Number (No)
	(ii) greater 1,0 m to 1,5 m	Number (No)
	(iii) greater than 1,5 m	Number (No)
	Amend the first paragraph to read:	

The unit of measurement shall be the number of times the machine is moved for more than 10km by lowbed, as approved by the Employer's Agent or Employer's Agent's Representative.

SECTION PS 4200: ASPHALT BASE AND SURFACING

Replace this section of the specification with the following:

PS 4201 SCOPE

This section covers all work in connection with the construction of asphalt bases and surfacing. It includes the procuring and furnishing of aggregate and bituminous binder, mixing at a mixing plant, spreading and compaction of the mixture, all as specified herein.

PS 4202 REFERENCES AND STANDARD SPECIFICATIONS

Reference to the following standard specifications, guideline documents and codes of practice (Table 1) shall be deemed to be references to the latest issues of the relevant documents: -

Table 1 Reference and Standard Specifications

Reference	Title	Date of Issue
SANS 9001	Quality management systems – Requirements	Edition 5 2015
SANS 4001-BT1	Penetration grade bitumen	Edition 1.3 2016
SANS 4001-BT3	Anionic bitumen road emulsions	Edition 1 2014
SANS 4001-BT4	Cationic bitumen road emulsions	Edition 1 2014
SANS 1083	Aggregates from natural sources	Edition 2.6 2018
SANS 824	Lime for soil stabilization	Edition 2.1 2006
SANS 50197-1	Cement – Part 1:Composition, specification and conformity criteria for common cements	Edition 2 2013
SATS 3208	South African PG Binder Classification System	Edition 1 2019
Act 85 of 1993	Occupational health and safety act	As amended
Act 39 of 2004	National environmental management : Air quality act	As amended
Sabita Manual 5	Guidelines for the manufacture and construction of hot mix asphalt	October 2020
Sabita Manual 24	User guide for the design of asphalt mixes	June 2022
Sabita Manual 27	Guidelines for thin hot mix asphalt wearing courses on residential streets	May 2008
Sabita Manual 32	Best practice guideline for warm mix asphalt	September 2011
Sabita Manual 33	Design procedure for high modulus asphalt (EME)	Revised 4 th edition November 2022

TRH8/ Sabita Manual 35	Design and use of asphalt in road pavements	Revised 6 th edition February 2023
Sabita TG1	The use of modified bituminous binder in road construction	5 th Edition November 2020
TRH 21 / Sabita Manual 36	Use of reclaimed asphalt in the production of asphalt	May 2022
SAPEM	South African Pavement Engineering Manual	Second Edition October 2014

PS 4203 DEFINITIONS AND MIX NOMENCLATURE

PS 4203.01 Definitions

The following definitions and abbreviations are used throughout this section.

Table 2 Definitions

NMPS	Nominal maximum particle size
Sa	Sand skeleton mix
St	Stone skeleton mix
SMA	Stone mastic asphalt
EME	Enrobé à module élevé
UTFC	Ultra thin friction course
WMA	Warm mix asphalt
BRASO	Bitumen rubber semi-open graded asphalt
S	Standard traffic and speed conditions
H	Heavy traffic and speed conditions
V	Very heavy traffic and speed conditions
E	Extreme traffic and speed conditions
R	Permanent deformation (Rutting) foremost consideration in mix
F	Fatigue foremost consideration in mix

PS 4203.02 Mix Nomenclature (or Mix Description)

The following nomenclature shall be used for mixes used for the eThekweni Municipality.

A mix shall be defined from amongst the following mix types :-

- Sa
- St (currently not applicable for eThekweni roads unless as a special mix (e.g. SMA, EME))
- Special Mixes
 - o SMA
 - o EME
 - o UTFC
 - o BRASO
 - o Proprietary Mixes

The mix type shall be further defined by the following :-

- the typical conditions under which a mix is to be used (type Sa mixes only)
 - o S Standard conditions
 - o H Heavy conditions
 - o V Very heavy conditions

- o E Extreme conditions

The criteria for these conditions is based on the binder grade selection procedure outlined in Sabita Manual 35 (reproduced below).

Table 3 Traffic Loading Conditions

Design Traffic (10 ⁶ E80's)	Traffic Speed (km/h)		
	< 20	20– 80	> 80
< 0.3	S	S	S
0.3– 3	H	S	S
>3-10	V	H	S
>10– 30	E	V	H
>30– 100	E	E	V
> 100	E	E	E

- the NMPS of the mix
 - o Permitted NMPS sizes are noted in Table 4.
- the critical failure consideration for the mix (optional for Type Sa and EME mixes)
 - o F fatigue
 - o R permanent deformation (rutting)
- The class of the mix (EME mixes only)
 - o Either class 1 or class 2.

The mix types shall thus be labelled as follows :-

- “Mix type”-“Condition” “NMPS” “Failure Mode” (Mix Class)

o Examples

- Sa-H14F

This is a Sand Skeleton mix for use under Heavy traffic loading and speed conditions with Nominal Maximum Particle Size of 14.0mm that should lend itself to maximizing fatigue resistance.

- EME-14R(2)

This is an EME class 2 mix with Nominal Maximum Particle Size of 14.0mm designed for resistance to permanent deformation (rutting).

- SMA-14

This is an SMA mix with Nominal Maximum Particle Size of 14.0mm.

Note that the mixes SMA, EME, UTFC and BRASO (etc.) will fall into either the type Sa or St mixes. However, these mixes (like the proprietary mixes) are special mixes with very specific characteristics and associated design approaches and are thus specifically and separately named.

PS 4204

MIX DESIGN

Mix designs are to be conducted in accordance with the documents noted in Table 4. Further reference should be made to Sabita Manual 24 “User Guide for the Design of Asphalt Mixes” as may be required.

Cost of designs:

There shall be no separate provision under Measurement and Payment for the costs associated with the asphalt mix designs. Such costs are to be included in the tenderers construction rates for supplying and laying that particular asphalt mix. Such costs shall include producing, for each mix, and or, binder type specified, laboratory mix design followed by plant mix verification and trials confirming conformance to the particular design method and product properties specified.

Any changes to individual components, or properties of a mix, even after initial acceptance has been given, shall require that a new mix design process be undertaken, with any extension of time and cost implications for re-design and trial section at the cost of the Contractor.

Table 4 Asphalt Mix Design Documents

Sand Skeleton Mixes	TRH 8/Sabita Manual 35	Design and use of asphalt in road pavements
Stone Mastic Asphalt (SMA)	TRH 8/Sabita Manual 35	Design and use of asphalt in road pavements (Appendix B)
Enrobé à Module Élevé (EME)	Sabita Manual 33	Design procedure for high modulus asphalt (EME)

Asphalt mixes shall be selected from the list of permitted mixes noted in Table 5. Mix requirements will be detailed in the project specification in terms of :-

- Mix description (as outlined in clause 4.2 Mix Nomenclature)
- The required level of design.

Table 5 eThekweni Asphalt Mixes

Mix Nomenclature	NMPS (mm)			
	7	10	14	20 ¹
Sa-S	X	X	X	
Sa-H		X	X	X
Sa-V			X	X
Sa-E			X	X
SMA		X	X	
EME			X	X
Proprietary and Other Mixes	To hold Agrément South Africa certification or subject to approval by Roads Provision. NMAS as per Manufacturer's specification.			

1. Use of 20mm NMPS mixes is not recommended.

Special asphalt mixes (e.g. UTFC, proprietary mixes, etc.) shall hold Agrément South Africa fit-for-purpose certification. Alternatively, the use of a particular mix shall be subject to the approval of the Roads Provision Department.

PS4204.1 Materials

Materials shall conform to the requirements and recommendations outlined in Sabita Manual 35.

PS 4204.1.1 Binders and Aggregates

The specifications pertinent to specific raw materials should conform to accepted industry standards and shall be documented in the Asphalt Mix Design Report. These specifications shall be used for quality management purposes. Any deviations from standard industry practice as outlined in Sabita Manual 35 shall be documented in the Asphalt Mix Design Report and shall specifically be brought to the attention of the Roads Provision Department.

PS 4204.1.1.1 Nominal Mix Proportions of Stone and Sand Skeletal Mixes for Tender Purposes

The mix proportions of bituminous binder, combined aggregates and filler for the various mix types, as listed in Tables 5a and Table 5b below, are nominal, and shall only be used for tendering purposes. The proportions actually used shall be as determined during the mix design, trial section and assessment requirements as specified in the project specifications, Section PS4200. Any approved variation to these nominal mix proportions, and or, application rates shall be subject to an adjustment in payment, as relevant to the applicable variation rates tendered for each component as listed under Measurement and Payment below

Table 5a: Nominal Mix Proportions of Stone Skeletal Mixes for Tender Purposes

MIX TYPE	High Modulus Base (EME)		Continuous graded base and surfacing: standard or homogenous modified bitumen			Stone Mastic Asphalt (SMA)		Continuous graded and semi-open graded surfacing: Bitumen-rubber:	
	20	14	20	14	10	14	10	20,0	14,0
Nominal maximum particle size	20	14	20	14	10	14	10	20,0	14,0
Aggregate (%)	93,0	92,0	94,0	93,5	93,0	92,5	92,0	92,0	91,5
Bitumen (%)	6,0	7,0	5,0	5,5	6,0	6,5	7,0	7,5	8,0
Active filler* ¹	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Cellulose fibre (%)	N/A	N/A	N/A	N/A	N/A	0,5	0,5	N/A	N/A

*Note 1: Active filler for tender purposes shall be hydrated lime

Table 5b: Nominal Mix Proportions of Sand Skeletal Mixes for Tender Purposes

MIX TYPE	Continuous graded base and surfacing: standard and homogenous modified bitumen			Gap and semi-gap mixes using standard and homogenous modified bitumen	
	20	14	10	14	10
Nominal maximum particle size	20	14	10	14	10
Aggregate (%)	94,0	93,5	93,0	92,5	92,0
Bitumen (%)	5,0	5,5	6,0	6,5	7,0
Active filler* ¹	1,0	1,0	1,0	1,0	1,0

*Note 1: Active filler for tender purposes shall be hydrated lime

PS 4204.1.2 Reclaimed Asphalt

The use of reclaimed asphalt (RA) is permitted subject to the limitations noted under the specific mix types. The inclusion of RA in a mix design shall be documented in the Asphalt Mix Design Report.

The incorporation of reclaimed asphalt into the mix should be guided by Sabita Manual 36 / TRH 21 "Use of reclaimed asphalt in the production of asphalt".

PS 4204.1.3 Warm Mix Asphalt Technologies/Additives

The use of Warm Mix Asphalt (WMA) is permitted (and preferred) and shall be documented in the Asphalt Mix Design Report. The use of Warm Mix Asphalt should be guided by Sabita Manual 32 "Best practice guideline for warm mix asphalt".

PS 4204.2 Mix Design

No mixes may be supplied without submission of an Asphalt Mix Design Report and acceptance thereof by the Roads Provision Department.

The mix design process shall consist of a laboratory design, a plant trial and (if required) a paved trial for every mix supplied

PS 4204.2.1 Specific Mix Design Requirements**PS 4204.2.1.1 Sand Skeleton Mixes**

The reclaimed asphalt (RA) content of sand skeleton mixes shall be limited to 50% maximum.

The following additional requirements and guidelines should be taken into consideration for any particular level of mix design :-

PS 4204.2.1.1.1 Level IA Design

The design should also take into consideration the recommendations of Sabita Manual 27 "Guidelines for thin hot mix asphalt wearing courses on residential streets".

Further to Sabita Manual 35 Table 23 (VMA), the VMA for the 7.1mm NMPS mix shall be 16% (target design voids 4%).

Mixes shall comply with the requirements noted in Tables 22, 23 and 24 of Sabita Manual 35. Mixes shall further comply with the requirements noted Table 6 (below).

Table 6 Empirical Performance Tests (Level 1A)

Test	Requirement	Test Method / Reference
Filler/Binder Ratio	1.3 max.	Sabita Manual 35 cl. 4.3.4 Note 4.3
Binder Film Thickness (µm)	7.5 min.	Sabita Manual 35 cl. 5.5.1(4)(a)
Modified Lottman (TSR)	0.8 min.	ASTM D 4867 M
Air Permeability (@ 7% Voids) (x 10 ⁻⁴ cm ²)	1.0 max.	TRH 8 App C
Marshall Stability, Flow and Quotient	Report	SANS 3001-AS2

PS 4204.2.1.1.2 Level IB Design

A maximum of 10% natural sand (by mass of mix aggregates) may be used in sand skeleton mix types designed to Level IB. Although Sabita Manual 35 requires the use of a gyratory compactor for laboratory mix evaluation, the use of Marshall compaction will however be permitted. Gyratory compaction is nevertheless the preferred method of compaction. Briquettes for mix evaluation shall be compacted at the compaction effort noted in Table 7.

**Table 7 Volumetric
Compaction Requirements**

Gyratory	Marshall
AASHTO T 312	SANS 3001 AS1
N _{design}	No. Blows
75	75+75

PS 4204.2.1.1.3 Level II Design

Although Sabita Manual 35 recommends the use of a Level III design for traffic loading in excess of 30 million E80's, within an urban environment there are a number of roads falling within this traffic loading scenario but for which a Level III design is not warranted. The Level II design approach is thus acceptable for roads with this higher traffic loading. However, the laboratory compaction will be as noted in Table 8.

Table 8 Level II Laboratory Compaction Requirements	
Design Traffic (E80's)	N_{design}
3 to 30 million	100
> 30 million	125

Therefore, in order to identify the requisite compaction parameters for a particular E80 design traffic loading, the Level II design will be labelled in the project specification as follows :-

- Level II(A)

Level II(A) will cater for an E80 design traffic loading of less than or equal to 30 million E80's.

- Level II(B)

Level II(B) will cater for an E80 design traffic loading of greater than 30 million E80's.

The mix durability requirements noted in Table 28 of Sabita Manual 35 shall be altered to reflect a minimum Modified Lottman value of 0.8 for both Base and Wearing Course mixes.

PS 4204.2.1.1.4 Level III Design

Level III designs (if required) will only be conducted on roads with a design traffic loading of greater than 30 million E80's in line with the recommendations of Sabita Manual 35.

The mix durability requirements noted in Table 28 of Sabita Manual 35 shall be altered to reflect a minimum Modified Lottman value of 0.8 for both Base and Wearing Course mixes.

PS 4204.2.1.2 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 permitted 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 after compaction on site thereby ensuring coarse aggregate interlock. Coarse aggregate for both NMPS shall be defined as all material retained on the 5mm sieve.

The use of “natural” sand and reclaimed asphalt (RA) shall not be permitted in SMA mixes. The stability of the fine aggregate mortar will require enhancement with either cellulose fibre or through modification of the binder or both.

The SMA mix shall also conform to the requirements in Table 9.

Table 9 SMA Mix Specifications

Design Air Void Content (%)	4.0
Voids in Mineral Aggregate (VMA) (Min.)	17
Modified Lottman (TSR) (Min.)	0.7
Schellenberg Drainage Test (%) (Max.)	0.3
Air Permeability (@ 7% Voids) ($\times 10^{-8} \text{cm}^2$) (Max.)	1.0
VCAmix ¹ (%)	< VCA _{dry} ²

Note 1. VCAmix is the voids in coarse aggregate (>5mm) of the compacted mix.

Note 2. VCA_{dry} is the voids in coarse aggregate (>5mm) of the dry rodded coarse aggregate.

SMA mixes shall also conform to the permanent deformation requirements noted in Table 33 of Sabita Manual 35.

The mix design document should clearly document the process followed to meet the desired SMA characteristics.

PS 4204.2.1.3 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 permitted for two NMPS:-

- 14mm
- 20mm

The use of “natural” sand shall not be permitted in EME mixes.

The reclaimed asphalt (RA) content of EME mixes shall be limited to 20%.

The mix design document should clearly document the process followed to meet the desired EME characteristics.

PS 4204.2.1.4 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 Manual 33 “Design procedure for high modulus asphalt (EME)” or standard industry practice shall be brought to the attention of the Roads Provision Department and shall be documented in the mix design report.

The use of Warm Mix Asphalt should be guided by Sabita Manual 32 “Best practice guideline for warm mix asphalt”.

PS 4204.2.2 Asphalt Mix Design Report

Once satisfied that the laboratory design, the plant and (if required) paved trials meet the specified mix requirements, the Manufacturer shall submit an Asphalt Mix Design Report

recording the essential information relating to the design. This shall be recorded on the relevant COTO "D3" form **and shall be supplemented with a report documenting any further information required in terms of this Technical Note**

The final mix parameters (i.e. the Job Mix Formula (JMF)) will be based on the test results for the plant trial and will be used for production quality control and acceptance purposes. The Manufacturer shall include the following "mix characteristics" as a part of his Mix Design Report submission :-

- A unique identification number for every mix design
- The use of any Warm Mix Asphalt technology/additive. The Manufacturer shall document the name and type of technology/additive to be used together with any other technical information pertinent to its use in the asphalt mix. The Manufacturer shall further comment on any modifications to the "standard" mix design process consequential to the use of the Warm Mix Asphalt technology/additive.
- The recommended maximum mix temperature in the truck at the exit from the plant (in line with industry norms)
- The recommended 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.

PS 4204.2.2.1 Mix Design Acceptance Process

It is not necessary for a new mix design to be compiled for every project. The Manufacturer may supply proof that an existing mix design is still current and has already been accepted by the Public Transport Infrastructure Department. In the case of the submission of a new mix design, the Manufacturer shall submit his proposed mix design to the Public Transport Infrastructure Department for acceptance of the mix design at least 2 weeks prior to initial supply of any particular mix.

Upon request by the Public Transport Infrastructure Department, the Manufacturer shall supply samples of raw materials and any other relevant information as may be requested to facilitate acceptance of the mix design.

Once satisfied with the content of the mix design, the Senior Manager : Pavement & Geotechnical Engineering (or his nominee) will give signed acceptance for the mix

PS 4204.2.3 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 basic raw material properties and mix characteristics.

Should the binder, aggregate or mix characteristics of any particular 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 Manufacturer shall undertake the appropriate performance test to prove compliance with the specification.

PS 4204.3 Asphalt Production**PS 4204.3.1 Mixing Plant**

Asphalt shall be manufactured through a plant capable of meeting the full design requirements of any particular mix. 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. The plant shall be approved by the Roads Provision Department.

Sufficient reserves of raw materials shall be held at the plant for all mixes being supplied to the eThekweni Municipality to prevent delays in construction projects. It will be incumbent on the plant manager to ascertain demand and time frames from Contractors or Municipal Departments to whom they are supplying mix.

All cold aggregates shall be stockpiled and protected in a manner that precludes the possibility of aggregate contamination from adjacent stockpiles, from the underlying ground or from weather conditions.

Binder storage tanks shall be provided and managed to ensure that there is no risk of contamination of different binder types. Binder storage tanks shall be heated and the binder circulated in such a manner that the binder is not degraded during heating. The heating and circulation of binders should conform to the recommendations of the binder supplier.

The plant and its operation shall conform to the requirements of the following legislation: -

- Occupational Health and Safety Act
- National Environmental Management : Air Quality Act

PS 4204.3.2 Quality Control

The Manufacturer shall have an active Quality Management System in place compliant with the quality processes outlined in Sabita Manual 35. The quality of mix produced shall be monitored as directed in the Manufacturer's Quality Management System. The asphalt mix constituents (i.e. binder and aggregates), and the asphalt mix produced shall be checked for compliance and consistency on a regular basis through routine process control testing. The results of such testing shall be made available for review by the Public Transport Infrastructure Department at all times.

PS 4204.3.2.1 Quality Management System

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 Public Transport Infrastructure Department. Such

samples are to be delivered to the Roads Provision's Bitumen and Asphalt Laboratory located at the Old Fort Road, City Engineers. All samples shall be adequately and uniquely labelled so that the location of any related mix is readily traceable.

The QMS shall also document the processes to be followed whenever a deviation from specifications is identified. The Manufacturer shall provide full rectification of any work undertaken with such asphalt mix or materials.

The plant laboratory should preferably be SANAS accredited for the tests undertaken. However, should the laboratory not be SANAS accredited, the laboratory will need to be approved by the Roads Provision Department.

In line with these processes, the QMS should include as a minimum the material characterisation tests included in Table 10 for every type of mix supplied

Table 10 Test Frequencies

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
		Aggregate Grading	Every batch delivered
	Fine Aggregate	Aggregates BRD, ARD and Water Absorption	1 per month
		Sand Equivalent (Fine Aggregates)	Every batch delivered
		Methylene Blue Adsorption Value	1 per month
Asphalt Mix	Temperature Of Mix	In the truck at the exit weighbridge	Every load
		In the truck at the point of delivery	Every load

PS 4204.3.2.1.1 Test Methods

The test methods used in the design of asphalt mixes and quality management in the production of asphalt should be in line with those noted in Sabita Manual 35. However, the determination of the bulk density of asphalt mix in terms of SANS 3001-AS10 shall be modified as follows.

PS 4204.3.2.1.1.1 Asphalt Briquette/Core Bulk Density Test Method

The bulk density of compacted asphalt mixtures shall be determined in accordance with SANS 3001-AS10:2011 Edition 1 save that the measurement of the volume of the specimen as stated in clause 6.2 shall not apply.

For general measurement of volume for non-absorptive mixes (generally VIM < 6%), the method outlined in clause 6.4 of SANS 3001-AS10 shall be used.

However, for mixes suspected of being absorptive/porous, or in the event of a dispute over mix density, briquette or core density shall be determined by either the paraffin wax coating method (ASTM D 1188) or the automatic vacuum sealing method (ASTM D 6752)

The density of porous mixtures (generally VIM >15%) shall be measured in accordance with SANS 3001-AS10 with the measurement of volume as specified in clause 6.6.

PS 4204.3.2.2 Process Control

The 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 11.

Table 11 Job Mix Formula Tolerances

Tolerances			Permissible Deviation from JMF (%)	
			Individual Results	Average of 3 Consecutive Results
Aggregate Fraction Grading	Sieve Size (mm)	28	± 5.0	± 3.0
		20	± 5.0	± 3.0
		14	± 5.0	± 3.0
		10	± 5.0	± 3.0
		7.1	± 5.0	± 3.0
		5	± 4.0	± 2.5
		2	± 4.0	± 2.5
		1	± 4.0	± 2.5
		0.6	± 4.0	± 2.5
		0.3	± 3.0	± 2.0
		0.15	± 2.0	± 1.5
		0.075	± 1.0	± 1.0
Voids in the Mix (@ design compaction)			± 1.5	± 1.0
Binder Content	General Mixes (Sa, SMA, EME, etc.)	± 0.3	± 0.2	
	Gap Graded & Bitumen Rubber	± 0.4	± 0.3	

All process control testing undertaken by the Manufacturer shall be signed off by the responsible person identified in the QMS and shall be made available to the Roads Provision Department.

- 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

The Manufacturer 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 Roads Provision Department. The processes related to the rectification of such work shall be outlined in the QMS

PS 4204.3.2.3 Acceptance Testing

After reviewing the results of the process control testing, the Roads Provision Department 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 Manufacturer as soon as they are available.

If the acceptance tests indicate that the mix (or any part thereof) is not to specification, the cost of any re-test by the Municipality shall be borne by the Manufacturer.

PS 4204.3.2.4 On Site Mix Problems

The Manufacturer 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 trouble-shooting the cause of such problems. If the root cause of the problem is related to the asphalt mix design, the Manufacturer shall re-evaluate his mix design to correct such issues and re-submit his mix design for acceptance.

PS 4205 CONSTRUCTION

PS 4205.01 Paver Trial

The Employer's Agent may authorize the Contractor to supply and place in an approved portion of the roadway one or more of the mixes. In such a case approximately 25 tons of the mix shall be laid and shall be paid for at the rates in the Schedule of Quantities. After the Employer's Agent has approved a mix design, the type of mix, shape of grading curve and source of the aggregate used in that mix shall not be changed without the prior approval of the Employer's Agent.

PS 4205.02 Tack Coat

Upon approval of the surface of the underlying layer, and immediately before laying asphalt, a tack coat shall be applied by approved means at the rate of 0,3 l/m² if required by the Employer's Agent. The Contractor shall take whatever measures are necessary to protect concrete kerbs and channels and other street furniture from overspray. Failure to comply will result in the contractor remedying the situation at his cost. The unit of measurement shall be the square metres (m²) of tack (60% anionic stable grade emulsion) applied at the specified application rate.

The tendered rate shall include for the procuring, furnishing and application of the material as specified, including all labour, plant, equipment and all other incidentals required to carry out the operation successfully.

PS 4205.03 Delivery

The asphalt shall be transported to the site in vehicles having bins consisting of metal sides and bottoms. The insides of the bins shall be free of all foreign matter and be lightly oiled to prevent adhesion of asphalt. The opinion of the Employer's Agent or Employer's Agent's Representative regarding the amount of oiling necessary shall be final. The bins shall be covered with tarpaulins or other suitable material when loaded to protect the asphalt from inclement weather and to

prevent loss of heat during transportation. The temperature of asphalt on arrival on site shall conform to relevant specification for the mix and in harmony with the Industry Standard Guidelines.

PS 4205.04 Placing

The laid widths of wearing course shall be so arranged that longitudinal joints shall coincide with future lines marking traffic lanes in the roadway. Paving shall cease when rain starts falling or when the surfaces to be paved are visibly wet

PS 4205.04(a) Paver Laid Asphalt

Asphalt mixture shall be delivered to the paver in such a manner that the paver will never be forced to stop for lack of asphalt. The mixer capacity and the operating speed of the paver are to be so co-ordinated as to ensure continuous laying and to avoid intermittent stopping of the paver.

The temperature of the mixtures shall be controlled by measuring in a random pattern in the truck immediately before emptying and shall not be more than 10oC below the minimum temperature specified for mixing as per the mix design. The adjustment of the screed, tamping bars, feed screws, hopper feed, etc, shall be checked frequently to ensure uniform spreading of the mix. If segregation or tearing occurs, the spreading operations shall immediately be suspended until the cause is determined and corrected.

No one shall not be permitted to walk on uncompacted asphalt.

Paving shall, if possible, commence at the bottom of the grades and the lower edges of super elevated curves. Paving shall be done upgrade on grades steeper than 5%.

Spreading shall be so arranged that longitudinal joints do not coincide with joints in lower layers of asphalt base, paver laid crushed stone bases or surfacing.

Unless otherwise specified in the project specifications the paver shall be equipped to provide automatic control of levels and cross section. In the case of asphalt base construction, automatic control shall be run off guide wires, stabilizing beams and in the case of surfacing and overlays skid stabilizing beams or guide wires shall be used.

Asphalt shall be placed in restricted areas with the aid of smaller specially equipped pavers, hand tools, or other approved equipment. The space concerned shall be properly filled with asphalt, without leaving any gaps between the fresh asphalt and the existing pavement layers.

PS 4205.04(b) Hand laid Asphalt

The Employer's Agent or Employer's Agent's Representative may approve the paving of asphalt by hand in where paving equipment is confined, restricted or inaccessible. In such cases the paving shall be carried out in a manner will minimize mix segregation and allow acceptable level of layer elevation control.

PS 4206 Joints and Compaction

The preparation of joints and the compaction of asphalt shall be done in accordance with methods described in the Sabita Manual 5 (March 2008, 3rd Edition relating to joints and compaction. Rolling shall commence immediately and be undertaken within the rolling temperature window for each mix.

Where the new surfacing is required to tie into the existing road surface the joint shall depend on the class of road.

Generally, joints shall consist of one of the following types which shall be billed separately in the Schedule of Quantities:

- (a) Transverse Joint: The joint is to be formed by milling out an area 3 m wide over the full width of the existing roadway, the area to be tapered from 0 to -40 mm in depth.
- (b) Longitudinal Joint: The joint is to be formed by cutting into the existing road surface by 150 mm wide to a depth of 40 mm where the new surfacing is to be tied longitudinally into the adjacent existing pavement.
- (c) Feathered Transverse Joint: The joint shall be formed by saw cutting a 500 mm wide by 30 mm deep key into the existing surface. The new wearing course shall be tapered over to tie in at the key a distance of not less than 1,0 m.

The position of the joint shall be indicated by the Employer's Agent or Employer's Agent's Representative on site.

After cutting the joint shall be swept of all loose material and painted with a tack coat

On completion of preparing the joint, the adjacent surface shall be inspected to ascertain that there has been no damage caused to the adjacent layer. Any identified damage shall be appropriately repaired prior to commencement of paving any adjacent asphalt layer.

Whenever the paving operation ceases due to lack of supply of mix, and the temperature of the mat has reduced to below the appropriate compaction temperature, the Contractor shall form a proper transverse construction joint as specified.

Unless otherwise provided for, joints in the final layer of the surfacing shall correspond with the intended lane markings. Joints in lower layers shall be offset by not less than 150 mm from either side of the edges of any underlying substrate joint

Cutting of the joints shall only take place immediately prior to the laying of the wearing course.

The unit of measurement shall be the metre (m) of joint cut, for each type of joint as specified above, and as instructed by the Employers Agent Representative. The tendered rate shall include compensation for all labour, plant, and equipment to undertake the cutting/milling of the joints, loading and transport of material to spoil, and all other incidentals required to carry out the operation successfully. The Employers Agent may instruct the Contractor to cart the material to a designated stockpile site with a free haul of 10km.

PS 4207 Minimum Lengths to be placed

Where possible a minimum length of 100 m of base course or 200 m of wearing course shall be placed at any one time. The delivery shall be at a uniform rate and shall be within the capacity of the paver and compaction equipment to ensure that the paver works continuously.

PS 4208 TOLERANCES

PS 4208.01 Bituminous Base Course

The base course layer shall be tested to comply with the following requirements:

(a) Thickness

The minimum thickness for the continuously graded base coarse layer shall be three (3) times nominal maximum aggregate size.

The average thickness of completed base course layer in any section, as determined from a minimum of five test holes, shall not be less than the thickness specified. The allowable tolerance at any one test hole shall be $\pm 10\%$ of the specified thickness.

(b) Smoothness

The maximum number of surface irregularities permitted with a 3 m rolling straight edge shall be as follows:

In any 300 m	In any 75 m
4 mm and above – 40	4 mm and above - 18
7 mm and above - 4	7 mm and above - 2
19 mm and above - None 1	0 mm and above - None

(c) Accuracy of Levels

In any section the average of the elevations taken shall be such that the average thickness of the succeeding layer or layers above the formation shall not be less than specified/nor greater than the specified plus 20mm.

The standard deviation of the differences between actual and design levels shall not be greater than 6mm.

PS 4208.02 Wearing Course

The wearing course shall be tested to comply with the following requirements.

(a) Thickness

The minimum thickness for the continuously graded wearing coarse layer shall be three (3) times nominal maximum aggregate size.

A tolerance of 5 mm will be allowed above or below the design levels for any single reading.

(b) Smoothness

The maximum number of surface irregularities permitted with a 3 m rolling straight edge will be as follows: -

CATEGORY 'A' ROADS

<u>In any 300 m</u>	<u>In any 75 m</u>
4 mm and above -10	4 mm and above - 4
7 mm and above - 1	7 mm and above - 1
10 mm and above - Nil	10 mm and above – Nil

CATEGORY 'B' ROADS

<u>In any 300 m</u>	<u>In any 75 m</u>
4 mm and above – 20	4 mm and above - 9
7 mm and above - 2	7 mm and above - 1
10 mm and above - Nil	10 mm and above – Nil

CATEGORY 'C' ROADS

<u>In any 300 m</u>	<u>In any 75 m</u>
4 mm and above - 40	4 mm and above - 18
7 mm and above – 4	7 mm and above - 2
10 mm and above - Nil	10 mm and above – Nil

The category classification of road is as per eThekweni Municipality's Pavement Management System classification. The information regarding each road classification can be obtained from the Pavement & Geotechnical Engineering branch of the Roads Provision Department.

(c) Riding Quality

The finished surface riding quality shall be in accordance with criteria as stipulated under section PS4216.02.04 Roughness, Table D6.

(d) Texture depths

A minimum in-situ texture depth of 1.0mm is required on the finished wearing course of Category A and Category B roads.

PS 4208.03 Rectification

The full depth of the layer shall be removed and replaced with fresh material laid and compacted to specification.

Where surface level or irregularities fail to conform to the specification, the area rectified shall be paver laid not less than one lane wide and at least 5 m long for base course and 15 m long for wearing course. The rate rectified shall conform in all regards with the full requirement of the specification.

Where the number of surface irregularities exceeds the specified limits the area to be rectified shall be 300 m long and not less than one lane wide.

PS 4209 MEASUREMENT AND PAYMENT**PS 4209.01 Asphalt mixes from commercial sources**

Measurement shall be tons (t) as recorded on printed weigh-bridge tickets.

The rates tendered for asphalt shall cover all materials, storage, handling, mixing, transporting, sweeping the previous surface where necessary, spreading, jointing, compacting, protection to adjacent concrete kerbing and street furniture, paving and testing other than those carried out by the Employer's Agent in accordance with the specification. Both longitudinal and transverse joints shall be included in the construction rates, unless requested or approved by the Employer's Agent or Employer's Agent's Representative.

PS 4209.01 (e) Variations

Item	Description	Unit
(i)	Bitumen	ton (t)
(ii)	Aggregate	ton (t)
(iii)	Active filler	ton (t)

The unit of measurement in respect of increases or decreases of any component of the approved mix from that specified in the nominal proportions specified for the relevant mix type, shall be the ton. No payment shall be made for inert filler added by the Contractor.

PS 4209.02 Asphalt mixes from Ethekwini Municipality Asphalt Plant (Collect and Deliver):

The unit of measurement shall be tons (t) as recorded on printed weigh-bridge tickets.

The rates tendered for asphalt shall cover transporting, sweeping the previous surface where necessary, spreading jointing, compacting, protection to adjacent concrete kerbing and street furniture, paving and testing other than those carried out by the Employer's Agent in accordance with the specification.

PS 4209.03 TESTING

Notwithstanding the provisions of Table 19 of this specification, Control Testing as specified in Table 10 on all asphalt supplied by the Contractor, shall be carried out by the Contractor. Should the asphalt be supplied from the EM Asphalt Plant, the Contractor will only be expected to carry out checking and keeping records of the temperature of the mix and of the densities of the laid asphalt. In addition to the tests specified in Table 10 the void content of the mix shall also be determined for every 200t of output or part thereof per day. The record of temperatures of the asphalt must include temperature as it arrives on site and temperatures as it is being paved (ie. In the paver's bin).

The Contractor will also be required to analyse all results before submitting to the Employer's Agent or Employer's Agent's Representative to ensure that the work undertaken is to the required specification, as it is the Contractor's responsibility to ensure that work is done to specification.

PS 4209.03(a) CORING FOR DENSITY TESTING

The Employer's Agent may instruct that cores are taken to test the density of the asphalt paved. Cores shall then be taken, using the Stratified Random Method (as per TMH5/TRH5) to locate the position of the tests, and tested with 48 hours of instruction.

The unit of measurement shall be number (No.), of the following specified core depths:

- (i) 0 – 50mm
- (ii) 0-100mm

and shall be per core taken, the rate shall include for getting a coring machine onto and off site, coring, filling in core holes with asphalt, marking of cores, testing and provision of test results.

Extra over Item (i) or (ii) will be paid for every 10mm of asphalt depth cored. The unit of measurement will be millimetre (mm)

PS 4209.03(b) NUCLEAR TESTING

The Employer's Agent may instruct that Nuclear Testing take place to test the density of the asphalt paved. Testing shall then be taken, using the Stratified Random Method (as per TMH5/TRH5) to locate the position of the tests and tested within 48 hours of instruction.

The unit of measurement shall be number (No), and shall be per test taken, the rate including for procuring a private Materials Laboratory's testing station onto and off the site, testing and provision of test result.

The asphalt final density is required as per Colto, with the following amendments:

*Ls=93% of Maximum Theoretical Density (Table 8206/3, Note 1(a))

The Contractor shall utilize the calibrated nuclear gauge for process control during compaction operations. Notwithstanding this requirement, the acceptance testing carried out for compaction by the Employer's Agent, shall still be based on cores taken from the compacted layer or nuclear gauge testing by the Ethekeini Municipality Laboratory or private laboratory (to be approved by the Employer's Agent or Employer's Agent's Representative)

PS 4209.04 PATCHING OF EXISTING SURFACE

Prior to resurfacing existing roads, those areas of the existing asphalt pavement which require patching will be marked by the Employer's Agent.

PS 4209.04(a) Patching (Surface: Asphalt wearing course)**(i) Deep Patching (0-160mm) – Category A & B Roads**

In the areas to be deep patched the in-situ asphalt laid sides shall be cut vertically to a depth of 160mm, shall be swept of all loose material, a 60% anionic stable emulsion grade track coat applied at an application rate of 0,3 l/m² to the bottom and the sides and then patched with asphalt wearing course in two layers of 55mm, and one of 50mm thick. After compaction the surface of the patch shall be flushed with the adjacent road surface.

(ii) Deep Patching (0-100mm) – Category C Roads

In the areas to be deep patched the in-situ asphalt laid sides shall be cut vertically to a depth of 100mm, shall be swept of all loose material, a 60% anionic stable emulsion grade track coat applied at an application rate of 0,3 l/m² to the bottom and the sides and then patched with asphalt wearing course in two layers of 50 mm thick each. After compaction the surface of the patch shall be flushed with the adjacent road surface.

(iii) Shallow patching (0-50mm)

In areas to be shallow patched, the in-situ asphalt surface layer shall be removed to a depth of 50mm. The sides shall be cut vertically with the edges square. The exposed surface shall be swept of all loose material, a 60% anionic stable emulsion grade track coat applied at an application rate of 0,3 l/m² to the bottom and the sides and then patched with asphalt wearing course. After compaction the surface of the patch shall be flush with the adjacent road surface.

PS 4209.04(b) Patching (Structural G2/BSM – Various road categories)**(i) Category B**

The existing wearing course (160mm) and crusher run (150mm) layer to be cut vertically and removed to spoil, a fresh layer of crusher (G2) shall be laid and compacted to 98% Mod AASHTO to a final thickness of 150 mm (ie compacted thickness).

The surface of this newly laid crusher layer to be swept of all loose material, a 60% anionic stable emulsion grade track coat applied at an application rate of 0,3 l/m² to the bottom and the sides and then patched with two 80 mm layers of asphalt wearing course. After compaction the surface of the patch shall be flushed with the adjacent road surface.

(ii) Category C

The existing wearing course (80mm) and crusher run(150mm) layer to be cut vertically and removed to spoil, a fresh layer of crusher (G2) shall be laid and compacted to 98% Mod AASHTO to a final thickness of 150 mm (i.e. compacted thickness). The surface of this newly laid crusher layer to be swept of all loose material, a 60% anionic stable emulsion grade track coat applied at an application rate of 0,3l /m2 to the bottom and the sides and then patched with a 80 mm layer of asphalt wearing course. After compaction the surface of the patch shall be flushed with the adjacent road surface.

(iii) Category D

The existing wearing course (50 mm) and crusher run(150 mm) layer to be cut vertically and removed to spoil, a fresh layer of crusher (G2) shall be laid and compacted to 98% Mod AASHTO to a final thickness of 150 mm (i.e. compacted thickness). The surface of this newly laid crusher layer to be swept of all loose material, a 60% anionic stable emulsion grade track coat applied at an application rate of 0,3l /m2 to the bottom and the sides and then patched with a 50 mm layer of asphalt wearing course. After compaction the surface of the patch shall be flushed with the adjacent road surface. Alternatively, the different reinstatement categories can be undertaken as follows and the material shall conform to PS10202 of the Project Specification, where specified by the Employer's Agent or Employer's Agent's Representative:

(i) Category B

The existing material to be cut vertically to a depth of 310 mm and removed to spoil, a fresh layer of in-plant foamed BSM shall be laid and compacted to 100% Mod AASHTO to a final thickness of 150mm (i.e. compacted thickness). The surface of this newly laid foamed BSM layer to be swept of all loose material, a 60% anionic stable emulsion grade track coat applied at an application rate of 0,3l /m2 to the bottom and the sides and then patched with two 80 mm layers of asphalt wearing course. After compaction the surface of the patch shall be flushed with the adjacent road surface.

(ii) Category C

The existing material to be cut vertically to a depth of 230 mm and removed to spoil, a fresh layer of in-plant foamed BSM shall be laid and compacted to 98% Mod AASHTO to a final thickness of 150 mm (ie compacted thickness). The surface of this newly laid foamed BSM layer to be swept of all loose material, a 60% anionic stable emulsion grade track coat applied at an application rate of 0,3l /m2 to the bottom and the sides and then patched with 80 mm layer of asphalt wearing

(iii) Category D

The existing material to be cut vertically to a depth of 200 mm and removed to spoil, a fresh layer of in-plant foamed BSM shall be laid and compacted to 98% Mod AASHTO to a final thickness of 150 mm (ie compacted thickness). The surface of this newly laid foamed BSM layer to be swept of all loose material, a 60% anionic stable emulsion grade track coat applied at an application rate of 0,3l /m2 to the bottom and the sides and then patched with 50 mm layer of asphalt wearing.

PS 4209.04(c) MATERIALS

The asphalt base course to be used shall comply with the requirements of the Sand Skeleton Mixes: Sa-S10. The asphalt wearing course to be used shall comply with the requirements of the Sand Skeleton Mixes: Sa-S10. The Graded crushed stone to be used shall comply with COLTO Section 3600 Table 3602/1. This is a G2 quality material.

PS 4209.04(d) MEASUREMENT AND PAYMENT**PS 4209.04(d)(i) Deep/Shallow Patching**

Shall include saw-cutting the area to be patched, for removal of the in-situ layers to spoil, trimming the sides, compaction, application of the tack coat, supply and laying of the asphalt, loading and haulage to the spoil site of excess material. Provision has been made in the schedule of quantities for measurement and payment for deep patching and shallow patching.

The unit of measurement shall be square metres (m²)

PS 4209.04(d)(ii) Patching on the various road categories

Shall include saw-cutting the area to be patched, for removal of the in-situ layers to spoil, trimming the sides, compaction, application of the tack coat, supply and laying of the crusher run and asphalt layers, loading and haulage to the spoil site of excess material. Provision has been made in the schedule of quantities for measurement and payment for the various road categories.

Where in-plant foamed BSM has been specified for reinstatement by the Employer's Agent, the rate shall cover saw-cutting the area to be patched, the removal of in-situ layers to spoil, trimming the sides, compaction, application of the tack coat, supply and laying of the in-plant foamed BSM from commercial Asphalt Plant stockpile, laying the asphalt layers, loading and haulage to spoil site of the excess material. The rate shall exclude mixing/processing of the in-plant BSM, provision and addition of the stabilizing agents, screening and crushing which all shall be paid for under the respective items in Section PS10200. Provision has been made in the schedule of quantities for measurement and payment for the various road categories.

The unit of measurement shall be square metres (m²)

PS 4210 VARIATION IN QUANTITY OF EMULSION

The unit of measurement shall be litres (l).

PS 4211 APPLICATION OF WEEDKILLER

Where directed by the Employer's Agent, the Contractor will apply a weed killer to the road surface prior to commencing asphaltting operations. The rate of application shall be as recommended. The weed killer to be used shall be fit for purpose and as approved by the Employer's Agent.

The unit of measurement shall be metre (m) and the rate shall include for all labour, plant, equipment, transport and materials required for the application of the weed killer.

PS 4212 PATCHING or RECONSTRUCTING OF EXISTING ASPHALT SIDEWALK/DRIVEWAY ACCESS SCOOPS

Those areas of the existing asphalt sidewalk/access scoops which require patching or requiring reconstruction will be marked by the Employer's Agent or Employer's Agent's Representative.

The existing wearing course (25 mm) and crusher run(100 mm) layer to be cut vertically (saw-cutting) and removed to spoil, a fresh layer of crusher (G2) shall be laid and compacted to 98% Mod AASHTO to a final thickness of 100 mm (ie compacted thickness). Alternatively, the existing sidewalk base be replaced with the in-plant BSM base from commercial Asphalt Plant Stockpile and shall be compacted to 100% Mod AASHTO to a final thickness of 100 mm (ie compacted thickness)

The surface of this newly laid crusher/BSM layer to be swept of all loose material, a 60% anionic stable emulsion grade tack coat applied at an application rate of 0.3l /m² to the bottom and the sides and then patched with a 25 mm layer of Sa-S10 asphalt wearing course. After compaction the surface of the patch shall be flushed with the adjacent sidewalk/access surface.

PS 4212.01 MATERIALS

The asphalt wearing course to be used shall comply with the requirements of the Sand Skeleton Mixes SaS10.

The Graded crushed stone to be used shall comply with COLTO Section 3600 Table 3602/1. This is a G2 quality material.

PS 4212.02 MEASUREMENT AND PAYMENT

Shall include for formation preparation, trimming the sides (saw-cutting), compaction, supply and application of weedkiller, application of the tack coat, supply and laying of the crusher run and asphalt layers, backfilling as required, loading and haulage to the tip/stockpile of excess material.

If the in-plant foamed BSM has been used, the rate shall include for formation preparation, trimming the sides (saw-cutting), compaction, supply and application of weedkiller, application of the tack coat, supply and laying of the in-plant foamed BSM from commercial Asphalt Plant stockpile and asphalt layers, backfilling as required, loading and haulage to the tip/stockpile of excess material. The rate shall exclude mixing/processing of the in-plant BSM, provision and addition of the stabilizing agents, screening and crushing which all shall be paid for under the respective items in Section PS10200.

The unit of measurement shall be square metre (m²) of sidewalk/access scoops repaired or reconstructed.

PS 4213 REMOVAL OF SPEED HUMPS

The unit of measurement shall be linear meter measured across the width of road of asphalt traffic calming devices or speed hump removed as per the municipal standard detail.

The tendered rate shall include full compensation for the breaking-out of the asphalt, removing, loading and carting to a spoil site (free haul) or if instructed by the Employers Agent, cart to stockpile within a free haul distance of 10 km

PS 4214 REINSTATING OF SPEED HUMPS

The unit of measurement shall be linear meter measured across the width of road of asphalt traffic calming devices or speed hump reinstated as per the municipal standard detail 43924 A/1.

The tendered rate shall include full compensation for saw cutting the keys, breaking out of the asphalt, removing, loading, carting to a spoil site (free haul) or if instructed by the Employers Agent, cart to stockpile within a free haul distance of 10 km, preparation, supply of continuously graded asphalt Sa-S10 and constructing the speed hump as per standard detail, and all incidentals. Painting the permanent road markings with the thermal plastic paint and road studs as per the standard detail, is paid for separately under section 5700.

PS 4215 REINFORCEMENT OF ASPHALT USING GEOTEXTILES**PS 4215.01**

A high strength, open fibreglass grid, custom knitted in a stable construction and coated with an elastomeric polymer and a pressure sensitive adhesive backing, for use as an asphalt reinforced interlayer, as specified by the Employers Agent. The data specification is as tabulated below, or similar approved by the Employers Agent

Mass	Nominal	g/m ²	205	405	610	ASTM D5261 ISO 9864
Tensile Strength (Ultimate)	Machine	kN/m	65	115	115	ASTM D5637 EN ISO 10319
	Across	kN/m	65	115	215	
	Elongation	%	2.5	2.5	2.5	
Tensile Resistance @ 2% strain	Machine	kN/m	45	95	95	ASTM D5637 EN ISO 10319
	Across	kN/m	45	95	180	
Secant Stiffness EA @ 1% strain	Machine	N/mm	2 200	4 600	4 600	ASTM D5637 EN ISO 10319
	Across	N/mm	2 200	4 600	6 600	
Young's Modulus E		MPa	73 000	73 000	73 000	
Melting Point	min	°C	>232	>232	>232	ASTM D276 EN ISO 3146
Damage during installation		%	< 5	< 5	< 5	Internal Test Method
Grid Size (centre to centre of strand)	mm		25 x 25	25 x 25	25 x 19	
Adhesive Backing			Pressure Sensitive			
Roll Dimensions	Roll Length	m	150	100	60	
	Roll Width	m	1.5	1.5	1.5	
	Roll Area	m ²	225	150	90	

PS 4215.02 STORAGE

The glass fibre reinforced geogrid must be stored in a dry covered condition free from dust, dirt and moisture. The geogrid is normally supplied upright on purpose-built pallets and it is recommended where possible to store in an upright position.

PS 4215.03 PAVEMENT PREPARATION

Surface must be prepared as a clean, dry even surface with pavement cracks sealed. Cracks up to 6mm should be filled with a suitable crack filler. A levelling course shall be laid as per the Employer's Agent's or Employer's Agent's Representative's instruction once all cracks and patches have been completed. Before installing the glass fibre reinforced geogrid on recently laid asphalt or levelling course, ensure that the surface has properly cured and that the surface temperature is between 5°C and no greater than 60°C before installing the geogrid. Prior to placing the geogrid, the existing pavement shall be cleaned by a mechanical device by sweeping or vacuuming and be free of oil, vegetation, sand, dirt, water, gravel and other debris.

PS 4215.04 CONSTRUCTION

1. Spray on a uniform application of bituminous tack coat, either an emulsion or hot applied. The necessary amount of tack coat is 1.0-1.2 l/m² of residual bitumen. When using a latex modified cationic emulsion, a minimum of 65 % residual bitumen content is preferable. (Total quantity of a 65 % modified emulsion to be applied is 1.7 /m².) Cutters or solvents to be avoided.
2. Emulsion - allow to break before installing the geogrid.
3. The geogrid may be laid mechanically or by hand. The geogrid should be laid free of wrinkles, using a squeegee or the reverse of a hard broom to smooth out any wrinkles. Stubborn folds are to be cut and smoothed. Overlaps should be 100-150 mm and adhered by applying additional binder (0.9 /m² residual bitumen)
4. Allow for 3-4 passes of a PTR (pneumatic tyred roller) once tack coat has cured sufficiently to prevent pick up. A steel drum roller should not be used. Avoid trafficking over the installed geogrid.
5. Paving of the asphalt overlay can proceed immediately after the installation of the geogrid. Application of additional bitumen is not necessary.

Note: If, after testing for proper adhesion as described below, further rolling may not be required.

Tests for Proper Adhesion to Geogrid Prior to Placing an AC Overlay:

1. Cut approximately 1m² of grid.
2. Place on area to be paved.
3. Activate self-adhesive glue (where applicable) by rolling with a rubber tyred roller or by walking on the samples.
4. Insert hook of spring balance under centre of geogrid piece
5. Pull upwards until grid starts to pull from the surface.
6. Record results in kg.
7. If 2kg or more, OK to pave. If 1 - 2kg, start paving with caution. Stop immediately if grid moves or ripples.
8. IF LESS THAN 1kg DO NOT PAVE DUE TO POOR ADHESION

Construction and emergency traffic may run on the geogrid after being placed. However, it must be ensured that damage is not caused to the geogrid by vehicles turning or braking etc., and that the mesh must be kept clean of mud, dust and other debris. Damaged sections shall be removed and patched, taking care to completely cover the damaged area.

PS 4215.05 MEASUREMENT AND PAYMENT

The unit of measurement shall for sub-item PS 4215.02(j) be the number (no.) of rolls of reinforcing geogrids supplied. Grade of fibre re-inforced geogrid as specified in the schedule of quantities.

The tendered rate shall include full compensation for supply, furnishing and delivery to site and protecting the reinforcing geotextile.

The unit of measurement shall for sub-item PS 4215.02 (ii) be the square metre (m²) of geogrid installed as specified by the Employer's Agent or Employer's Agent's Representative. Installation of fibre re-inforced geogrid as per area size as specified in the schedule of quantities.

The tendered rate shall include full compensation for cutting, overlapping, jointing, placing and protecting the filter fabric as specified as well as wastage.

PS 4216 ADDITIONAL PERFORMANCE AND ASSESSMENT CRITERIA**PS4216.01 SCOPE**

This Section covers the specifications related to the provision of functional and, or, structural layers of a road pavement structure comprising the asphalt surfacing, and, or the base layer (where specified) in terms of the assessment criteria for approval of works. It includes performance parameters, field measurements, acceptance criteria and remedial work methodologies.

PS4216.02 ASSESSMENT CRITERIA

The performance parameters to be assessed are listed in Tables D1 and D2 for visual, instrumentally and test assessed parameters or as otherwise prescribed in the Contract Documentation. Table D1 is specific for the performance of the slow lanes only in the case of a dual carriageway, or the travelled lane in the case of a single carriageway. Table D2 is specific to the asphalt surfacing performance of the shoulders and inner lanes, where applicable, on dual carriageways.

Table D1: Performance parameters for the slow lane of dual carriageways and the travelled lane of single carriageways

Visually Assessed Parameters	Instrumentally Assessed Parameters	Test Assessed Parameters
1. Cracking	1. Deflection	1. Air Permeability
2. Bleeding	2. Rutting	2. Water Permeability
3. Ravelling	3. Roughness	3. Marvil Permeability
	4. Mean Profile Depth	

Table D2: Performance parameters for the shoulders of dual and single carriageways and inner lanes of dual carriageways

Visually Assessed Parameters	Instrumentally Assessed Parameters	Test Assessed Parameters
1. Cracking	1. Deflection	1. Air Permeability
2. Bleeding	2. Rutting	2. Water Permeability
3. Raveling	3. Roughness	3. Marvil Permeability

Cracking shall be defined as either Surface Cracking and/or Longitudinal and/or Transverse and/or Crocodile Cracking as defined in TMH9 Manual for Visual Assessment of Road Pavements.

PS4216.02.01 Visual Assessments

Visual assessment shall be carried out in accordance with the requirements of TMH9. The visually assessed parameters as well as the calculated Combined Index Value (CIV) shall meet the Acceptance Criteria listed in Table D3 below, which shall be applicable at the end of the Defects Maintenance/Liability Period. Interim visual assessments shall be as specified in the Contract Documentation.

The visual assessments of the pavement during the Defects Maintenance/Liability Period shall be undertaken by means of an assessment panel comprising the following representatives:

- Employer: 1 representative
- Contractor: 1 representative
- Employer's Agent: 1 representative

All site inspections/investigations shall be undertaken by the panel of representatives. The arrangements, responsibilities and all costs associated with providing the necessary equipment, transport and traffic accommodation measures required to undertake the visual inspection shall be to the cost of the Contractor, included in the construction rates. The presence of the Employer's representatives shall be at the discretion of the Employer. The visual assessments shall be carried out during daylight and off-peak traffic periods.

Table D3: Acceptance criteria for visually assessed types of distress

Type of Distress	Maximum allowance					
	Degree	CIV				
		Class 1	Class 2	Class 3	Class 4	Class 5
Cracking	2	0,05	0,05	0,1	0,10	0,15
Bleeding (flushing)	2	0,1	0,1	0,1	0,15	0,2
Surface raveling	1	0,05	0,05	0,1	0,1	0,15

The detailed visual assessment (walk over) by the assessment panel will quantify each occurrence of the visually assessed parameters by rating the degree of distress according to the TMH 9 definitions and the extent as the linear length (in metres) affected in the direction of travel. The minimum linear length to be recorded for any single occurrence of any of the visually assessed parameters shall be 0,5 metres. Visual assessments must be done in accordance with the specification presented in Table D3-1, below

Table D3-1: Specification for visual assessment

Item	Specification
Frequency of assessment	At the end of the Defects Maintenance/Liability Period. Interim visual assessments shall be as specified in the Contract Documentation
Position of assessment	Each lane and shoulder shall be individually assessed.
Segment lengths	500 m
Degree	As defined in TMH 9.
Extent	The actual length affected, with a minimum recorded linear length per single occurrence of 0,5 metres.

For each of the visually-assessed parameters the Combined Index Value will be calculated for every 500m segment of each lane and shoulder. The Combined Index Value (CIV) for each visually-assessed parameter will be processed as follows:

$$Combined\ Index\ Value(CIV) = \sum_{Degree=1}^5 Degree \times \frac{(Length_{Degree})}{10}$$

$$\left(1 \times \frac{Length_1}{10}\right) + \left(2 \times \frac{Length_2}{10}\right) + \left(3 \times \frac{Length_3}{10}\right) + \left(4 \times \frac{Length_4}{10}\right) + \left(5 \times \frac{Length_5}{10}\right)$$

Where Length1 = Total linear length (in metres) of degree 1 distress over the 500m segment, etc.

The processed results shall be used to produce results in the format specified in Table D3-2.

Table D3-2: Specification for output of visual assessments

Item	Specification
Unit	Combined Index Value (CIV)
Segment lengths	500m
Statistical summary	Produce Combined Index Value (CIV) for each lane and shoulder

Reporting, which shall be the responsibility of the Contractor, shall consist of the following:

- Compiling of report on findings as well as remedial measures required.

The abovementioned requirements shall be completed and delivered in triplicate to the office of the Employer within one calendar month of the inspection date

PS4216.02.02 Deflection

Deflection measurements shall be carried out as specified in Annexure 1. Where so specified in the Contract Documentation, at the end of the Defects Maintenance/Liability Period, the structural capacity of the road pavement, as determined in terms of deflection measurements, shall conform to be acceptance criteria presented in Table D4 below. The acceptance criteria is specified in terms of the maximum deflection (Ymax), base layer index (BLI) and middle layer index (MLI) as calculated from FWD deflection measurements. Segment lengths of 500m in length shall be identified for evaluation. The 90th percentile value per segment shall be used to judge acceptance.

Table D4: Acceptance criteria for deflection

Base type	Maximum 90 th Percentile Value (Micron)	Class 1	Class 2	Class 3	Class 4	Class 5
Granular (G1)	Ymax	500	600	650	1 000	1 500
	BLI	190	240	250	420	800
	MLI	50	75	100	160	350
Asphalt	Ymax	420	510	680	NR	NR
	BLI	155	140	175	NR	NR
	MLI	30	50	100	NR	NR
Bitumen Modified	Ymax	450	500	600	650	NR
	BLI	170	190	240	250	NR
	MLI	40	50	75	100	NR
Cement Treated	Ymax	NR	NR	440	590	1 000
	BLI	NR	NR	85	110	290
	MLI	NR	NR	45	90	240

Notes:

1. Class 1 to 5 are defined in TRH26 – South African Road Classification and Access Management Manual issued by the Committee of Transport Officials Version 1.0, August 2012.
2. NR – Not Recommended

PS4216.02.03 Rutting

At the end of the Defects Maintenance/Liability Period, as determined in terms of the specified methodology, the surface deformation (rutting) as determined shall not exceed the values as specified in Table D5 below for the specific road class.

Table D5: Specification for rut depth criteria

Maximum length (%) of segment with rut depth worse than limiting value	Profilometer measurements: Limiting Rut Depth (mm)				
	Class 1	Class 2	Class 3	Class 4	Class 5
10 %	6	8	8	8	10
5 %	8	10	10	10	15
0 %	10	15	15	15	20

PS4216.02.04 Roughness

Roughness shall be measured in accordance as specified in Annexure 1. At the end of the Defects Maintenance/Liability Period, as determined in terms of the Specified Methodology, the surface roughness, shall not exceed the values as specified in Table D6 below

Table D6: Specification for roughness criteria

Maximum length (%) of segment with roughness worse than limiting value	Roughness measurements limiting IRI (mm)									
	Class 1		Class 2		Class 3		Class 4		Class 5	
	S	AC	S	AC	S	AC	S	AC	S	AC
10 %	2,2	1,8	2,5	2,0	3,0	2,5	3,6	3,0	4,4	3,5
5 %	2,5	2,1	2,7	2,2	3,5	3,0	3,9	3,5	4,7	4,0
0 %	2,7	2,3	3,0	2,5	4,0	3,5	4,8	4,0	5,0	4,5

Notes:

1. S – Single or Double Seal Surfacing
2. AC – Asphalt Surfacing

PS4216.02.05 Mean profile depth

At the end of the Defects Maintenance/Liability Period, as determined in accordance with Annexure 1, the mean profile depth as determined shall not exceed the values as specified in Table D7 below

Table D7: Specification for mean profile depth

Maximum length (%) of segment with mean profile depth worse than limiting value	Mean profile depth (mm) for Road Class				
	Class 1	Class 2	Class 3	Class 4	Class 5
10%	0,8	0,8	0,8	0,4	0,4
5%	0,6	0,6	0,6	0,35	0,35
0%	0,4	0,4	0,4	0,3	0,3

PS4216.02.06 Air permeability

Before issuing of the Completion Certificate, and at the end of the Defects Maintenance/Liability Period, the permeability of the asphalt layers, as determined by means of the air permeability test method described in Annexure 1 shall conform to the acceptance criteria as specified in Table D8 below

Table D8: Criteria for air permeability tests acceptance

Year	Limiting Air Permeability ($\times 10^{-9} \text{cm}^2$)
0 and 1	1.0

PS4216.02.07 Water permeability

Before issuing of the Completion Certificate, at the end of the Defects Maintenance/Liability Period, the permeability of the asphalt layers, as determined by means of the Water Permeability test method, as prescribed in EN 12697, shall conform to the acceptance criteria as specified in Table D9 below.

Table D9: Acceptance criteria for water permeability tests

Year	Limiting Water Permeability ($\times 10^{-4} \text{cm}^2$)
0 and 1	< 4 mm/s

PS4216.02.08 Marvil Permeability

Before issuing of the Completion Certificate, and at the end of the Defects Maintenance/Liability Period, the permeability of the asphalt layers, as determined by means of the Marvil permeability test method defined in SANS 3001-BT12, shall conform to the acceptance criteria as specified in Table D10 below.

Table D10: Acceptance criteria for marvel permeability tests

Year	Limiting Marvil permeability
0 and 1	< 1 l/hour

PS4216.03 MEASUREMENT AND PAYMENT

The arrangements, responsibilities and all costs associated with providing the necessary equipment, transport, supervision, traffic accommodation measures and all other costs necessary as required to undertake all tests described in Section PS4216.02 ASSESSMENT CRITERIA shall be to the cost of the Contractor, included in the tendered construction rates for the asphalt works.

PS4216.04 REMEDIAL WORK**PS4216.04.01 Determination of extent of work**

The Contractor, in liaison with the Visual Assessment Panel and Employer, shall be responsible for determining the extent to which remedial work is to be undertaken. Depending on the type of distress and severity thereof, further investigation and testing (e.g. test pits, etc.) may be necessary to be undertaken by the Contractor to, not only determine the extent of the area to be repaired, but also the depth to which repairs of the pavement structure are to be undertaken. The extent of repair work shall be agreed and confirmed with the Employer prior to commencement of any repair work. The cost of such further investigation and testing shall be borne by the Contractor.

PS4216.04.02 Evaluation at any time during the Defects Maintenance/Liability Period

The Employer shall be entitled to carry out an assessment of the Works at any time during the Defects Maintenance/Liability Period. Should any parameter/s fall into the remedial-work-required category, the Employer shall inform the Contractor who shall immediately propose a solution to rectify the problem/s and obtain the Employer's approval and rectify the problem/s in accordance with Clause PS4216.03.03. The remedial work shall commence within 28 days of being notified by the Employer.

PS4216.04.03 Execution of work

All remedial work or repairs to the pavement structure in order to satisfy the performance requirements as specified shall comply with the following requirements:

- (i) The Contractor shall, at his own cost, supply, erect and maintain the necessary temporary traffic-control signs in accordance with the requirements in Section 1500 or as amended, or any other requirements as prescribed in the Contract Documentation with respect traffic accommodation.
- (ii) The Contractor shall, also at his own cost, repair/reinstate such items as road studs, road markings, etc., should these be damaged or influenced by the required remedial work.
- (iii) The various types of remedial work contained in Table D11, depending on the degree of distress, shall be undertaken by the Contractor, at his own cost, to reinstate/rectify specified defects in the pavement structure recorded during the Defects Maintenance/Liability Period.

Table D11: Remedial work

Type of Distress	Acceptance Criteria: Clause	Minimum Remedial Measures
Cracking	PS4216.02.01	Mill out full depth of defective surfacing including pavement layers, if required, and reconstruct
Bleeding (flushing)	PS4216.02.01	Mill out full depth of defective surface and replace surfacing
Surfacing raveling	PS4216.02.01	Repair with AC or mill out full depth of defective surfacing and replace surfacing
Excessive deflection	PS4216.02.02	Mill out full depth of surfacing and pavement layers to pre-determined depth and reconstruct pavement layers and surfacing
Rutting	PS4216.02.03	Mill out full depth of defective surfacing including pavement layers if required, and reconstruct
Roughness	PS4216.02.04	Mill out to pre-defined depth and replace
Mean Profile Depth	PS4216.02.05	Mill out surfacing and replace
Air Permeability	PS4216.02.06	Fog spray surfacing with agreed emulsion or mill out surfacing and repave surfacing
Water Permeability	PS4216.02.07	Fog spray surfacing with agreed emulsion or mill out surfacing and repave surfacing
Marvil Permeability	PS4216.02.08	Fog spray surfacing with agreed emulsion or mill out surfacing and repave surfacing

SECTION 4800: TREATMENT OF AN EXISTING SURFACE EXHIBITING CERTAIN DEFECTS**PS4802 MATERIALS****(a) Bituminous binders**

Add the following to the first paragraph:

“The classification of modified binders for crack sealing shall be as shown in Table PS4801

TABLE PS 4801

<i>Classification of Modified Binders for Crack Sealing</i>	
<i>Modified Binder Class (C)</i>	<i>Application</i>
<i>C-E1</i>	<i>Crack sealant – hot applied elastomer modified</i>
<i>CC-E1</i>	<i>Crack sealant – emulsion elastomer modified</i>
<i>C-R1</i>	<i>Crack sealant – hot applied bitumen rubber</i>

The binder to be used on this contract for the sealing of cracks shall be C-E1 modified binder crack sealant. The minimum required properties of crack sealant are shown in Table PS4802

TABLE PS4802

Properties for modified binder crack sealants

	<i>Unit</i>	<i>Test Method</i>	<i>C-E1</i>	<i>CC-E1</i>	<i>C-R1</i>
<i>Softening point (R&B)</i>	<i>°C</i>	<i>MB-17</i>	<i>80 (min)</i>	<i>70* (min)</i>	<i>55-65</i>
<i>Elastic recovery @ 15°C</i>	<i>%</i>	<i>MB-4</i>	<i>80 (min)</i>	<i>50* (min)</i>	<i>N/A</i>
<i>Flow @ 60 °C</i>	<i>mm</i>	<i>MB-12</i>	<i>Nil</i>	<i>Nil</i>	<i>15-70</i>
<i>Resilience @ 25 °C</i>	<i>%</i>	<i>MB-10</i>	<i>N/A</i>	<i>N/A</i>	<i>13-40</i>
<i>Dynamic viscosity @ 190°C</i>	<i>dPa.s</i>	<i>MB-13</i>	<i>N/A</i>	<i>N/A</i>	<i>20-40</i>
<i>Dynamic viscosity @ 170°C</i>	<i>dPa.s</i>	<i>MB-13</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
<i>Dynamic viscosity @ 165°C</i>	<i>Pa.s</i>	<i>MB-18</i>	<i>0.65 (max)</i>	<i>N/A</i>	<i>N/A</i>
<i>Dynamic viscosity @ 25°C</i>	<i>Pa.s</i>	<i>MB-18</i>	<i>N/A</i>	<i>0.8(max)</i>	<i>N/A</i>
<i>Binder content (m/m)</i>	<i>%</i>	<i>MB-22</i>	<i>N/A</i>	<i>55 (min)</i>	<i>N/A</i>

* Note: Value to be determined on the residue after recovery of the binder by evaporation method MB-20.

PS4803 PLANT AND EQUIPMENT**(b) Equipment for crack sealing**

Replace this entire subclause with the following:

“The contractor shall inter alia provide the following equipment for crack sealing:

(i) Blowing out cracks

A mobile compressor capable of discharging at least 3 m³/min compressed air at 650 kPa pressure. The compressed air shall be free of deleterious matter that may adversely affect the bond between the sealant and the cracks. The compressor shall be free of oil and diesel leaks.

A lance shall be used to direct the force of the air into the cracks and must be manoeuvrable enough to follow the path of the crack accurately

(ii) Sealant applicator

The sealant shall be applied through an applicator manufactured specifically for this purpose. Essentially the equipment for the hot sealant shall consist of a mobile vessel capable of heating the sealant to the required application temperature by indirect heat, controlled by a thermostat to prevent overheating. A calibrated thermometer shall be fitted in an accessible position to accurately measure the sealant temperature in the tank. Only pumps which can deliver the sealant to the crack in a controlled fashion shall be used.

The sealant shall only be applied with pressure type application equipment to ensure that the cracks are filled rather than covered.

The contractor shall ensure that all equipment is kept clean so as to prevent blockages and resultant poor Workmanship.

PS4804 CONSTRUCTION**(f) Sealing cracks****(ii) Preparation**

Add the following:

“The cracks shall be blown out with compressed air. All dirt, grit and other base or foreign matter shall be blown out and be removed from the cracks and road surface.”

(iii) Cracks smaller than 3mm

Add the following:

“No cracks smaller than 3 mm width shall be sealed unless so ordered by the Employer’s Agent.”

(iv) Cracks of 3mm and wider

Add the following:

“Cracks shall first be cleaned before the crack is sealed. The sealant shall be forced into the cracks by means of the specified sealant applicator. The contractor shall ensure that the sealant mixture actually penetrates the crack and does not merely cover the crack in the form of a bandage. All excess sealant on the road surface wider than 30mm on each side of the crack and 1mm thick shall be removed, and will not be paid for.”

(v) Restrictions

Add the following at the end of the second paragraph:

“This re-application forms part of the measured meter of crack completed and will not be measured separately.”
Add the following:

“Crack sealing shall not take place when the conditions are excessively windy or dusty as determined by the Employer’s Agent or Employer’s Agent’s Representative.

B4807 MEASUREMENT AND PAYMENT

Add the following items:

Item	Unit
“B48.14 Cleaning, Supplying Sealant and Sealing cracks	
Cleaning crack with compressed air, and sealing the cracks using modified binder crack sealant	metre (m)

The unit of measurement for sealing of cracks shall be the metre of crack sealed as specified.

The tendered rates shall include full compensation for blowing/cleaning the cracks, supply and application of sealant, heating (where required) and applying all the materials as specified, and for all equipment, labour, supervision and incidentals for completing the work. No additional payment will be made for multiple applications of material, and payment will not distinguish between the various types, widths or lengths of cracks.

SECTION 5600 : ROAD SIGNS

Replace this section of the specification with the following:

DESCRIPTION OF WORKS

This specification covers requirements for all labour, materials, transport, plant and equipment for the manufacture, delivery and installation of traffic signs and posts as and when required by the Roads Provision Department:-

- i. Manufacture of the signs.
- ii. Supplying all posts, nuts, bolts and washers etc. (stainless steel grade 304), and clamps for the assembly and erection of the signs.
- iii. Transporting and installation of the posts, and signs.
- iv. Removal and disposal of damaged posts and signs.

All signs shall be manufactured fully in conformity with the latest Southern African Development Community Road Traffic Signs Manual (SADCRTSM), the Road Traffic Act (RTA) and SABS 1519-1990.

PS 5600 ROAD SIGNS**PS 5601 MATERIALS**

- 1.1. Only new material shall be used.
- 1.2. The backing shall be 1.4mm chromadek sheeting
- 1.3. Preparation and painting shall be carried out in accordance with CKS 193-1977 and the paint system shall be as follows:-
 - 1.3.1 PVC plastical system having a 150 micron min.dry film thickness on each side of the sheet.
 - 1.3.2 The coat on the back face of the sign sheeting shall be grey in colour G29 to SABS 1091 or similar.
 - 1.3.3 Where sign backings are to be faced with retro-reflective background material, application shall be carried out as per the manufacturer's instructions.
 - 1.3.4 When tested with a straight edge the flat surface of the sign shall not deviate from a true plane by more than 0.25% of the test length. The min test length shall be 1m.
 - 1.3.5 Bolts washers and nuts shall be stainless steel grade 304 bolts manufactured to SABS 136.Nuts shall be locking 'nyloc' or equally approved.
 - 1.3.6 Blind rivets shall be 48mm diameter and non-corrosive.
- 1.4. All steel sections shall be hot dip galvanised in accordance with SABS 763.
- 1.5. The Contractor shall ensure that the signs and supports supplied by the manufacturers are correct in all respects

PS 5602 MANUFACTURE OF SIGNS**Retro-reflective Sheeting**

- 2.1 All sheeting used in the manufacture of signs must be approved by the South African Bureau of Standards
- 2.2 All Class 1 sheeting used for the manufacture of the signs shall carry an identifying mark and shall be Class 1, 7 year engineer grade retro-reflective material and shall comply with the minimum standards for Class 1 sheeting. Where Class 3 sheeting is specified, it shall comply with the minimum standards for Class 3 sheeting.
- 2.3 All sheeting used in the manufacture of the sign must be approved by the South African Bureau of Standards in terms of performance and retro-reflective sheeting material.

Only Class 1 and Class 3 sheeting is to be used and must comply with the minimum standards for Class 1 and Class 3 sheeting. All retro-reflective sheeting must comply with SABS 1519. The contractor shall provide the necessary SABS certificates for the various sheeting used in the manufacture of the signs.

2.4 The application of all retro-reflective sheeting shall be carried out as per the manufacturers' instructions.

2.5 The entire sign, except where otherwise specified, shall be manufactured using 7 year engineer grade retro-reflective material, i.e. the background, border and symbol shall be reflective except where the symbol is black semi-matt. Silk screening with inks shall not be permitted on any signs. The signs shall be manufactured using a single piece of retro-retro-reflective sheeting for the background and symbols as necessary.

PS 5603 SIGN BACKING MATERIAL

3.1 The backing material of all signs shall be 1,4mm thick Chromadek sheeting or otherwise specified.

3.2 All sheeting used for signs shall be new, and refurbished backings shall not be accepted.

3.3 The cut edges shall be true and smooth and free from burrs or ragged breaks.

3.4 All triangular backings for standard traffic signs are to have the corners shaped to comply with the latest edition of the SADCRTSM ie. The corners shall be rounded to the radius as specified in the manual.

3.5 The colour on the back of all signs shall be grey except for STOP signs where the colour shall be white semi-matt, in accordance with the SADCRTSM

3.6 Drilling of Signs and Fixing of Uni-struts to Signs

3.6.1 All signs shall be drilled, or fitted with uni-strut channels, as shown on the attached annexures. Regulatory and warning signs shall be drilled on the vertical centre line as shown.

3.6.2 The diameter of the holes shall be 12mm. All holes must be drilled prior to the application of retro-reflective sheeting. All holes shall be perpendicular to the principal surface and free from burrs. Holes shall not be drilled in such a manner as to distort the metal.

3.6.3 Drilling details for sign backings are attached. Dimensions are given to the centre of the drilled holes.

3.7 Samples

3.7.1 The Contractor shall deposit samples of :-

- a) A STOP sign (R1 - 600mm)
- b) A children ahead warning sign (W 308 - 900mm)

All samples shall be deposited at the offices of the Employers Agent, at the Roads Provision Dept. at 30 Archie Gumede Place.

3.7.2 The Employers Agent reserves the right to subject samples to such tests as may be deemed reasonable and necessary.

3.7.3 The samples of the signs will be retained for comparison with the goods supplied.

3.8 Details on Sign

The manufacturer will be required to affix a sticker to the back of every sign that he manufactures. The sticker must be durable and last as long as the guarantee on the signs and shall bear the name of the manufacturer and the month and year of manufacture.

3.9 Double Sided Signs

Double sided signs will have identical details on both faces of the chromadek sheet. It will be clearly indicated in the schedule of quantities which signs are double sided.

3.10 Exclusive Secondary Message Sign

The regulatory sign and the exclusive secondary message sign shall be incorporated onto a single chromadek backing. The bottom corners of the sign backing shall be rounded to the radius as specified in the SADCRTSM.

3.11 One Way Roadway Sign

Backings for this type of sign shall have four 12mm diameter holes drilled as shown on the drilling detail. The corners of all one way roadway sign backings shall be rounded to the radius as shown in the SADCRTSM.

3.12 Specification for W407 to W410

Signs W407 to W410 shall be manufactured with a 1mm chromadek backing, white class 1 retro-retroreflective background and red class 3 chevrons. The signs shall be rivetted onto a hot dipped galvanised frame manufactured 32mm square tube (2mm wall thickness). Mounting hooks shall be welded onto the

frame and drilled prior to galvanising. Mounting hooks shall be 30 x 5mm thick flat bar.

PS 5604 TRANSPORT AND PACKAGING OF SIGNS

The contractor shall ensure that all signs are properly packaged and protected against damage during storage and transportation. Any damaged signs shall be returned to the contractor for repairs/replacement.

PS 5605 EXCAVATION AND BACKFILLING FOR ROAD SIGN SUPPORTS

Road signs shall be erected in the positions shown on the drawings or indicated by the Employers Agent. The unit of measurement shall be the number (no) of excavation measured in place according to the neat dimension of the footings or excavations as shown on the drawings or directed by the Employers Agent. In the case of timber or aluminium posts not in concrete, the plan area of the excavated hole shall be taken as 0,15 m² irrespective of the actual size of the excavated hole. All excavation shall be carried out by hand with the contractor exercising due care when working near underground services. If any service is damaged, the contractor shall bear the cost of the repair to such service. The contractor shall ensure that the work site is safe before leaving it. All holes excavated for post planting shall be backfilled at the end of the working day and all spoil shall be removed from site within 48 hours. Where excavation is required to be done in a hardened sidewalk, items for these are included in the bill of quantities. The re-instatement of sidewalks has also been included in the bill of quantities.

PS 5606 RE-INSTATEMENT SIDEWALKS

All sidewalks to be re-instated to comply with Section PS 4200, Item PS 4212 – Patching or reconstruction of existing asphalt sidewalk / driveway access scoops.

PS 5607 SUPPLY OF POSTS FOR THE INSTALLATION OF SIGNS

This specification will require the supply and installation of the types of posts specified below: -

7.1. Wooden posts of varying diameters and lengths

Timber posts for road sign supports shall conform to the requirements of SABS 754, shall be equal to or better than strength group B timber posts and shall be stamped with the SABS mark. The posts shall be treated in accordance with creosote or copper-chromium-arsenic (CCA) compounds which complies with SABS 753. After the posts have been treated, they shall not be sawn, drilled or shaped.

Where, however, the cutting of posts is unavoidable after having been treated, the Employers Agent may permit the required length to be cut off from the bottom of a post, provided that the exposed area is subsequently thoroughly treated with creosote or CCA compounds.

Timber posts shall not exhibit excessive cracking at the ends. Posts which, in the opinion of the Employers Agent, exhibit a degree of cracking that would render them unfit for service during a much shorter than normal life shall not be used.

7.2. 76mm diameter (2mm wall thickness) hot dipped galvanised posts of varying lengths

Where, the cutting of posts is unavoidable after having been treated, the Employers Agent may permit the required length to be cut off from the bottom of a post, provided that the exposed area is subsequently thoroughly treated as per manufacturers specification to avoid rusting / deterioration.

PS 5608 TRANSPORT AND INSTALLATION OF POSTS

The installation of posts shall be carried out as specified below:-

- 8.1. Posts shall be soilcreted into position
- 8.2. Posts shall be placed into position and the backfill earth compacted
- 8.3. Posts shall be placed in position, in the case of sleeves at the end of traffic islands, the sleeve shall then be backfilled with river-sand or the post may be secured in position with the use of polystyrene wedges.
- 8.4 The post shall be set to a depth of 600-700mm. The minimum distance between the ground and the lowest portion of the sign shall be 2100mm, and a maximum distance of 2500mm, unless otherwise specified.
- 8.5 Soilcrete shall consist of 1 part cement and 12 parts granular sand such as river sand and adequate water to cause the materials to react and set.

Excess lengths of the posts to be cut off and appropriately treated as mentioned in this specification.

PS 5609 REMOVAL AND DISPOSAL OR RE-ERECTION OF DAMAGED POSTS AND SIGNS

- 9.1 Where ordered by the Employers Agent, the contractor shall dismantle existing road signs and / or posts, store them and re-erect them at new positions indicated. This work shall be done with as little damage as possible to the signs
- 9.2 Where ordered by the Employers Agent, the contractor shall dismantle existing road signs and / or posts, and dispose of.

PS 5610 INSTALLATION OF SIGNS

Signs may be installed on new and existing posts or ELP's (as instructed by the Employers Agent) by various methods as outlined below: -

- 10.1. With the use of stainless steel bridges, clips and strapping (two per sign)
 - 10.2. With the use of uni-strut clamps (two pairs)
 - 10.3. With the use of stainless steel self-tapping coach bolts, where the signs are being installed on wooden posts.
- Signs shall be installed at the correct heights as per the SADCRTSM.

PS 5611 SUPPLY OF VARIOUS FASTENERS

- 11.1 All bridges, clips and strapping shall be stainless steel grade 304. Bridges shall be supplied with a washer.
- 11.2 Uni-strut clamps shall be galvanized and shall be supplied in pairs, in various sizes as required. Bolts (M8x45), washers (x2) and nuts used to fasten the uni-strut clamps shall be stainless steel grade 304.
- 11.3 Self-tapping M8 coach bolts shall be stainless steel grade 304.

PS 5612 PROTECTION AND MAINTENANCE

The contractor shall protect the completed road signs against damage until they have been finally accepted by the employer, and he shall maintain the road signs until the completion certificate has been issued. Damage or defects caused by negligence or faulty workmanship shall be rectified by the contractor at his own cost to the satisfaction of the Employers Agent.

MEASUREMENT AND PAYMENT

PS 56.01 SUPPLY OF TRAFFIC SIGNS

This item covers road sign boards with painted or coloured semi-matt background, symbols, lettering and borders in Class 1 retro-reflective material, where the sign board is constructed from pre-painted galvanised steel plate (1.4 mm chromadek).

The tendered rate shall include full compensation for procuring and furnishing all the materials, and for manufacturing and supplying the completed road sign board, including amongst others galvanizing (if specified), drilling, painting, retro-reflective lettering, symbols, numbers, arrows, emblems and borders, and for

all other materials, equipment, labour, supervision, transport, handling, etc necessary for the manufacture, supply and delivery of the sign board to the site.

Sign type and size to be as specified individually as indicated in the bill of quantities.

The unit of measurement shall be the number of completed single sign boards supplied

PS 56.02 SUPPLY OF POST, BRACKETS, FASTNERS

The tendered rate shall include full compensation for procuring and furnishing all the materials, and for manufacturing and supplying the posts, including amongst others supporting framework, reinforcement, cross bracing, struts, fixing brackets, angle irons, channel profiles, nuts, bolts and for all other materials necessary, equipment, labour, supervision, transport, handling, etc necessary for the manufacture, supply and delivery of the post and installation accessories to the site.

(i) Post type, diameter and length to be as specified individually as indicated in the bill of quantities.

The unit of payment shall be the number of posts supplied.

(ii) Type of fastener to be as specified individually as indicated in the bill of quantities.

The unit of measurement shall be the number of that fastener type supplied.

PS 56.03 INSTALLATION OF POSTS

The tendered rate shall include full compensation for excavating, backfilling and compacting the backfill material, for the disposal of all surplus excavated material, and for providing the backfill material materials, equipment, labour, supervision, handling, etc necessary for the installation of the post on site. The supply of the cement is to be included in the construction rate. This rate excludes the supply of the posts, which is catered for in PS56.02

The unit of measurement shall be the number of posts installed.

PS 56.04 INSTALLATION OF TRAFFIC SIGNS

The tendered rate shall include full compensation for attaching the road sign board to the road sign support structure (new or existing posts) and for all other materials, equipment, labour, supervision, handling, etc necessary for the installation of the sign on site. This rate excludes the supply of the signs, which is catered for in PS56.01

Installation to be based on the type of fastener as specified individually as indicated in the bill of quantities.

The unit of measurement shall be the number of sign boards installed of that fastener type specified.

PS 56.05 REMOVAL AND DISPOSAL OF DAMAGED SIGNS AND POSTS

(i) Signs: The tendered rates shall include full compensation for carefully dismantling and disassembling the road signs, loading, transporting, off-loading and disposing all the materials as required by the Employers Agent. It shall also include compensation for restoring the site where the road signs have been dismantled.

The unit of measurement shall be the number of signs dismantled and disposed off, irrespective of size of sign and type of fasteners.

(ii) Posts: The tendered rates shall include full compensation for demolishing the concrete footings (if applicable) of existing signs to at least 200 mm below the adjacent ground level, disposing of the resulting debris at approved dumping sites provided, and cutting timber or steel support structures at not less than 200 mm below the adjacent ground level and disposing thereof.

The unit of measurement shall be the number of posts dismantled and disposed off, irrespective of length and diameter of posts.

PS 56.06 REMOVAL AND RE-ERECTION OF SIGNS AND POSTS

(i) Signs: The tendered rates shall include full compensation for carefully dismantling and disassembling the road signs, storing the road signs, loading, transporting the material to the new location, off-loading and re-erecting the road signs, and restoring the location where they were dismantled.as required by the Employers Agent.

The unit of measurement shall be the number of signs dismantled and re-erected, irrespective of size of sign and type of fasteners.

(ii) Posts: The tendered rates shall include full compensation for demolishing the concrete footings (if applicable) of existing signs to at least 200 mm below the adjacent ground level, disposing of the resulting debris at approved dumping sites provided, and cutting timber or steel support structures at not less than 200 mm below the adjacent ground level, loading, transporting the material to the new location, off-loading and re-erecting the support posts, and restoring the location where they were dismantled.as required by the Employers Agent.

The unit of measurement shall be the number of posts dismantled and re-erected, irrespective of length and diameter of post

SECTION 5700 : ROAD MARKING**PS5701 SCOPE**

Replace "South African Road Traffic Signs Manual" in the second paragraph with:
 "SADC Road Traffic Signs Manual"
 Replace the words "ordinary road marking paint" with "solvent borne road marking paint".
 Replace "BS 3262" with "EN 1436".
 Replace "Hot melt plastic road marking" with "thermoplastic road marking".

PS5702 MATERIALS

Insert the following before subclause (a) Paint:

"The selection of the appropriate road marking paint and materials for permanent road markings to ensure conformance with the requirements of this specification rests with the contractor. Such paint and material shall have technical characteristics (brightness, luminance, skid resistance, durability) equal to or greater than road marking paint and materials specified in subclauses 5702(a), (b) and PS5702(c).

Where plastic road-marking material (hot-melt plastic (also known as thermoplastic) and two-component (also known as cold plastic)) is used, the contractor shall obtain an approved guarantee from the manufacturer that the paint complies with the specification. This shall be submitted to the Employer's Agent on request."

Replace sub-subclause PS5702(a)(i) with the following:

"(i) Road marking paint

Road marking paint shall be Type 1 as specified in SANS 731-1. Only paint, manufactured in a SANS approved and accredited facility shall be accepted. The no-pick-up time of roadmarking paint shall comply with the Class 1 requirement in accordance with SANS 731-1.

The paint shall be delivered at the site in sealed containers marked in accordance with SANS 731-1.

The viscosity of the paint shall be such that it can be applied without being thinned down."

Replace sub-subclause PS5702(a)(iii) with the following:

"(iii) Thermoplastic road marking material

Thermoplastic road marking material shall comply with the requirements of EN 1436, and EN 1423: 1998 for drop-on glass beads for road marking and anti-skid aggregates and mixtures thereof. Blending of thermoplastic road marking material and glass beads shall comply with EN 1424: 1998.

The binder shall be an elasticized synthetic resin and the material shall be reflectorized by mixing in 25% by mass Class A glass beads in accordance with EN 1424: 1998. An additional topping of glass beads shall be applied to the hot surface of the material for instant retro-reflectivity.

The white road marking material shall contain 6% by mass minimum titanium dioxide content and shall have a skid resistance of 45 S.R.T. – units or higher. SABS Method 1248: 1995 shall be used for determination of traffic wear index; indication of durability.

The following minimum lumination values are required for the completed product.

- 250 mcd/m².lux & 120 mcd/m².lux for white & yellow lines respectively, at 30 days after application.
- 200 mcd/m².lux & 100 mcd/m².lux for white & yellow lines respectively, at 6 months after application.

Determination of coefficient of retro-reflected luminance by means of portable retroreflectometer shall be carried out using SANS 6261: 2008. Application of the permanent roadmarking will thus have to be performed within the first 6 months of the 12 month defects liability period to allow for the second measurement to fall within the contract dates. Should the application of the permanent road-marking fall outside the first half of the defects liability period for whatever reason, the settlement of the retention money will be delayed until the second

measurement of luminance can be performed at the stipulated time and the required adjustment can be made to the tendered rate (if required).
Two-component cold plastic road marking material shall be used for symbols, arrows and letters (hand painted markings) unless otherwise instructed by the Employer's Agent."

Add the following sub-subitem:

"(v) Cold plastic road marking material

Cold plastic road marking material shall be used for symbols, arrows and letters (hand painted markings) and shall consist of a solvent-free reactive acrylic resin, stuffing, beads and pigment to which a hardener shall be added. Application shall be carried out using a trowel. Application by paint brush shall not be permitted.

Cold plastic road marking material shall be reflectorized by mixing in 25% by mass (or 400 g/m²) Class A glass beads in accordance with EN 1424: 1998. An additional topping of glass beads is applied to the wet surface of the material after application and will comply with EN 1423: 1997."

b) Roadstuds

Replace the second sentence with the following:

"All square roadstuds shall have a footprint of 100mm x 100mm and a height of at least 20mm. Round roadstuds shall be 100mm in diameter and not less than 20mm in height."

Add the following sub-item:

c) Retro-reflective beads

Retro-reflective glass beads shall be applied to the wet paint, thermoplastic and cold plastic. The beads shall comply with Class A beads in accordance with EN 1424: 1998, with the following

requirements or as approved by the Employer's Agent:

- colour: crystal clear
- roundness: > 80%
- size range of: 14 – 200 US Mesh (75 – 1400 Microns)
- refractive index: > 1.5
- specific gravity: $\pm$ 2.5
- granulometry:

CUMULATIVE RETAINED MASS		
SIEVE	MINIMUM	MAXIMUM
1700	0	2
1400	0	10
1180	5	30
850	40	80
600	70	100
425	80	100
355	90	100
212	95	100
PAN	100	100

The beads shall be delivered to the site in sealed bags, marked with the name of the manufacturer, the batch number and an inspection seal of SANS, confirming that the beads form part of a lot tested by SANS and comply with the requirements of EN 1424: 1998. Alternatively, the Contractor shall at all times have a SANS certificate on the site, identifying the batches to which the inspection seals apply and certifying that they have been tested by SANS, and comply with the requirement of EN 1424: 1998."

PS5704 MECHANICAL EQUIPMENT FOR PAINTING

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

"The road-marking machine shall be fitted with a device to guide the operator to the centre of the line to be painted. This device shall be used at all times of operation."

PS5705 SURFACE PREPARATION

Add the following at the end of the second paragraph:

"The onus is on the contractor to ensure that the surface on which the road markings are to be applied is sufficiently clean and dry to ensure that the quality of the road markings will not be adversely affected. The contractor is also responsible for protecting road studs from being painted over, and the subsequent cleaning thereof if such over-painting did occur."

PS5707 APPLYING THE PAINT

Insert the following before the first paragraph:

"The Contractor's establishment on site and general obligation shall be deemed to fully include the establishment of the road-marking team, irrespective of the number of times the road-marking team is required to be on site or is required to move within the site."

Replace the sixth paragraph with the following:

"Solvent borne road marking paint shall be applied at a nominal rate of 0,42 l/m² or as directed by the Employers Agent. Thermoplastic road marking shall be applied at a nominal rate of 2,5 kg/m² to achieve a minimum thickness of 1,25mm to 1,5mm or as directed by the Employers Agent. The two-component road marking material shall be applied by hand by means of a trowel. The desired symbol or line shall be marked with a tape or a template on the road surface. Thereafter apply the required volume of material and spread uniformly over the entire area. When dry/set, remove the tape or template. A spreading rate of 4,5kg/m² is estimated to achieve a 2,0mm material thickness."

In order to ensure proper coverage on all types of surfaces the Employers Agent may order an increase in the above nominal application rates. Payment for these variations in application rates shall be made under item 57.04.

A daily log-sheet, provided by the Employer, shall be completed and signed by the Contractor and the Employer's Agent representative, recording the quantities of paint and glass beads used on that day and shall be available for inspection at all times. The completed and signed log-sheet for the period covered by a payment certificate shall be attached to the payment certificate."

Replace the last paragraph with the following:

"Solvent-based road marking as specified by the Employers Agent shall be carried out within 14 days of opening the road full width to traffic after the completion of the surfacing."

If in the in the opinion of the Employers Agent, conditions are unsafe, the centre-line shall be painted immediately after 2,0 km of continuous road has received a new asphalt layer, or 4,0 km of continuous road has received a new seal surfacing."

PS5708 APPLYING THE RETRO-REFLECTIVE BEADS

In the first paragraph, replace the nominal application rate of 0,8kg/litre with "400gm/m²".

Replace the second paragraph with the following:

"The thermoplastic road marking material and two-component road marking material shall contain insitu glass beads of minimum content of 25% in order to obtain night visibility (reflectivity). The contractor shall immediately apply additional glass beads at 400g/m² to obtain immediate reflectivity. The beads shall be sprayed onto the road marking layer by means of a pressure sprayer. Where letter, symbol, traverse line and island road marking is undertaken by hand, the glass beads may be applied by hand if approved by the Employers Agent. Prior to any hand application work, the contractor shall first request approval from the Employers Agent."

Add the following:
 "Beads shall be applied in accordance with EN 1424."

PS5710 TOLERANCES

Add the following paragraphs to subclause (c) Alignment of markings:

" When an unbroken line and a broken line are painted alongside each other, the beginning and the end of the unbroken line shall coincide with the beginning of one broken line and the end of another broken line. When existing lines are repainted, the new markings shall not deviate more than 100mm in the longitudinal direction nor 10 mm in the transverse direction from the existing marking.

The alignment of the road studs shall not deviate from the true alignment by more than 10mm and shall be positioned so that the reflective faces are within 5° of a right angle to the centre line of the road."

Add the following subclause:

"e) Testing

(1) Plant

Before painting any permanent road markings, the Contractor shall satisfy himself and the Employers Agent, by painting test lines on a section of pavement other than the section required to be marked:

- (i) that the painting machine is in good working order and properly adjusted;
- (ii) that the operator is fully experienced; and
- (iii) that the machine sprays at the specified rate of paint application

The Contractor shall bear the cost of all materials and workmanship required for the above plant tests.

In addition, the Contractor shall conduct random paint thickness tests and dip/spread tests as required by the Employers Agent."

PS5711 GENERAL

Insert the following into the last sentence of the last paragraph between "black paint" and "or chemical paint remover":

", bituminous emulsion, slurry"

Add the following to the last paragraph:

"Where black paint is used, it shall be matt."

Add the following clause:

" The Contractor shall provide temporary traffic control facilities in accordance with Section 1500 of the COLTO's standard specifications for road and bridge works to ensure traffic safety where work is being executed.

Property and/or road signs damaged by the Contractor, his personnel, his agents or sub-contractors

shall be repaired or restored to their condition prior to the damage at his own cost."

PS5712 FAULTY WORKMANSHIP OR MATERIAL

Add the following paragraphs to this item:

"The Contractor shall rectify in an acceptable manner and at his own costs; all marking that do not comply with the specified requirements.

While work is in progress, tests shall be carried out on materials and/or the quality of work to ensure compliance with the specified requirements. The sampling methods are specified in SANS 731-1. The sampling methods described in TMH5 shall be followed where applicable."

PS5713 PROTECTION

Add the following paragraph

"Traffic cones shall not be smaller than 750mm in height and shall be placed on the road not further than 48m apart. Cones shall not be removed before the paint on the road has hardened to such an extent that it will not be damaged by traffic and the adhesive of the road studs has hardened to such an extent that the studs will not turn or become loose. All marks on the road caused by traffic driving over wet paint shall be removed by the Contractor at his own cost."

PS5714 MEASUREMENT AND PAYMENT

Amend the heading for payitem 57.03 as follows:

Item	Unit
"PS57.03 Thermo-plastic road-marking paint	metre (m)"
Amend the unit of measurement of items 57.03(a), 57.03(b), 57.03(c) from kilometre (km) to metre (m):	

Add the following after the third paragraph:

"Full payment of the tendered rate will be applicable upon completion of the application of the roadmarking paint. However, should the coefficient of retro-reflected luminance fall below the required.

minimum levels as specified in paragraph PS5702 above, payment will be reduced on the following

sliding scale :

White:

- Below 250 mcd/m².lux at 30 days : minus 10 % of the tendered rate
- Below 200 down to 180 mcd/m².lux at 6 months : minus 10% of the reduced rate
- Below 180 down to 160 mcd/m².lux at 6 months : minus 20% of the reduced rate
- Below 160 down to 140 mcd/m².lux at 6 months : minus 30% of the reduced rate

Yellow:

- Below 120 down at 30 days: minus 20 % of the tendered rate
- Below 100 down to 80 mcd/m².lux at 6 months: minus 20% of the reduced rate

The reduction in the tendered rate applicable for failing to meet the specified minimum luminance level

at the 30 days and 6 months measurement dates shall be applied accumulatively in the certificate immediately following the date of measurement."

Amend payitem PS57.05 as follows:

Item	Unit
PS57.05 Roadstuds (installation and maintenance)	number (No)"

(a) Heavy duty aluminium road stud

(K-lite SKU-304 or similar and approved by Employers Agent) No

(b) Glass dome road stud

(Holophane type or similar and approved by Employers Agent) No

Add the following after the first sentence of the second paragraph:

"No additional payment will be made should temporary or permanent road studs be replaced if lost or broken during the construction period or during the Defects Notification Period."

Item Unit

PS57.06 Setting out and pre-marking the lines (excluding traffic island markings, lettering and symbols)

metres(m)

Add the following:

“Referencing of existing barrier lines and other road marking lines prior to milling and other operations,

shall be included in the tendered rate for setting out and pre-marking.”

Item Unit

PS57.08 Removal of existing, temporary or permanent road

Markings by:

square metre (m2)

Add the following subclause:

“(c) Water Jetting square metre (m2)

Add the following pay items:

“Item

Unit

PS57.10 Cold plastic road marking material

(a)White lettering and symbols

square metre (m2)

(b)Yellow lettering and symbols

square metre (m2)

(c)Transverse lines, painted island and arrestor bed markings (any colour) square metre (m2)

The unit of measurement for applying the roadmarking material for the lettering, symbols, transverse lines, islands and arrestor bed markings shall be the square metre, and the quantity to be paid for shall be the actual surface area of the lettering, symbols, transverse lines, islands and arrestor bed markings, completed in accordance with the instructions of the Employers Agent. The tendered rate per square metre for applying the road marking material shall include full compensation for procuring and furnishing all material, including the retro-reflective beads and all necessary equipment, and for applying, protecting and maintenance as specified, including the setting out of lettering, symbols, transverse lines, islands and arrestor bed markings.

Add the following Specification:

SECTION PS10200: SPECIFICATION FOR PROCESSING RECLAIMED ASPHALT FOR SUBBASE OR BASE OFF SITE IN A STATIC COLD RECYCLING MIXING PLANT AND PLACED BY A PAVER, PROCESSED BY A GRADER OR BY HAND IN RESTRICTED AREAS

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PS10201 SCOPE

"Cold recycling using a Static Cold Recycling Plant" is a construction process that uses large special-purpose pug mill type machine together with stabilizing and dispersing agents to recycle reclaimed asphalt or granular material for reuse in existing pavements, without pre-heating the material. This process is referred to as "Static Plant recycling" in these specifications

- The road base or subbase for Pavements in this contract shall be constructed from crushed and screened or unscreened reclaimed asphalt material, stabilized with foamed bitumen in a central-type mixer and paver laid, laid/processed using a grader or laid by hand in restricted areas, all as specified by the Employers Agent. The new base shall be opened to traffic immediately after completion.

PS10202 MATERIALS

(2.1) The Crushed and Screened or Unscreened Reclaimed Asphalt Material

For this contract shall meet the requirements specified in TG2 (2020) Table 4.7 Recommended Grading for BSM foam and BSM emulsion.

Should the results of foamed bitumen mix designs indicate that blending of the crushed stone material with crusher dust is desirable to achieve an optimal product, the crusher dust used for blending shall meet the grading requirements for 'Fine Slurry – Fine Grade' specified under Section 4300, 4302 (b) (ii) Aggregates for Slurry Seals– Table 4302/11, Materials for slurry seal, as amended in Section PS4300, Table PS4302/13."

(2.2) Stabilising Agents

(2.2.1) Cementitious stabilizing/dispersing agents

- (a) Cement shall comply with the relevant requirements of SANS 50197-1:2013 for a CEM II. The use of strength classes greater than 32.5 shall not be permitted.
- (b) Road lime shall comply with the requirements of SABS 824.

(2.2.2) Bituminous stabilising agents

- (a) The bitumen emulsion to be used will be specified in the project Document and shall comply with the appropriate specification for a stable-grade bitumen emulsion (60% net bitumen) for: SANS 309 (SANS 4001 BT3: 2014) for anionic emulsion; or SANS 548 (SANS 4001 BT4: 2014) for cationic emulsion

(b) Foamed bitumen shall be produced by injecting a small amount of water (between 2% and 4% by mass of bitumen) into an 70/100 road-grade bitumen complying with the SANS 4001-BT1:2012 specification. The minimum foaming characteristics (in terms of expansion ratio and half-life) shall be consistent with those stipulated in the latest version of TG2.

(2.2.3) Water for construction

Water shall not contain any deleterious materials in harmful concentrations. Only approved sources of water shall be used.

(3.1) Mix Design Procedures

The Employer's Agent will determine the optimal application rates for foamed bitumen and any active filler using specialised laboratory equipment to produce foamed bitumen to mix with representative samples of the material to be stabilised.

200 kg of representative samples of each of the crushed stone and crusher dust materials that the contractor intends using for bitumen stabilized road base shall be delivered to the Employer's Agent's Representative at least six weeks before foamed bitumen stabilizing work is scheduled to commence. Should the Contractor elect to use more than one aggregate source, the procedures described below shall be repeated for each source, allowing a six week period for each to enable the Employer's Agent's Representative to undertake the necessary testing programme.

The Employer's Agent's Representative shall undertake the necessary tests in the site laboratory to determine the need for blending crushed stone with crusher dust and the relevant proportions should blending be required. Any blending requirement shall be prescribed in terms of percentage (by volume) of each component. The application rate of foamed bitumen will be determined from mix design procedures conducted on the specified blend of crushed stone and crusher dust and may vary between a minimum of 2.5% and maximum of 3.5% (by mass). In addition, tests will be carried out to determine the need for adding an active filler to the mix. A nominal application rate of 1% (by mass) of either hydrated lime or cement is usually added as a dispersing agent for the foamed bitumen.

Following these tests, the Employer's Agent's Representative will issue the Contractor with a memo specifying:

- the temperature range at which the bitumen is to be supplied for foaming;
- the amount of water to be injected into the bitumen for foaming;
- any requirements for blending the crushed stone material with crusher dust, together with applicable proportions (by volume);
- the application rate (to one decimal place, by mass) for foamed bitumen;
- the type and application rate (to one decimal place, by mass) of any active filler to be added to the aggregate prior to mixing with foamed bitumen; and
- the minimum strength values that will be applicable for quality control of the mixed product."

(3.2) Determining the Application Rates for Foamed Bitumen and Active Filler

Five (5) drums, each containing twenty (20) litres of representative samples of the bitumen that the contractor intends using on this contract, shall be delivered to the Employer's Agent's Representative at least six weeks before foamed bitumen stabilizing work is scheduled to commence. These samples shall be used to determine:

- the optimal foaming characteristics of the bitumen
- the optimal application rate of foamed bitumen for stabilizing the material to be used in the construction of the new road base, and
- whether or not an active filler is required in the mix.

The laboratory procedures for determining optimal application rates and the need for an active filler shall be referred to as "mix design procedures".

(3.3) Foaming Characteristics of the Bitumen

The Employer's Agent or Employer's Agent's Representative will determine the optimal foaming characteristics using specialised laboratory equipment to inject water into hot bitumen and measuring two key characteristics of the resulting foam at various bitumen temperatures and amounts of added water.

The two key characteristics are:

- the expansion ratio. This is a measure of the viscosity of the foam and is calculated as the ratio of the maximum volume of foam relative to the original volume of bitumen, and right
- the half-life. This is a measure of the stability of the foam and is the time taken (in seconds) for the foam to collapse to half the maximum volume achieved.

The laboratory procedure determines the temperature of the bitumen and amount of water addition (expressed as a percentage of the mass of bitumen) required to achieve a maximum of both expansion ratio and half-life.

An expansion ratio in excess of 10 with a corresponding half-life of more than 10 seconds are typical foaming characteristics for the bitumen specified on this contract under the following conditions:

Road-grade Bitumen (Penetration)	Bitumen Temperature (°C)	Water Addition (% of Bitumen Mass)
70/100	160 – 190	1 – 3

Stabilisation mix designs shall be carried out in accordance with the latest edition of the following publications:

- Cementitious stabilisation: TRH 13 and TRH14
- Bituminous stabilisation: TG2

Recycling work may only commence once the relevant mix designs have been approved for the initial 1km section. Thereafter, it will be incumbent on the Contractor to ensure that the laboratory work proceeds at a sufficiently fast pace to provide the relevant mix design requirements and obtain the necessary approval ahead of the recycling work. Should the situation arise where there is no approved mix design due to any delay, recycling work shall cease until such time as the approved mix design information becomes available and the Contractor shall have no recourse for costs incurred as a consequence of such a delay.

PS10204. PLANT AND EQUIPMENT

PROCESSING, LAYING AND COMPACTING SCREENED OR UNSCREENED RECLAIMED ASPHALT SUBBASE AND BASE

NOTE. These specifications are focused on the use of a Static Plant Recycler of site – KMA or similar. Where the contractor intends using any other type of machine to recycle reclaimed asphalt he shall submit a full motivation for using such a machine, including a detailed work plan describing the foaming, mixing process and subsequent compaction processes that will produce a layer that meets the specified end product requirements.

(4.1) Mixing Plant/Static Plant Recycler – KMA or similar

The mixing plant shall be purpose-built and supplied by a reputable manufacturer who can prove a successful history of foamed bitumen application with such a system in an environment similar to the region KwaZulu Natal. The foamed bitumen application system shall consist of a series of individual expansion chambers in which regulated amounts of water are mixed with hot bitumen. Modified hot-mix asphalt plants and “open” foaming systems that create foam by spraying a fine jet of water onto a hot bitumen stream in the open air (i.e. not in an enclosed chamber) shall not be used on this contract.

The material to be stabilized shall be fed continuously to the mixing unit. Where blends of crushed stone aggregate and crusher dust are specified, each component shall be fed through individual separate bins (coldfeed bins) and the required blend shall be achieved by adjusting the gate opening on each bin. Sensors shall be installed at each gate opening to monitor the flow of material and shall cause the plant to stop working in the event of no material flow.

The mass of material being transported on the main feed conveyor shall be determined by means of a loadcell that shall be linked to a central micro-processor control unit. This unit shall regulate the addition of foamed bitumen, active filler and water. In addition, the micro-processor shall record the throughput of material and related consumption of active filler, bitumen and water.

The application of active filler shall be achieved by adding dry powder onto the main feed conveyor prior to the material entering the pugmill mixer. Water and foamed bitumen shall only be applied in the mixer. Water shall first be added to the material at the inlet of the mixer, followed by the foamed bitumen. Each application system (active filler, water and foamed bitumen) shall be regulated by the central micro-processor control unit.

The foamed bitumen application system shall include the following features:

- electrical heating to raise the temperature of the entire bitumen flow path to at least 150°C before introducing bitumen into the system;
- a flow meter to measure and regulate the flow of hot bitumen;
- a series of separate expansion chambers spaced equidistant on a spraybar spanning the width of the pugmill mixer;
- a positive automatic control system to maintain a bitumen feed-pressure in excess of three (3) bars; and
- an easily accessible "test nozzle" that will instantly deliver a representative sample of the foam being injected into the mixer.

For safety reasons, systems that circulate hot bitumen from a tank, through the plant and back to the tank by means of a return pipe, shall not be employed unless the entire bitumen flow circuit is electrically heated. Such heating shall be applied continuously to the return pipe to safeguard against blockages forming whilst the plant is working.

The mixing plant that the contractor intends employing shall be subject to the Employer's Agent's or Employer's Agent's Representative's approval and he shall be entitled to reject a process which, in his opinion, may not consistently produce a mix with the required proportions or properties.

(4.2) (a) Paver

The base or subbase material shall be laid by a self-propelled track-mounted paver fitted with a single-unit screed that can pave a minimum width of 5m, equipped with "high compaction" features capable of uniformly compacting the full thickness of the paved layer to the minimum density of 98% of MDD (AASHTO T180). The equipment used shall be of adequate rated capacity, in good working order, and subject to the approval of the Employer's Agent or Employer's Agent's Representative. Obsolete or worn out equipment will not be permitted on the Site.

Only one longitudinal construction joint coinciding with the centre-line shall be permitted in the new base or subbase layer on this contract.

(4.2) (b) Hand laid

The base or subbase material shall be hand laid by labour intensive personnel to a depth of up to 150mm and levelled using hand rakes to suitable finished road level. The process shall include loading the BSM from the production plant and transporting to site, and spread to 150mm depth with proper level controls such as surveyor pegs must be in place to ensure proper thickness control, processing and compacting the layer to 98% MOD AASHTO as specified. The equipment used shall be in good working order and subject to the approval of the Employer's Agent. Obsolete or worn out equipment will not be permitted on the site.

Only one longitudinal construction joint coinciding with the centre-line shall be permitted in the new base or subbase layer on this contract.

(4.2) (c) Grader finished

The base or subbase material shall be laid by end-tipping and levelled using a Grader to a depth of up to 150mm, to suitable finished road level as directed by the Employers Agent. The process shall include loading the BSM from the production plant and transporting to site, and spread to 150mm depth with proper level controls such as surveyor pegs must be in place to ensure proper thickness control, processing and compacting the layer to 98% or 100% MOD AASHTO as specified. The equipment used shall be in good working order and subject to the approval of the Employer's Agent. Obsolete or worn out equipment will not be permitted on the site.

Only one longitudinal construction joint coinciding with the centre-line shall be permitted in the new base or subbase layer on this contract.

(4.3) Compaction

Compaction of the material shall be carried out using both vibrating smooth-drum rollers (minimum static mass of 12 tons and minimum drum width of 2.0 m) and pneumatic-tyred rollers (minimum 9-tyres and operating mass of 20 tons). The rolling pattern shall be so designed as to retain the shape of the layer and shall be as determined during the Trial Section. The size/mass of the rollers may be reduced in

areas which are restrictive, however the compaction requirements as stated above are to be achieved.

(4.3.1) Placing and Compaction

The mixed material shall be loaded into trucks used for transporting the material in such a manner that segregation will not take place while the material is being loaded, nor whilst in transit to the point of offloading.

Care shall be taken to prevent excessive loss of moisture between the time when the materials are loaded into trucks for transport and when they are finally compacted on the road. Where necessary, trucks shall be provided with protective covers to limit the loss of moisture.

The sub-base layer shall be swept clean of all debris and loose material over the full area. The surface shall be thoroughly moistened prior to laying the base and kept moist until covered by the new base. The contractor shall arrange his operations so that trucks transporting material to the site travel for the least distance possible on the prepared surface of the subbase. No turning of trucks shall be permitted on the prepared subbase and only wide-radius turns may be made whilst the truck is lining up. Any damage caused to the surface of the subbase layer shall immediately be rectified by:

- removing all loose subbase material by hand;
- moistening the surface so exposed;
- backfilling any gouges with foamed bitumen stabilised material; and
- compacting the backfill material to reinstate the original surface levels.

The new bitumen stabilized road base shall be constructed in half widths with only one longitudinal joint at the centre-line. To prevent a vertical step remaining along the centre-line overnight, the Contractor shall arrange his daily programme such that both half-widths are completed in a single shift. This means that whatever length of base is constructed on one half-width during the first part of the shift must be matched by constructing the same length on the other half-width before the end of work.

The longitudinal joint along the centre-line shall be kept continuously moist until the opposite half-width is laid and processed. At the end of each day's work, and when operations are delayed or stopped for more than one (1) hour, a lateral joint shall be formed by trimming back into the previously material until the full layer thickness of thoroughly compacted material is achieved. Such joints shall not be vertical, nor flatter than 1:2 (vertical : horizontal). All loose material shall be removed and the joint thus formed shall be moistened prior to works recommencing.

Once the layer has been compacted, the surface shall be gently slushed out by a pneumatic-tyred roller working in conjunction with a water tanker to obtain a tightly-knit surface finish. The finished surface of the foamed bitumen stabilised base course shall be of a uniform consistency. Any surface defect, including areas of coarse segregated aggregate, shall be removed by excavating the full layer depth. The sides of the holes so formed shall be trimmed, as described above for construction joints, before backfilling with fresh foamed bitumen stabilised material, compacted to the required density and finished off to the required elevation.

Sufficient time shall be allowed at the end of the shift to allow the surface to dry back to a moist state before opening the full road width to traffic. Curing, the new foamed bitumen stabilised road base shall commence the following morning and continue until the fog spray (or surfacing) is applied. It shall be kept continuously moist for seven days by an effective application system that will not damage the surface of the layer. If requested by the Employer's Agent or Employer's Agent's Representative a fog spray of dilute bitumen emulsion to protect the surface from the abrasive forces of traffic shall be applied and paid for separately.

PS10205 SETTING OUT AND CONTROL OF THE WORK

Must be read in conjunction with clause PS10105

PS10206 CONSTRUCTION

(6.1) General limitations and requirements

No recycling/mixing work shall be undertaken during misty or wet conditions, nor shall any work commence if there is a risk that it may not be complete before such conditions set in. Similarly, work shall not be undertaken if the ambient air temperature is below 5°C for emulsions and between 10-15oC for foam. No further work, other than finishing and compaction, will be permitted if the air temperature falls below 10°C during operations.

The limitations shown in the following table shall be strictly enforced.

<i>Temperature and time limitations for different stabilising agents</i>			
<i>Limitation</i>	<i>Stabilising agent</i>		
	<i>Cement</i>	<i>Bitumen emulsion</i>	<i>Foamed bitumen</i>
<i>Minimum material temperature (°C)</i>	10	10	15
<i>Maximum time for completion (hours)</i>	4 (from first bag been opened)	12	10

(6.2) Requirements before mixing/recycling commences

On a daily basis, before the start of recycling/mixing work (or, alternatively, at the end of the day's work), a bulk sample (>100kg) of screened/unscreened material shall be taken from an area that is going to be processed for laboratory testing

(6.3) Treating the Material with Foamed Bitumen and Active Filler

Mixing shall be done at locations off the road by means of a mobile mixing plant. Mixing the materials in-situ on the road will not be allowed and no alternative methods, including those that employ recycling-type machines for in-situ mixing, will be considered.

(6.4) Stockpile Areas

The crushed stone material, any crusher dust required for blending and, where required, the treated product shall be stockpiled separately adjacent to the mixing plant. To prevent contamination, the entire area on which material is to be stockpiled shall be prepared by creating a hard surface. The decision as to how such a surface is created is entirely the responsibility of the Contractor, as is the area of hard surface required for each material type. The cost of constructing such hard surfaces shall be included in the rates for bitumen stabilization.

The Contractor shall be solely responsible for ensuring that any material placed in stockpile does not become contaminated with that from the underlying floor. Any contamination of the material in stockpile will be sufficient reason for the Employer's Agent or Employer's Agent's Representative to reject the entire stockpile and the Contractor shall remove all material deemed to be contaminated at his own cost and such material shall not be used in the permanent work.

(6.5) Mixing Plant

The mixing plant shall be purpose-built and supplied by a reputable manufacturer who can prove a successful history of foamed bitumen application with such a system in an environment similar to the region KwaZuluNatal. The foamed bitumen application system shall consist of a series of individual expansion chambers in which regulated amounts of water are mixed with hot bitumen. Modified hot-mix asphalt plants and "open" foaming systems that create foam by spraying a fine jet of water onto a hot bitumen stream in the open air (i.e. not in an enclosed chamber) shall not be used on this contract. The material to be stabilized shall be fed continuously to the mixing unit. Where blends of crushed stone aggregate and crusher dust are specified, each component shall be fed through individual separate bins (cold-feed bins) and the required blend shall be achieved by adjusting the gate opening on each bin. Sensors shall be installed at each gate opening to monitor the flow of material and shall cause the plant to stop working in the event of no material flow.

The mass of material being transported on the main feed conveyor shall be determined by means of a loadcell that shall be linked to a central micro-processor control unit. This unit shall regulate the addition of foamed bitumen, active filler and water. In addition, the micro-processor shall record the throughput of material and related consumption of active filler, bitumen and water.

The application of active filler shall be achieved by adding dry powder onto the main feed conveyor prior to the material entering the pugmill mixer. Water and foamed bitumen shall only be applied in the mixer. Water shall first be added to the material at the inlet of the mixer, followed by the foamed bitumen. Each application system (active filler, water and foamed bitumen) shall be regulated by the central micro-processor control unit.

The foamed bitumen application system shall include the following features:

- electrical heating to raise the temperature of the entire bitumen flow path to at least 150°C before introducing bitumen into the system;
- a flow meter to measure and regulate the flow of hot bitumen;
- a series of separate expansion chambers spaced equidistant on a spraybar spanning the width of the pugmill mixer;
- a positive automatic control system to maintain a bitumen feed-pressure in excess of three (3) bars; and
- an easily accessible "test nozzle" that will instantly deliver a representative sample of the foam being injected into the mixer.

For safety reasons, systems that circulate hot bitumen from a tank, through the plant and back to the tank by means of a return pipe, shall not be employed unless the entire bitumen flow circuit is electrically heated. Such heating shall be applied continuously to the return pipe to safeguard against blockages forming whilst the plant is working.

The mixing plant that the contractor intends employing shall be subject to the Employer's Agent's or Employer's Agent's Representative approval and he shall be entitled to reject a process which, in his opinion, may not consistently produce a mix with the required proportions or properties.

(6.6)Mixing

The mixing plant shall be operated to produce on a continuous basis. Small batches shall be avoided.

Sufficient loading capacity shall be provided to maintain an adequate supply of material in the cold-feed bins and bulk tankers with a minimum capacity of 20 000 litres shall be used to supply hot bitumen and water.

Where active filler is not supplied from a bulk silo, sufficient labour shall be employed to maintain a continuous supply from bags into a feeding hopper.

Before mixing commences, the amount of water to be added to the hot bitumen in the expansion chambers shall be entered into the micro-processor's "settings" mode, as well as the application rates for active filler, foamed bitumen and water. The gate openings on each cold-feed bin shall be set to deliver the required proportion of material into the resulting blend.

The temperature of the bitumen in the bulk tanker shall not be less than that required for foaming, as determined by the Employer's Agent or Employer's Agent's Representative from initial laboratory tests. If the bitumen temperature drops by more than 5°C below that required whilst bitumen is being drawn from the tanker, foaming characteristics shall be estimated using the test nozzle (as described below). The expansion ratio and half-life thus estimated will be used by the Employer's Agent as an indication of whether an acceptable quality of mix can be achieved. Should the Employer's Agent or Employer's Agent's Representative decide that the temperature is too low, then the Contractor shall immediately stop mixing and either heat the bitumen in that tanker or utilise another tanker with bitumen at the required temperature.

The amount of water added in the mixer shall be sufficient to achieve the optimum mixing moisture content (approximately 80% of the Optimum Moisture Content (OMC) of the blended material.) This setting may be changed periodically whilst mixing in response to varying moisture conditions of the input materials.

The foaming characteristics of each and every tanker-load of bitumen shall be checked using the test nozzle on the mixing plant. Within five minutes of starting to mix with a new tanker load of bitumen, a sample of foamed bitumen shall be discharged from the test nozzle into a clean steel container (bucket) with a capacity of 20 litres. The test nozzle shall be opened for approximately five seconds and all foamed bitumen caught in the bucket. The half-life shall be estimated in seconds from the time taken for the foam to collapse to

approximately half the volume initially achieved. The expansion ratio achieved shall be estimated from measurements of the maximum height achieved and the height of bitumen after the foam has totally collapsed. These estimates shall be recorded for each bulk-tanker load along with the bitumen temperature, bitumen pressure and percentage water addition, as well as bitumen-type and details of the supply tanker (where relevant).

No mixing shall be undertaken if the temperature of any of the aggregate materials that will be used in the mix is less than 15°C. The temperature of the material shall be measured not less than 150 mm below the surface of the aggregate stockpile. In addition, no mixing shall be undertaken when the ambient air temperature falls below 10°C.

The mixed product may be transported to site and laid immediately or placed in stockpile for later use.

(6.7) Control of Application Rates

The Contractor shall establish a control system on site for checking the consumption of active filler and bitumen against the tonnage of material mixed.

This system will be used for:

- checking the application rate of both active filler and foamed bitumen, and
- determining the amount of active filler and bitumen actually consumed.

The Contractor shall present his proposals for such a control system to the Employer's Agent or Employer's Agent's Representative for approval and no foamed bitumen stabilising work shall commence until an acceptable control system has been finalised.

(6.8) Stockpiling the Treated Material

Where the treated material is placed in stockpile, care shall be taken to ensure that the following minimum requirements are met:

- the area on which the material is stockpiled shall be prepared, similar to those on which the aggregate ingredients for the mix are stockpiled (refer sub-sub-clause (ii) above) and the Contractor's attention is drawn to the consequences of allowing the treated material to become contaminated.
- the maximum height of stockpiled material shall be 4 m;
- moisture loss from the material in stockpile shall be prevented, either by covering the entire stockpile with an impervious sheet, or by spraying the surface of the stockpile with water every two hours between sunrise and sunset;
- no vehicles, front-end loaders or other equipment shall be permitted to drive on stockpiled material. Stockpiled material shall be maintained in as loose a state as is practical;
- samples shall be extracted from the stockpiled material seven (7) days after being placed in stockpile and, thereafter, every seven (7) days whilst the material remains in stockpile. Such samples shall be tested for moisture content and indirect tensile strength. Samples shall be taken from each 500 mm horizon below the surface of the stockpile to a maximum depth of 2 m;
- no material shall remain in stockpile for more than thirty (30) days unless the contractor can show by means of laboratory tests that keeping the material in stockpile for longer periods is not detrimental to the performance expectations of the final base course; and
- loading material from stockpile shall be undertaken by front-end loaders running on a thin layer of sacrificial mix on the stockpile floor. Loading shall be done in such a manner that the material is extracted from the base of a vertical face, thereby promoting mixing as the

face collapses. All due care and diligence will be required by the contractor regarding the safety of plant and personnel during loading operations and to ensure that the stockpile is "made safe" at the end of work each day."

(6.9) Transporting the Mix, Placing, Compaction and Finishing

(a) Thickness Limitations

The compacted thickness of the foamed recycled reclaimed asphalt layer shall not exceed 200 mm. Where a greater thickness is required (up to a maximum thickness of 300 mm), the material shall be treated in two layers of equal thickness.

(b) Compaction Requirements

The Compaction requirements will be dependent on the supporting layer underneath. The following requirements will apply:

- (a) Asphalt or stabilized supporting layer – 102% to 100% Mod AASHTO.
- (b) Crushed Stone or well compacted natural gravel support – 100% to 98% Mod AASHTO.
- (c) Insitu natural gravel support – 98% Mod AASHTO.

The project Specific compaction requirements will be stated in the Project Order.

No single test shall be lower than the Project Specific compaction minus 2%, i.e. Project Specific compaction = 100%, therefore, no test may be less than 98% Mod AASHTO.

The minimum number of tests per lot shall be 5.

(c) Finishing off the layer

After compaction is complete, the surface will be sprayed with an appropriate amount of water and a pneumatic tyred roller (PTR) applied. The PTR shall make sufficient passes required to generate a "mild" slush and close up voids in the surface together with any other grader-induced defects and achieve a tightly-knit surface finish.

Where the recycled material is treated with a bitumen stabilising agent and the intention is to open the finished layer to early trafficking, a dilute emulsion (15% residual bitumen) may be substituted for water in the slushing process on the Employer's Agent's or Employer's Agent's Representative's request. Such slushing shall be undertaken in short sections ($\pm 20\text{m}$) over the full width of the recycled layer. A water tanker fitted with an appropriate spraying system (or binder distributor) shall be used to spray a uniform amount of dilute emulsion on the surface before applying the PTR. Additional dilute emulsion may be applied where the first application failed to generate sufficient slush under the wheels of the PTR. Personnel equipped with squeegees shall be deployed to move the slush over areas showing signs of roughness and/or segregation. Squeegees shall be used to remove any surplus slush to the side of the road.

Once slushing is complete, the entire area shall receive a fog spray application using the same dilute emulsion (applied at a nominal rate of 0.75 litres/m^2) and left to dry back before opening the road to traffic. This item shall be measured and paid separately as and when requested.

Note.

Dilute emulsion for slushing and fog spraying shall only be applied using an appropriate water tanker or binder distributor.

(d) Curing of Bitumen Stabilized Work

The surface of the new foamed bitumen stabilised road base shall be kept continuously moist for seven days by an effective application system that will not damage the surface of the layer. If requested by the Employer's Agent or Employer's Agent's Representative a fog spray of dilute bitumen emulsion to protect the surface from the abrasive forces of traffic shall be applied and paid for separately.

(6.10) Construction Limitations

Each section of bitumen stabilised base shall be completed the same day that it is laid.

The new bitumen stabilised base shall be constructed in half widths with only one longitudinal joint at the centre-line. To prevent a vertical step remaining along the centre-line overnight, the Contractor shall arrange his daily programme such that both half-widths are completed in a single shift. This means that whatever length of base is constructed on one half-width during the first part of the shift must be matched by constructing the same length on the other half-width before the end of work.

The full road width shall be opened to traffic at the end of each day's work and traffic shall be allowed to run on the completed layer during the curing period. Traffic speed shall be controlled to a maximum of 40 kph by the installation of suitable temporary traffic-calming measures approved by the Employer's Agent or Employer's Agent's Representative.

If, for any reason, the Contractor is unable to complete both half-widths and match up before the end of work, he shall, at his own cost, protect the travelling public by installing the necessary signage and delineators along the entire length of road where the base is incomplete. In such instances, the surface of the incomplete section, including the step along the centre-line shall be kept wet (day and night) by frequent watering until the adjacent half-width is laid and finished off. Failure to keep the completed half-width wet shall result in the material being rejected and the Contractor will have to remove it from site at his own cost.

PS10207 CONSTRUCTION OF TRIAL SECTIONS

Before the Contractor commences with the construction of the foamed bitumen stabilised base, he shall demonstrate by constructing a trial section that the equipment and procedure he proposes to use will result in him constructing the layers in accordance with the specifications. The trial section shall be at least 2,000 m² in area and shall be constructed in its proper position in the pavement. Only when such a trial section has been satisfactorily constructed and accepted will the Contractor be permitted to proceed with the foamed bitumen stabilised layer in the permanent work.

In the event of the trial section being unsuccessful, the Contractor shall remove the trial section should the Employer's Agent so require. The trial section shall be paid for separately only when it complies with all the requirements of the specifications and has been approved by the Employer's Agent or Employer's Agent's Representative. After approval has been obtained, the mixing process and equipment shall remain unaltered unless otherwise approved by the Employer's Agent or Employer's Agent's Representative.

PS10208 PROTECTION AND CURING

The provisions of Sub-clause 8.1 of Section PS10108 shall apply.

No additional payment shall be made for curing with water, as described above. The application of a dilute bitumen emulsion fog spray on the completed base shall be measured and paid separately.

PS10209 TRAFFIC

The full road width shall be opened to traffic at the end of each day's work and traffic shall be allowed to run on the completed layer during the curing period. Traffic speed shall be controlled to a maximum of 40 kmph by the installation of suitable temporary traffic-calming measures approved by the Employer's Agent or Employer's Agent's Representative. No additional payment shall be made for this item.

PS10210 TOLERANCES**(10.1) Amount of Stabilizer****(i) Foamed Bitumen and Active Filler for Bitumen Stabilisation**

The rate of application of foamed bitumen and active filler shall be determined from the consumption of each material relative to the quantity of product mixed and used for the construction of the new road base. The approved method of measurement (refer sub-subclause PS10206 (6.7)) shall be used for determining the amount of foamed bitumen and active filler that was actually consumed.

The tolerances that shall be applied are:

- Active filler. The actual application rate of active filler shall be within 0.25% of the specified application rate; and
- Foamed bitumen. The actual application rate of foamed bitumen shall be $\pm 0.25\%$ of that specified. (e.g. if an application rate of 3.5% is specified, mixes that contain between 3.25% and 3.75% shall be accepted.)"

(10.2) Uniformity of Mix

Bitumen Stabilised Material

The uniformity of mixing with foamed bitumen and active filler shall be assessed from samples taken from trucks delivering the mixed product to the site. At least one bulk sample (200 kg) shall be taken for every 2000 m² of finished road base and retained in sealed bags for transport to the laboratory.

In the laboratory, the moisture content of the material shall first be determined. The moisture content of the bulk sample shall then be adjusted to the optimum moisture content. This material shall then be used to manufacture 150 mm diameter briquettes, cured and tested for ITS values. These results shall be assessed against the relevant mix design specified for that particular material. The quality shall be acceptable if the strengths achieved are more than 75% of the ITS achieved in the mix design. No statistical judgement plan shall be applied to these test

PS10211 QUALITY OF MATERAILS AND WORKMANSHIP

Must be read in conjunction with clause PS10110 and PS10206

PS10212 MEASUREMENT AND PAYMENT

PS10212.01 Preparations for pavement rehabilitation

Will be paid under PS10111.01

PS10212.02 Processing/Mixing of Reclaimed Asphalt in a Static Plant Recycler – KMA or similar

Processing/Mixing bitumen stabilised reclaimed asphalt in a static plant recycler – KMA or similar and stockpile onsite.....cubic metre (m3)

"The unit of measurement shall be the cubic meter of material processed/mixed in a Static Plant recycler –

KMA or similar, to be used in construction, measured in place after compaction.

"The tendered rates shall include full compensation for processing/mixing the bitumen recycled reclaimed asphalt material in a mobile mixing plant – KMA 200 or similar, addition of bitumen and other stabilizing agents, for stockpiling, protecting until used, and for conducting control tests, all as specified.

Rate shall exclude crushing, screening to the correct grading, hauling, adding the specified amount of crusher dust, and the specified amount of foam/emulsified bitumen and cement/lime stabilizing agent.

10212.03 Processing/Mixing of Reclaimed Asphalt in a Static Plant Recycler – KMA or similar, and paver laid.

(a) For material, paver laid and compacted to 102% (average) of Mod AASHTO density, to

compacted layer thickness:

- (i) 100 mm, up to and including 150 mm..... cubic metre (m3)**
- (ii) Exceeding 150 mm and not 200 mm..... cubic metre (m3)**
- (iii) Exceeding 200 mm and not 300 mm..... cubic metre (m3)**

(b) For material, laid and compacted to 100% (average) of Mod AASHTO density, to compacted layer thickness:

(c) Paver Laid:

- (i) 100 mm, up to and including 150 mm..... cubic metre (m3)**
- (ii) Exceeding 150 mm and not 200 mm..... cubic metre (m3)**

(iii) Exceeding 200 mm and not 300 mm..... cubic metre (m3)

(d) Grader Finished:

- (i) 100 mm up to and including 150 mm..... cubic metre (m3)**

(c) For material, laid and compacted to 98% (average) of Mod AASHTO density, to compacted layer thickness:

(e)Paver Laid:

- (i) 100 mm up to and including 150 mm..... cubic metre (m3)**
- (ii) Exceeding 150 mm and not 200 mm..... cubic metre (m3)**
- (iii) Exceeding 200 mm and not 300 mm..... cubic metre (m3)**

(f) Hand Laid:

- (i) 100 mm up to and including 150 mm..... cubic metre (m3)**

(h) Grader Finished:

- (j) 100 mm up to and including 150 mm.....cubic metre (m3)**

"The unit of measurement shall be the cubic meter of material processed/mixed in a Static Plant recycler –KMA or similar and used in construction, measured in place after compaction.

"The tendered rates shall include full compensation for processing/mixing the bitumen recycled reclaimed asphalt material in a mobile mixing plant – KMA 200 or similar , addition of bitumen and other stabilizing agents, hauling within a freehaul distance of 10km radius from the processing plant to the site, for any wastage, for placing by paver/hand/grader, rolling, slushing and finishing, for protection and maintenance of the completed layer and for conducting control tests, all as specified.

Rate shall exclude crushing, screening to the correct grading, adding specified amount of crusher dust, and the specified amount of foam/emulsified bitumen and cement/lime stabilizing agent.

(d) Extra over item (a), (b) or (c) for crushing of the reclaimed asphalt..... cubic metre (m3)

"The unit of measurement shall be the cubic meter of material crushed and finally used in construction, measured in place after compaction. No allowance will be made for waste material screened out and discarded.

The tendered rate shall include for full compensation for labour, plant, fuel, handling, processing, stockpiling if necessary, and for conducting control tests, all as specified.

(e) Extra over item (a), (b) or (c) for screening of the reclaimed asphalt/crushed reclaimed asphaltcubic metre (m3)

"The unit of measurement shall be the cubic meter of material screened and finally used in construction, measured in place after compaction. No allowance will be made for waste material screened out and discarded.

The tendered rate shall include for full compensation for labour, plant, fuel, handling, processing, stockpiling if necessary, and for conducting control tests, all as specified.

(f) Extra over item (a), (b) or (c) for mechanically modifying of the reclaimed asphalt/crushed/screened reclaimed asphalt by adding a specified amount of crusher dust as and when ordered by the Employer's Agent tonne (t)

The unit of measurement shall be the tonne of material blended with the crushed stone aggregate in the mixing plant and shall include full compensation for all necessary work/plant to blend the crusher dust with the screened asphalt. The quantity of crusher dust that is added shall be measured in accordance with the proportion of the total volume that comprises crusher dust, as dictated by the settings on the feed gates of the mixing plant. This proportion shall be applied to the relevant measurement under Item a) or b) and paid under this item as an extra over.

(For example. Where the mix design calls for 10% crusher dust: 90% graded crushed stone blend, the gates on the mixing plant will be set to deliver such proportions by volume. Assuming that the quantity of this mix measured under item a/ or b) is 1,000 m3, and then the quantity to be measured and paid as an extra over under this item will be 100 m3, which will then be multiplied by the Relative Density of this material to give tonne's.

The tendered rate shall include full compensation for procuring and furnishing the crusher dust material (including quarrying, crushing and screening to the correct grading) for all haulage from the supply source to the mixing plant, for any wastage and for adding the crusher dust to the reclaimed asphalt/crushed/screened material, and for conducting control tests, all as specified, all as specified

(g) Extra Over Item (a), (b) or (c) for overhaul on material in excess of 10km radius (ordinary overhaul) cubic metre.kilometre (m3 .km)

The unit of measurement shall be the cubic meter of material, measured in place after compaction, of overhaul material hauled in excess of 10.0km, multiplied by the overhaul distance in kilometers,

The tendered rate shall include full compensation for hauling material in excess of the free haul distance.

PS10212.04 Stabilising agents:

- (a) Cementitious stabilising agents (and active fillers)**
- (i) Cem II 32.5 ton (t)**
- (ii) Road lime ton (t)**
- (b) Bituminous stabilising agents**
- (i) Bitumen emulsion (type specified)..... ton (t)**
- (ii) Foamed bitumen from 70/100 Pen-grade bitumen ton (t)**

The unit of measurement shall be the ton of stabilising agent/dispersing agent actually consumed in the

recycling / stabilising process. Measurement shall be based on assized weighbridge tickets issued for each and every tanker load of bitumen consumed in the recycling process. The measured quantity shall not exceed the calculated theoretical quantity by more than 5%. The measurement for bitumen stabilising agents shall provide for double treatment over a nominal 100mm overlap width along longitudinal joints.

The tendered rates for cementitious stabilising agents shall include full compensation for procuring and providing the stabilising agent or active filler on site, for all handling and temporary storage requirements, for setting out and spotting bags/pockets in a grid matrix along the line of cut, for opening, emptying and spreading the contents of the bags/pockets accurately within the confines of the relevant cells, for collecting and disposing of all empty bags/pockets, for all wastage and for adhering to all safety measures whilst handling the bags/pockets.

The tendered rate for bituminous stabilising agents/active fillers shall include full compensation for procuring and transporting the material to site, for transfer into storage tanks, storage, heating and transfer into tankers for coupling to the recycling train, for all transport on site, for issuing the required assized weighbridge ticket showing the mass of bitumen contained in the tanker, for any re-heating required, for all wastage and for strict adherence to all safety measures required when handling warm or hot bitumen. For foamed bitumen, the rate shall include for foaming the bitumen on the recycler, including the water and any other additive that may be required to achieve the minimum foaming characteristics and for injecting the foamed bitumen in to the recycled material. The rate shall exclude for slushing with a dilute bitumen emulsion, which will be paid separately if requested/the need arises

The tendered rate shall include full compensation for gathering the surplus material by windrowing or pushing it into heaps, for loading and transporting to a designated spoil or stockpile site within a 10 km radius, for offloading and either spreading the material or placing in neat stockpiles

PS10212.05 Trial Sections..... cubic metre (m3)

Foamed bitumen stabilised graded crushed stone base trial section (all thicknesses) constructed in accordance with the provisions of the Project Specifications. cubic metres (m3), as and when ordered by the Employer's Agent or Employer's Agent's Representative. Where a Trial Section fails to achieve the specified result for any reason whatsoever, no payment shall be affected under this item, nor shall any payment be made under the various related items for the failed work.

The unit of measurement shall be the cubic meter of completed trial section approved by the Employer's Agent or Employer's Agent's Representative.

The tendered rate shall include full compensation for constructing the trial section complete as specified." The rate shall also include full compensation for all additional costs incurred as a consequence of designating the section of work a Trial Section, including all costs relating to low productivity

10212.06 Stabilising or dispersing agents

Will be paid under PS10111.6

10212.07 Application of fog spray of diluted emulsion as and when requested by the Employer's Agent or Employer's Agent's Representative.

Will be paid under 10212.07/48.01

- | | | |
|-----|-------------------------------------|-----------|
| (a) | 65% Cationic spray grade emulsion | litre (l) |
| (b) | 32.5% Cationic spray grade emulsion | litre (l) |
| (c) | 16% Cationic spray grade emulsion | litre (l) |

The unit of measurement shall be the litres of emulsion sprayed measured at spraying temperature.

The tendered rate shall include full compensation for procuring and providing all plant, labour and materials required for applying the fog spray as specified, including all preparation work required to dilute the emulsion and sweep the road surface before applying the fog spray.

10212.08 Spread, level/shape, Water and Final Compaction of BSM (RAP)...cubic metre (m³)

"The unit of measurement shall be the cubic meter of material, measured in place after compaction. The tendered rate shall include for full compensation for labour, plant, fuel, handling, processing, stockpiling if necessary, and for conducting control tests, all as specified.

Add the following Specification:

SECTION PS10300: SPECIFICATION FOR ESTABLISHMENT OF CONSTRUCTION PLANT

PS10301 SCOPE

This section covers establishment at the commencement of work and de-establishment on completion of the work, of all the construction plant and teams (human resources) that is necessary for the construction or deconstruction of any road layers to the required specification. The layers and operations which may need construction plant may include but not limited to the following:

- Paving of asphalt layers or application of surfacing seals
- Milling out of existing road layers
- Construction of layerworks using in-plant BSM
- Construction of layerworks using in-situ BSM
- Construction of granular layers.
- Construction due to subgrade improvements i.e. undercut
- Construction of ancillaries

The use of all hand-operated constructional equipment, or in other words construction equipment which does not require a driver, shall be included in the respective rates of the items for which this equipment is used. i.e. Wacker, Jack-hammer, etc.

The establishment and de-establishment of any equipment shall be agreed with Employer's Agent or Employer's Agent's Representative in writing before doing so. The Contractor may not remove construction plant from the site without the written consent of the Employer's Agent. Should the Contractor remove any plant from the site without the permission of the Employer's Agent, the contractor shall be liable to a fine of R2000 per item of construction plant and may be required to re-establish the construction plant at the cost of the Contractor.

The construction plant covered under this section is the plant that is normally included in the fixed obligations of Section 1300, Contractor's Establishment on site and General Obligations of the COLTO Specifications.

Note: Storage of construction plant on the roadway outside of the permitted working hours is strictly prohibited, unless approved in writing by the Employer's Agent. The Contractor shall factor into his establishment rates the necessary movement of plant in terms of storage so as not to constitute a safety hazard to the public and travelling motorists. The Employer's Agent may, at his discretion, suspend all works for the non-compliance to this requirement.

PS10302 MEASUREMENT AND PAYMENT

PS10302.01

The unit of measurement shall be the number of establishments and de-establishments of all the construction plant required to complete an operation to specification. Establishment and de-establishment shall form a combined quantity of one.

The tendered rate shall include full compensation for establishing and de-establishing, loading and transporting all the necessary plant and equipment that the contractor deems necessary in order to complete an operation to the required specification.

The responsibility shall rest with the Tenderer to identify such plant and price accordingly as plant will not be paid for individually but for the successful completion of an operation to specification. i.e. if the operation requires the construction of an in-situ BSM layer, then the plant required to complete the operation would be:

- The recycler
- The water tanker
- The bitumen tanker

- The grader
- The pad-foot roller
- The smooth-drum roller

The above is only an example which should not be taken as binding or the actual requirement. The cost of carrying out the actual work by the plant shall be included in the construction rates, as stated in the COLTO specifications.

Establishment of:

- | | |
|--|-------------|
| (a) Plant necessary for paving asphalt layers | number (No) |
| (b) Plant necessary for milling operations | number (No) |
| (c) Plant necessary for constructing in-plant BSM layers by
(Excl. KMA plant covered by sub-item(h)) | |
| (i) Paver | number (No) |
| (ii) Grader | number (No) |
| (d) Plant necessary for constructing in-situ BSM layers | number (No) |
| (e) Plant necessary for constructing granular layers | number (No) |
| (f) Plant necessary for completing subgrade improvements (undercuts) | number (No) |
| (g) Plant necessary for carrying out the required ancillary works | |

Note: payment for this item shall be effected per sub-contractor undertaking the works as agreed and approved by the Employers Agent.

- | | |
|---|-------------|
| (i) Pre-treatment (plant for excavation and compaction) | number (No) |
|---|-------------|

This includes activities to be undertaken prior to the main rehabilitation works such as patching, construction of sub-soil drains or stormwater drains etc. that requires the establishment of plant for excavation and compaction activities. The Contractor is to programme the works such that the plant may have a continuous flow of work and only de-establish once all pre-treatment works are complete.

- | | |
|---|-------------|
| (ii) Post-treatment (plant for excavation and compaction) | number (No) |
|---|-------------|

This includes activities to be undertaken upon completion of the main rehabilitation works such as construction of speed-humps, sidewalks and kerbing or kerbing-channelling combination etc. that requires the establishment of plant for excavation and compaction activities. The Contractor is to programme the works such that the plant may have a continuous flow of work and only deestablish once all post-treatment works are complete.

- | | |
|--|-------------|
| (h) Static Plant Recycler – KMA or similar | number (No) |
|--|-------------|

- | | |
|-------------|-------------|
| (i) Crusher | number (No) |
|-------------|-------------|

- | | |
|--|-------------|
| (j) Screen (26.5/19mm max particle stone size), as specified by the Employer's Agent | number (No) |
|--|-------------|

- | | |
|--|-------------|
| (k) Plant necessary for single seal construction | number (No) |
|--|-------------|

- | | |
|---|-------------|
| (l) Plant necessary for slurry seal construction (including microsurfacing) | number (No) |
|---|-------------|

The tendered rate for subitem PS10302.01(h), the establishment of Static Plant Recycler (KMA or similar) shall cover full compensation for preparing the platform where the Plant and the stockpiling area will be kept, setting up the KMA plant, establishing and de-establishing, loading and transporting all the necessary plant and equipment that the contractor deems necessary in order to complete an operation to the required specification

Add the following Specification:

SECTION PS10400: SMALL CONTRACTOR DEVELOPMENT

PS10401 SCOPE

This section covers construction aspects relating to the processes by which the construction industry develops contractors. This includes training, coaching, guidance or mentoring which may be required by the local ward based emerging sub-contractors.

Definitions

(i) Training:

Training refers to the process of teaching a learner – usually in a classroom or simulated work environment situation. Training usually takes place with one teacher/trainer and several learners. Principles and theory are taught. Demonstrations are given. Assignments are then set to ensure that the learner is able to apply what has been taught. Training is done by a specialist in the subject, who is also qualified to train.

Example: use of a dumpy level

Training would involve the theory of how a dumpy level works and how to calculate levels. A demonstration of how to set up and read a level could be given.

(ii) Coaching:

Coaching refers to hands-on training and is mostly on a one-on-one basis of tangible and measurable skills. It is typically on-site training, or learning-on-the-job. Coaching is training by the process of “watch-do-correct-practice”. The coach does the task while the learner watches and asks questions. Then the learner does the same task while the coach watches. The learner is corrected until the coach feels that he has gained competence in the function. The learner is then left to practice the task or skill, which the coach oversees. Coaching is imparting a skill – usually manual or physical. A coach is usually a person doing the same type of work on a higher or more competent level, or has a mastery of the skill/task. While training gives the theory or shows/explains the principles, coaching helps the learner become competent and master a skill. A coach is often in the direct reporting line, i.e. someone in authority. Coaching could be part of the management function and would make the job run more smoothly.

Example: Use of a dumpy level

Coaching would involve taking the learner onto site, setting up a dumpy level, reading levels. Then the coach would get the learner to do the job, while the coach checked setting up and reading. Once the learner understands and can do the tasks, the coach checks periodically to ensure the learner is still doing the job properly. The desired outcomes of coaching are for the learner to “fit-the-mould”, or do things the same standard as the coach.

(iii) Guidance:

Guidance is anticipating where one might go wrong, or where one is doing a task in a complicated, inefficient or ineffective way, and giving advice as to how to achieve a better result. Guidance is mostly given by a person in the direct reporting line but can be given by anyone. Guidance is not imparting skills, but suggesting ways to improve performance.

Example: Use of a dumpy level

A person who knows how to use a dumpy level would be given guidance as to where he would next set up the level to limit the number of set-ups. Guidance could be an extension of coaching.

(iv) Mentoring:

Mentoring is developing a person on a long-term career path. It is mostly about imparting skills that are often intangible and non-measurable. A mentor is seldom anyone in the direct reporting line –although he could be a person several levels higher in that reporting line. Mentoring is more about developing a relationship and taking a personal interest in an individual. A mentor looks out for that individual and gives him advice that

cannot be found in a book or in the normal course of business. The sort of issues a mentor discusses with the protégé is company politics, how-to pick-up work before others get wind of it, how to position ones company to get a better competitive advantage, how to tender such that the tender is lowest, but the profit is as good or better than the next person, how to determine and assess risk. Mentoring helps the protégé think strategically, sharpen entrepreneurial skills and grow – both personally and in terms of the company. A mentor helps the protégé to develop insight and shrewdness. It is more about business skills to survive long-term than the technical, tactical or day-to-day activities of doing business. The desired outcome for mentoring is for the protégé to develop his own style, i.e. to shape his own “mould”.

s(v) Supervision

Supervision is instruction regarding the work to be performed, and ensuring it is carried out to specification and to the satisfaction of the supervisor. It is not instruction on how the work is to be performed, but rather on what work has to be performed, and usually has specific time frames.

PS10402 GENERAL RESPONSIBILITIES FOR DEVELOPMENT

The Contractor may request, or the Employer's Agent may determine, where applicable, the need for developmental assistance for the sub-contractors, where such sub-contractors experience and competencies are limited and require training, coaching, guidance and mentorship, to ensure successful completion of the allocated project/s.

The Contractor shall appoint a dedicated Senior Foreman or Clerk of Works (internally or externally sourced) or Site Technician (hereafter referred as Service Provider) whose sole responsibility shall be to assist with the execution of its responsibilities towards the training, coaching, guidance, mentoring, development and/or support of the local ward based sub-contractors.

The qualifications and experience of the Service Provider shall be relevant and of a suitable level to enable them to supervise the level of the sub-contractors. The minimum requirements thereof being:

- i. Minimum ten (10) years' experience in the type of works being undertaken,
- ii. Relevant trade-test certification (where applicable).

The Service Provider shall evaluate whether the local sub-contractor(s) would require assistance in form of training, coaching, guidance and/or mentoring and subsequently develop and establish a Support Development Programme, which shall be approved by the Employers Agent prior to implementation.

a) General Obligations of Service Provider

The Service Provider shall comply with the following minimum obligations:

- (i) Assist the local sub-contractors in instituting a quality assurance system;
- (ii) Provide adequate training, coaching, guidance, mentoring or any other identified and approved assistance.
- (iii) Provide support and any other identified and approved assistance to ensure that the Contractors meet their obligations and commitments with respect to their subcontracts, and
- (iv) Assist the local sub-contractors planning of construction activities (programming), and required production rates in order to achieve a positive cashflow
- (v) Assist the local sub-contractors with all health and safety and environmental requirements in relation to the project specifications, and the relevant acts or guidelines
- (vi) Assist the local sub-contractors with the procurement of plant, materials and human resources, where applicable.

b) Quality of Work and Performance of Sub-contractors

The Contractor shall closely monitor and supervise all sub-contractors and where requested and approved by the Employer's Agent, shall appoint a Service Provider to train, coach, guide, mentor and assist subcontractor's

in all aspects of management, execution and completion of its subcontract. This shall typically include assistance with planning of the works, sourcing and ordering of materials, labour relations, monthly measurements and invoicing procedures. The extent and level of such training, coaching, guidance, mentoring, and assistance to be provided shall be commensurate with the level of subcontract applicable and shall be directed at enabling the sub-contractor to achieve the successful execution and completion of its subcontract. The Contractor shall give reasonable warning to the sub-contractors when any contravention of the terms and conditions of the subcontract have occurred or appears likely to occur. The Contractor shall, whenever feasible, give the sub-contractors reasonable opportunity to make good any such contravention, or to avoid such contravention, and shall render all reasonable assistance to the sub-contractors in this regard.

c) Dispute Avoidance and Resolution Procedures for sub-contractors

When any disputes arise as provided for in the subcontract, the Contractor shall explain fully to the sub-contractor that such actions are provided for in the subcontract. If such action is contemplated it shall be discussed with the Employer before any action is taken.

If the sub-contractor, in the opinion of the Employer, fails to comply with any of the criteria listed below, the Employer shall issue a written warning to the Contractor, stating all the areas of non-compliance. The criteria are as follows:

- (i) Acceptable standard of work as set out in the specifications;
- (ii) Progress in accordance with the time constraints in the construction programme;
- (iii) Punctual and full payment of the workforce and suppliers;
- (iv) Site safety; and
- (v) Accommodation of traffic.

The sub-contractor shall have 21 days from the date of receipt of the letter of warning by the Contractor to address and rectify the issues raised by the Employer, except for sub-clauses (iv) and (v) above, for which the reaction time shall be in accordance with the relevant specifications for those aspects of the Works, but which shall not be longer than 24 hours. Failure by the sub-contractor to comply with a deadline, will be sufficient grounds for the Contractor to apply a penalty or terminate the subcontract provided that the Employer is satisfied that the Contractor has made every effort to correct the performance of the sub-contractors.

The sub-contractor shall have the right to dispute any ruling given or deemed to have been given by the Contractor or Employer. Provided that, unless the sub-contractor shall, within 21 days after his receipt of a ruling or after a ruling shall have been deemed to have been given, give written notice (hereinafter referred to as a Dispute Notice) to the Contractor, referring to the relevant clause(s) in the subcontract agreement, disputing the validity or correctness of the whole or a specified part of the ruling, he shall have no further right to dispute that ruling or the part thereof not disputed in the said notice.

PS10403 TRAINING, COACHING, GUIDANCE, MENTORING OR ASSISTANCE

(a) Purpose of the Support Development Programme(s)

Skills development forms an integral part of the Employer's Transformation and Community Development Policies and hence, it is important to the Employer that Targeted Enterprises (local ward based subcontractors) be equipped with skills that can be used to gain meaningful future employment and secure subcontracting opportunities.

It is, therefore, a requirement of this Contract that adequate Training, Coaching, Guidance, Mentoring and assistance be provided, to ensure skills development within the Construction Industry.

(b) Skills Audit and Gap Analysis

Prior to establishing the Support Development Programme(s), the Contractor shall conduct a Skills Audit and Analysis of the Subcontractors to determine their levels of skills sets in undertaking the works allocated to

them. The outcome of the Skills Audit and Analysis shall be used to compile the Support Development Programme(s).

The Contractor shall be paid separately in the Bill of Quantities for compliance to this required specification.

(c) Developing the Support Development Programme(s)

The Employer shall be involved in the decision making and quality control pertaining to the development and implementation of the Support Development Programme(s) facilitated through this Contract.

The Support Development Programme shall address two elements, namely:

- (i) The skills gap identified during the skills audit and analysis as referred to in PS10403 (b), and,
- (ii) The general obligations of the Service Provider as referred to in PS10402 (a).

The complete Support Development Programme shall be approved by the Employer before any training commence, and shall include the following, but not limited to:

- (i) specify the development needs of each sub-contractor contracting entity – the systems the entity lacks,
- (ii) specify the development needs of the individuals comprising the entity – the skills the individuals within the entity lacks,
- (iii) the level to which that activity will be developed within the period of the contract
- (iv) whether training, coaching, guidance and/or mentoring is to be given in each activity, and
- (v) the person/s responsible for each activity.

The Contractor shall be paid separately in the Bill of Quantities for compliance to this required specification.

An example of what the Support Development Programme(s) could entail includes the following, but not limited to:

- (i) Understanding and interpreting drawings
 - Understanding the cross referencing to drawings from the contract documents and the bill of quantities,
 - Understanding the layout of the drawings,
 - Understanding the plan view, elevations and cross sections, and
 - How to interpret, accurately layout and construct the details
- (ii) Setting out construction works

This skill requires an understanding of the function and use of instruments such as the dumpy level, the theodolite, and procedures such as stringing a line.
- (iii) Technical know-how of activities.
- (iv) Task organization

This activity involves the correct supervision of labour and organisation of tasks to ensure that labour is utilised most effectively. This includes the following:

 - Allocation of the appropriate number of people for the task,
 - Availability on site of the correct type and amount of material and equipment at the point of use, and
 - Planning tasks ahead so that labour does not stand idle.
- (v) Task prioritization

Task prioritization must cover an understanding of critical paths, including identifying which tasks can be postponed and which are urgent. It includes planning and monitoring so that time targets are achieved. It must also cover gaining an understanding of the penalties applicable to late completion of tasks.
- (vi) Works schedule

This is the ability to produce daily work plans and will assist with task organization. Daily work plans need to be developed into monthly work plans and vice versa. These plans assist in material

ordering, plant scheduling, labour allocation, timeous completion of the work, and keeping track of profit/losses.

(vii) Quality Control

Quality control requires knowledge of specifications and tolerances and ensuring that the work adheres to these, as well as understanding the requirements of the client.

(viii) Measuring work done for payment certificates

This is the ability to measure actual work done and to translate these measurements into a payment certificate. Knowledge must be gained on how to calculate escalation, how to claim for VO's and how to handle other claims.

(ix) Handling site instructions and VO's

This is the ability to distinguish between site instructions and variation orders and how to respond to such instructions.

(x) Materials planning

- Determining the quantity of materials required for each task and planning ordering,
- Determine appropriate lead times to ensure that everything required to do a job is on hand, and
- Quantity take-offs for pricing a bill at higher levels of development.

(xi) Receiving, storing and handling materials

Receiving includes checking materials delivered against the delivery note and the order placed.

Storage involves knowing what quantities and type of materials to store, planning accessibility, and safety of materials from inter alia theft and weather. Handling of materials needs to be carried out to ensure no wastage or damage.

(xii) Machine analysis

This is the analysis of the use of equipment. It includes calculating fuel and hourly costs. This will enhance an understanding of the effective use of equipment, how to reduce costs and provide a background for pricing of equipment for tenders.

(xiii) Maintenance schedule

This covers the importance of maintenance of equipment and how to schedule this so that there is minimal disruption in day-to-day work.

(xiv) Construction programme/work plan

Knowledge of how to develop a construction programme/work plan, monitor and assess the production, and corrects the programme where necessary.

(xv) Understanding tests

Understanding what tests are required, reading and interpreting results relating to specifications and quality, and how to make the corrections required.

(xvi) Cash Flow

The concept of cash flow, as well as the development of cash flow projections and monitoring of the cash flow are vital aspects of running a business. Included under this topic is knowing how long it takes from placing an order for material until payment is due, and time lags between ordering the materials and using materials and receiving payment for work done. The concept of sufficient working capital also needs to be imparted.

(xvii) Risk Assessment

This involves learning how to assess the financial risks associated with the job in terms of his performance and profitability and the management of these risks. This becomes increasingly important as the sub-contractor company grows.

(xviii) Insurance

This includes an understanding of why insurance is required, how to obtain insurance, the benefits and costs, insurance providers and what can be claimed from different types of insurance. The different types of insurance to be included are Short Term insurance, Public Liability and Contractors All Risk insurance.

(xix) Sureties

This involves understanding what sureties are, why and when they are needed, how they can be obtained, what they cost and how they can be redeemed.

(xx) Procurement of plant and equipment

The difference between purchasing, leasing, hire purchase and hiring plant needs to be understood. Also included is gaining knowledge of all aspects of these options as well as the benefits and implications for the business for each option.

(xxi) Employee Records

This involves knowing and applying with legislation for conditions of employment. Employment contracts must be in place for all labour employed and a formal system of keeping employee records must be established. Employee records must be in line with legislation including recording of employee details and copies of identification documents, termination of service procedures, and certificates of service.

(xxii) Record Keeping

This activity involves developing knowledge of what records need to be kept and how best to keep them.

(xxiii) Good housekeeping

Good housekeeping is about developing a work approach of keeping the site tidy, cleaning and putting away tools, and working in an orderly way. Developing good housekeeping assists a company in working efficiently and improving profit margins.

(d) Portfolio of Evidence

The Service Provider is to develop and maintain a portfolio of evidence for each sub-contractor. The Portfolio of Evidence is a collection of proof of the training, coaching, guidance and mentoring inputs provided to these entities. It is a living document which records the development progress of and will need to be updated continually throughout the duration of the project.

The Portfolio of Evidence should include the following documentation:

- a) Training courses completed by each sub-contractor,
- b) Hours of guiding, coaching and mentoring received for each activity listed in the development plan,
- c) Monthly progress reports on the development provided (inputs) versus the actual progress made (output) by the local sub-contractors, and
- d) List of competencies.

Whenever required, the Contractor via the Service Provider shall provide copies of such portfolio of evidence records to the Employer.

The Service Provider shall be paid separately in the Bill of Quantities for compliance to this required specification.

(e) Learning Material

Learning material may be required for the support development programme(s). Each Trainees shall receive a copy of the learning material to learn the contents and to use it as reference source for future works. Learning material shall include all technical specifications or best practice guidelines, manuals, literature papers, acts or policies etc as deemed necessary. The cost of procuring and furnishing such materials to the trainees shall be included in the rate for the provision of training facilities as specified below. The Contractor shall be required to submit tax invoices or receipts of purchase of such learning materials.

(f) Training Facilities

Where necessary, in such cases where on-site training is not practical, the Contractor shall be

responsible for providing everything necessary to offer the various training workshops including:

- (i) a suitable venue with sufficient furniture, lighting and power,
- (ii) all necessary stationery consumables and study material,
- (iii) transport for attendees.

The Service Provider shall be paid separately in the Bill of Quantities for compliance to this required specification.

PS10404 MEASUREMENT AND PAYMENT

ITEM

UNIT

PS10404.01 Provision of key personnel

(a) Senior Foreman or Clerk of Works or Site Technician..... Person-Month

The tendered monthly rate for the provision of the required key personnel (Service Provider) shall cover all costs related to establishing a dedicated Senior Foreman or Clerk of Works or Site Technician for the duration of the project as necessary, insurances, profit, overheads and any other day to day costs. Transport for this service and accommodation and subsistence, where applicable, shall be included in this rate. It must be noted that the key personnel provided is specific and dedicated to this Project Order and such resource shall not be permitted to be shared with other Project Orders/Contracts.

The unit of measurement shall be the person-months

ITEM

UNIT

PS10404.02 Training, coaching, guidance, and mentoring

(a) Conducting a skills audit and gap analysis..... Provisional (Prov) sum
 (b) Preparing Support development programme(s)..... Provisional (Prov) sum
 (c) Implementing Support development programme(s)..... Provisional (Prov) sum
 (d) Portfolio of evidence..... Provisional (Prov) sum
 (e) Training facilities..... Provisional (Prov) sum
 (f) Remuneration for workers undergoing training..... Provisional (Prov) sum
 (g) Handling costs and profit in respect of payment associated
 with sub-item PS10404.02(a) to PS10404.02(f)..... Percentage (%)

Measurement and payment shall be in accordance with the provisions of subclause 6.6 of the General

Conditions of Contract for Construction Works, 2015.

Payment under subitem PS10404.02 (a) shall be full compensation for the Service Provider conducting the skills audit and gap analysis for the Contractor (Pool A) or each sub-contractor, where applicable, in respect of the works allocated to them.

Payment under subitem PS10404.02 (b) shall be full compensation for the Service Provider in preparing the Support Development Programme(s) for the Contractor (Pool A) or each sub-contractor, where applicable.

Payment under subitem PS10404.02 (c) shall be full compensation for the Service Provider for costs arising from implementing the Support Development Programme(s) which shall include elements of training, coaching, guidance and mentoring, where necessary, of the Contractor (Pool A) or each sub-contractor, where applicable.

Payment under subitem PS10404.02 (d) shall be full compensation for the Service Provider for preparing and maintaining a portfolio of evidence for the Contractor (Pool A) or each sub-contractor, where applicable, in terms of any training, coaching, guidance and mentoring activities conducted.

Payment under subitem PS10404.02 (e) shall be full compensation for the Service Provider for the provision of the training venue, for all necessary lighting, power, furniture, stationery, consumables and study material and for transportation of the trainees to and from the training venue.

Payment under subitem PS10404.02 (f) shall be the daily wage in normal work hours of the individual workers whilst they are away from their normal duties and at training.

The tendered percentage for subitem PS10404.02 (g) is a percentage of the amounts actually spent under subitems PS10404.02 (a) to PS10404.02 (f), which shall include full compensation for handling costs, overhead charges and profit of the Contractor in appointing the Service Provider.

SECTION 8100: TESTING MATERIAL AND WORKMANSHIP**B8117 MEASUREMENT AND PAYMENT**

Add the following

B81.04 Testing for the design of Bitumen Stabilised Material (BSM).....number (No)

"The unit of measurement shall be the number of tests. The tendered rate shall include full compensation for having the test conducted by an approved laboratory to determine:

- details for blending the recycled material with imported material (where necessary);*
- application rates for stabilising agent(s); and*
- target strengths achieved from such application rates.*

C1000 DAYWORKS

This part of the Particular Specifications deals with the provision for daywork in the Schedule of Quantities. Rates for daywork shall be entered in the Schedule of Quantities in accordance with the following specifications.

D1. SCOPE

According to Clause 6.5 of the General Conditions of Contract 2015, certain work may be carried out using rates tendered in the daywork schedule. A schedule of personnel, plant and equipment which may be necessary to perform work on a daywork basis is included in the Schedule of Quantities. The quantities used in the Schedule of Quantities are for tender evaluation purposes only and the use or not of these items shall not constitute a variation in terms of Clause 6.3 of the General Conditions of Contract 2015. No work will be paid for as daywork without the written instruction or approval of the Employer's Agent Representative.

D2. TYPE OF WORK

The Employer's Agent Representative may order daywork in certain cases where it is necessary to vary or to extend the works due to new or unforeseen circumstances to such an extent that the tendered rates for specific items of work are no longer applicable, or where no suitable combination of tendered rates can be used to pay for such work.

As a general rule, applicable rates for additional work items will be agreed between the Contractor and the Employer's Agent Representative. Daywork will only be used in exceptional circumstances.

D3. MATERIALS

Materials for use in works carried out under daywork shall be purchased by the Contractor who shall also arrange for delivery to site and shall be responsible for any other requirements associated with specific materials. A Provisional Sum has been allowed in the Schedule of Quantities for daywork materials. The Contractor shall enter a tendered percentage in the Schedule of Quantities to cover his handling costs and profit, as per other provisional and prime cost sums in this Contract. Materials shall be paid for using the method described in C2.1, 'Pricing Instructions'. No contract price adjustment will be applicable to materials. The Contractor shall submit proof of ownership for any materials used in daywork with his daywork claim to the Employer's Agent Representative. Further, if specific materials are required for daywork, quotations will be called for as per Clause 6.5.2 of the General Conditions of Contract 2015.

D4. CONSTRUCTION PLANT HIRE

Where daywork is ordered, the tendered rates for plant hire in Section D of the Schedule of Quantities shall be used in calculating the payment due for any plant required to execute the daywork. If no rate is included in the Schedule of Quantities for a particular piece of equipment, and where no other rate or combination of rates would provide suitable compensation, then the daywork method of payment described in Clause 6.5.1 of the General Conditions of Contract 2015 will be used.

The tendered rates for each item of constructional plant shall include for all operating costs associated with the said item of plant. Such costs are deemed to include fuel, re-fuelling costs, lubrication and routine servicing / Maintenance, breakdowns and spares, all overhead costs, site management costs and administration costs. The tendered rates shall also include the plant operator and the general supervision of the plant while it is engaged in the daywork

D5. SALARIES AND WAGES OF WORKMEN

The salaries and wages of workmen executing daywork shall be paid for using the tendered rates in the Schedule of Quantities. The tendered rates shall include for all costs associated with the employment of

personnel, including salaries, wages, allowances, workmen's compensation, medical aid and pension contributions, government levies and taxes, training costs and any costs associated with living on the site. The tendered rates shall also include for the transportation of the workmen to the site of the daywork.

All overhead costs, administration costs, site management costs and the Contractor's profit are deemed to be covered by the daywork rates and no additions or mark ups will be made to the tendered rates.

The tendered rates shall also include any hand tools normally associated with the workmen's job description e.g. picks, shovels, hammers, saws, spirit levels, etc. The tendered rate for labourers shall also include for the casual supervision by a gang boss or foreman. Only when specifically called for by the Employer's Agent Representative, will payment be made for the use of a gang boss or foreman supervising on a continuous basis.

D6. MEASUREMENT AND PAYMENT

The following principles shall also apply to the measurement and payment of daywork.

The unit of measurement for plant shall be the number of vibroclock hours worked and each item of plant shall be fitted with a vibroclock, the cost of which shall be included in the rates. Excessive non-productive time when the engine is idling will not be paid for. Where there is ambiguity between the flywheel horsepower and mass of the machine, the flywheel horsepower shall govern the measurement category. Where width and mass are specified, mass shall govern the measurement category.

The Contractor's attention is drawn to the requirements of Clauses 6.5.3 and 6.5.4 of the General Conditions of Contract 2015 with regard to the submission of daywork claim.

C3.4: PARTICULAR SPECIFICATIONS

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

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

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

C3.5: CONTRACT AND STANDARD DRAWINGS

C3.5.1 CONTRACT DRAWINGS / DETAILS

List the drawings here

C3.5.2 STANDARD DRAWINGS

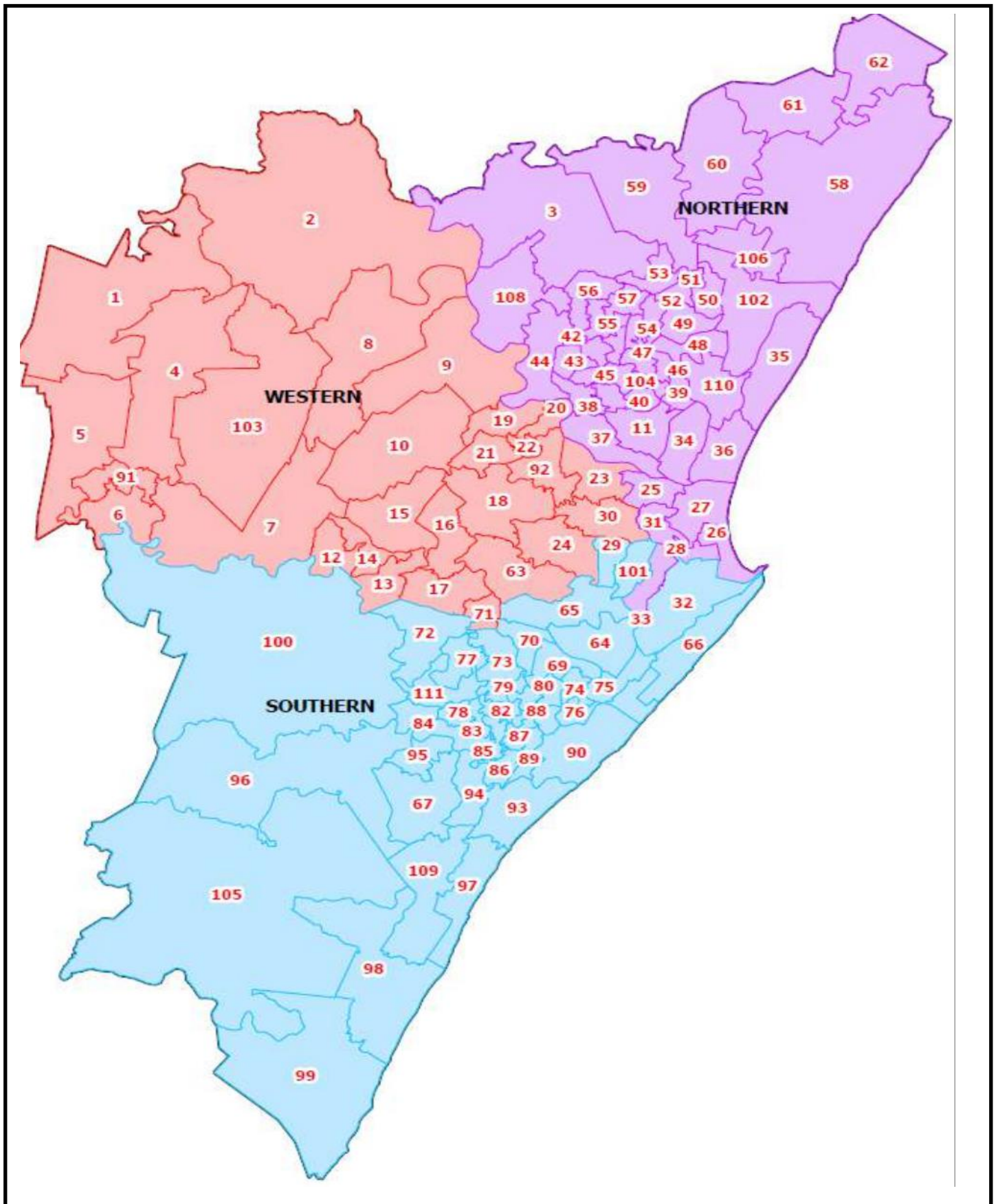
The Standard Drawings to which these Standard Engineering Specifications refer are listed below.

Dwg No	Description	Date of Issue	
38570	Ring Manholes	February	1990
38571	Brick Manhole Details	February	1990
38572	Stormwater Inlet Details	February	1990
38573	Stormwater Inlet Special Details	February	1990
38574	Sewer Manholes: Ramp, Backdrop and Channelling Details	February	1990
38575	Sub-Soil Drain, Pipe Bedding and Pipe Protection Details	February	1990
38576	Headwall Details	February	1990
38577	Kerbing Details	February	1990
38578	Concrete Median Barriers	February	1990
38579	Vehicular and Pedestrian Scoops	February	1990
38580	Concrete Bollard and Steel Guard Rail	February	1990
38581	Retaining Wall, PC Steps, Staircase, Cable Ducts and Headwalls	February	1990
38582	Precast Concrete Fencing and Aluminium Gates	February	1990
38583	Wire Mesh Fence and Gate Details	February	1990
38584	Standard Hydrant Thrust Blocks and Trenches	February	1990
38585	Water Connections, Pipework and Fittings	February	1990
38586	DP & TC Manholes - Rectangular	February	1990
38587	DP & TC Manholes - "L" Shaped	February	1990
38588	DP & TC Manholes - "T" Shaped	February	1990
38589	DP & TC Cable Ducts and Junction Box Details	February	1990
43120	Typical Details of Grid Inlets	February	1990

C3.6: ANNEXURES

PART C4: SITE INFORMATION

C4.1 LOCALITY PLAN



C4.2 CONDITIONS ON SITE

No additional payment shall be made due to the nature of the site conditions, including the extent of work in a defined area. All costs associated with carrying out the works are deemed to be included in the tendered rates for the items in the Schedule of Quantities.

The public transport Facilities (Taxi and Bus Ranks) are located within the West region of eThekweni Municipality within the various wards. The public transport facilities have a high number of minibus taxis from different taxi associations operating within them. The tenderer is required to take due note of this.

C4.3 TEST RESULTS

There are no specific test results.