



CLUSTER
Human Settlement, Engineering, and Transport

UNIT
Engineering

DEPARTMENT
Roads and Stormwater Maintenance

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: **1M-31187**

Contract Title: **UPGRADING OF LOW VOLUME GRAVEL ROADS WITH THE USE OF BITUMEN STABILISED MATERIAL (BSM BASE LAYER) FOR THE ROADS AND STORMWATER MAINTENANCE DEPARTMENT IN THE NORTH REGION OF ETHEKWINI MUNICIPALITY FOR 24 MONTHS**

Est. CIDB Grade/ Class: **6 CE**

CLARIFICATION MEETING AND QUERIES

Clarification Meeting: **Compulsory Clarification Meeting**

Meeting Location, Date, Time: **Engineering Training Centre, 8 Electron Road, Springfield on 30 April 2025 at 09h00 am**

Queries can be addressed to: **A. Naidoo**
The Employer's Agent's: **Tel: 031 322 6830**
Representative: **eMail: adrian.naidoo@durban.gov.za**
Email queries from the clarification meeting and any questions and answers will be consolidated and uploaded on the website on 13 May 2025.

TENDER SUBMISSION

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

Closing Date/ Time: **Friday, 23 May 2025** **At 11h00**

FACSIMILE, eMAIL, or POSTED TENDERS WILL NOT BE ACCEPTED

Issued by:

ETHEKWINI MUNICIPALITY

Deputy Head: **Roads and Stormwater Maintenance**

FOR OFFICIAL USE ONLY

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

FOR OFFICIAL USE ONLY

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

INDEX to PROCUREMENT DOCUMENT

TENDER PART	Part T1	TENDERING PROCEDURES		Page
		T1.1	Tender Notice and Invitation to Tender	
		T1.1.1	Tender Notice and Invitation to Tender	2
		T1.2	Tender Data	
		T1.2.1	Standard Conditions of Tender	4
		T1.2.2	Tender Data (<i>applicable to this tender</i>)	4
		T1.2.3	Additional Conditions of Tender	12
	Part T2	RETURNABLE DOCUMENTS		Page
		T2.1	List of Returnable Documents	16
		T2.2	Returnable Schedules, Forms and Certificates	17

CONTRACT PART	Part C1	AGREEMENT AND CONTRACT DATA		Page
		C1.1	Form of Offer and Acceptance	
		C1.1.1	Offer	49
		C1.1.2	Acceptance	50
		C1.1.3	Schedule of Deviations	51
		C1.2	Contract Data	
		C1.2.1	Standard Conditions of Contract.....	52
		C1.2.2	Contract Data.....	53
		C1.2.3	Additional Conditions of Contract	59
	Part C2	PRICING DATA		Page
		C2.1	Pricing Assumptions / Instructions.....	61
		C2.2	Bill of Quantities (separate page numbering system).....	63
	Part C3	SCOPE OF WORK		Page
		C3.1	Project Description and Scope of Contract.....	74
		C3.2	Project Specifications	75
		C3.3	Standard Specifications	84
		C3.4	Particular Specifications	153
		C3.5	Contract and Standard Drawings	154
		C3.6	Annexures	155
	Part C4	SITE INFORMATION		Page
		C4.1	Locality Plan	156
		C4.2	Conditions on Site.....	156
		C4.3	Test Results	156

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

Tenders are hereby invited for the works to construct base layer and wearing course on low volume gravel roads located within North region of eThekweni municipality.

Subject	Description	Tender Data Ref.
Employer	The Employer is the eThekweni Municipality as represented by: Deputy Head: Roads and Stormwater Maintenance	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 6 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	Engineering Training Centre, 8 Electron Road, Springfield on 30 April 2025 at 09h00 am	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: A. Naidoo Tel: 031 322 6830 eMail: adrian.aidoo@durban.gov.za Email queries from the clarification meeting and any questions and answers will be consolidated and uploaded on the website on 13 May 2025. SSS Queries Contact Lindo Dlamini: Tel: 031-3227133/031-3227153 email: supplier.selfservice@durban.gov.za	F.2.8
Submitting a Tender Offer	Tender offers shall be delivered to: The Tender Box in the foyer of the Municipal Building 166 KE Masinga Road, Durban	F.2.13

TENDER INFORMATION: Closing Date and Delivery of Tender Submissions

Bidders must submit a "hard copy" submission to the Tender Box located in the ground floor foyer of the Municipal Buildings, 166 KE Masinga Road (Old Fort Rd), Durban and 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. Tender closing date and time remain unchanged.

BID VIEWING, TENDER DOCUMENT DOWNLOAD AND BID SUBMISSION PROCESS

To submit your bid once registered the following link must be followed for login to view advertised bids and to submit a bid advertised by

EThekweni Municipality.
<https://rfq.durban.gov.za/jde/E1Menu.maf>

Closing Time	Tender offers shall be delivered on or before Friday, 23 May 2025 at or before 11h00 .	F.2.15
Evaluation of Tender Offers	The 80/20 Price Preference Point System, as specified in the PPPFA Regulations 2022 will be applied in the evaluation of tenders. Refer to Clause F.3.11 of the Tender Data for the Specific Goal(S) for the awarding of Preference Points, and other related evaluation requirements.	F.3.11

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

PART T1: TENDERING PROCEDURES

T1.2: TENDER DATA

T1.2.1 STANDARD CONDITIONS OF TENDER

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

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

T1.2.2 TENDER DATA

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

F.1: GENERAL

F.1.1 The employer: The Employer for this Contract is the eThekweni Municipality as represented by: Deputy Head: **Roads and Stormwater Maintenance**

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

- 1) This procurement document.
- 2) "General Conditions of Contract for Construction Works – 3rd Edition 2015" issued by the South African Institution of Civil Engineering (GCC 2015). This document is obtainable separately, and Tenderers shall obtain their own copies.
- 3) "City of Durban Technical Specifications" hereinafter referred to as the Standard Engineering Specifications. This document is obtainable separately, and Tenderers shall obtain their own copies of the applicable Sections.
- 4) Drawings, issued separately from this document, or bound in Section C3.4 (as an Annexure).
- 5) In addition, Tenderers are advised, in their own interest, to obtain their own copies of the following acts, regulations, and standards referred to in this document as they are essential for the Tenderer to get acquainted with the basics of construction management, the implementation of preferential construction procurement policies, and the participation of targeted enterprise and labour.
 - The Employer's current (as at advertising date) Supply Chain Management Policy.
 - The Preferential Procurement Policy Framework Act No 5 of 2000, and the Preferential Procurement Policy Framework Act Regulations (2022).
 - The Occupational Health and Safety Act No 85 and Amendment Act No 181 of 1993, and the Construction Regulations (2014).
 - The Construction Industry Development Board Act No 38 of 2000 and the Regulations issued in terms of the Act (July 2013).
 - SANS 1921:2004 – Construction and Management Requirements for Works Contract, Parts 1-3.
 - Any other 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: **V. Govender**
 Tel: **031 311 4901**
 eMail: **shan.govender@durban.gov.za**

The Employer's Agent's Representative is:

A. Naidoo

Tel: 031 322 6830

eMail: adrian.naidoo@durban.gov.za

Email queries from the clarification meeting and any questions and answers will be consolidated and uploaded on the website on 13 May 2025.

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

F.2: TENDERER'S OBLIGATIONS

F.2.1.1 Eligibility: General

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

- (a) the Tenderer does not comply with the legal requirements as stated in the Employer's current SCM Policy.
- (b) the Tenderer cannot provide proof that he is in good standing with respect to duties, taxes, levies and contributions required in terms of legislation applicable to the work in the contract.
- (c) In the event of a Compulsory Clarification Meeting:
 - i) the Tenderer fails to attend the Compulsory Clarification Meeting.
 - ii) the Tenderer fails to have 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:

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

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

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

“Documents are to be obtained, free of charge, in electronic format, from the **National Treasury’s eTenders website** or the **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:

Engineering Training Centre, 8 Electron Road, Springfield on 30 April 2025 at 09h00 am

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. : **1M-31187**
- Contract Title : **UPGRADING OF LOW VOLUME GRAVEL ROADS WITH THE USE OF BITUMEN STABILISED MATERIAL (BSM BASE LAYER) FOR THE ROADS AND STORMWATER MAINTENANCE DEPARTMENT IN THE NORTH REGION OF ETHEKWINI MUNICIPALITY FOR 24 MONTHS**

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**

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. “**1M-31187 – 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, 23 May 2025**
- Time : **11h00**

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

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

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

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

The Form of Offer (C1.1.1), Data to be provided by the Contractor (C1.2.2.2), and the Bill of

Quantities (C2.2) are also required to be completed in full.

Tax Clearance

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

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

Failure to comply will make the tender non-responsive.

Compensation Commissioner

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

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

Failure to comply will make the tender non-responsive.

Central Supplier Database (CSD)

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

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

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

CIDB Registration

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

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

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

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

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

Clause 20(1)(d)(i): Audited Financial Statements

Audited financial statements, if it is required by law, for the past three years or since their establishment if established during the past 3 years, but only if the value of the transaction is expected to exceed R10 million (VAT included) Audited or Annual Financial Statement must be included with the tender submission.

F.3: THE EMPLOYER'S UNDERTAKINGS

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

days”.

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

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

F.3.11 Evaluation of Tender Offers:

Eligibility

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

Functionality

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

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

Evaluation of similar nature Tender

Enquires 1M-31187, 1M-31188 and 1M-31190 are of the same nature and will be evaluated and awarded simultaneously. It is the intention of the department to limit the number of enquiries that may be awarded to any one tenderer, to 1 contract per tenderer.

In the event that tenderers are considered most responsive for multiple enquiries, the recommendation for award will be based on the contract with the highest most responsive tender offer received, across all enquiries, being recommended firstly for that particular enquiry and thereafter recommendations will be made for the remaining enquiries accordingly.

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: 50%

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

Ownership Categories	Criteria	80/20	90/10
Race: Black (w1)	Equals 0%	0	n/a
	Between 0% and 51%	4	n/a
	Greater or equal to 51% and less than 100%	8	n/a
	Equals 100%	10	n/a
Maximum Goal Points:		10	n/a

The **Weightings** of the **Ownership Categories** will be:

- w1 = 50%, (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)

- Companies and Intellectual Property Commission registration document (CIPC)
- CSD report.
- B-BBEE Certificate of the tendering entity.
- Consolidated BBEE 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: 50%

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 (W2)	80/20	90/10
Not in South Africa	0	n/a
South Africa	2.5	n/a
Kwa Zulu Natal	5	n/a
eThekweni Municipality	10	n/a
Maximum Goal Points:	10	n/a

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

- CSD report

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

- 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.
- The tenderer is **registered, and "Active", with the Construction Industry Development Board**, at time of tender closing, in an appropriate contractor grading designation.
- 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.3.17 Copies of contract: The number of paper copies of the signed contract to be provided by the Employer is **ONE (1)**.

Tenderers are to include, with their "hard copy" submission, a memory-stick containing an electronically scanned (300 dpi resolution) Public Document Format (PDF) copy of their complete bid submission. This PDF file should be named using the contract number and the Tenderer's name, eg. **"1M-31187 – 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.

T1.2.3.5 Functionality Specification

The value of W₂ is 100. The Functionality criteria (and sub criteria if applicable) and maximum score in respect of each of the criteria are as follows:

Functionality Criteria / Sub Criteria		Maximum Points Score
Tenderer's Experience		40
Project Organogram and Experience of Key Staff	Contracts Manager	15
	Site agent	15
	Foremen	10
Construction Methodology & Quality Control		20
Maximum possible score for Functionality (M _s)		100

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

Functionality shall be scored by not less than three evaluators and the scores of each of the evaluators will be averaged, weighted and then totalled to obtain the final score for Functionality. Each evaluation criteria will be assessed in terms of six indicators and scores allocated according

to the following table:

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

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

Functionality Criteria	Returnable Schedules
Tenderer's Experience	Experience of Tenderer
Project Organogram and Experience of Key Staff	- Proposed Organisation and Staffing - Key Personnel - CV's with Experience of Key Personnel
Construction Methodology & Quality Control	- Construction Approach, Methodology, and Quality Control - Plant and Equipment

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

- **“successfully completed”** implies a project has been completed on time and to specification;
- **“similar nature”** had a comparable Scope of Work in terms of technical requirements and operations;
- **“experience”** implies experience on projects of a similar nature;
- **“accredited degree / diploma”** implies a minimum 3 year qualification within the built environment, from a registered University or Institute of Technology.

Criterion: Tenderer's Experience	
Note: Projects of a similar nature that will be considered shall be new surfaced road construction or gravel to surface road upgrades with use of Bitumen Stabilised Material (BSM)	
Level 0	No information provided; OR submission of no substance / irrelevant information provided
Level 1	To have successfully completed <u>1 project</u> of a similar nature within the past 10 years.
Level 2	To have successfully completed <u>2 projects</u> of a similar nature within the past 10 years.
Level 3	To have successfully completed <u>3 projects</u> of a similar nature within the past 10 years.
Level 4	To have successfully completed <u>4 projects</u> of a similar nature within the past 10 years.
Level 5	To have successfully completed <u>5 projects</u> of a similar nature within the past 10 years.

N.B: Tenderers are to submit signed copies of letter of award and completion certificates for all completed projects. Failure to submit these documents will result in the tenderer not being scored/assessed for tenderer's experience criteria.

Criterion : Project Organogram and Experience of Key Staff

Note 1: "experience" implies experience on projects of a similar nature with respect to the Scope of works

Note 2: "accredited degree / diploma" implies a minimum 3 yr qualification within the built environment, from a registered University or Institute of Technology.

	CONTRACTS MANAGER	SITE AGENT	FOREMAN
Level 0	No information provided OR submission of no substance / irrelevant information provided	No information provided OR submission of no substance / irrelevant information provided	No information provided OR submission of no substance / irrelevant information provided
Level 1	Relevant ECSA registration Pr-Tech / Pr Eng in Civil Engineering and less than or equal to 2 years' experience.	Relevant ECSA registration Pr-Techni in Civil Engineering and less than or equal to 2 years' experience.	Less than or equal to 3 years' of relevant experience
Level 2	Relevant ECSA registration Pr-Tech / Pr Eng in Civil Engineering and greater than 2 years up to and including 4 years' experience.	Relevant ECSA registration Pr-Techni in Civil Engineering and greater than 2 years up to and including 4 years' experience.	Greater than 3 years' up to and including 5 years' relevant experience
Level 3	Relevant ECSA registration Pr-Tech / Pr Eng in Civil Engineering and greater than 4 years up to and including 6 years' experience.	Relevant ECSA registration Pr-Techni in Civil Engineering and greater than 4 years up to and including 6 years' experience.	Greater than 5 years up to and including 8 years' relevant experience
Level 4	Relevant ECSA registration Pr-Tech / Pr Eng in Civil Engineering and greater than 6 up to an including 8 years' experience.	Relevant ECSA registration Pr-Techni in Civil Engineering and greater than 6 up to an including 8 years' experience.	Greater than 8 years up to an including 10 years' relevant experience
Level 5	Relevant ECSA registration Pr-Tech / Pr Eng in Civil Engineering and greater than 8 years' experience.	Relevant ECSA registration Pr-Techni in Civil Engineering and greater than 8 years' experience.	Greater than 10 years' relevant experience

Criterion: Construction Methodology & Quality Control	
Level 0	No information provided; OR submission of no substance / irrelevant information provided
Level 1	The technical approach / methodology, plant and equipment is poor and gives no relevant information in satisfying the projects objectives Quality control statement is poor with no relevant information
Level 2	The technical approach and/or methodology is less than acceptable and unlikely to satisfy project objectives or requirements. Plant and equipment is unlikely to provide adequate protection of the works. Quality control statement is generic.
Level 3	Brief overview of a site specific methodology which encompasses all programmed activities in appropriate order and includes staff, plant and equipment resources, including subcontractors if applicable, a brief description of preparatory work, construction processes including finishing works for each activity. Quality control statements are site specific with statements covering required sampling and testing requirements for the programmed activities.
Level 4	The methodology is specifically tailored to address specific project requirements. The methods and approach to managing risk etc. are specifically tailored to the critical characteristics of the project. The plant and equipment are specifically tailored to the project requirements and are sufficiently adaptable to accommodate changes that may be required during execution Quality control statements are site specific covering required sampling and testing for programmed activities including site specific quality control checklist for programmed activities
Level 5	Besides meeting the "above Level 4" rating, the important issues are approached in an innovative and efficient way, indicating that the tenderer has excellent knowledge of working in the projects environment and producing the required final product. Plant and equipment proposals and ownership/provision arrangements are most likely to ensure a satisfactory project outcome. Quality control statements are site specific covering required sampling and testing for all programmed activities including site specific quality control checklist for all programmed activities

PART T2: RETURNABLE DOCUMENTS

T2.1 LIST OF RETURNABLE DOCUMENTS

T2.1.1 General

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

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

T2.1.2 Returnable Schedules, Forms and Certificates

Entity Specific

T2.2.1	Compulsory Enterprise Questionnaire	18
T2.2.2	Certificate of Attendance at Clarification Meeting	20
T2.2.3	Tax Compliance Status PIN.....	21
T2.2.4	Contractor's Health and Safety Declaration.....	22
T2.2.5	MBD 4: Declaration of Interest	24
T2.2.6	MBD 5: Declaration for Procurement Above R10 Million	26
T2.2.7	MBD 6.1: Preference Points Claim Form ITO the Preferential Regulations	27
T2.2.8	MBD 8: Declaration of Bidder's Past SCM Practices	30
T2.2.9	MBD 9: Certificate of Independent Bid Determination	32
T2.2.10	Joint Venture Agreements (if applicable)	35
T2.2.11	Record of Addenda to Tender Documents (if applicable).....	36

Eligibility

T2.2.12	Eligibility: Declaration of Municipal Fees	37
T2.2.13	Eligibility: Registration with Compensation Commissioner	38
T2.2.14	Eligibility: CSD Registration Report	39
T2.2.15	Eligibility: Verification of CIDB Registration and Status	40

Technical or Functionality Evaluation

T2.2.16	Experience of Tenderer	41
T2.2.17	Proposed Organisation and Staffing	42
T2.2.18	Key Personnel.....	43
T2.2.19	Experience of Key Personnel.....	44
T2.2.21	Construction Approach, Methodology, and Quality Control	45
T2.2.22	Schedule of Proposed Subcontractors	46
T2.2.23	Plant and Equipment.....	47
T2.2.24	Contractor's Health and Safety Plan	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 [18](#) to [36](#).

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 OHS 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 OHS 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 OHS 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: _____

T2.2.5 MBD 4: DECLARATION OF INTEREST

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

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

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

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

3.1 Name of enterprise	Complete T2.1.2.1 Item 1.1				
Name of enterprise's representative	Complete T2.1.2.1 Item 1.2				
3.2 ID Number of enterprise's representative	Complete T2.1.2.1 Item 1.3				
3.3 Position enterprise's representative occupies in the enterprise	Complete T2.1.2.1 Item 1.4				
3.4 Company Registration number	Complete T2.1.2.1 Item 3.1 or 3.2				
3.5 Tax Reference number	Complete T2.1.2.1 Item 3.3				
3.6 VAT registration number	Complete T2.1.2.1 Item 1.7				
3.7 The names of all directors / trustees / shareholders / members / sole proprietors / partners in partnerships, their individual identity numbers and state employee numbers must be indicated in paragraph 4 below. In the case of a joint venture, information in respect of each partnering enterprise must be completed and submitted.					
<table border="1"> <thead> <tr> <th colspan="2">Circle Applicable</th> </tr> </thead> <tbody> <tr> <td>YES</td> <td>NO</td> </tr> </tbody> </table>		Circle Applicable		YES	NO
Circle Applicable					
YES	NO				
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:					
.....					

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

YES

NO

If yes, furnish particulars:

.....

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

YES

NO

If yes, furnish particulars:

.....

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

YES

NO

If yes, furnish particulars:

.....

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

YES

NO

If yes, furnish particulars:

.....

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

YES

NO

If yes, furnish particulars:

.....

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

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

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

NAME (Block Capitals):

Date

SIGNATURE:

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

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

Circle Applicable	
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:

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

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

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

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

1.0 GENERAL CONDITIONS

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

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

1.2 The applicable preference point system for this tender is the 80/20 preference point system.

1.3 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**:
- 4.2 In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of state must, in the tender documents, stipulate in the case of:
- (a) an invitation for tender for income-generating contracts, that either the 80/20 or 90/10 preference point system will apply and that the highest acceptable tender will be used to determine the applicable preference point system, or
 - (b) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system,
- then the organ of state must indicate the points allocated for specific goals for both the 90/10 and 80/20 preference point system.

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

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

The Specific Goals to be allocated points in terms of this tender	Maximum Number of points ALLOCATED (80/20 system)	Maximum Number of points ALLOCATED (90/10 system)	Number of points CLAIMED (80/20 system)	Number of points CLAIMED (90/10 system)
Ownership Goal: Race (black)	10	n/a		n/a
RDP Goal: The promotion of South African owned enterprises.	10	n/a		n/a
Total CLAIMED Points (20 Maximum)				n/a

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

I acknowledge that:

- 1) The information furnished is true and correct.
- 2) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form.
- 3) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct.
- 4) If the specific goals have been claimed or obtained on a fraudulent basis, or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have:
 - (a) disqualify the person from the tendering process.
 - (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct.
 - (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation.
 - (d) recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
 - (e) forward the matter for criminal prosecution, if deemed necessary.

NAME (Block Capitals): _____

Date

SIGNATURE: _____

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

- 1.0 This Municipal Bidding Document must form part of all bids invited.
- 2.0 It serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.
- 3.0 The bid of any bidder may be rejected if that bidder, or any of its directors have:
- 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:

.....

.....

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

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

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

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

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

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

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

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

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

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

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

(Bid Number and Description)

in response to the invitation for the bid made by:

(Name of Municipality / Municipal Entity)

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

I certify, on behalf of:

(Name of Bidder)

that:

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

Copyright © cidb 2011. All rights reserved
[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:

T2.2.17 PROPOSED ORGANISATION and STAFFING

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

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

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

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

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

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

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

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.18 KEY PERSONNEL

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

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

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

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

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

NAME (Block Capitals): _____

Date

SIGNATURE: _____

T2.2.19 EXPERIENCE OF KEY PERSONNEL

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

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

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

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

Each CV should be structured under the following headings:

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

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

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.21 CONSTRUCTION APPROACH, METHODOLOGY, AND QUALITY CONTROL

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

Construction Approach and Methodology

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

Quality Control

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

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

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

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

T2.2.23 PLANT and EQUIPMENT

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

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

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

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

Attach additional pages if more space is required

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

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

Attach additional pages if more space is required

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

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

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.24 CONTRACTOR'S HEALTH AND SAFETY PLAN

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

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

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

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

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

NAME (Block Capitals):

Date

SIGNATURE:

PART C1: AGREEMENT AND CONTRACT DATA**C1.1: FORM OF OFFER AND ACCEPTANCE****C1.1.1: OFFER**

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

Contract No: 1M-31187

Contract Title: **UPGRADING OF LOW VOLUME GRAVEL ROADS WITH THE USE OF BITUMEN STABILISED MATERIAL (BSM BASE LAYER) FOR THE ROADS AND STORMWATER MAINTENANCE DEPARTMENT IN THE NORTH REGION OF ETHEKWINI MUNICIPALITY FOR 24 MONTHS**

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.

C1.2.1.2 SPECIAL CONDITIONS OF CONTRACT

1. GENERAL

The Special Conditions of Contract (SCC) form an integral part of the contract. The Special Conditions of Contract shall amplify, modify or supersede, as the case may be, the General Conditions of Contract 2015, 3rd edition (for construction works) to the extent specified below, and shall take precedence and shall govern.

The Clauses of the Special Conditions hereafter are numbered "SCC" followed in each case by the number of the applicable clause or sub clause in the General Conditions of Contract 2015 3rd edition, and the applicable heading, or (where a new special condition that has no relation to the existing clauses is introduced) by a number that follows after the last clause number in the General Conditions, and an appropriate heading.

2. SCC 9.2 TERMINATION OF CONTRACTS (in addition to clause 9.2.4)

Should it appear to the Head of the Department concerned that the contractor is not executing the contract in accordance with the true intent and meaning thereof, or that he is refusing or delaying to execute the contract or that he is not carrying on the contract at such rate of progress as to ensure delivery by the date of delivery or that the time has expired within which delivery should have taken place or in the event of any other failure or default by the contractor, then in any such events, the Head of the Unit, may give notice in writing to the contractor to make good the failure or default, and should the contractor fail to comply with the notice within the period specified therein, then and in such case report the matter to the Bid Adjudication Committee.

The terminations of contracts awarded via the Bid Adjudication Committee are to be approved by the Bid Adjudication Committee. The contractor shall be responsible for any loss the Council may sustain by reason of such action as may be taken in terms of this clause.

3. SCC 5 CONTRACT PERIOD (clause 5.14.8)

The contract period is intended to be 24 months or the tendered sum, whichever comes first.

N.B: Work may not be undertaken on a monthly basis for 24 months.

4. SCC 5.4.4 SITE LOCATION (in addition to clause 5.4)

The head of the department reserves the right to interchange or transfer the successful contractor to any of the various regions within eThekweni Municipality to undertake work of the same nature at the tendered rates should there be a need for the successful contractor to undertake work.

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 **24 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: **Roads and Stormwater Maintenance**
- 1.2.1.2 The address of the Employer is:
Physical: **Engineering Unit, 166 K.E. Masinga Road, DURBAN, 4001**
Postal: **Engineering Unit, P O Box 680, Durban, 4000**
Telephone: **031 311 7428**
E-Mail: **thanda.zulu@durban.gov.za**
- 1.1.1.16 The **name of the Employer's Agent** is V. Govender (Pr Tech Eng)
- 1.2.1.2 The address of the Employer' Agent is:
Physical: **Engineering Unit, 166 K.E. Masinga Road, DURBAN, 4001**
Postal: **Engineering Unit, P O Box 680, Durban, 4000**
Telephone: **031 311 4901**
E-Mail: **shan.govender@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:
- i) "similar nature" implies projects that were of a value of at least 70% of this tender's value, and had a comparable Scope of Work in terms of technical requirements and operations.
 - ii) "experience" implies experience on projects of a similar nature.
 - iii) "accredited degree / diploma" implies a minimum 3-year qualification within the built environment, from a registered University or Institute of Technology.
- 5.3.1 The **documentation required** before commencement with Works execution are:

- Health and Safety Plan (refer to Clause 4.3)
- Initial Programme (refer to Clause 5.6)
- Security (refer to Clause 6.2)
- Insurance (refer to Clause 8.6)
- CV(s) of Key Site Staff (refer to Clause 4.11.1)
- CPG Implementation Plan (if applicable)

5.3.2 The **time to submit the documentation** required before commencement with Works is **21 Days**.

5.3.3 Add the following paragraph:

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

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

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

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

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

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

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

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

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

5.13.1 The **penalty for delay** in failing to complete the Works is **R 10 000** (per Day).

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

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

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

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

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

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

- **80%** of the gross remuneration of workmen and foremen actually engaged in the daywork;
- **20%** on the net cost of materials actually used in the completed work.

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

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

- The proportion not subject to adjustment: **x = 0.10**.
- The base month will be the month prior to the month in which tenders close.
- The Index for, **Plant, Materials, and Fuel** shall be based on **2023 = 100**.
- The Index for **Labour** shall be based on **2021 = 100**.

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

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

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

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

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

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

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

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

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

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

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

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

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

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 2,000,000.**
- Maximum first excess: **R 10,000.**

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: **R500,000.**
- Maximum first excess: **R 10,000.**

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."

10.7.1 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:

.....

C1.2.3 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 will be undertaken**. The contractor will be required to provide proof of authenticity of local labour. Signed confirmation by the appointed CLO will suffice for this.

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

C1.2.3.3 SUB CONTRACTING

It is a condition of contract that the contractor must allow for a minimum of **10%** of the contract value (excluding PC Sum items and Fixed Cost allowances) to be subcontracted to **51% black owned enterprises**. Proof of payment to the subcontractors will be required to verify that the minimum has been achieved.

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

C1.2.3.4 FTE (Full Time Equivalent) EMPLOYMENT INFORMATION

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

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

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

- Category of Employment

Category A: Employed as Local Labour for this contract only Category B: Temporarily employed by the Contractor Category C: Permanently employed by the Contractor
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In addition, the following information is required in respect of each person listed above, on a monthly basis:

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

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

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

C1.2.3.5 PERFORMANCE MONITORING OF SERVICE PROVIDERS

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

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

C1.2.3.6 EXCEPTED RISKS (Clause 8.3)

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

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

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 **10** pages. The pages are numbered **BoQ 1 to BoQ 9** in addition to the **BOQ summary page**.

The completed BOQ is to be attached after this page.

PART C3: SCOPE OF WORK

	<u>PAGE</u>
C3.1 PROJECT DESCRIPTION AND SCOPE OF CONTRACT	74
C3.2 PROJECT SPECIFICATIONS	75
PS.1 Programme, Method of Work, and Accommodation of Traffic	
PS.2 Services	
PS.3 Watermains	
PS.4 Sewers	
PS.5 Stormwater	
PS.6 Electrical Plant	
PS.7 Telkom S.A. Limited / Neotel Plant	
PS.8 CCTV Plant	
PS.9 Management of the Environment	
PS.10 Occupational Health and Safety	
C3.3 STANDARD SPECIFICATIONS	84
C3.3.1 Listing of the Standard Specifications	
C3.3.2 Amendments to the Standard Specifications	
C3.4 PARTICULAR SPECIFICATIONS	153
C3.4.1 Part AH - OHSA 1993 Safety Specification (2014)	
C3.4.2 Standard Environmental Management Plan for Civil Engineering Construction Works	
C3.5 CONTRACT AND STANDARD DRAWINGS	154
C3.5.1 Contract Drawings / Details	
C3.5.2 Standard Drawings	
C3.6 ANNEXURES	155

C3.1: PROJECT DESCRIPTION AND SCOPE OF CONTRACT**C3.1.1 Description of Works**

The scope of work consists of the construction of base layer and wearing course on low volume gravel roads located within the Northern region of eThekweni municipality.

Wards covered under the North region include:

Wards 3,44,56,59,60,108,38,45

N.B: Work may not be undertaken on a monthly basis for 24 months.

C3.1.2 Description of Site and Access

The roads to be asphalted are located within various wards within the North region of eThekweni municipality.

C3.1.3 Nature of Ground and Subsoil Conditions

The subsoil condition varies.

C3.2: PROJECT SPECIFICATION

PREAMBLE

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

C3.2.1 GENERAL

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

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

PS.1.1 Preliminary Programme

The Contractor shall include with his tender a preliminary programme on the prescribed form (see **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 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 required for service relocations.
- (2) Time allowances to be made for the ordering of special items.
- (3) Notification required by service organisations.

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

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

PS.1.3 Requirements for Accommodation of Traffic

PS.1.3.1 General

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

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

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

PS.1.3.2 Basic Requirements

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

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

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

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

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

PS.1.3.3 Traffic Safety Officer

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

PS.1.3.4 Payment

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

PS.1.3.5 Pedestrian Movement

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

PS.1.3.6 Temporary Reinstatement

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

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

PS.2 SERVICES

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

PS.2.1 Existing Services

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

PS.2.2 Proving Underground Services

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

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

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

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

When a service is not located in its expected position the Contractor shall immediately report such circumstances to the Employer's Agent who will decide what further searching or other necessary action is to be carried out and shall instruct the Contractor accordingly. The cost of this additional searching shall be to the Council's cost and shall be paid for under **DB.8.19 - Proving Existing Services**.

Should any service be damaged by the Contractor in carrying out the works and should it be found that the procedure as laid down in this clause has not been followed then all costs in connection with the repair of the service will be to the Contractor's account.

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

It should be noted that 33,000 Volt and 132,000 Volt cables may only be exposed by the eThekweni Electricity's personnel. The cables are usually protected by concrete covering slabs, and therefore if the slabs are inadvertently exposed, excavation work must stop, and the eThekweni Electricity shall be contacted immediately on the above telephone numbers.

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

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

PS.2.3 New Services and Relocation of Existing

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

New services are either to be installed by the Contractor as part of the contract or by others during the contract period. In the latter case excavation and subsequent backfilling of the trench from the top of the bedding layer shall generally be carried out by the Contractor.

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

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

Services affected by the contract are described as follows:

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

[Note: It is important to briefly describe the work envisaged and the time required for this work where other organisations are involved. Particular attention should be paid to tie-ins to the existing live mains which normally have to be done by the Water Supply Branch even if the installation of the new main is included in the contract.]

PS.3.2 Water Main Valve Access

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

Whatever method the Contractor chooses to use for this work, the cost of raising the valves from existing level to ultimate level shall be paid only once, irrespective of the number of times the valve is uncovered. Spacer rings required for the height adjustment of valve covers shall be supplied by the Water and Sanitation Unit. Tolerances on valve cover levels shall be as specified in clause PH.6.5. Before final setting in position of valve covers the Contractor shall liaise with the Employer's Agent regarding the direction in which covers shall be placed.

PS.3.3 Restriction on Compactive Equipment

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

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

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

PS.4 SEWERS**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.6.4 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:

Describe issues relating to OH&S and the Regulations

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.12 PERFORMANCE MONITORING OF SERVICE PROVIDERS

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

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

N.B: This will be discussed and agreed with the Contractor before commencement of the contract.

C3.3: STANDARD SPECIFICATIONS

C3.3.1 The Specifications on which this contract is based are the [eThekwiini 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
EA	Lime Stabilisation		
ED	Road Asphalt	July	1992
EH	Steel Guardrails & Conc. Median Barriers		
EM	Concrete Surface to Roads		
PC	Stabilisation of Gravel Base		
TA	Road Signs	October	1989
TB	Road Markings	October	1989

STANDARD SPECIFICATIONS**PS.AB.12 Re-establishment for low volume gravel roads upgrade**

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

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.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 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	4 mm and above - 18
7 mm and above - 4	7 mm and above - 2
19 mm and above - None	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

* Ls = 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 COLTO AND 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 AA (for ethekweni 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****AA.ED ROAD ASPHALT****AA.ED.1 SUPPLY OF ASPHALT**

The tender documents make provision for the Contractor to obtain asphalt from either the Ethekeweni Municipality (EM) Asphalt Plant or from a commercial asphalt plant as directed by the engineer.

The Schedule of Quantities provides for items under the heading “Asphalt from EM Plant” and for items under the heading “Asphalt from Commercial Plant.”

Measurement and payment items under “Asphalt from EM Plant” shall include collection and paving of asphalt, but exclude the supply of asphalt.

AA.ED.1.1 Supply of Asphalt From EM Plant

The items under Standard Departmental Specification - Part ED : Road Asphalt will be supplied to the Contractor free of charge at the Ethekeweni Municipality (EM) Asphalt Plant. Therefore the rates of these items **must include for the collection and paving of asphalt, but exclude the supply of asphalt.**

The EM Asphalt Plant is situated on Umhlatuzana Road, which is a continuation of Seaward Road of South Coast Road. The following requirements pertain to the collection of asphalt from the DM Asphalt Plant.

1. *It is the Contractor's responsibility to order asphalt by fax, giving 24 hours advance notice when placing the order. The Contractor must confirm this order by phone by 07h15 am on the day of collection.*
2. *When making an order, and when reconfirming the order, the Contractor must supply details of the make, registration numbers, sizes of the trucks which he will be utilising for the haulage of the asphalt, tonnage and mix type of asphalt, job site, job number, and the rate of supply. He must further provide contact names and telephone numbers of these people. These details must be supplied anew, for each day that the asphalt is to be collected.*

*All correspondence is to be addressed to The Asphalt Manufacture / Paving Superintendent of Pre-Mix Control on:
Telephone number: 031-311 5769, or
Facsimile number: 031-465 1273.*

3. *The cost of the asphalt, which is ordered, confirmed on the day and not collected in good time by the Contractor, and is required to be wasted by the plant, will be to the Contractor's account. The cost of this asphalt will be in accordance with the annual supply contract rates applicable at the time. Parties are to notify each other immediately there are complications on site or at the Asphalt Plant.*
4. *In the event of the EM Asphalt Plant being unable to supply the required asphalt, the Contractor will be instructed by Pre-Mix Control to collect asphalt supplied from a private/commercial source. An extra over item has been included in the Schedule of Quantities to cover this possibility. (Rate in tonne.km to cover any **additional** haulage or costs in collecting asphalt from an alternative plant **over and above** the cost of collecting from the EM Asphalt Plant. The distance is measured one way, however the Tenderer is to allow for a round trip distance in his rate.*
5. *Any asphalt supplied by the EM Asphalt Plant remains the property of Ethekeweni Metro and any loss or wastage incurred due to the Contractor's negligence after collection of the asphalt from the EM Asphalt Plant shall be to the account of the Contractor. The Engineer's decision in regard to wastage is final.*
6. *The EM Asphalt Plant guarantees that all asphalt supplied by them complies in every way with requirements of the specification for Mix "B" and Mix "D" asphalt. The Materials Testing Laboratory checks the quality of the products at pre-determined intervals and submits reports to Pre-Mix Control. Further on-site testing will be to the Contractor's account. Should any material have to be removed and replaced as a result of non-compliance therewith, the cost of such removal and replacement and of any retesting will be charged to the Council on a day works basis.*

Should the events described above result in delay in the completion of the Works, then the Contractor shall be entitled to an extension of time commensurate with the delay.

The Contractor shall be responsible for checking and reconciling charge-outs.

6. *The EM Asphalt Plant will supply a minimum of 40 tonnes per hour in an 8 hour day and a maximum of 80 tonnes per hour in a 8 hour day.*
7. *Asphalt will be available for collection at the EM Asphalt Plant on weekdays from 07h30 to 16h00. Lunchtime is from 12h00 to 12h30 and the time for last load mixing is 15h00. Asphalt is available on weekends on demand.*
8. *The Tenderer is to make allowance in his relevant rates for a 30 minute turnaround time for haulage units arriving at the EM Asphalt Plant weighbridge.*

The procedures to be followed once the units arrive at the weighbridge is as follows:

- (a) *The unit is weighed at the weighbridge.*
- (b) *The unit moves to the oiling stand.*
- (c) *The sail is rolled up (driver's assistance required) and the unit is oiled.*
- (d) *The unit moves to the plant or to the plant silo and is filled.*

- (e) The unit is weighed at the weighbridge and the temperature is checked.
- (f) The driver signs for the contents and is given two copies of the delivery note.
- (g) The unit goes to the sail stand. The asphalt is covered (driver's assistance required) and the unit can leave the plant.

AA.ED.1.2. 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.

AA.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.

Continuously graded asphalt overlays or replacement layers supplied from EM Plant shall comply with Departmental Specification - Part ED: Road Asphalt, and Project Specification Clauses AA.ED.1 and AA.ED.4.

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.

AA.ED.3 BASECOURSE SUPPLIED BY DM PLANT

Further to Clause ED.5.1 the asphalt base course mix - Mix "B" used for the roadworks shall comply with the following:

The coarse and fine aggregate and filler shall be combined to produce a continuously graded material, the grading of which shall conform to the following grading and bitumen characteristics:

Sieve Size in mm	% Passing by Mass
26,5	100
19,0	90 ± 10%
13,2	70 ± 10%
9,5	61 ± 10%
4,75	46 ± 10%
2,36	36 ± 8%
1,18	27 ± 7%
0,6	21 ± 6%
0,3	15 ± 5%
0,15	9 ± 3%
0,075	4 ± 2%

Residual bitumen by mass (35/50 or 50/70 pen) : Specified percentage 4,7 ± 0,3%.

AA.ED.4 ASPHALT WEARING COURSE SUPPLIED BY DM PLANT

The following shall apply to the continuously graded asphalt.

Coarse aggregate : freshly quarried stone complying with S.A.N.S. 1083.

Fine aggregate : sand equivalent 40 minimum.

AA.ED.4.1 Continuously Graded Wearing Course

The continuously graded wearing course shall be a 40 mm compacted layer of hot asphalt (Mix "D") with or without modification, which will be specified by the Engineer. The asphalt shall have the grading and bitumen characteristics properties as indicated in Clause ED 5.1.1 of Departmental Specification, Part ED : Road Asphalt.

AA.ED.5 ASPHALT WEARING COURSE SUPPLIED FROM A COMMERCIAL ASPHALT PLANT.

AA.ED.5.1 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.

AA.ED.5.2 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.

AA.ED.5.3 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 AA.ED.5.1 : 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.5.2 below.

Table AA.ED.5.2 : 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	

AA.ED.5.4 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.

AA.ED.5.5 SPREADING THE ASPHALT LAYER**AA.ED.5.5.1 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.

AA.ED.5.5.2 Hand Laid

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

AA.ED.5.6 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

* Ls = 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 Ethekewini Municipality Laboratory or a private laboratory (to be approved by the Engineer).

AA.ED.5.7 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.

AA.ED.6 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..

AA.ED.7 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..”

AA.ED.8 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.

AA.ED.9 TESTING

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.

AA.ED.9.1 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).

AA.ED.9.2 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.

AA.ED.10 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.

AA.ED.10.1 Patching (Surface : Asphalt wearing course)

(a) 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.

(b) 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.

(c) 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.

AA.ED.10.2 Patching (Structural – Various road categories)**(a) 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 0,3l /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.

(b) 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 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.

(c) 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 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.

AA.ED.10.3 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.

AA.ED.10.4 MEASUREMENT AND PAYMENT**AA.ED.10.4.1 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.

AA.ED.10.4.2 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.

AA.ED.11 VARIATION IN AGGREGATE / ACTIVE FILLER / MODIFIER / 40/50 OR 60/70 PEN BITUMEN IN ASPHALT

The unit of measurement shall be tonnes (t).

AA.ED.12 VARIATION IN QUANTITY OF EMULSION

The unit of measurement shall be litres (l).

AA.ED.13 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.

AA.ED. 14 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.

AA.ED.15 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.

AA.ED.15.1 MATERIALS

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.

AA.ED.15.2 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.

AA.ED.16 SPEEDHUMPS

The unit of measurement shall be linear meter measured across the width of road asphalt speed hump constructed as per municipal standard detail 43924 A/1.

The tendered rate shall include full compensation for saw cutting the keys, breaking out of asphalt, removing, loading, carting to spoil, preparation, supply of continuously graded asphalt Mix A, and constructing the speed hump as per standard detail, and all incidentals. The rate must also include for painting the permanent road markings with retro-reflective road marking paint as per standard detail.

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 Roads and Storm Water Maintenance Dept. at RSWM HQ, 25 Archie Gumede Place. Samples shall be clearly marked with the name of the tenderer.

3.7.2 The DH: R&SWM reserves the right o 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 W407 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.

PROJECT SPECIFICATIONS – COLTO SPECIFICATIONS

PART B: AMENDMENTS TO THE STANDARD COLTO 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 'B' 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 'B'. 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 the conforms to the HRB classification for an A3 material as follows :

% passing	4,75 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 Engineer.

“acceptance control” - acceptance control means whatever testing the Engineer 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 Engineer’s laboratory or one approved by him.

“recycling” - the in situ processing or the processing of salvaged material in a plant for re-use.

“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.

B1115 GENERAL CONDITIONS OF CONTRACT

Replace clause 1115 with the following:

“The General Conditions of Contract for Construction Works 2nd edition 2010 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 have to 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 B1115 below (context of reference is also given) together with the relevant equivalent clause in the SAICE General Conditions of Contract for Construction Works 2nd t edition 2010 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 2nd edition 2010 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 : 6.9	Vesting of materials
		52(1)(e)	Monthly payments (documentary evidence of ownership 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) 54(2) 54(3)	Certificate of practical completion	514.1 514.2 514.3	Certificate of Practical Completion
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
1303	1300-1 and 1300-2	49 & 53:		6.8 & 6.11:	
		49(2) and 49(3)	Contract Price Adjustment Factor and special materials	6.8.2 and 6.8.3	Contract Price Adjustment Factor and special materials
		53	Variations exceeding 20%	6.11	Variations exceeding 15%
1303	1300-2	12 & 45:		5.3 & 5.12:	
		12	Commencement of Works and Commencement Date	5.3.1	Commencement of the Works
		45	Extension of time for completion	5.12	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:		6.4	
		40(1)	Valuation of variations	6.4.1	Valuation of variations
1507 Items: 15.08 15.09 15.11	1500-8	48:		6.6:	
		48.1	Provisional Sums	6.6.1	Provisional Sums
3108 Note (2)	3100-4	40:		6.4:	
		40(1)	Valuation of variations	6.4.1	Valuation of variations
3204 (b)(iii)	3200-2	40:		6.4:	
		40(1)	Valuation of variations	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:		6.4:	
		40(1)	Valuation of variations	6.4.1	Valuation of variations
5805(d)	5800-4	40:		6.4:	

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
		40(1)	Valuation of variations	6.4.1	Valuation of variations
5809 Item 58.10	5800-10	48:		6.6:	
		48.1	Provisional Sums	6.6.1	Provisional Sums
8103(c)	8100-1	40:		6.4:	
		40(1)	Valuation of variations	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

B1202 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 Engineer 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.
- (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.
- (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.'

B1205 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)."

B1206 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."

B1209 PAYMENT

(a) Contract rates

Add the following new paragraph at the end of subclause B1209(a):

"All rates tendered are to be exclusive of VAT."

B1215 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 period approved by the Engineer.

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 B1215 below for each respective calendar month of any year:

Table B1215

<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>5</i>	<i>July</i>	<i>1</i>
<i>February</i>	<i>4</i>	<i>August</i>	<i>1</i>
<i>March</i>	<i>4</i>	<i>September</i>	<i>2</i>
<i>April</i>	<i>3</i>	<i>October</i>	<i>3</i>
<i>May</i>	<i>2</i>	<i>November</i>	<i>4</i>
<i>June</i>	<i>1</i>	<i>December***</i>	<i>5</i>

**** Includes the whole month of December / January.*

Each "n"-value in Table B1215 applies only to the calendar month immediately to the left of the number, and the "n"-values as specified shall not be taken as being carried forward so as to accumulate over the contract period. If no abnormal rainfall occurs during a particular calendar month in a particular year, then no extension of time for abnormal rainfall shall be granted with respect to that calendar month for that year, and no further consideration shall be given to that "n"-value in respect of that year.

Similarly, if the "n" working days expected delay caused by normal rainy weather during a particular calendar month in a particular year (for which the Contractor shall have made provision in his programme of work in accordance with Method (ii)) are not taken up (either in whole or in part) by standing time due to normal rainy weather during that month of that year, then no further consideration shall be given to those "n" working days

(or portion thereof), which effectively have been gained, when any subsequent extension of time claims which may arise later during the contract period are assessed by the Employer."

B1224 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 and pedestrians as well as any service providers in the execution of their duties."

B1229 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:

B1230 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 manner in which compensation in terms of this Act shall be handled shall be resolved by the Contractor at the commencement of each Project.

B1231 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 Engineer 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 Engineer against any claims, damages and / or costs that may arise in this regard.

B1232 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 C3.3 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 Engineer.*
- (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 Engineer.*
- (h) *Invader species of plants shall be controlled.*
- (i) *As the works are located 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 of the amounts to be paid for the above item in order to pay for the repairs to any damages.

12.33 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 Engineer 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 Durban Metro Water for the necessary water connections he requires for the execution of the works. Applications for a metered water connection must be made timeously to Durban Metro Water.

The Contractor shall make his own arrangements with Durban Electricity 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 no be altered without the permission of the Engineer.*
- (b) *The Employer is indemnified in all respects through the occupation and use of the land including all claims 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 Engineer.*
- (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 Engineer is obtained to occupy the site for a longer period.*

12.34 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.

12.35 PUBLIC AWARENESS NOTICE BOARDS

The Contractor shall arrange for pre-made Notice Boards (45 cm x 60 cm cardboard "Warning Notice Board"), which are to be erected on site (strapped to ELPs, etc) 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.

12.36 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 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.

12.37 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 OHSA 1993 Construction Regulations 2003 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 J (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 Tenderer shall provide sufficient proof that he has a Health and Safety Plan in place and submit his Health and Safety Plan on request by the Employer during the Tender evaluation stage.

In terms of OHS Act the Tender will be disqualified if the tenderer has no Health and Safety Plan.

The Contractor's Health and Safety Plan will be subject to approval by the Employer, 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

12.38 SITE DIARY

The Contractor must keep a triplicate site diary on site, which must record the daily site activities, plant, site supervision, rainfall, site visitors, etc. this diary must be filled in daily and signed by the Contractor's Representative.

12.39 SUB-CONTRACTORS

Contractors are encouraged to employ and train emerging Sub-Contractors to undertake labour intensive work such as minor patching, cleaning and other related work.

12.40 APPROVED TIP SITE

The approved tip sites for this contract are as follows in accordance with the Ethekweni Regions :

- South and South Central Region : Bisasar (Springfield)
- West and West Central Region : Marianhill and Bisasar (Springfield)
- North and North Central Regions : Buffelsdraai (Verulam) and Bisasar (Springfield)

All haulage to these tip sites shall be free haul, ie. tendered rates shall include for any overhaul. Unless otherwise specified or agreed to by the Engineer 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. Contractors must make due allowance for such charges in pricing the relevant items for disposal of to the tip.

B1234 MEASUREMENT AND PAYMENT

Item	Unit
B12.01 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 B12.01(a) above	Percentage (%)

Expenditure under this item shall be made in accordance with clause 45 of the General Conditions of Contract 2004.

The tendered percentage is a percentage of the amount of expenditure approved by the Engineer under subitem B12.01(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.

Item	Unit
B12.02 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 B12.02(a) above	Percentage (%)

Expenditure under this item shall be made in accordance with clause 6.6 of the General Conditions of Contract 2010.

The tendered percentage is a percentage of the amount of expenditure approved by the Engineer under subitem B12.02(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."

SECTION 1300: CONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS

B1302 GENERAL REQUIREMENTS

(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: OHS 1993 Safety Specification contained in section C3.3 Particular Specifications."

B1303 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.
 - 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.

Starting with “ *Should the final value of the work*” and ending with : “ *which is in excess of twenty (20) percent of the tendered amount.*”.

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 (2010), 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 2010, 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.*
- (v) 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, 1400, 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
B13.02 Health and Safety	
(a) <i>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 Contract.</i>	Sum
(b) <i>Time related obligations for updating and amending the</i>	

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**.

Month

Payment of the lump sum tendered under subitems B13.02(a) and the rate per month for subitem B13.02(b) shall, for the two subitems together, include full compensation for all the Contractor's costs in respect of compliance with the OHS Act and Construction Regulations.

Payment of the lump sum tendered under subitem B13.02(a) shall be made once off at the beginning of the Contract, subject to the Contractor delivering the plan and it is approved by the Engineer.

And payment for the tendered rate for subitem B13.02(b) shall be paid per month or part thereof for the duration of each Project.

Item		Unit
B13.03	Community Liaison Officer	
(a)	Allow for CLO to be appointed and paid for on a monthly basis	Prov Sum
(b)	Handling and profit in respect to subitem B13.03 (a)	Percentage(%)

Expenditure under these items shall be made in accordance with Clause 6.6 of the General Conditions of Contract 2010. The cost of providing a CLO paid for on a monthly basis as described in B1303 and shall be subject to the approval of the Engineer.

The tendered percentage is a percentage of the amount of expenditure approved by the Engineer under subitem B13.03 (a) and shall include full compensation for the handling costs of the contractor and the profit in connection with the provision of the CLO.

SECTION 1500: ACCOMMODATION OF TRAFFIC

B15.01 SCOPE

Add the following to the end of clause 1501:

"Throughout the course of each Project of the Contract 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 Engineer. The public has the right to use the roads and therefore the safety of the traveling public and pedestrians shall take precedence in the accommodation of traffic.

In this regard, the contents of Clause B1231 (Compliance with the Road Safety Act) are to be complied with.

B1502 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 Departmental Specifications. Details shall be submitted to the Engineer 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 as specified in Clause B15.02 (b)(c).*
- (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 Ethekweni 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 Engineer 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 Engineer 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 engineer 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 engineer 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 engineer 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 subsubclauses:

- (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 site agent. 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 engineer 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 engineer 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 responsible for 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 advent 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 Engineer, shall be sufficient cause for the engineer 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 B1500 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 within the allowable time after the engineer has given an instruction to this effect. The Engineer's instruction shall state the allowable time, which shall be the time in hours for reinstatement of the defects. Should the Contractor fail to adhere to this instruction, the time-related penalty shall be applied from the time the instruction was given."

B1503 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 Engineer 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 Engineer. 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 night time shall be demarcated by delineators only.

The use of steel drums as channelization devices shall not be allowed on this Contract. Channelization shall be effected 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 Engineer 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 Engineer 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 Engineer

"The Engineer 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 engineer. 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 Engineer 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 retro-reflective 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.

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."

(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 Engineer 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, staff of the Engineer 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 Engineer, ineffective shall be replaced immediately by the Contractor."

Add the following new Clause :

B15.18 LIGHTING REQUIREMENTS DURING NIGHT WORK

Where night work is deemed necessary and approved by the Engineer, 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 Engineer 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 Engineer for night time inspections.

The Contractor shall submit his lighting operational plan to the Engineer for approval and demonstrate the effectiveness of the lights before the commencing of any night work. The Engineer 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 Engineer. If lighting

requirements are not met for any particular activity, the Engineer may order that activity to be stopped until the required lighting has been re-instated.

B15.19 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 C4 : Site Information 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.

B1517 MEASUREMENT AND PAYMENT

Replace item 15.01 to read as follows:

Item	Description	Unit
B15.01	The provision of temporary traffic control facilities (except traffic lights and amber flicker lights for the supervisory staff) for the following road categories :	
	(a) Category D : Residential Streets	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 over the length of road on which such control facilities has to be provided irrespective of the number of lanes used by traffic or it being single or double carriageway roads, width of the road 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 length of road where construction is done in half widths.

The tendered monthly rate shall include full compensation for accommodating traffic on the existing road, or diversions alongside work areas or where the road is constructed in half widths 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 Engineer. 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."

The requirements and provisions shall be as deemed necessary for each type of rehabilitation work and respective road categories.

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 B15.01 shall be paid per month or part thereof for the duration of each Project.

SECTION 1600: OVERHAUL

B1602 DEFINITIONS

(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 5,0 km in the case of all overhaul materials”.

Add the following Specification:

SECTION B10100: SPECIFICATION FOR COLD IN SITU RECYCLING WORK

CONTENTS

B10101	SCOPE
B10102	MATERIALS
B10103	STABILISATION MIX DESIGN
B10104	PLANT AND EQUIPMENT
B10105	SETTING OUT AND CONTROL OF THE WORK
B10106	CONSTRUCTION
B10107	TRIAL SECTIONS
B10108	PROTECTION AND MAINTENANCE
B10109	CONSTRUCTION TOLERANCES
B10110	QUALITY OF MATERIALS AND WORKMANSHIP
B10111	MEASUREMENT AND PAYMENT

B10101. SCOPE

“Cold in situ recycling” is a construction process that uses large special-purpose machines to recover and reuse material from the upper portion of existing pavements, without pre-heating the road surface. This process is referred to as “in situ recycling” or “recycling” in these specifications.

The work to be undertaken by in situ recycling will be described in the *Scope of Works of the Project Order*, including details of:

- The extent of the recycling work in terms of length and width to be recycled;
- Traffic accommodation during construction;
- The depth to which the materials in the existing pavement are to be recycled;
- The different materials that will be encountered in the recycling horizon;
- The degree of pulverisation required for breaking down previously bound materials;
- Pre-treatment requirements, including the import of any fresh material;
- Stabilisation or other treatment of the recycled material;
- Requirements for finishing the new recycled layer including opening to traffic; and
- Surfacing or construction of additional layers on top of the new recycled layer.

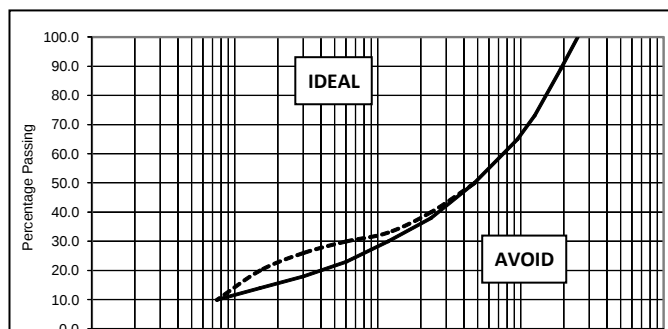
B10102. MATERIALS

2.1) In situ pavement material

*The results of all relevant investigations, surveys and tests carried out **on the existing pavement will be included in the Design report and shall be made available on request.** As a minimum, these will include test pit profiles, results of laboratory tests carried out on material sampled from the various layers as well as any stabilisation*

mix designs, the thickness and integrity of any previously bound material (e.g. asphalt or cement stabilised layers) and in situ subgrade conditions (indicated by the results of DCP surveys).

The recycling process shall break down (pulverise) and blend together all material encountered in the recycling horizon (previously bound and unbound materials), to produce a homogeneous mixture with a grading curve that is relatively continuous, similar to the "ideal" curve shown below.



In addition, the grading curve shall fall within the envelope relevant to the type of stabilisation specified in the latest edition of the following publications:

- Cementitious stabilisation: TRH 13 and TRH14
- Bituminous stabilisation: TG2

Where this cannot be achieved, sufficient material (specified in sub-clause 2.2) shall be imported and spread on the existing road surface prior to recycling in order to achieve the required grading.

2.1.1) The Crushed and Screened or Unscreened Reclaimed Asphalt Material

For this contract shall meet the requirements specified in TG2 table A.9 ideal for BSM Emulsion or foam.

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."

2.2) Imported material

The Project Document will include details of the materials to be imported for blending with the recycled material (e.g. G2 crushed stone from commercial sources).

2.3) The unscreened or crushed and screened reclaimed asphalt material

For this contract shall meet the requirements specified in TG2 Table A.9 Ideal for BSM Emulsion or Foam.

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."

2.4) Stabilising Agents

2.4.1 Cementitious stabilising agents

(a) Cement shall comply with the relevant requirements of SANS 50197-1:2000 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.

(c) Other cementitious stabilising agent or blend of stabilising agents, as specified in the Project Document.

2.4.2 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:
SABS 309 for anionic emulsion; or
SABS 548 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 SABS 307 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.

2.5) Water for construction

Water shall not contain any deleterious materials in harmful concentrations. Only approved sources of water shall be used.

B10103. STABILISATION MIX DESIGNS

The Project Order will include the details of all relevant stabilisation mix designs undertaken prior to the award of the Project.

Within 7 days of the Contractor taking possession of the site, the “Advance Testing Programme” shall commence. This testing programme shall be carried out on samples of materials extracted from the full depth of the recycling horizon, taken from the outer wheel path at 1km intervals, alternating between the left and right side of the road. These samples shall be tested to determine the grading and plasticity of the material and the results used to identify sections of Material Uniformity in the existing pavement (the minimum length of such a section shall be 500m).

For each Material Uniform Section thus identified, two separate bulk samples shall be extracted from the recycling horizon and used in the stabilisation mix design procedures. The location at which such samples are taken shall be selected by dividing the length of the uniform section by three and sampling from the outer wheel path in opposite lanes at one-third intervals. Stabilisation mix designs shall be undertaken 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.

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.

B10104. PLANT AND EQUIPMENT

NOTE. These specifications are focused on the use of purpose-built wheel-mounted recyclers. Where the contractor intends using any other type of machine to recycle (e.g. a modified track-mounted milling machine) he shall submit a full motivation for using such a machine, including a detailed work plan describing the recycling / mixing process and subsequent compaction / levelling processes that will produce a layer that meets the specified end product requirements.

4.1) Recyclers

In situ recycling shall be carried out using a special-purpose recycler to break down and recover material from the prescribed horizon in the upper layers of the existing pavement, blended together with any imported material, stabilising agent(s), water and any other specified additives. The machine employed shall be capable

of achieving the required grading and consistency of mix in a single pass. As a minimum, the recycler shall meet the following requirements:

- It shall be factory-built by a proprietary manufacturer having a demonstrable track record and manufacturing history in producing such equipment;
- If older than 10 years, the machine shall be certified by the manufacturer or manufacturer's authorised agent to confirm operational fitness-for-purpose dated not more than 3 months earlier than the date on which it commences work on the project;
- A level-control system to maintain the cut depth within a tolerance of ± 10 millimetres of the required depth during continuous operation;
- The milling / mixing drum (the "cutter") shall have a minimum cut width of 2 metres with a facility to change the speed of rotation. The machine shall be capable of recycling to the maximum depth specified in the Project Document in a single pass;
- The cutter shall rotate within an enclosed chamber (the mixing chamber) into which water and any liquid stabilising agents are injected under pressure at the specified application rate relative to the mass of material in the mixing chamber.
- The cutter shall be mounted on a swing arm that is separate from the housing of the mixing chamber, thereby allowing the volume of the mixing chamber to increase as the depth of cut increases.
- A liquid application system dedicated to adding water to the material in the mixing chamber;
- Where a bitumen stabilising agent is to be applied, a second separate liquid application system shall be fitted to the mixing chamber. Such system shall be appropriate for the addition of either bitumen emulsion or foamed bitumen;
- All liquid application systems shall be controlled by a micro-processor / flow meter combination that accurately regulates pump delivery (flow rate) with the speed of advance.
- All liquid application systems shall include a dedicated spraybar that spans the full width of the mixing chamber. Each spraybar shall be equipped with multiple injection nozzles mounted equidistant along the length of the bar at a maximum interval of 200mm with the ability to close off selected nozzles, thereby allowing the width of application to be preset;
- Where two liquid application systems are used, the water application spraybar shall be mounted below the other spraybar (relative to the direction of rotation of the cutter) such that the recycled material encounters the water spray before the stabilising agent; and
- The recycler shall have sufficient power to recover and mix the existing pavement material together with all additives to produce a homogeneously mixed material whilst pushing (or pulling) bulk supply tanker(s).

Additional requirements when stabilising with foamed bitumen:

The liquid application system mounted on the recycler shall have the following additional features:

- Each injection nozzle on the spraybar shall be fitted with an expansion chamber (the so-called "Mobil system") for foaming the bitumen;
- Functioning gauges on the bitumen supply line for monitoring temperature and pressure;
- The ability to demonstrate that all expansion chambers are free of blockages in both the water and bitumen feed lines;
- A means of producing a representative sample of foamed bitumen at any stage during normal operations (i.e. a "test nozzle"); and
- The micro-processor shall continuously monitor the actual bitumen consumption whilst working and provide a running total that allows immediate reconciliation with theoretical (calculated) consumption.

Before any recycling work commences, the contractor shall submit a specification sheet (obtained from the manufacturer) stating the capacity, pressure and temperature limits for each liquid application system that will be used to treat the recycled material.

The recycler that the contractor intends deploying shall be subject to the Engineer's approval and he shall be entitled to reject a machine which, in his opinion, may not be capable of producing a consistent product when recycling to the specified depth(s).

4.2) Plant for processing the treated material - Compaction

The treated material exiting from the rear of the recycler shall be processed using suitable compaction equipment and graders to achieve a layer that meets the specified requirements. Sufficient plant and equipment shall be deployed to enable the treated material to be processed and finished off within the time limitations specified in Clause 6.1 below.

4.2.1) Primary compaction.

Initial compaction shall be undertaken immediately behind the recycler using a vibrating single-drum padfoot roller selected in accordance with the following guidelines.

Guideline for selection of primary roller				
Minimum static mass of roller (tons)	Final layer thickness			
	< 150mm	150 – 200mm	200 – 250mm	> 250mm
	12	14	16	20

The drum of the primary roller shall be capable of vibrating with minimum amplitude of 1.8mm at a frequency in the range of 30 – 35Hz.

The roller must be equipped with an integrated compactometer device (Hamm HCN-GPS Navigator system, or similar) to indicate and record the level of density that is achieved with each successive recording pass of the roller. The minimum interval of recording such measurements shall be 2 metres. These records shall be used by the Contractor for Process Control to indicate that the maximum density has been achieved.

4.2.2) Secondary compaction

After the grader has pre-shaped the material, a smooth drum vibrating roller with a static mass not less than 10 tons and not more than 14 tons shall be used to compact the upper portion of the layer after the grader has pre-shaped the material.

4.2.3) Final rolling

A pneumatic-tyred roller (PTR) with a minimum static mass of 18 tons and mounted on at least seven (8) tyres shall be used to finish off the new layer.

4.3) Bulk tankers

Only tankers with a capacity exceeding ten thousand (10 000) litres shall be deployed to supply the recycler with water and liquid stabilising agents. Tankers containing a bitumen stabilising agent shall be fitted with two recessed pin-type tow hitches, one in front and one at the rear, thereby allowing the tanker to be pushed from behind by the recycler, and to push a water tanker in front. No leaking tanker will be permitted on the site.

Where a bituminous stabilising agent is added, each tanker shall be equipped with:

- A functioning thermometer reflecting the temperature of the contents in the bottom half of the tank; and
- A rear feed valve (minimum internal diameter of 75mm when fully opened) that is capable of draining the contents of the tank.

B10105. SETTING OUT AND CONTROL OF THE WORK

Unless otherwise stated in the Scope of Works of the Project Order, the Contractor shall establish his own reference and level beacons for the setting-out and control of the works. The existing horizontal alignment shall be retained and only minor modifications made to the vertical alignment, as described below.

The Contractor shall establish a series of level control poles placed at a constant offset on either side of the road at a minimum interval of 20m. At each 20m location, the Contractor shall record the existing road surface levels at the centre-line and at the outer limits of each lane and prepare a series of graphs (for sections not less than 2.0km in length) with the recorded levels plotted at an exaggerated scale against the km distance. Final levels for the new stabilised layer shall be selected in accordance with a "best-fit" principle, taking into account the following:

- the required camber or superelevation details at each location;
- the minimum requirements governing changes in grade (longitudinal grade line);
- the thickness of the existing base layer; and
- minimising the amount of pre-work required (pre-treatment and/or importing new material) before recycling can commence.

At least two weeks before recycling work is scheduled to commence on any specific section, the Contractor shall select the best-fit design levels and submit these proposals to the Engineer (both as a schedule of longitudinal grade, cross-fall and final surface levels, as well as a drawing with the design lines superimposed on the existing levels) for approval or amendment.

The Engineer will take control measurements to determine the accuracy and adequacy of the reference beacons / control poles, and may instruct the Contractor to correct any faulty work and to take and provide such additional measurements and details as may be deemed necessary. Survey work will not be measured

and paid for separately and compensation for any work involved in staking, setting out, taking levels, determining the final surface elevations and transferring these design levels on to the level control poles (including the cost of all labour materials and reinstatement if required for any reason) will be deemed to be included in the rates for the various items of work included in this contract. No payment will be made for any inconvenience or delay caused by compliance with these requirements.

B10106. CONSTRUCTION

6.1) General limitations and requirements

No recycling 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 10-15°C for foam. No further work, other than finishing and compaction, will be permitted if the air temperature falls below 10°C during operations.

Spreading of powdered stabilising agent(s) and active filler(s) (lime and cement) on the road ahead of the recycler shall not be permitted when windy conditions adversely affect the operation.

The limitations shown in the following table shall be strictly enforced.

Temperature and time limitations for different stabilising agents				
Limitation	Stabilising agent			
	Cement	Lime	Bitumen emulsion	Foamed bitumen
Minimum material temperature (°C)	5	5	10	15
Maximum time for completion (hours)	4	8	12	12

6.2) Requirements before recycling commences

On a daily basis, before the start of recycling work (or, alternatively, at the end of the day's work), on instruction by the Engineer the recycler shall be used to pulverise a short section of the road ($\pm 10\text{m}$) that will be recycled when work begins. Such pulverising shall be carried out with the cutter set to the specified recycling depth and the machine moving forward at the normal operating advance speed ($\pm 8\text{m/min}$) with no water or stabilising agent applied. A bulk sample ($>100\text{kg}$) of such pulverised material shall be taken from an area where the machine was advancing at the normal operating advance speed and retained for laboratory testing. No payment will be made separately for this and would be deemed to be included in the various items of recycling.

6.2.1) Production Plan

Prior to the start of work every day, the contractor shall prepare a Production Plan detailing his proposals for the forthcoming day's work. As a minimum, this plan shall include a sketch showing:

- the overall layout of the length and width of road intended to be recycled during the day, broken into the number of parallel cuts required to achieve the specified width of treatment;
- the location of and overlap width at each longitudinal joint between adjacent cuts, together with the location of the inner and outer wheel paths of each lane affected by recycling;
- the sequence and length of each cut to be recycled before starting on the adjacent or following cut; and
- an estimate of the time required for recycling each cut and for finishing off the work.

Note. The minimum width of overlap between adjacent cuts shall be 100mm.

6.2.2) Preparing the Surface

Before any recycling work commences, the surface of the existing road shall be prepared by:

- cleaning all vegetation, garbage and other foreign matter from the full road width, including any adjacent lanes or shoulders that are not to be recycled;
- removing any standing water;
- pre-milling to remove high-spots and/or pre-pulverising (where ordered); and
- providing an accurate guideline to assist the operator to accurately steer the recycler.

In addition, the contractor shall record the location of all road marking features (e.g. extent of barrier lines) that will be obliterated by recycling.

6.2.3) Surface shape and level requirements

Where the grade line and cross-sectional shape of the existing road are acceptable (i.e. not excessively distorted), it shall be the contractor's responsibility to conduct his operations in such a manner as to ensure that the surface levels of the completed recycled layer are consistent with those that existed prior to recycling. Where surface defects are to be corrected and/or modifications made to the grade line, instructions will be issued detailing the new surface level requirements. These may be achieved prior to recycling by either pre-milling to remove in-situ material, by pre-pulverising, pre-shaping and pre-compacting the pulverised material, or by importing material and accurately spreading on the existing road surface, as described below.

6.2.4) Pre-milling

Where instructed, pre-milling shall be undertaken using a milling machine (not a recycler) to:

- Remove material from the road. Isolated high spots shall be removed and/or minor modifications made to crest vertical curves by accurate milling. The material resulting from such milling operations shall be loaded onto trucks and disposed of as directed.
- Break down (pulverise) thin layers of asphalt. Badly cracked asphalt layers (full-depth crocodile cracks at intervals < 100mm), and/or sections where thin asphalt overlays are delaminating, shall be pre-milled immediately in advance of the recycling operation. To ensure that the milling operation achieves the required degree of pulverisation, the depth of milling shall be constantly monitored and adjusted so that the bottom of the milling drum remains within the lower half of the cracked / delaminating asphalt layer. Where an acceptable degree of pulverisation cannot be achieved, the machine shall be operated in reverse (i.e. down-cutting) with the same controls applied to the depth of milling. If such reverse milling fails to produce an acceptable degree of pulverisation, the offending asphalt layer shall be milled off and removed. The pulverised asphalt material generated from such pre-milling shall remain on the road, behind the milling machine, where it shall be spread across the width of recycling and rolled with a smooth-drum roller.

6.2.5) Pre-pulverising existing pavement material

Pre-pulverising shall only be undertaken on instruction from the engineer for the purpose of:

- breaking down excessively hard material;
- loosening the material across the road width so that it can be cross-mixed by grader;
- exposing the loosened (fluffed-up) material to the atmosphere to promote drying; or
- loosening the material in the existing pavement so that it can be loaded and removed from site.

The depth of pre-pulverising shall be carefully controlled throughout the operation to ensure that the cut horizon always remains at least 25mm above the bottom of the subsequent recycling / stabilisation horizon.

Unless the objective of pre-pulverising is to dry for the material, a water tanker shall be coupled to the recycler and sufficient water added to allow the material to be compacted to a minimum density of 95% of the mod AASHTO density. Except where the material is to be cross-mixed, it shall be compacted immediately behind the recycler before using a grader to pre-shape the material in accordance with final level requirements. Where cross-mixing is ordered, the material shall be bladed by grader across the specified width to achieve a uniform blend of material before being compacted and shaped.

6.2.6) Addition of imported material

Where instructed to import material for blending and/or as make-up material for the purpose of shape correction, the prescribed material shall be imported and spread on the existing road surface prior to recycling. The method of placing and spreading the imported material shall be such as to achieve the required surface levels and will require the use of a paver, motor grader or other such plant. All imported material shall be pre-compacted to a minimum of 95% of the mod AASHTO density.

Nowhere shall the thickness of imported material exceed the recycling depth.

6.3) THE RECYCLING PROCESS

6.3.1) Before starting

Prior to starting recycling, the production planned for the day shall be approved by the engineer and the following checks carried out:

- All relevant temperatures shall be measured and recorded, including:
 - air temperature;
 - the material in the recycling horizon; and
 - the contents of all bulk supply tankers (including water).
- All plant and equipment is on site and the operators of the different machines are adequately trained and briefed on their particular tasks.
- The recycler has been prepared and set up for the first cut. Such preparations shall include:

- checking that the mixing chamber is free of any material build-up that may affect the functioning of the application nozzles on all relevant spraybars;
- the cutting tools have sufficient remaining life to complete the first cut without stopping;
- all relevant liquid application systems are functioning, free of blockages and the in-line filters are clean. Where a bitumen stabilising agent is applied, a relevant check-sheet (similar to the example forms included in the Appendices of the latest version of TG2) shall be diligently followed, signed off and submitted to the engineer;
- the on-board computer has been correctly set up and the input data verified;
- the spraybar is set up with the correct nozzles selected to achieve the required width of application;
- Bulk supply tanker(s) are coupled correctly to the recycler, all feed pipes are properly connected, bled of air and free of leaks. Where a bitumen stabilising agent is applied, the feed pipe shall only be connected immediately before work is about to start. Where the stabilising agent is foamed bitumen, the outlet plumbing on the tanker shall be checked and any “cold plug” of bitumen removed before attaching the feed pipe.
- Where cement or lime is spread by hand on the road surface ahead of the recycler, the “spot marks” for bag spacing shall be checked at random intervals and recorded.
- A clear guideline is in place for the recycler to follow and is correctly aligned relative to the road geometry.
- The integrated compactometer system on the primary roller properly functioning and has been set up to record the correct relevant data.

6.3.2) Recycling

The recycler shall be set up and operated to ensure that:

- The speed of advance is regulated (below the maximum allowable of 10m/min) to achieve;
 - adequate pulverisation of all bound materials in the existing pavement to produce a material that meets the grading requirements;
 - operating pressures and flow rates in all liquid application systems that remain within the limits prescribed by the manufacturer of the machine.
- The depth of recycling coincides with the line and level specified for the bottom horizon of the new stabilised layer. The bottom of cut horizon shall be checked at least once every 100m of cut using a suitable T-bar to dip from a stringline pulled between the relevant final level reference marks on the level control poles.
- The planned width of overlap along all longitudinal joints is maintained and the line of cut does not deviate laterally by more than 50mm from that required (measured from the operator's guideline that shall be positioned for each and every cut).
- The process is continuous with a minimum number of stops. Transverse joints that occur every time the recycler stops are properly treated to achieve continuity of stabilisation and moisture across the resulting joint.
- The application rate of liquid stabilising agent(s) and water is uniformly continuous across the required width of treatment, including all longitudinal joints. The temperature across the width of material exiting the mixing chamber shall be checked at least once every 100m using a digital thermometer with a laser beam target held no more than 100mm above the material. Where the temperature varies consistently by more than 3°C along a particular longitudinal strip $\pm 200\text{mm}$ wide, the recycler shall be stopped and the relevant application nozzles on all spraybars that coincide with the offending strip shall be checked for blockages.
- The moisture content of the treated material is continuously monitored and the application of water adjusted to achieve a uniform moisture content of not less than 60% and not more than 80% of the optimum moisture content.
- The mixed material exiting from the behind the recycler is struck off by the rear door of the mixing chamber with sufficient pressure applied to obtain a uniform surface that is free of valley lines, empty pockets and particle segregation.

The advance speed of the recycler and the speed of rotation of the recycling drum shall be set to obtain the required grading and sufficient mixing of all components (recycled material and additives) so that a homogeneous material is produced.

IMPORTANT NOTE. Recyclers are configured such that their rear wheels run on top of the treated material towards the outer extremities of the cut. To prevent introducing a density differential across the width of cut, primary compaction shall be completed prior to any grader work commencing. If the treated material is pre-shaped by grader prior to being compacted, the work shall be summarily rejected.

6.4) Primary compaction

A single-drum vibrating roller (described in sub-clause 4.2.1) shall be deployed to compact the recycled material immediately behind the recycler. This roller shall travel forwards and backwards at a constant speed (maximum 3km/hr (50m/min)), remaining within the confines of the recycled cut. Recycled material covering the outer extremities of cut shall be moved at regular intervals (± 5 m) to expose the cut line, thereby allowing the operator to remain within the cut width.

The vibration mode shall be set on “high” amplitude and shall not be adjusted for the duration of the primary compaction exercise. Successive lengths of recycled / treated material shall be compacted (each approximately 50m in length).

Rolling shall continue on each section until the integrated compactometer device indicates that no further density is being achieved over at least 80% of the length of the section (i.e. maximum achievable density has been reached). Should the device indicate a consistent loss of density at any point during primary compaction (as indicated over two successive recording passes), rolling on that section shall be terminated and the roller moved forward to start compacting the next section.

After each day's production, the contractor shall provide the engineer with an electronic copy of the data file from the compactometer device containing detailed compaction records for the day's work. As a minimum, this file will include the number of passes made on each section of every cut made by the recycler, as well as the following data for each 2m interval along the length of each cut:

- the compactometer reading;
- the amplitude of vibration; and
- the advance speed of the roller.

These records will constitute the contractor's Process Control for primary compaction.

Notes.

i. A “roller pass” shall be defined as a single unidirectional pass made by the roller. Where the roller travels forwards and backwards over the same point, it would have made “2 passes”.

ii. A “recording pass” is a roller pass where the compactometer readings are stored (recorded) and used for comparison purposes. Recording passes are always in one direction of travel only. Recordings shall be made commencing with the first pass and every alternative subsequent pass that is made (i.e. 1, 3, 5, 7, etc.)

iii. The minimum number of primary roller passes shown in the following table.

Layer thickness (mm)	Number of passes	
	Minimum	Maximum
Up to 175	5	9
175 – 250	7	11
Over 250	9	15

Additional roller passes (to the maximum shown in the above table) shall not be paid separately and would be deemed to be included in the tendered rates.

iv. The contractor must ensure at the time of compaction, the moisture content of the mixed material falls within the prescribed range of not less than 60% and not more than 80% of the optimum moisture content (OMC).

v. Where the moisture content is below 60% of OMC, additional passes will be required to achieve the maximum density for which no additional payment shall be made. Where the moisture content is above 80% of OMC, the contractor runs the risk of creating instability (heaving) in the layer that may result in the layer being rejected.

vi. Where the number of passes required by the primary roller exceeds 5, a second identical roller may be required to ensure that the primary compaction process follows at the same rate as the recycling operation. Where two rollers are used, only one needs to be fitted with an integrated compactometer device provided they work in tandem. The roller with the integrated compactometer device shall then be positioned to follow the one without a device (travelling towards the recycler) and the number of passes recorded will be multiplied by two (2). No additional payment shall be made for this plant

6.5) Grader work and secondary compaction

After completing the primary compaction on all adjacent cuts that make up the width of pavement that is recycled in one shift, the surface shall be pre-shaped before final compaction is applied. Pre-shaping shall address the lateral shift of material resulting from the surface inclination (cross-fall) and shall be undertaken in the following sequence:

- i. the full width of primary compacted material shall be treated with a generous application of water sprayed from a tanker;
- ii. the grader shall then cut the uppermost portion of recycled material from the centre-line extremity towards the outer shoulder, cutting to a depth that coincides with the lower part of the step located at each longitudinal construction joint (overlap between adjacent cuts), often identifiable with padfoot imprints (normally $\pm 50\text{mm}$ for standard 2% camber). The cut material is windrowed to the outermost edge of cut and a light application of water sprayed on the full width of the exposed surface. To prevent the lamination phenomenon (biscuiting), no roller will be allowed onto the exposed cut surface.
- iii. The grader shall then blade the windrowed material to the opposite side of the recycled width, cutting the strip underlying the location of the original windrow to the same depth as the first cut, and placing the material in windrow along the innermost edge of cut. A light application of water is then sprayed over the full width of the exposed surface. As with the previous cut, no roller will be permitted onto this exposed surface.
- iv. After spraying the exposed surface with water, the grader shall then spread the windrow across the full recycled width as a layer of uniform thickness approximating final surface levels.

Secondary compaction shall then be applied using the smooth-drum vibrating roller operating in low amplitude vibration mode. A minimum of three (3) unidirectional passes shall be applied to the entire area. The outer cut extremities shall be exposed as a guide for the roller operator to ensure that the compaction effort is directed only on to the recycled material (thereby preventing any "bridging across" from the unrecycled pavement).

Once compacted, final surface levels will be cut with the grader and finished off by blading (skimming) the working windrow across the surface, first from the outer edge towards the centre-line and then back towards the outer shoulder where it shall either be spread across the shoulder and compacted or picked up and removed. After cutting final levels the smooth-drum roller shall make a final compacting pass over the entire area before the finishing work commences.

6.6 Finishing off the layer

When the grader work and secondary 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 Engineers 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 by the Engineer.

Note.

Dilute emulsion for slushing and fog spraying shall only be applied using an appropriate water tanker or binder distributor.

B10107. TRIAL SECTIONS

Before the contractor commences with any recycling work, he shall demonstrate by means of constructing a trial section that the processes he proposes to use will enable him to construct a new layer in accordance with the specified requirements.

Prior to carrying out the trial section, the contractor shall assemble all items of plant and equipment that he proposes to use for the recycling operation. Only those machines he intends using for production work shall

be used to construct the trial section and under no circumstances shall he be permitted to use any substitutes. The first section of pavement to be recycled shall be regarded as a trial section with the objective of:

- demonstrating that the equipment and processes he proposes to employ are capable of constructing the recycled layer in accordance with the specified requirements;
- determining the effect on the grading of the recycled material by varying the forward speed of the recycling machine and the rate of rotation of the milling drum; and
- determining the amount of rolling necessary to achieve the compaction requirements.

The trial section shall be at least 200m in length and shall cover the full lane-width or half-road width in accordance with the geometry of the road and the accepted work plan.

To allow the engineer sufficient time to assess all aspects of quality of the completed trial section and contingent on the results being satisfactory, the contractor shall programme to start production recycling work no sooner than one week after constructing the trial section.

Should the contractor make any alterations in the methods, processes, equipment or materials used, or if he is unable to comply consistently with the specifications due to variations in the in-situ material, or for any other reason, he may be required to undertake further trial sections before continuing with the permanent work. Provision is made for payment for the first approved trial section, measured separately in square metres for the area actually constructed as a trial section. Such payment will be made as an extra-over to the various payment items for recycling work together with all additives that will be measured and paid as normal production work. Any further trial sections ordered by the engineer shall likewise be paid provided they are approved. Trial sections that fail to obtain approval shall be deemed to be the contractor's expense.

B10108. PROTECTION AND MAINTENANCE

New layers construction from recycled material stabilised with cement require different protection and maintenance measures from those stabilised with bitumen.

8.1 Curing

8.1.1 Cementitious stabilisation

- (a) Where the recycled layer forms the subbase in the new pavement structure

The provisions of Clause 3503 (h) (ii) shall apply:

"The stabilised layer shall be covered with the material required for the next layer while the stabilised layer is still in a wet or damp condition. The material forming the protective layer shall be watered at such intervals as may be required to keep the stabilised layer continuously wet or damp and, in dry weather, this shall be done at least once every 24 hours."

- (b) Where the recycled layer forms the base of the new pavement structure

The provisions of Clause 3503 (h) (iv) shall be modified to read:

"The prime coat shall be utilised as a curing membrane and will be applied no later than 24 hours after completing the recycled layer, all in accordance with Section 4100."

8.1.2 Bituminous stabilisation

No special curing treatment is required for layers of bitumen stabilised material.

8.2 Trafficking the completed layer

8.2.1 Cementitious stabilisation

Under no circumstance shall traffic be allowed to travel on layers of cement stabilised material.

8.2.2 Bituminous stabilisation

- (a) Where bitumen emulsion is applied as the stabilising agent

Traffic shall not be allowed to travel on the completed layer for a period of 24 hours. The moisture content of the layer shall then be checked and, provided it is below 80% of OMC, the new layer may be opened to traffic.

- (b) Where foamed bitumen is applied as the stabilising agent

Traffic shall be allowed to traffic the completed layer as soon as the surface has dried back to a damp condition. As soon as the surface of the layer has dried (normally within 24 hours

under favourable weather condition), the section shall be closed to traffic to allow a fog spray of dilute emulsion (15% residual bitumen) to be applied at a nominal application rate of 0.75 litres/m². The section shall be reopened to traffic after two hours or as soon as the emulsion has broken.

Where the surface was slushed with a dilute emulsion and a fog spray applied as part of the finishing process (as described in Clause 6.6 above), the section shall remain closed to traffic for a minimum of two hours after completion or until the emulsion at the surface has broken.

Until the surfacing is applied, the contractor shall maintain the surface integrity of the new layer by deploying staff on a daily basis to visually monitor all sections under traffic and take immediate action as soon as signs of ravelling are detected. Such action shall include the local application of dilute emulsion (applied by hand using a large paint brush) or the application of a further fog spray.

8.3 Application of surfacing

To prevent environmental degradation and abrasion damage (where the completed work is open to traffic), new base layers shall be surfaced as soon as the moisture content in the upper 100mm horizon has reduced to below 50% of OMC.

The maximum time delay between completing a new base layer and applying the surfacing shall be 14 days (with due allowance made for inclement weather).

B10109. CONSTRUCTION TOLERANCES

The provisions of Clause 3405 shall apply to all layers constructed by in situ recycling.

9.1 Stabilising agents

The average rate of application of stabilising agents (cementitious and bituminous) as measured from consumption records shall be within 5% of the specified application rate.

9.2 Bitumen stabilised bases subjected to early trafficking.

The contractor shall be responsible for the maintaining the surface integrity of new bitumen stabilised base layers that are opened to traffic before the surfacing has been applied. Where damage occurs as a consequence of the surfacing not being applied within the time limits specified in Clause 8.3 above, the engineer shall have the right to summarily reject the affected layer and the contractor will have no recourse for the costs he incurs in removing the layer and replacing it with fresh bitumen stabilised material.

B10110. QUALITY OF MATERIALS AND WORKMANSHIP

10.1 Process control

The contractor shall establish a comprehensive process control system for the recycling work.

10.1.1 Daily reports

The following daily reports shall be submitted:

- The production plan (refer Clause 6.2.1).
- The completed pre-start check list (where the material was stabilised with bitumen).
- A "Daily Production Record" that includes:
 - weather conditions and temperature measurements (refer Clause 6.3.1)
 - details of the recycling work completed during the day with the following information for each cut that was made:
 - start and end chainages;
 - depth of cut (including a schedule of dip measurements);
 - width of application of stabilising agent(s);
 - nozzle settings (closures) for each spraybar;
 - computer data input; and
 - cement / lime spreading check measurements (where relevant).

Where the material is treated with a bitumen stabilising agent, the following shall be included:

- bitumen emulsion or Pen-grade bitumen consumption; and
- average temperature and pressure measured at the spraybar; and

- all other details shown in the sample report included in the Appendices of the latest edition of TG2.
- relevant comments / information concerning the recycling operation. These shall include but shall not be limited to:
 - standing time and the reason(s);
 - sections where in situ pavement conditions changed together with a description of the change (e.g. thick asphalt between km 1+200 and km 1+230 in Cut #2);
 - details of any non-routine tests that were undertaken;
 - any changes in the weather during the day (e.g. strong wind from 13:00); and
 - relevant instructions received and from whom.
- the location where the daily sample of pulverised material was taken.

10.1.2 Bitumen consumption

Where the recycling process includes bitumen stabilisation, the contractor shall base his consumption claim on that indicated the recycler's computer. To verify his claim, the contractor shall provide the engineer with a weekly reconciled schedule showing any stock records together with all consumption and deliveries for that specific week. All deliveries shall be supported by original (or certified copies of) official weighbridge certificates that are used by the contractor as the basis of payment to the supplier.

Where there is a discrepancy between the actual and theoretical consumption for stabilisation, the contractor shall immediately check the calibration of the flow meter on the recycler. To do so, he shall provide a full tanker load of bitumen stabilising agent with a loading ticket from an assized weighbridge. The entire contents of the tanker shall then be used to recycle a continuous section of cut (after resetting the computer). The consumption reflected by the computer on the recycler shall be compared with the mass shown on the weighbridge ticket and, if necessary, the computer shall be re-calibrated. A second tank-load of bitumen stabilising agent with a loading ticket shall then be used to confirm the accuracy of the recalibration exercise.

Note. Dipstick readings shall not be used as a basis of payment for bitumen stabilising agents.

10.1.3 Density of the recycled layer

Compaction data from the integrated compactometer device fitted to the primary roller (refer Clause 4.2.1) shall be submitted daily in an electronic format. Where the contractor elects to provide the engineer with printed summary sheets, the electronic data shall also be supplied.

10.1.4 Grading of the recycled material

Samples of pulverised material shall be taken on a daily basis (refer to the first paragraph in Clause 6.2) and tested to determine the grading curve. Where the curve consistently fails to meet the requirements specified in the Project Document, the engineer may issue an order for suitable blend material to be imported.

10.1.5(a) Process Control Testing

The Contractor must carry out the necessary process control testing required to prove to the Engineer that the layer has been constructed to specification. These results must be made available to the Engineer who will decide if any further Acceptance testing is required. No additional payment will be made for Process Control Testing and it will be deemed to be included in the tendered rates.

10.15(b) Acceptance control

Routine inspection and tests shall be carried out by the engineer to determine the following aspects of quality of the completed work:

10.2.1 Strength of the stabilised material

At least one sample shall be taken for every 1000m² of stabilised material and subjected to strength tests according to the type of stabilising agent applied.

(a) Cementitiously stabilised materials

Standard TMH1 tests shall be undertaken to determine the UCS of the material. The results will be used to indicate whether the material meets the "C" classification stipulated in the Project Document.

(b) Bituminous stabilised materials

Samples shall be taken to the laboratory and, within 12 hours, 100mm diameter specimens shall be manufactured in accordance with the guidelines of the latest publication of TG2 and the relevant ITS values determined. The results will be used to indicate whether the material meets the "BSM" classification stipulated in the Project Document.

10.2.2 Density of the completed layer

Unless otherwise stated in the Project Document, the reference density for recycled materials shall be the modified AASHTO density. (ARD or BRD shall only be considered where the material in the existing pavement is relatively uniform.)

Target densities are shown in the following table:

Predominant material type	Target density (% of modified AASHTO density)	
	Cementitious	Bituminous
Natural gravel	97	100
Graded crushed stone	98	102
Crushed and Screened Reclaimed Asphalt		102
Unscreened Reclaimed Asphalt		100

At least one density test shall be undertaken per 180m² of completed layer using a nuclear gauge. At each and every density test location, sufficient material shall be sampled from the full layer thickness to determine the moisture / density relationship and the in situ moisture content. The results shall be used to determine the density achieved at that specific location.

Where a density test result falls below the target, the Engineer will first check the data produced by the integrated compaction system to determine whether or not sufficient compaction effort was applied and confirm that the maximum density was achieved. If so, then the moisture content of the material will first be checked (from the oven-dried sample taken for the moisture correction value used by the nuclear gauge).

Should this value fall below 50% of the OMC (determined for the same sample), then the test will be deemed a "failure" and the affected portion of the layer reworked at the correct moisture level (or, in the case of cement stabilisation, rejected).

If the moisture content is above 50%, then the Engineer will inspect the location of the low density result and take whatever measurements are deemed necessary to determine the cause of such low density. Such measurements may include:

- repeating the mod AASHTO density test to confirm the MDD target;
- driving a DCP probe through the underlying pavement structure to determine the support conditions; and/or
- taking additional samples and conducting further laboratory tests (e.g. gradings of different horizons to determine the influence of any segregation that may have occurred whilst blading the treated material with a grader).

10.2.3 Layer thickness

The thickness of the completed layer will be measured from sample holes excavated at each density test location.

B10111. MEASUREMENT AND PAYMENT

Note. The quantities reflected in the Schedule, and especially those relating to the import of new material, stabilising agents and the recycling / stabilising work, must be regarded as "provisional" since they can only be finalised once the stabilisation mix designs have been completed.

Item

Unit

B10111.1 Preparations for pavement rehabilitation Lane kilometre (Lane.km)

The unit of measurement shall be the lane kilometre (ie 3.5m wide by 1km in length) of road subjected to rehabilitation.

The tendered rate shall include full compensation for undertaking all the work required in preparation for rehabilitation, including all survey and survey-related work (e.g. setting out, establishing the level control poles and fixing the design levels), removal of standing water, grass and weeds from the road (including the shoulders) and for preparing the pavement surface.

- (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.

B10111.7 Trial Sections where orderedcubic metre (m³)

(A)The unit of measurement shall be the cubic meter of recycled pavement treated as a Trial Section, as ordered by the Engineer. Where the Trial Section is successful, this item shall be measured and paid in addition to the various related work items. 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 tendered rate shall 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.

(b)Extra over item for overhaul on reclaimed asphalt material in excess of 10km radius. The unit of measurement shall be m³.km

B10111.8 / 48.01 Application of a fog spray of diluted bitumen emulsion:

- (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.

(A) Levelling, compacting and preparing RAP material. The unit of measurement shall be m³.

B10111.9 Establishment of (approved) insitu recyclernumber (No)

The unit of measurement shall be the number of times to establish all the necessary paving plant and equipment on site. The rate shall include for loading and transporting all the necessary plant and equipment from site to site by lowbed, as agreed and instructed by the Engineer.

Add the following Specification:

SECTION B10200: SPECIFICATION FOR PROCESSING RECLAIMED ASPHALT FOR SUBBASE OR BASE OFF SITE IN A STATIC COLD RECYCLING MIXING PLANT AND PLACED BY A PAVER

CONTENTS

B10201	SCOPE
B10202	MATERIALS
B10203	STABILISATION MIX DESIGN
B10204	PLANT AND EQUIPMENT
B10205	SETTING OUT AND CONTROL OF THE WORK
B10206	CONSTRUCTION
B10207	TRIAL SECTIONS
B10208	PROTECTION AND CURING
B10209	TRAFFIC
B10210	CONSTRUCTION TOLERANCES
B10211	QUALITY OF MATERIALS AND WORKMANSHIP
B10212	MEASUREMENT AND PAYMENT

B10201 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. The new base shall be opened to traffic immediately after completion.

Base:

The crushed and screened asphalt material for base shall meet the requirements specified in Section 4200 Clause ED 3: Materials and Grading as specified in TG2 Table A.9 Ideal for BSM Emulsion or Foam.

The unscreened asphalt material for base shall meet the requirements specified in Section 4200 Clause ED 3: Materials.

Subbase:

The crushed and screened asphalt material for Subbase shall meet the requirements specified in Section 4200 Clause ED 3: Materials and Grading as specified in TG2 Table A.9 Ideal for BSM Emulsion or Foam.

The unscreened asphalt material for Subbase shall meet the requirements specified in Section 4200 Clause ED 3: Materials.

B10202 MATERIALS**(2.1) The Crushed and Screened or Unscreened Reclaimed Asphalt Material**

For this contract shall meet the requirements specified in TG2 Table A.9 Ideal for BSM Emulsion or Foam.

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."

(2.2) Stabilising Agents

(2.2.1) Cementitious stabilizing/dispersing agents

(a) Cement shall comply with the relevant requirements of SANS 50197-1:2000 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:

SABS 309 for anionic emulsion; or
SABS 548 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 SABS 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.

B10203. STABILISATION MIX DESIGNS

The Project Order will include the details of all relevant stabilisation mix designs undertaken prior to the award of the Project.

Within 7 days of the Contractor taking possession of the site, the "Advance Testing Programme" shall commence.

(3.1) Mix Design Procedures

The Engineer 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 Engineer 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 Engineer to undertake the necessary testing programme.

The Engineer 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 Engineer 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 Engineer 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 Engineer 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	165 – 180	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.

B10204. 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 **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 load-cell 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 Engineer’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) 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 93% of MDD (AASHTO T180). The

equipment used shall be of adequate rated capacity, in good working order, and subject to the approval of the Engineer. 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 paved 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.

(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 to the paver 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 to be paved. The surface shall be thoroughly moistened prior to paving the base and kept moist until covered by the new base. The contractor shall arrange his operations so that trucks transporting material to the paver 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 with the paver. 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 paved. 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 paved 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 paving 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 Engineer a fog spray of dilute bitumen emulsion to protect the surface from the abrasive forces of traffic shall be applied and paid for separately.

(4.3.1) Compaction Requirements

The dry density of the completed foamed bitumen stabilised base shall meet the following requirements:

- The average for the lot shall not be less than **102% and <100% of Mod ASSHTO**, and

- No single test result shall be less than **98% of Mod ASSHTO**.

The minimum number of tests per lot shall be 5.

The dry density of the completed foamed bitumen stabilised subbase shall meet the following requirements:

- The average for the lot shall not be less than **100% and < 98% of Mod ASSHTO**, and
- No single test result shall be less than **96% of Mod ASSHTO**.

The minimum number of tests per lot shall be 5.

B10205 SETTING OUT AND CONTROL OF THE WORK

Must be read in conjunction with clause B10105

B10206 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 10-15°C 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.

Temperature and time limitations for different stabilising agents			
Limitation	Stabilising agent		
	Cement	Bitumen emulsion	Foamed bitumen
Minimum material temperature (°C)	10	10	15
Maximum time for completion (hours)	4(from first bag been opened)	12	12

(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 Engineer 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 load-cell 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 Engineer'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.

(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 Engineer 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 Engineer as an indication of whether an acceptable quality of mix can be achieved. Should the Engineer 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 paved 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 Engineer 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 dry density of the completed foamed bitumen stabilised base shall meet the following requirements:

- The average for the lot shall not be less than **102% and <100% of Mod ASSHTO**, and
- No single test result shall be less than **98% of Mod ASSHTO**.

The minimum number of tests per lot shall be 5.

The dry density of the completed foamed bitumen stabilised subbase shall meet the following requirements:

- The average for the lot shall not be less than **100% and < 98% of Mod ASSHTO**, and
- No single test result shall be less than **96% of Mod ASSHTO**.

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 Engineers 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 Engineer 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 paved.

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 Engineer.

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 paved 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.

B10207 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 Engineer 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 Engineer. After approval has been obtained, the mixing process and equipment shall remain unaltered unless otherwise approved by the Engineer.

B10208 PROTECTION AND CURING

The provisions of Sub-clause B9206, 6.9 (d) 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.

B10209 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 Engineer. **No additional payment shall be made for this item.**

B10210 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-sub-clause B10206 (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 paver. 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

B10211 QUALITY OF MATERAILS AND WORKMANSHIP

Must be read in conjunction with clause B10110 and B10206

B10212 MEASUREMENT AND PAYMENT

B10212.01 Preparations for pavement rehabilitation Will be paid under B10111.01

B10212.02 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.....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 dispersing agent, 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.

10212.03 Processing/Mixing of Reclaimed Asphalt in a Static Plant Recycler – KMA or similar, and paver laid.

- i. For subbase, paver laid and compacted to 100% (average) and < 98% of Mod AASHTO density, to compacted layer thickness:

(i) 100 mm, up to and including 150 mm..... cubic metre (m³)

(ii) More than 150 mm, up to and including 200 mm..... cubic metre (m³)

(b) For base, paver laid and compacted to 102% (average) and < 100% of Mod AASHTO density, to compacted layer thickness:

- | | | |
|------|---|-------------------------------|
| (i) | 100 mm, up to and including 150 mm..... | cubic metre (m ³) |
| (ii) | More than 150 mm, up to and including 200 mm..... | cubic metre (m ³) |

"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 dispersing agent, hauling within a freehaul distance of 10km radius from the processing plant to the paver, for any wastage, for placing by paver, 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.

(c) Extra over item a) or b) 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.

(d) Extra over item a) or b) for screening of the reclaimed asphalt/crushed reclaimed asphalt cubic 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.

(e) Extra over item a) or b) 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 Engineer 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

(f) Extra Over Item a) or b) 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 overhauls distance in kilometers,

The tendered rate shall include full compensation for hauling material in excess of the free haul distance.

10212.04 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 Engineer.

The unit of measurement shall be the cubic meter of completed trial section approved by the Engineer.

The tendered rate shall include full compensation for constructing the trial section complete as specified."

**10212.05 Stabilising or dispersing agents
Will be paid under B10111.6**

**10212.06 Application of fog spray of diluted emulsion as and when requested by the Engineer.
Will be paid under B1011.9/48.01**

10212.07 Establishment of:

- a. Static Plant Recycler – KMA or similar.....
.....number (No)
- b. Crusher.....
.....n
umber (No)
- c. Screen ((26.5/19mm max particle stone size), as specified by the Engineer.....number (No)

The unit of measurement shall be the number of times to establish all the necessary paving plant and equipment on site. The rate shall include for loading and transporting all the necessary plant and equipment from site to site by lowbed, as agreed and instructed by the Engineer.

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.

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.

PART C: DAYWORKS**C1. 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 unit measurement shall be hours (hr).

C2. CONSTRUCTION PLANT HIRE

Where daywork is ordered, the tendered rates for plant hire in Section 6 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 2010 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.

The unit measurement for personnel shall be hours (hr) except for C2(j) where the unit measurement shall be Number (No).

C3. 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 Section 6 of 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 Engineer. 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 2010.

The unit measurement for personnel shall be Provisional Sum (Prov Sum)

C3.3.2 AMENDMENTS TO THE STANDARD SPECIFICATIONS

INTRODUCTION

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

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

PS AB	General Specifications
PS B	Site Clearance
PS C	Concrete Work
PS EA	Lime Stabilisation
PS ED	Road Asphalt
PS EH	Steel Guardrails & Conc. Median Barriers
PS EM	Concrete Surface to Roads
PS PC	Stabilisation of Gravel Base
PS TA	Road Signs
PS TB	Road Markings

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 (Not Applicable)

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

C3.6.1 “There are no Annexures”

PART C4: SITE INFORMATION

C4.1 LOCALITY PLAN

Insert Locality plan here

C4.2 CONDITIONS ON SITE

There is no specific geotechnical information or other site information.

C4.3 TEST RESULTS

There are no specific test results.