



DEPARTMENT
OPERATIONS MANAGEMENT
DIRECTORATE
PROGRAMME MANAGEMENT
DIVISION
VARIOUS

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 website](#)

Contract No: 1A-33571

Contract Title: As and When, Rates Based Contract for Disaster Response in the West 2 Region of the eThekweni Municipality, for 36 Months

CIDB Grade/ Class: 7CE or higher

CLARIFICATION MEETING AND QUERIES

Clarification Meeting: Non-Compulsory Clarification Meeting

Meeting Location, Date, Time: Non-Compulsory Meeting will be held at 30 Archie Gumede Place, Boardroom 213, 2nd floor ETA Building.
Date & Time: 23 October 2025: 10:30am

Queries can be addressed to: Name: G Dichabe : eMail: gran.dichabe@durban.gov.za

The Employer's Agent's:

Representative: All email questions & answers will be consolidated and posted on eTenders/ Municipal website by 11 November 2025

TENDER SUBMISSION

The Tender Offer (hard copy) shall be delivered to:

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

Tenderers are to also make an **electronic submission** via the eThekweni Municipality **JDE System (SSS Module)** (see Tender Data: C.2.13).

JDE Queries
Contact:

Lindo Dlamini: Tel: 031-322-7133 / 031-322-7153
Email: supplier.selfservice@durban.gov.za

Closing Date/ Time: Friday, 21 November 2025 at 11h00

Tender Offers submitted via any means other than that stated in the Tender Data will be deemed invalid

Issued by:

ETHEKWINI MUNICIPALITY

Deputy Director: **OPERATIONS MANAGEMENT**

Date of Issue: Sep-2025

Document Version 01/07/2025

FOR OFFICIAL USE ONLY

Tenderer Name:			VAT Registered: Yes No
	Price (excl)	VAT	Price (incl)
Submitted: R	R	R	R
Corrected: R	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
		T1.1.2	Information Regarding the eThekwini JDE System	3
		T1.1.3	Notes to Tenderers	5
		T1.2	Tender Data	
		T1.2.1	Standard Conditions of Tender	7
		T1.2.2	Tender Data (<i>applicable to this tender</i>)	16
		T1.2.3	Additional Conditions of Tender	29
		RETURNABLE DOCUMENTS		Page
	Part T2	T2.1	List of Returnable Documents	30
		T2.2	Returnable Schedules, Forms and Certificates	31

CONTRACT PART	Part C1	AGREEMENT AND CONTRACT DATA		Page
		C1.1	Form of Offer and Acceptance	
		C1.1.1	Offer	63
		C1.1.2	Acceptance	65
		C1.1.3	Schedule of Deviations	66
		C1.2	Contract Data	
		C1.2.1	Standard Conditions of Contract.....	67
		C1.2.2	Contract Data.....	67
		C1.2.3	Additional Conditions of Contract	73
	Part C2	PRICING DATA		Page
		C2.1	Pricing Assumptions / Instructions.....	78
		C2.2	Bill of Quantities (separate page numbering system).....	80
	Part C3	SCOPE OF WORK		Page
		C3.1	Project Description and Scope of Contract.....	82
		C3.2	Project Specifications.....	83
		C3.3	Standard Specifications	99
		C3.4	Particular Specifications	218
		C3.5	Contract and Standard Drawings	221
	Part C4	SITE INFORMATION		Page
		C4.1	Locality Plan	222
		C4.2	Conditions on Site.....	222
		C4.3	Test Results	222
		C4.4	Region Map	223

PART T1: TENDERING PROCEDURES

T1.1.1: TENDER NOTICE AND INVITATION TO TENDER

The Employer seeks to establish 5 (five) regional managing contractors in the eThekweni Municipality (see Region Map in Part C4.4) to respond to emergency repairs arising out of disasters. The Works under this contract will entail rates-based contracting, for infrastructure repairs, on an as and when required basis, with no guarantee of any quantum of work.

Works issued under this contract will be on a Task Order basis as the needs arise. These Works will be overseen by various infrastructure Divisions (previously Departments) in the Municipality. These Divisions include Roads Provision, Roads and Stormwater Maintenance, Coastal and Stormwater Catchment Management, Water and Sanitation, and any other Divisions that would require Contractors to respond to an emergency.

Subject	Description	Tender Data
Employer	The Employer is the eThekweni Municipality as represented by: Deputy Director: OPERATIONS MANAGEMENT	C.1.1.1
Tender Documents	Documentation is to be downloaded from the National Treasury's eTenders website or the eThekweni Municipality Website : • https://www.etenders.gov.za/ • https://www.durban.gov.za/pages/business/procurement	C.1.2
CIDB Eligibility	It is <u>estimated</u> that Tenderers should have a CIDB contractor grading designation of 7CE or higher	C.2.1.2
Clarification Meeting	Non-Compulsory Meeting will be held at 30 Archie Gumede Place, Boardroom 213, 2nd floor ETA Building. Date & Time: 23 October 2025: 10:30am	C.2.7
Seek Clarification	Queries relating to these documents are to be addressed to the Employer's Agent's Representative whose contact details are: Name: G Dichabe : eMail: gran.dichabe@durban.gov.za	C.1.4
Submitting a Tender Offer	The Tender Offer (hard copy) shall be delivered to: The Tender Box in the foyer of the Municipal Building, 166 KE Masinga Road, Durban An electronic submission , via the eThekweni Municipality JDE System (SSS Module) , is also to be made. Refer to Part T1.1.2 and Tender Data: C.2.13. Notwithstanding the electronic submission , a tender offer will only be deemed valid if the "hard copy" submission has been made.	C.2.13
Closing Time	The Tender Offer (hard copy) shall be delivered, and the electronic submission completed, both on or before Friday, 21 November 2025 , at or before 11h00 .	C.2.15
Evaluation of Tender Offers	The 90/10 Price Preference Point System, as specified in the SCM Policy: Section 52: Preferential Procurement will be applied in the evaluation of tenders. Tender Data: C.3.11: Evaluation of Tender Offers details the awarding of Preference Points, and other related evaluation requirements.	C.3.11

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

Should a **Task Order** trigger the requirements of the CIDB B.U.I.L.D. Programme in terms of either:

- The Standard for Indirect Targeting for Enterprise Development through Construction Works Contracts, or
- The Standard for Developing Skills through Infrastructure Contracts, then the requirements will be specified in the Task Order Documentation.

T1.1.2: INFORMATION REGARDING THE ETHEKWINI JDE SYSTEM

This Part (T1.1.2) is for information purposes only.

Compliance requirements are stated in Part T1.2: Tender Data.

1) General

eThekwini Municipality Bids, Tenders and Quotations (hereafter referred to as Tenders) are going to be submitted using the JDE System.

This JDE System will be used for:

- Viewing of available (open) Tenders,
- Downloading procurement documentation for Tenders,
- Uploading completed and signed Tender documentation,
- Completion and submission of Tenders electronically,
- Viewing the Tender opening schedule.

2) Registrations

To be granted access to the **JDE System** prospective service providers must be registered on the **National Treasury's Central Supplier Database (CSD)**, the **eThekwini Municipality Supplier Portal**, and the **eThekwini Municipality JDE System**.

National Treasury: Central Supplier Database

- Registration can be made on <https://secure.csd.gov.za>.
- Service Providers will be issued a "MAAA" number when registered.

eThekwini Municipality Supplier Portal

- Registration can be made on <https://www.durban.gov.za> by following these links:
>Business >Supply Chain Management (SCM) >Accredited Supplier & Contractor Database.

eThekwini Municipality JDE System

- Service providers requiring access must send an email to supplier.selfservice@durban.gov.za
The following information is required:
 - Copy of the **Director's ID**.
- On receipt of this email, the Procurement and Supply Chain Management (P&SCM) Directorate will respond with the login credentials and a link to the **JDE System**.

3) Assistance with using the JDE System

The following P&SCM Official(s) can be contacted in connection with any queries regarding the use of the **JDE System**:

- Lindo Dlamini Tel: 031 322 7153 or 031 322 7133
 Email: supplier.selfservice@durban.gov.za

4) Viewing of available tenders

By following link <https://rfq.durban.gov.za/jde/E1Menu.maf> prospective Service Providers will be able to view available (open) Tender opportunities without signing into the system. However, Service Providers will not be able to respond to a Tender without being signed into the system using a JDE User ID and Password.

5) Tender documentation

By accessing the **JDE System** (using <https://rfq.durban.gov.za/>) and viewing any available Tenders, prospective Service Providers will be able to download the relevant Tender documentation.

The Tender documentation consists of the **TENDER** and **CONTRACT Parts**, as described in the INDEX, and will include any drawings and other information (if applicable). Referred to or included in the documentation are the **Standard Conditions of Tender (and associated Tender Data)**, and the **Conditions of Contract (and associated Contract Data)** which will govern the tendering and contract processes respectively.

6) Submission of tender offers

Reference is to be made to the **Tender Data: C.2.13** that specifies compliance requirements.

Tender Offers are to be delivered, in “hard copy” format, to the Delivery Location as stated in the **Tender Data**.

In addition to the above, **Tender Offers are also to be SUBMITTED ELECTRONICALLY** (uploaded) on the eThekweni Municipality JDE System (Supplier Self Service (JDE-SSS) Module). Notwithstanding the **electronic submission**, a tender offer will only be deemed valid if the “hard copy” submission has been made.

Bidders are responsible for resolving all access rights and submission queries on the JDE System before the tender closing date/ time, as stated in the **Tender Data: C.2.15**.

7) Viewing the Tender opening schedule

Users on the **JDE System** will be able to view the **Tender Opening Schedule** for each closed Tender. The tender opening schedule will also be made available on the eThekweni Municipal website at URL: <https://www.durban.gov.za/pages/business/publication-of-received-bids>

T1.1.3: NOTES TO TENDERERS

These “Notes to Tenderers” are intended to provide guidance to Tenderers regarding tendering obligations and requirements.

Compliance requirements are stated in the relevant parts of the Tender Data: T1.2.

eThekwini Supply Chain Management Policy (SCMP)

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

1) Section 14(4): ETM Supplier Database

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

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

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

The following is to be noted:

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

2) Section 20(1)(d)(i): Audited Financial Statements

Audited Financial Statements (prepared for auditing) are required to be submitted if the value of the tender offer exceeds R10 million (incl. VAT). See **Returnable Form: MBD 5** and **Returnable Form: Contracts awarded by Organs of State** in the past 5 years.

3) Section 20(1)(d)(iii): Contracts Awarded during the past 5 Years

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

4) Section 13.1(b)(vii), 20(1)(d)(ii), Section 28(1)(c) and Section 29(10): Municipal Fees

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

5) Section 21.2: Tender Validity

Tenders are to remain valid for twelve (12) months after the expiry of the original tender validity period unless the Municipality is notified, in writing, of anything to the contrary.

6) Section 28(2)(d), Section 28(2)(h) and Clause 29(12): Certifications and Registrations

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

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

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

7) Section 28(2)(e): Joint Ventures (JV)

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

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

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

8) Section 49.1.2: Complaints and Objections (Appeals)

A non-refundable tariff, as per the approved Council tariffs, is payable by the Complainant to the Municipality. Proof of the payment of the Fee must be attached to the Complaint.

CIDB**Regulation 25(8)**

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

B.U.I.L.D. Programme Clarified

- 10) A programme to accelerate transformation in the construction industry, increase the capacity of the construction industry to deliver infrastructure and support the growth of emerging contractors, was launched on 14 March 2024 by the Deputy Minister of Public Works and Infrastructure and the Construction Industry Development Board.

Details of the B.U.I.L.D. Programme were published in a Government Gazette in 2020 (GG 43726) and B.U.I.L.D. has gradually been phased in at various levels of government and the private sector. The CIDB, a public entity with the mandate to promote improved performance in construction, oversees the programme and manages the B.U.I.L.D Fund.

The B.U.I.L.D programme determines that public sector entities which implement construction projects, that meet certain minimum requirements, must include developmental goals to the deliverables defined in the tenders. Contractors are required to include these goals in the plans and pricing when they submit their tender bids.

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 C** of the CIDB Standard for Uniformity in Construction Procurement as published in Government Gazette No 42622, Board Notice 423 of 8 August 2019, as duplicated below.

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.

Annex C

Standard Conditions of Tender

C.1	General	
C.1.1	Actions	
C.1.1.1	The employer and each tenderer submitting a tender offer shall comply with these conditions of tender. In their dealings with each other, they shall discharge their duties and obligations as set out in C.2 and C.3, timeously and with integrity, and behave equitably, honestly and transparently, comply with all legal obligations and not engage in anticompetitive practices.	2) <i>Conflicts of interest in respect of those engaged in the procurement process include direct, indirect or family interests in the tender or outcome of the procurement process and any personal bias, inclination, obligation, allegiance or loyalty which would in any way affect any decisions taken.</i>
C.1.1.2	The employer and the tenderer and all their agents and employees involved in the tender process shall avoid conflicts of interest and where a conflict of interest is perceived or known, declare any such conflict of interest, indicating the nature of such conflict. Tenderers shall declare any potential conflict of interest in their tender submissions. Employees, agents and advisors of the employer shall declare any conflict of interest to whoever is responsible for overseeing the procurement process at the start of any deliberations relating to the procurement process or as soon as they become aware of such conflict and abstain from any decisions where such conflict exists or recuse themselves from the procurement process, as appropriate.	C.1.1.3 The employer shall not seek, and a tenderer shall not submit a tender, without having a firm intention and the capacity to proceed with the contract.
		C.1.2 Tender Documents
		The documents issued by the employer for the purpose of a tender offer are listed in the Tender Data .
		C.1.3 Interpretation
		C.1.3.1 The Tender Data and additional requirements contained in the tender schedules that are included in the returnable documents are deemed to be part of these conditions of tender.
		C.1.3.2 These conditions of tender, the Tender Data and tender schedules which are required for tender evaluation purposes, shall form part of any contract arising from the invitation to tender.
	<i>Note:</i> 1) <i>A conflict of interest may arise due to a conflict of roles which might provide an incentive for improper acts in some circumstances. A conflict of interest can create an appearance of impropriety that can undermine confidence in the ability of that person to act properly in his or her position even if no improper acts result.</i>	

C.1.3.3 For the purposes of these conditions of tender, the following definitions apply: a) conflict of interest means any situation in which: i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfil his or her duties impartially; ii) an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or iii) incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee. b) comparative offer means the price after the factors of a non-firm price and all unconditional discounts it can be utilised to have been taken into consideration; c) corrupt practice means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process; d) fraudulent practice means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels;	c) no acceptable tenders are received; d) there is a material irregularity in the tender process.
C.1.4 Communication and employer's agent Each communication between the employer and a tenderer shall be to or from the employer's agent only, and in a form that can be readily read, copied and recorded. Communications shall be in the English language. The employer shall not take any responsibility for non-receipt of communications from or by a tenderer. The name and contact details of the employer's agent are stated in the Tender Data.	C.1.5.2 The decision to cancel a tender invitation must be published in the same manner in which the <i>original</i> tender invitation was advertised.
C.1.5 Cancellation and Re-Invitation of Tenders C.1.5.1 An employer may, prior to the award of the tender, cancel a tender if- a) due to changed circumstances, there is no longer a need for the engineering and construction works specified in the invitation; b) funds are no longer available to cover the total envisaged expenditure;	C.1.5.3 An employer may only with the prior approval of the relevant treasury cancel a tender invitation for the second time. C.1.6 Procurement procedures C.1.6.1 General Unless otherwise stated in the Tender Data, a contract will, subject to C.3.13, be concluded with the tenderer who in terms of C.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submissions that are received at the closing time for tenders. C.1.6.2 Competitive negotiation procedure C.1.6.2.1 Where the Tender Data require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of C.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of C.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply. C.1.6.2.2 All responsive tenderers or at least a minimum of not less than three responsive tenderers that are highest ranked in terms of the evaluation criteria stated in the Tender Data shall be invited to enter into competitive negotiations based on the principle of equal treatment, keeping confidential the proposed solutions and associated information. Notwithstanding the provisions of C.2.17, the employer may request that tenders be clarified, specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

C.1.6.2.3 At the conclusion of each round of negotiations, tenderers shall be invited by the employer to revise their tender offer based on the same evaluation criteria, with or without adjusted weightings. Tenderers shall be advised when they are to submit their best and final offer.	submit a tender offer and obtain the employer's written approval to do so prior to the closing time for tenders.
C.1.6.2.4 The contract shall be awarded in accordance with the provisions of C.3.11 and C.3.13 after tenderers have been requested to submit their best and final offer.	C.2.2 Cost of tendering
C.1.6.3 Proposal procedure using the two stage-system	C.2.2.1 Accept that, unless otherwise stated in the Tender Data , the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer complies with requirements.
C.1.6.3.1 Option 1	C.2.2.2 The cost of the tender documents charged by the employer shall be limited to the actual cost incurred by the employer for printing the documents. Employers must attempt to make available the tender documents on its website so as not to incur any costs pertaining to the printing of the tender documents.
Tenderers shall in the first stage submit technical proposals and, if required, cost parameters around which a contract may be negotiated. The employer shall evaluate each responsive submission in terms of the method of evaluation stated in the Tender Data , and in the second stage negotiate a contract with the tenderer scoring the highest number of evaluation points and award the contract in terms of these conditions of tender.	C.2.3 Check documents
C.1.6.3.2 Option 2	Check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.
C.1.6.3.2.1 Tenderers shall submit in the first stage only technical proposals. The employer shall invite all responsive tenderers to submit tender offers in the second stage, following the issuing of procurement documents.	C.2.4 Confidentiality and copyright of documents
C.1.6.3.2.2 The employer shall evaluate tenders received during the second stage, in terms of the method of evaluation stated in the Tender Data , and award the contract in terms of these conditions of tender.	Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a tender offer in response to the invitation.
C.2 Tenderer's obligations	C.2.5 Reference documents
C.2.1 Eligibility	Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are not attached but which are incorporated into the tender documents by reference.
C.2.1.1 Submit a tender offer only if the tenderer satisfies the criteria stated in the Tender Data and the tenderer, or any of his principals, is not under any restriction to do business with employer.	C.2.6 Acknowledge addenda
C.2.1.2 Notify the employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the employer as the basis in a prior process to invite the tenderer to	Acknowledge receipt of addenda to the tender documents, which the employer may issue, and if necessary apply for an extension to the closing time stated in the Tender Data , in order to take the addenda into account.
	C.2.7 Clarification meeting
	Attend, where required, a clarification meeting at which tenderers may familiarize themselves

with aspects of the proposed work, services or supply and raise questions. Details of the meeting(s) are stated in the Tender Data.	C.2.12 Alternative tender offers
C.2.8 Seek clarification Request clarification of the tender documents, if necessary, by notifying the employer at least five (5) working days before the closing time stated in the Tender Data.	C.2.12.1 Unless otherwise stated in the Tender Data, submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted as well as a schedule that compares the requirements of the tender documents with the alternative requirements that are proposed.
C.2.9 Insurance Be aware that the extent of insurance to be provided by the employer (if any) might not be for the full cover required in terms of the conditions of contract identified in the Contract Data. The tenderer is advised to seek qualified advice regarding insurance.	C.2.12.2 Accept that an alternative tender offer must be based only on the criteria stated in the Tender Data or criteria otherwise acceptable to the employer. C.2.12.3 An alternative tender offer must only be considered if the main tender offer is the winning tender.
C.2.10 Pricing the tender offer	C.2.13 Submitting a tender offer
C.2.10.1 Include in the rates, prices, and the tendered total of the prices (if any) all duties, taxes except Value Added Tax (VAT), and other levies payable by the successful tenderer, such duties, taxes and levies being those applicable fourteen (14) days before the closing time stated in the Tender Data.	C.2.13.1 Submit one tender offer only, either as a single tendering entity or as a member in a joint venture to provide the whole of the works identified in the Contract Data and described in the scope of works, unless stated otherwise in the Tender Data.
C.2.10.2 Show VAT payable by the employer separately as an addition to the tendered total of the prices.	C.2.13.2 Return all returnable documents to the employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.
C.2.10.3 Provide rates and prices that are fixed for the duration of the contract and not subject to adjustment except as provided for in the conditions of contract identified in the Contract Data.	C.2.13.3 Submit the parts of the tender offer communicated on paper as an original plus the number of copies stated in the Tender Data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the employer.
C.2.10.4 State the rates and prices in Rand unless instructed otherwise in the Tender Data. The conditions of contract identified in the Contract Data may provide for part payment in other currencies.	C.2.13.4 Sign the original and all copies of the tender offer where required in terms of the Tender Data. The employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.
C.2.11 Alterations to documents Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations.	C.2.13.5 Seal the original and each copy of the tender offer as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the

employer's address and identification details stated in the Tender Data, as well as the tenderer's name and contact address.	
C.2.13.6 Where a two-envelope system is required in terms of the Tender Data, place and seal the returnable documents listed in the Tender Data in an envelope marked "financial proposal" and place the remaining returnable documents in an envelope marked "technical proposal". Each envelope shall state on the outside the employer's address and identification details stated in the Tender Data, as well as the tenderer's name and contact address.	
C.2.13.7 Seal the original tender offer and copy packages together in an outer package that states on the outside only the employer's address and identification details as stated in the Tender Data.	
C.2.13.8 Accept that the employer will not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.	
C.2.13.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the Tender Data.	
C.2.14 Information and data to be completed in all respects Accept that tender offers, which do not provide all the data or information requested completely and in the form required, may be regarded by the employer as non-responsive.	
C.2.15 Closing time	C.2.16 Tender offer validity
C.2.15.1 Ensure that the employer receives the tender offer at the address specified in the Tender Data not later than the closing time stated in the Tender Data. Accept that proof of posting shall not be accepted as proof of delivery.	C.2.16.1 Hold the tender offer(s) valid for acceptance by the employer at any time during the validity period stated in the Tender Data after the closing time stated in the Tender Data.
C.2.15.2 Accept that, if the employer extends the closing time stated in the Tender Data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.	C.2.16.2 If requested by the employer, consider extending the validity period stated in the Tender Data for an agreed additional period with or without any conditions attached to such extension.
C.2.17 Clarification of tender offer after submission Provide clarification of a tender offer in response to a request to do so from the employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted. <i>Note: Sub-clause C.2.17 does not preclude the negotiation of the final terms of the contract with a preferred tenderer following a competitive selection process, should the Employer elect to do so.</i>	C.2.18 Provide other material
C.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment.	

	Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employer's request, the employer may regard the tender offer as non-responsive.				requirements used to prequalify a tenderer to submit a tender offer in terms of a previous procurement process and deny any such request if as a consequence:
C.2.18.2	Dispose of samples of materials provided for evaluation by the employer, where required.				a) an individual firm, or a joint venture as a whole, or any individual member of the joint venture fails to meet any of the collective or individual qualifying requirements;
C.2.19	Inspections, tests and analysis				b) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or
	Provide access during working hours to premises for inspections, tests and analysis as provided for in the <i>Tender Data</i> .				c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.
C.2.20	Submit securities, bonds and policies				
	If requested, submit for the employer's acceptance before formation of the contract, all securities, bonds, guarantees, policies and certificates of insurance required in terms of the conditions of contract identified in the <i>Contract Data</i> .		C.3.2	Issue Addenda	
C.2.21	Check final draft				If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date that tender documents are available until three (3) working days before the tender closing time stated in the <i>Tender Data</i> . If, as a result a tenderer applies for an extension to the closing time stated in the <i>Tender Data</i> , the Employer may grant such extension and, shall then notify all tenderers who collected tender documents.
	Check the final draft of the contract provided by the employer within the time available for the employer to issue the contract.				
C.2.22	Return of other tender documents		C.3.3	Return late tender offers	
	If so instructed by the employer, return all retained tender documents within twenty-eight (28) days after the expiry of the validity period stated in the <i>Tender Data</i> .				Return tender offers received after the closing time stated in the <i>Tender Data</i> , unopened, (unless it is necessary to open a tender submission to obtain a forwarding address), to the tenderer concerned.
C.2.23	Certificates		C.3.4	Opening of tender submissions	
	Include in the tender submission or provide the employer with any certificates as stated in the <i>Tender Data</i> .				
C.3	The employer's undertakings		C.3.4.1		Unless the two-envelope system is to be followed, open valid tender submissions in the presence of tenderers' agents who choose to attend at the time and place stated in the <i>Tender Data</i> . Tender submissions for which acceptable reasons for withdrawal have been submitted will not be opened.
C.3.1	Respond to requests from the tenderer				
C.3.1.1	Unless otherwise stated in the <i>Tender Data</i> , respond to a request for clarification received up to five (5) working days before the tender closing time stated in the <i>Tender Data</i> and notify all tenderers who collected tender documents.		C.3.4.2		Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the <i>Tender Data</i> , the name of each tenderer whose tender offer is opened and, where applicable, the total of his prices, number of points claimed for its BBBEE status level and time for completion for the main tender offer only.
C.3.1.2	Consider any request to make a material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying				

C.3.4.3	Make available the record outlined in C.3.4.2 to all interested persons upon request.	c) is responsive to the other requirements of the tender documents.
C.3.5	Two-envelope system	C.3.8.2
C.3.5.1	Where stated in the Tender Data that a two-envelope system is to be followed, open only the technical proposal of valid tenders in the presence of tenderers' agents who choose to attend at the time and place stated in the Tender Data and announce the name of each tenderer whose technical proposal is opened.	A responsive tender is one that conforms to all the terms, conditions, and specifications of the tender documents without material deviation or qualification. A material deviation or qualification is one which, in the Employer's opinion, would: a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work, b) significantly change the Employer's or the tenderer's risks and responsibilities under the contract, or c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified. Reject a non-responsive tender offer and not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.
C.3.5.2	Evaluate functionality of the technical proposals offered by tenderers, then advise tenderers who remain in contention for the award of the contract of the time and place when the financial proposals will be opened. Open only the financial proposals of tenderers, who score in the functionality evaluation more than the minimum number of points for functionality stated in the Tender Data , and announce the score obtained for the technical proposals and the total price and any points claimed on BBBEE status level. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for functionality.	
C.3.6	Non-disclosure	C.3.9
	Not disclose to tenderers, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of tender offers, the final evaluation price and recommendations for the award of a contract, until after the award of the contract to the successful tenderer.	Arithmetical errors, omissions and discrepancies
C.3.7	Grounds for rejection and disqualification	C.3.9.1
	Determine whether there has been any effort by a tenderer to influence the processing of tender offers and instantly disqualify a tenderer (and his tender offer) if it is established that he engaged in corrupt or fraudulent practices.	Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern.
C.3.8	Test for responsiveness	C.3.9.2
C.3.8.1	Determine, after opening and before detailed evaluation, whether each tender offer properly received: a) complies with the requirements of these Conditions of Tender, b) has been properly and fully completed and signed, and	Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with C.3.11 for: a) the gross misplacement of the decimal point in any unit rate; b) omissions made in completing the pricing schedule or bills of quantities; or c) arithmetic errors in: (i) line-item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or (ii) the summation of the prices.
		C.3.9.3
		Notify the tenderer of all errors or omissions that are identified in the tender offer and either confirm the tender offer as tendered or accept the corrected total of prices.
		C.3.9.4
		Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:

- a) If bills of quantities or pricing schedules apply and there is an error in the line-item total resulting from the product of the unit rate and the quantity, the line-item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line-item total as quoted shall govern, and the unit rate shall be corrected.
- b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

C.3.10 Clarification of a tender offer

Obtain clarification from a tenderer on any matter that could give rise to ambiguity in a contract arising from the tender offer.

C.3.11 Evaluation of tender offers

The Standard Conditions of Tender standardize the procurement processes, methods and procedures from the time that tenders are invited to the time that a contract is awarded. They are generic in nature and are made project specific through choices that are made in developing the **Tender Data** associated with a specific project.

Conditions of tender are by definition the document that establishes a tenderer's obligations in submitting a tender and the employer's undertakings in soliciting and evaluating tender offers. Such conditions establish the rules from the time a tender is advertised to the time that a contract is awarded and require employers to conduct the process of offer and acceptance in terms of a set of standard procedures.

The CIDB Standard Conditions of Tender are based on a procurement system that satisfies the following system requirements:	
Requirement	Qualitative interpretation of goal
Fair	The process of offer and acceptance is conducted impartially without bias, providing simultaneous and timely access to participating parties to the same information.
Equitable	Terms and conditions for performing the work do not unfairly prejudice the interests of the parties.
Transparent	The only grounds for not awarding a contract to a tenderer who satisfies all requirements are restrictions from doing business with the employer, lack of capability or capacity, legal impediments and conflicts of interest.
Competitive	The system provides for appropriate levels of competition to ensure cost effective and best value outcomes.
Cost effective	The processes, procedures and methods are standardized with sufficient flexibility to attain best value outcomes in respect of quality, timing and price, and least resources to effectively manage and control procurement processes.

The activities associated with evaluating tender offers are as follows:

- a) Open and record tender offers received
- b) Determine whether or not tender offers are complete
- c) Determine whether or not tender offers are responsive
- d) Evaluate tender offers
- e) Determine if there are any grounds for disqualification
- f) Determine acceptability of preferred tenderer
- g) Prepare a tender evaluation report
- h) Confirm the recommendation contained in the tender evaluation report .

C.3.11.1 General

The employer must appoint an evaluation panel of not less than three persons conversant with the proposed scope of works to evaluate each responsive tender offer using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the **Tender Data**.

C.3.12 Insurance provided by the employer

If requested by the proposed successful tenderer, submit for the tenderer's information the policies and / or certificates of insurance which the conditions of contract identified in the **Contract Data**, require the employer to provide.

C.3.13 Acceptance of tender offer

Accept the tender offer; if in the opinion of the employer, it does not present any risk and only if the tenderer:

- a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement;
- b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract;
- c) has the legal capacity to enter into the contract;
- d) is not; insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act No. 2008, bankrupt or being wound up, has his/her affairs administered by a court or a judicial officer, has suspended his/her business activities or is subject to legal proceedings in respect of any of the foregoing;
- e) complies with the legal requirements, if any, stated in the **Tender Data**; and
- f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

C.3.14 Prepare contract documents

C.3.14.1 If necessary, revise documents that shall form part of the contract and that were issued by the employer as part of the tender documents to take account of:

- a) addenda issued during the tender period,
- b) inclusion of some of the returnable documents and
- c) other revisions agreed between the employer and the successful tenderer.

C.3.14.2 Complete the schedule of deviations attached to the form of offer and acceptance, if any.

C.3.15 Complete adjudicator's contract

Unless alternative arrangements have been agreed or otherwise provided for in the contract, arrange for both parties to complete formalities for appointing the selected adjudicator at the same time as the main contract is signed.

C.3.16 Registration of the award

An employer must, within twenty-one (21) working days from the date on which a contractor's offer to perform a construction works contract is accepted in writing by the employer, register and publish the award on the cidb Register of Projects.

C.3.17 Provide copies of the contracts

Provide to the successful tenderer the number of copies stated in the **Tender Data** of the signed copy of the contract as soon as possible after completion and signing of the form of offer and acceptance.

C.3.18 Provide written reasons for actions taken

Provide upon request written reasons to tenderers for any action that is taken in applying these conditions of tender but withhold information which is not in the public interest to be divulged, which is considered to prejudice the legitimate commercial interests of tenderers or might prejudice fair competition between tenderers.

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.

C.1: GENERAL**C.1.1 The employer:**

The Employer for this Contract is the **eThekweni Municipality** as represented by:
Deputy Director: **OPERATIONS MANAGEMENT**

C.1.2 Tender documents:

The Tender Documents issued by the Employer comprise:

- 1) This procurement document.
- 2) The **Conditions of Contract** identified in Section C1.2.1.1. Tenderers/ Contractors are required to obtain their own copies.
- 3) The **Specifications** identified in Section C3.3.1. Tenderers/ Contractors are required to obtain their own copies.
- 4) **Drawings**, if applicable, issued separately from this document, or included in Section C3.5.
- 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 Supply Chain Management Policy (as at advertising date).
 - 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 Website** at URL:

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

C.1.4 Communication and employer's agent:

The Employer's Agent is:
Name: **Nontobeko Mwelase**
eMail: **nontobeko.mwelase@durban.gov.za**

The Employer's Agent's Representative is:
Name: **G Dichabe** : eMail:
gran.dichabe@durban.gov.za

The Tenderer's contact details, as indicated on **Returnable Document T2.2.1: Compulsory Enterprise Questionnaire**, shall be deemed as the only valid contact details for the Tenderer for use in communications between the Employer's Agent and the Tenderer during tender evaluation.

The Employer's Agent and Employer's Agent's Representative for each Task Order will be specified in the Task Order documentation.

C.2: TENDERER'S OBLIGATIONS

C.2.1 Eligibility:

Entities may only submit one (1) tender offer, either as a single tendering entity or as a partner of a joint venture. Should a tendering entity submit more than one (1) tender, all submissions by that tendering entity, including submissions where the entity is a partner of a joint venture, will be deemed not to be eligible.

C.2.1.1 Eligibility: General

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

- (a) In the event of a Compulsory Clarification Meeting:
 - i) the Tenderer fails to attend the Compulsory Clarification Meeting, or
 - ii) the Tenderer fails to have **Returnable Document T2.2.2: Certificate of Attendance at Clarification Meeting / Site Inspection** signed by the Employer's Agent or their representative.
 - (b) At the time of tender closing, the Tenderer is not registered on the **National Treasury Central Supplier Database (CSD)** and the **eThekweni Municipality Supplier Portal**. In the case of a Joint Venture, this requirement will apply individually to each party in the Joint Venture. Tenderers are to reference **Returnable Document T2.2.1: Compulsory Enterprise Questionnaire** (section 1.5) and **Returnable Document T2.2.12: "CSD Registration Report"**.
 - (c) In the case of a Joint Venture (JV) submission:
 - i) Two or more JV entities have common directors/ shareholders or common entities tendering for the same works.
 - ii) A **JV Agreement**, using either the Standard CIDB JV Agreement or another approved JV Agreement format, and a **Consolidated B-BBEE Level of Contributor Certificate** has not been attached to **Returnable Document T2.2.13: Joint Venture Agreement and Consolidated B-BBEE Certificate**.
 - iii) The Lead Partner of the Joint Venture does not sign the Form of Offer in Section C1.1.1.
 - (d) The following documentation is to be completed in full, signed, and returned with the tender submission:
 - T2.2.1: Compulsory Enterprise Questionnaire.
 - T2.2.5: MBD 4: Declaration of Interest.
 - T2.2.6: MBD 5: Declaration for Procurement Above R10 Million.
 - T2.2.8: MBD 8: Declaration of Bidder's Past SCM Practices.
 - T2.2.9: MBD 9: Certificate of Independent Bid Determination.
 - T2.2.10: Declaration of Municipal Fees

Failure to comply will result in the tender offer being deemed non-responsive.
 - (e) The certificates listed in the **Tender Data: C.2.23: Certificates** are to be included with the tender submission. These include:
 - T2.2.1: SARS Tax Compliance Status - PIN Issued
(submitted with the Compulsory Enterprise Questionnaire).
 - T2.2.12: Central Supplier Database (CSD) Report.
 - T2.2.13: CIDB Registration and Status.

Failure to comply will result in the tender offer being deemed non-responsive.
 - (f) The tenderer must submit a letter of intent, from an approved insurer, undertaking to provide a performance bond to the amount specified. Reference is to be made to Clause C.2.20: "Submit securities, bonds and policies" of this Tender Data.
- Failure to comply will result in the tender offer being deemed non-responsive.**

C.2.1.2 Eligibility: CIDB

Tenderers are to reference the provisions of **Tender Data: C.2.23: Certificates and Returnable Document: T2.2.13: Verification of CIDB Registration and Status** with respect to CIDB registration.

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 **7CE or higher** 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 **7CE or higher** 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 **7CE or higher** class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.

C.2.1.3 Eligibility: Tenderer’s Experience

Tenderers are to complete and sign **Returnable Form T2.2.15: Eligibility: Experience of Tenderer**.

Only those Tenderers that can demonstrate experience and submit the associated documentation/information, in works of a similar nature, within the past 10 years, will be eligible to have their tenders evaluated in terms of Clause C.3.11.

- **Table 1:** The **Experience Requirement** is specified on this table.
- **Table 2:** The experience is to be **Similar in Nature** to that specified on this table. Tenderers are to note the exclusions (if any) stated on this table.
- **Table 3:** The **Documentation/ Information** that is required to be included in this submission is specified on this table (which includes the Notes below the table).
- Tenderers may submit experience gained as **Sub-Contractors or Main Contractors**.
- **Guidance** on the completion of the **Experience Submission Form** is provided on the first page of **Returnable Form T2.2.15**.

Tenderers are to indicate the documentation that has been included in the tender submission, in support of each experience submission, in the shaded column on Page **51**.

Should there be insufficient evidence for verification of the information submitted for any specific experience submission, that experience submission will be deemed invalid.

Table 1: Experience Requirement
Experience Submissions for <u>5 contracts</u> , with <u>works of a similar nature</u> , with a <u>minimum value</u> of R3 million (3 million Rand), within the <u>past 10 years</u> , must be included for this tender on Returnable Document T2.2.15: “Experience of Tenderer”. At least <u>2</u> of the submissions must have been executed as the <u>Main Contractor</u> . This will also apply to the Lead Partner for a JV submission.

Table 2: Works of a Similar Nature	
Provision of Roads and Ancillary Works	
- Projects of a similar nature that will be considered will be one, or a combination of, the following types of projects: - new road construction - road widening/upgrades - provision of interim roadway related services to informal settlements - Reinforced concrete construction. - intersection improvements - gravel to surfaced road upgrades - access road upgrades - major parking areas - major water reticulation projects	
Each project must consist of <u>at least five</u> of the following elements:	
- bulk earthworks - roadway layer-works - asphalt roadway surfacing - concrete surfacing to roads - kerbing / channelling - sidewalk / walkway construction - traffic calming measures - installation/ repair of stormwater drainage (including manholes and appurtenant works)	- retaining structures (reinforced concrete, masonry, gabion, proprietary block systems etc). - reinforced concrete pedestrian bridges. - dealing with underground services (watermains, sewers, electricity, communication infrastructure) - Installation/ repair of sewer reticulation (including manholes and appurtenant works)

- Projects that <u>will not</u> qualify as experience submissions are: - road rehabilitation projects - road maintenance projects - the construction of gravel roads

Table 3: Documentation / Information Requirements				
Note: an "X" in this table indicates that the associated documentation should be provided, if applicable.	Works as Sub-Contractor		Works as Main Contractor	
	Current Contracts	Completed Contracts	Current Contracts	Completed Contracts
Proof of Sub-Contract Agreement See Note 1.	X	X	-	-
Letter of Award OR Form of Offer & Acceptance See Note 2.	-	-	X	X
Most recent Payment Certificate (with Quantities summary), OR Invoice (with Quantities summary). See Note 3.	X	-	X	-
Final Payment Certificate (with Quantities summary), OR Invoice (with Quantities summary). See Note 4.	-	X	-	X
Completion Certificate. See Note 5.	-	-	-	X
Scope of Work See Note 6.	To be indicated on individual experience submission form			

NOTES (for Table 3)

- To include the names of the parties, the managing entity's name, the effective dates, and the signature(s) page, all pertaining to the agreement.
- Issued by the Client / Employer.

3. Proof of the most recent payment received from the Main Contractor or Client/ Employer, OR the most recent submitted INVOICE. Whichever of these documents is submitted, a summary breakdown of quantities is to accompany that document.
4. Proof of the final payment received from the Main Contractor or Client/ Employer, OR the most recent submitted INVOICE. Whichever of these documents is submitted, a summary breakdown of quantities is to accompany that document.
5. Issued by the Client/ Employer.
6. If executed as a Sub-Contractor, the Scope-of-Work should be indicative of only the works carried out by the Sub-Contractor, and not the overall Scope-of-Work of the main contract.
If executed as a Main Contractor, the overall contract Scope-of-Work is to be indicated.

C.2.2.2 The cost of the tender documents:

Replace this paragraph with the following:

“Documents are to be downloaded, free of charge, from the **National Treasury’s eTenders website** or the **eThekwini Municipality’s Website**.”

C.2.6 Acknowledge addenda:

Add the following paragraphs:

“Addenda will be published on the **eThekwini Municipality website** as stated in **Tender Data: C.1.2**. Tenderers are to ensure that this 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 WILL result in the tender submission being made non-responsive.”

C.2.7 Clarification meeting:

Non-Compulsory Meeting will be held at 30 Archie Gumede Place, Boardroom 213, 2nd floor ETA Building.

Date & Time: 23 October 2025: 10:30am

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.

C.2.12 Alternative tender offers:

No alternative tender offers will be considered.

C.2.13 Submitting a tender offer:

The downloaded Tender document is to be printed in its entirety. Printing should be done on white A4 paper, with printing on only one side of the paper.

The **Tender Offer (“hard copy”)** is to comprise of the following portions of the Tender document:

- 1) Cover Page
- 2) Part T1.1.1 : Tender Notice and Invitation to Tender (page 2)
- 3) Part T1.2.2 / 3 : Tender Data (pages 16 to 29)
- 4) Part T2 : Returnable Documents (pages 30 to 62)
- 5) Part C1.1 : Signed Form of Offer (pages 63 to 64)
- 6) Part C1.2 / 3 : Contract Data (pages 67 to 77)
- 7) Part C2.1 : Pricing Assumptions/ Instructions (pages 78 to 79)
- 8) Priced Bill of Quantities: produced from the EXCEL file

Incomplete Tender Offers will be deemed non-responsive.

The **Tender Offer (“hard copy”)** is to be sealed in an envelope, addressed to the City Manager, marked with the **identification details** and be delivered to the **delivery address**, both as stated below.

The **Tender Offer (hard copy)** is to be delivered to the following **delivery address**:
the Tender Box in the foyer of the Municipal Building, 166 KE Masinga Road, Durban

Identification details to be shown on the hard copy package are:

Contract No. **1A-33571**

Contract Title **As and When, Rates Based Contract for Disaster Response in the West 2 Region of the eThekweni Municipality, for 36 Months**

Tender Offers are also to be **SUBMITTED ELECTRONICALLY** (uploaded) on the eThekweni Municipality **JDE System** (Supplier Self Service (SSS Module)). For information pertaining to the JDE System, Tenderers are referred to **Section T1.1.2**.

Notwithstanding the **electronic submission**, a tender offer will only be deemed valid if the “hard copy” submission has been made. **The “hard copy” submission will be the governing submission.**

After completion and signature (using **black ink**), the **Tender Offer (“hard copy”)** is to be scanned to a single PDF document (**P**ortable **D**ocument **F**ormat), at a resolution of 300 DPI (dots per inch).

The scanned (PDF) **Tender Offer (“hard copy”)** is to be uploaded via the (Tender specific) upload option on the JDE System (SSS Module).

The **priced EXCEL file of the Bill of Quantities** is to be uploaded with the above mentioned PDF document, to facilitate ease of the rate comparison in the evaluation process. The Excel version will assist with the comparisons of BoQ line item RATES. Tenderers must refer to the submission notes in the excel-workbook as it carries pricing instructions for this tender.

Tender Offer delivery, and the electronic submission on the JDE System, are both to be completed on or before the closing date/ time stated in the **Tender Data: C.2.15**.

The submission of Tender Offers via any means other than that stated above will not be accepted, and those that are will be deemed invalid.

Tenderers are responsible for resolving all access rights and submission queries on the JDE System before the tender closing date/ time (**Tender Data: C.2.15**).

Tenderers are to retain a copy of the complete documentation for their own records.

C.2.15 Closing date and time:

The closing time is:

- **Date : Friday, 21 November 2025**
- **Time : 11h00**

The **delivery of the hard copy package AND** the completion of the requirements on the **JDE System (SSS Module)** are to be completed prior to the Tender **closing date and time** as stated above. Any Tender Offer submitted thereafter will not be considered.

C.2.16 Tender offer validity:

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

In terms of the SCM Policy (Cl.21.2) tenders must remain valid for acceptance for a period of twelve (12) months after the expiry of the original validity period, unless the Municipality is notified in writing of anything to the contrary by the tenderer.

C.2.20 Performance Guarantee requirement

Refer to the SCM Policy Clause 20.3.

The tenderer must submit a letter of intent, from an approved insurer, undertaking to provide a **Performance Guarantee** to a minimum amount of R5,000,000 (five million Rand), should it be requested to do so by the Tenderer/ Contractor during the Contract Period.

This undertaking is to be attached to Page 47 of the Returnable Documents: **T2.2.12: “Letter of Intent to Provide Performance Guarantee”**.

C.2.23 Certificates:

Refer to **C.2.1.1: “Eligibility: General”** for compliance requirements in term of Certificates.

Refer to **T2.1: “List of Returnable Documents”** 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 a printout of the required documents/ certificates at the back of their tender submission.

SARS Tax Compliance Status – PIN Issued

Reference is to be made to **Returnable Document T2.2.1: Compulsory Enterprise Questionnaire** which requires the “SARS Tax Compliance Status – PIN Issued” to be included with this returnable document.

Central Supplier Database (CSD)

Reference is to be made to **Returnable Document T2.2.12: CSD Registration Report**.

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

The date of the report, as indicated at the top right of each page, should be on or after the date of advertising of this tender.

Separate **CSD Registration Reports** are required for each party to a Joint Venture.

CIDB Registration

Reference is to be made to **Returnable Document T2.2.13: Verification of CIDB Registration and Status**.

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

The date of obtaining the CIDB printout(s) is to be indicated on the printout, and the Tenderer's registration with the CIDB must be reflected as “Active” as at the date of tender closing.

Separate **CIDB Registration printouts** are required for each party to a Joint Venture.

The **Joint Venture Grading Designation Calculator** printout should be included when making a submission as a Joint Venture:

(<https://registers.cidb.org.za/PublicContractors/JVGradingDesignationCalc>)

B-BBEE Status Level of Contribution Certificate

Tenderers are referred to **Returnable Document T2.2.6: MBD 6.1: “Preference Points Claim”** for the B-BBEE Certificate requirements. Notwithstanding the completion of Returnable Document T2.2.6, should no B-BBEE Status Level of Contribution Certificate be returned no points for Preferential Procurement will be deemed to have been claimed.

The Amended Construction Sector Code (Government Gazette No.41287) is applicable to the B-BBEE compliance measurement of all entities that fall within the Construction Sector. The requirements for measurement and verification of entities are contained in the “Amended Code Series CSC000: Framework for Measuring Broad Based Black Economic Empowerment in the Construction Sector”, as published in Notice 931 of 2017, Government Gazette No.41287 of 01/12/2017.

An EME Contractor with a Total Annual Revenue of less than R3 million may present an affidavit OR a certificate issued by the CIPC OR an authorised B-BBEE verification certificate by a SANAS accredited Verification Agency.

Any B-BBEE Certificate where the entity has been assessed using **Generic Codes** will not be accepted.

C.3: THE EMPLOYER'S UNDERTAKINGS

C.3.1.1 Respond to requests from the tenderer:

Replace the words “five working days” with “three working days”.

C.3.2 Issue addenda:

Add the following paragraph:

“Addenda will be published on the **eThekwini Municipality Website** (refer to **Tender Data: C.1.2**).”

C.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 P&SCM Boardroom, 6th Floor, (Municipal Building), 166 KE Masinga Road, Durban.

The tender opening schedule will also be made available on the eThekwini Municipal website at URL: <https://www.durban.gov.za/pages/business/publication-of-received-bids>

C.3.9 Arithmetical errors, omissions and discrepancies:

Add the following Clause:

“C.3.9.5 Reject a tender offer if the Tenderer does not accept the correction of the arithmetical error in the manner described in C.3.9.4.”

C.3.11 Evaluation of Tender Offers:

Eligibility

Tenders will be checked for compliance with the ELIGIBILITY requirements, as specified in the **Tender Data: C.2.1**. Tenders not in compliance will be deemed non-responsive.

Functionality

FUNCTIONALITY will not be used in the evaluation of tenders.

Preference Point System

The procedure for the evaluation of responsive tenders is **PRICE AND PREFERENCE**, in accordance with the Employer's **SCM Policy: Section 52: Preferential Procurement**.

The **90/10** preference points system, for requirements with a Rand value above R50,000,000 (all applicable taxes included), will be applied. The Formula used to calculate the **Price Points (max. 90)** will be according to that specified below.

Price Points

The financial offer will be reduced to a comparative basis using a **Tender Assessment Schedule**.

A maximum of 90 points is allocated for price on the following basis:

90/10 Procurement System

$$P_s = 90 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$$

Where: P_s = Points scored for comparative price of bid under consideration
 P_t = Comparative price of bid under consideration
 $P_{\min}$ = Comparative price of lowest acceptable bid

Preference Points

Reference is to be made to **Returnable Form: MBD 6.1: Preference Points Claim**.

The Basket of Preference Goals (SCM Policy Section 52.7)

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

- **Ownership Goal**

Goal Weighting: 60%

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

Ownership Categories	Criteria	90/10
Race: Black	Equals 0%	0
	Between 0% and 51%	0.96
	Greater or equal to 51% and less than 100%	1.92
	Equals 100%	2.4
Gender: Female	Equals 0%	0
	Between 0% and 51%	0.72
	Greater or equal to 51% and less than 100%	1.44
	Equals 100%	1.8
Disabilities	Equals 0%	0
	Between 0% and 51%	0.72
	Greater or equal to 51% and less than 100%	1.44
	Equals 100%	1.8

Maximum Ownership Goal Points: 6 Max

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

- Companies and Intellectual Property Commission registration document (CIPC)
- CSD report.
- B-BBEE Certificate of the tendering entity.
- Consolidated BBBEE Certificate if the tendering entity is a Consortium, Joint Venture, or Trust (Issued by verification agency accredited by the South African Accreditation System).
- Agreement for a Consortium, Joint Venture, or Trust.

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

Goal Weighting: 30%

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	90/10
Not in South Africa	0
South Africa	0.75
Kwa Zulu Natal	1.5
eThekweni Municipality	3.0
Maximum Goal Points:	3.0 Max

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

- CSD report

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

Goal Weighting: 10%

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. The **regions** and **zones** (or wards) within the eThekweni Municipality are as specified on the Part C4: "Site Information" of this procurement document.

Municipal Area	90/10
Not within eThekweni Municipality	0
Within eThekweni Municipality	0.25
Within the specified region / Adjoining Wards	0.5
Within the specified zone / Project Ward(s)	1.0
Maximum Goal Points:	1.0 Max

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

C.3.13 Acceptance of tender offer:

In addition to the requirements of **Tender Data: C.3.13** of the **Standard Conditions of Tender**, tender offers will only be accepted if:

- The Tenderer's municipal rates and taxes are not in arrears, or they have made arrangements to meet outstanding municipal fee obligations.

- (b) The Tenderer's tax compliance status has been verified, or they have made arrangements to meet outstanding tax obligations.
- (c) If applicable, the Tenderer is **registered**, and "**Active**", with the **Construction Industry Development Board** in an appropriate contractor grading designation.
- (d) The Tenderer or any of its directors/ shareholders are **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.
- (e) The Tenderer has not:
 - i) Abused the Employer's Supply Chain Management System; or
 - ii) Failed to perform on any previous contract and has been given a written notice to this effect.
- (f) 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 the **Standard Conditions of Tender: C.1.1.3** of, the municipality reserves the right to award or not award the tender based on the municipalities available budget.

There are 5 Contracts that are similar in nature, covering the 5 different Regions. The Contracts are: 1A-33566, 1A-33568, 1A-33569, 1A-33570, 1A-33571.

These contracts will be assessed together with regard to the awarding of contracts.

It is the intention of the Employer to award the 5 Regional Contracts to 5 different Tenderers. Tenderers will be ranked in each Contract according to their Preferential Procurement Points System (PPPS) (90/10) score.

Should a Tenderer be the most responsive in more than one of the above Contracts, they will be awarded a Contract in the Region most advantageous to the Employer. The Employer's decision in this regard will be final.

C.3.15 Complete adjudicator's contract:

Refer to the **Conditions of Contract** and the **Contract Data**.

C.3.17 Copies of contract:

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

T1.2.3 ADDITIONAL CONDITIONS OF TENDER**T1.2.3.1 Appeals**

In terms of Section 49 of the EtheKwini SCM Policy any person aggrieved by the decisions taken in the implementation of the SCM System may lodge within 14 days of notification, a written objection against the decision of the following:

The City Manager
Attention: Ms S Pillay (E-Mail: Simone.Pillay@durban.gov.za)
P O Box 1394
DURBAN
4000

Please be advised that any objection to this decision will only be processed upon receipt of a non-refundable administration fee of R1,814.00 including VAT as stipulated in the municipality's SCM Policy approved on 29/08/2024 as well as the municipal budget for the financial year 2025/26. An objection will only be considered upon receipt of proof of payment of this fee. This amount must be paid into the following bank account as a real-time payment:

EThekwini Metropolitan Municipality
Nedbank – 1107821118
Reference Number: Please insert contract number

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:

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

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 and signed as required.

The Tenderer is required to complete and sign 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	31
T2.2.2	MBD 4: Declaration of Interest	32
T2.2.3	MBD 5: Declaration for Procurement Above R10 Million	34
T2.2.4	Contracts Awarded by Organs of State in the past 5 years	35
T2.2.5	MBD 6.1: Preference Points Claim Form (SCM Policy Section 52.7).....	36
T2.2.6	MBD 8: Declaration of Bidder's Past SCM Practices	38
T2.2.7	MBD 9: Certificate of Independent Bid Determination	40
T2.2.8	Declaration of Municipal Fees	42
T2.2.9	Contractor's Health and Safety Declaration	43
T2.2.10	CSD Registration Report.....	45
T2.2.11	CIDB Registration and Status	46
T2.2.12	Letter of Intent to Provide Performance Guarantee	47
T2.2.13	Joint Venture Agreement and Consolidated B-BBEE Certificate (if applicable) ..	48
T2.2.14	Record of Addenda to Tender Documents.....	49
T2.2.15	Experience of Tenderer.....	50

Contract Part: The Tenderer is required to complete following forms:

C1.1.1	Form of Offer	63
C1.2.2.2	Data to be Provided by Contractor	67
C2.2	Bill of Quantities	78

T2.2.1 COMPULSORY ENTERPRISE QUESTIONNAIRE

Ref	Description	Tenderer to Complete	
1.1	Name of enterprise		
1.2	Name of enterprise's representative		
1.3	Email address of representative		
1.4	Contact numbers of representative	Tel:	Cell:
1.5	National Treasury Central Supplier Database Registration number	MAAA	
1.6	VAT registration number, if any:		
1.7	CIDB registration number, if any:		
1.8	Department of Labour: Registration number		
1.9	Department of Labour: Letter of Good Standing Certificate number		

2.0 Particulars of sole proprietors and partners in partnerships (attach separate pages if more than 4 partners)			
	Full Name	Identity No.	Personal income tax No. *
2.1			
2.2			
2.3			

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	MBD 4, MBD 6, MBD 8, and MBD9 issued by National Treasury <u>must be completed for each tender and be included as a tender requirement.</u>
-----	--

Tenderers are to include, at the back of their tender submission, a printout of their SARS "Tax Compliance Status – PIN Issued" certificate.

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

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.2 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

Name of enterprise’s representative

3.2 ID Number of enterprise’s representative

3.3 Position enterprise’s representative occupies in the enterprise

3.4 Company Registration number

3.5 Tax Reference number

3.6 VAT registration number

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

3.8 Are you presently in the service of the state?

Circle Applicable

YES

NO

If yes, furnish particulars:

.....

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

YES

NO

If yes, furnish particulars:

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

YES

NO

If yes, furnish particulars:

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

YES

NO

If yes, furnish particulars:

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

YES

NO

If yes, furnish particulars:

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

YES

NO

If yes, furnish particulars:

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

YES

NO

If yes, furnish particulars:

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

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

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

NAME (Block Capitals):

Date

SIGNATURE:

**T2.2.3 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?	YES	NO
2.1	If NO, this serves to certify that the bidder has no undisputed commitments for municipal services towards any municipality for more than three months or other service provider in respect of which payment is overdue for more than 30 days.		
2.2	If YES, provide particulars. 		
3.0	Has any contract been awarded to you by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract?	YES	NO
3.1	If YES, provide particulars. SEE Returnable Document T2.2.5		
4.0	Will any portion of goods or services be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality / municipal entity is expected to be transferred out of the Republic?	YES	NO
4.1	If YES, provide particulars. 		

If required by 1.1 above, Tenderers are to include, at the back of their tender submission, 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:

T2.2.4 CONTRACTS AWARDED BY ORGANS OF STATE IN THE PAST 5 YEARS

In terms of SCM Policy Section 20(1)(d)(iii), Tenderers are to provide details of Works undertaken for the Government or Public Sector entities/ Organs of State in the past 5 Years, including particulars of any material non-compliance or dispute concerning the execution of such contract.

Material non-compliance or dispute (Yes or No)													
Date Completed													
Value of Work													
Consulting Engineer/Engineers representative													
Employer													
Contract Number													

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.

NAME (Block Capitals):

Date

SIGNATURE:

T2.2.5 MBD 6.1: PREFERENCE POINTS CLAIM)

(SCMP 52.7: Basket of Preference Goals)

This form serves as a claim form for preference points for **Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution**. **Reference is to be made to the Tender Data: C.3.11.**

1.0 GENERAL CONDITIONS

- 1.1 The relevant **Preference Points System (90/10)** applicable to this bid is stated in the **Tender Data: C.3.11.**
- 1.2 Failure on the part of a bidder to fill in and/ or sign this form, and submit a B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System (SANAS), or a Registered Auditor approved by the Independent Regulatory Board of Auditors (IRBA), or sworn affidavits in the case of Exempted Micro Enterprises or Qualifying Small Enterprises, together with the bid, will be interpreted to mean that preference points for **B-BBEE Status Level Of Contribution** are not claimed.
- 1.3 The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

2.0 ADJUDICATION USING A POINT SYSTEM

- 2.1 The bidder obtaining the highest number of total points will be recommended for the award of the contract.
- 2.2 Preference points shall be calculated after prices have been brought to a comparative basis taking into account all factors of non-firm prices and all unconditional discounts.
- 2.3 Points scored will be rounded off to the nearest 2 decimal places.
- 2.4 In the event that two or more bids have scored equal total points, the successful bid must be the one scoring the highest number of preference points for B-BBEE.
- 2.5 However, when functionality is part of the evaluation process and two or more bids have scored equal points including equal preference points for B-BBEE, the successful bid must be the one scoring the highest score for functionality.
- 2.6 Should two or more bids be equal in all respects the award shall be decided by the drawing of lots.

3.0 POINTS AWARDED FOR PRICE

A maximum of 90 points is allocated for price on the following basis:

90/10 Procurement System

$$P_s = 90 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$$

Where: P_s = Points scored for comparative price of bid under consideration
 P_t = Comparative price of bid under consideration
 $P_{\min}$ = Comparative price of lowest acceptable bid

4.0 POINTS ALLOCATED FOR THE BASKET OF PREFERENCE GOALS

4.1 Preference points may be claimed for the **Specific Goals** stated in the **Tender Data: C.3.11**.

For the purposes of this tender, the Tenderer may claim points based on the goal(s) stated in the table below, as supported by proof/ documentation specified in the Tender Data.

90/10 Preference Points System The Specific Goals to be allocated points in terms of this tender and the	Maximum Number of points ALLOCATED	Tenderer's Number of points CLAIMED
Ownership Goal: Race (black)	2.4	
Ownership Goal: Gender (female)	1.8	
Ownership Goal: Disabilities	1.8	
RDP Goal: The promotion of South African owned enterprises.	3.0	
RDP Goal: The promotion of enterprises located in a specific municipal area.	1.0	
Total CLAIMED Points (maximum 10)	10.0	

5.0 REMEDIES FOR THE SUBMISSION OF FALSE INFORMATION

5.1 The remedies for the submission of false information regarding claims for specific goals are stated in the **SCM Policy: Section 52.9**.

Tenderers are to include, at the back of their tender submission, the required proof/ documentation in support of their Preference Goal claims.

*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:

T2.2.6 MBD 8: DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

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

- 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:

T2.2.7 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:
- take all reasonable steps to prevent such abuse;
 - reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and
 - cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.
- 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 below **Certificate of Independent Bid Determination** must be completed and submitted with the bid.

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid for: Contract **1A-33571**

As and When, Rates Based Contract for Disaster Response in the West 2 Region of the eThekweni Municipality, for 36 Months

in response to the invitation for the bid made by: **ETHEKWINI MUNICIPALITY**

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

I certify, on behalf of:

that:

(continued on next page)

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:

T2.2.9 DECLARATION OF MUNICIPAL FEES

Reference is to be made to the **Tender Data: C.2.23 and C.3.13(a)**.

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												

- If applicable, a copy of a recent (within the past 3 months) Metro Bill is to be provided.

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.
- Where a Tenderer's place of business or business interests are carried out from premises as part of any other 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, copies of the above-mentioned account's, agreements signed with the municipality, lease agreements, or official letters.

*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: _____

T2.2.9 CONTRACTOR'S HEALTH AND SAFETY DECLARATION

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

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

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

Declaration by Tenderer

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

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

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

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

Circle Applicable	
Yes	No
Yes	No
Yes	No

- 4 Details of resources I propose:

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

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

NAMES OF COMPETENT PERSONS	POSITIONS TO BE FILLED BY COMPETENT PERSONS

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

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

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

- Name of proposed subcontractor:
Qualifications or details of competency of the subcontractor:

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

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

NAME (Block Capitals):

Date

SIGNATURE:

.....

.....

T2.2.10 CSD REGISTRATION REPORT

Reference is to be made to **Tender Data: C.2.1.1(b) and C.2.23.**

The **Tender Data: C.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.

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

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

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

Note: the printout will contain more than one page.

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, a printout of their 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: _____

T2.2.11 CIDB REGISTRATION AND STATUS

Reference is to be made to the **Tender Data: C.2.1.2, C.2.23, and C.3.13(c).**

The **Tender Data: C.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 the **Tender Data: C.2.1.2.**

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

CIDB Registrations can be obtained from the CIDB website at:

<https://portal.cidb.org.za/RegisterOfContractors/>

The following is an example of the printout obtained from the above website using the provided “Print” button. Note: the printout may contain more than one page.

Tenderers are to include, at the back of their tender submission, a printout of their CIDB Registration and Status.

*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:

T2.2.12 LETTER OF INTENT TO PROVIDE PERFORMANCE GUARANTEE

Reference is to be made to **Tender Data: C.2.20**.

Attach the Letter-of-Intent to this page.

T2.2.13 JOINT VENTURE AGREEMENT and CONSOLIDATED B-BBEE CERTIFICATE

If this tender submission is to be made by a Joint Venture, the Joint Venture Agreements and Power of Attorney Agreements are to be attached to this page.

The JV's consolidated B-BBEE Level of Contributor Certificate, and combined CIDB Grading, is also to be attached to this page.

T2.2.14 RECORD OF ADDENDA TO TENDER DOCUMENTS

Reference is to be made to the **Tender Data: C.2.6.**

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: _____

T2.2.15 ELIGIBILITY: EXPERIENCE OF TENDERER

Reference is to be made to the **Tender Data: C.2.1.3**.

Only those Tenderers that can demonstrate experience and submit the associated documentation/ information, in works of a similar nature, within the past 10 years, will be eligible to have their tenders evaluated in terms of **Tender Data: C.3.11**.

- The **Eligibility Criteria Requirement** is as stated on **Table 1: “Experience Requirement”**.
- The experience is to be “**Similar in Nature**” to that specified on **Table 2: “Works of a Similar Nature”**. Tenderers are to note the exclusions (if any) stated on this table.
- The **Documentation/ Information** that is required is specified on **Table 3: “Documentation/ Information Requirements”** (which includes the Notes below the table).
- Tenderers may submit experience gained as **Sub-Contractors or Main Contractors**.

It is the responsibility of the Tenderer to ensure that the experience submissions comply with the requirements as stated in the Tender Data: C.2.1.3.

Guidance to Tenderers: Experience Submission Form**Client / Employer Details**

- Provide details for whom the works were carried out (works owner).
- Provide **Contact details of the Client or Main Contractor** (if experience was gained as a sub-contractor) is required to be provided.

The contact details may be used by the Employer to verify the information, pertaining to the experience submission. Should the Employer’s reasonable attempts to make contact with the Client or Main Contractor fail (for whatever reason), that specific experience submission may be considered invalid.

Contract Details

- Provide the **Contract Reference Number** and **Contract Title**.
- Indicate if this contract has been completed or is still in progress.
- Provide **Contract Dates**.
- Provide **Contract Values** - Where works are still in progress, provide the value of works that have been completed as detailed on the most recent payment to the Contractor / Sub-Contractor. If the works are complete, provide the Final Value of the sub-contract or Final Contract Price.

Scope of Works

- Indicate the **Works Type(s)** that best describe the works included in the project.
Select the most applicable option (only 1).
- Indicate the **Works Elements(s)** that were included in the project.
Select any elements that were included in the contract.

Joint Ventures

In the event of a Joint Venture (JV) tendering for this contract, experience gained by the separate entities making up the JV may be used as experience, provided that the experience complies with the requirements, as stipulated in **Table 1**, and that the required documentation/ information is provided.

(continued on the next page)

Confirmation of submission of Information/ Documentation

The Tenderer is to indicate (by marking with an "X" in the shaded column) the documentation that has been included in this tender submission, in support of each experience submission.

		If submitted, mark with an "X"
SUBMISSION #1	Experience Submission Form (completed and signed)	
	Proof of Sub-Contract Agreement (if experience was gained as a sub-contractor)	
	Letter of Award OR Form of Offer & Acceptance	
	Most recent Payment Certificate (with Quantities summary), OR most recent INVOICE (with Quantities summary)	
	Final Payment Certificate (with Quantities summary), OR most recent INVOICE (with Quantities summary)	
	Completion Certificate	
SUBMISSION #2	Experience Submission Form (completed and signed)	
	Proof of Sub-Contract Agreement (if experience was gained as a sub-contractor)	
	Letter of Award OR Form of Offer & Acceptance	
	Most recent Payment Certificate (with Quantities summary), OR most recent INVOICE (with Quantities summary)	
	Final Payment Certificate (with Quantities summary), OR most recent INVOICE (with Quantities summary)	
	Completion Certificate	
SUBMISSION #3	Experience Submission Form (completed and signed)	
	Proof of Sub-Contract Agreement (if experience was gained as a sub-contractor)	
	Letter of Award OR Form of Offer & Acceptance	
	Most recent Payment Certificate (with Quantities summary), OR most recent INVOICE (with Quantities summary)	
	Final Payment Certificate (with Quantities summary), OR most recent INVOICE (with Quantities summary)	
	Completion Certificate	
SUBMISSION #4	Experience Submission Form (completed and signed)	
	Proof of Sub-Contract Agreement (if experience was gained as a sub-contractor)	
	Letter of Award OR Form of Offer & Acceptance	
	Most recent Payment Certificate (with Quantities summary), OR most recent INVOICE (with Quantities summary)	
	Final Payment Certificate (with Quantities summary), OR most recent INVOICE (with Quantities summary)	
	Completion Certificate	

(continued on next page)

SUBMISSION #5		If submitted, mark with an "X"
	Experience Submission Form (completed and signed)	
	Proof of Sub-Contract Agreement (if experience was gained as a sub-contractor)	
	Letter of Award OR Form of Offer & Acceptance	
	Most recent Payment Certificate (with Quantities summary), OR most recent INVOICE (with Quantities summary)	
	Final Payment Certificate (with Quantities summary), OR most recent INVOICE (with Quantities summary)	
	Completion Certificate	

Note: Should there be insufficient evidence for verification of the information submitted for any specific experience submission, that experience submission WILL be deemed invalid.

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:

EXPERIENCE SUBMISSION #1Reference is to be made to the **Tender Data: C.2.1.3.**

(Where required, in the shaded areas, clearly mark selection with an "X" or circle applicable)

Experience as a:	Sub-Contractor:		Main Contractor:	
-------------------------	------------------------	--	-------------------------	--

Client/ Employer OR (if experience as a sub-contractor) Main Contractor's Details Should the Employer's reasonable attempts to make contact, to verify the information provided, fail (for whatever reason) this experience submission WILL be considered invalid.	Entity Name:												
	Contact Name:												
	Contact Tel:				-				-				
	Contact Cell:				-				-				
	Contact email / other:												
Enter the Client/ Employer's details, OR, if the works was done as a sub-contractor, enter the Main Contractor's Details													

Contract Details	Contract (Reference) Number:													
	Contract Title:													
	Has this Contract been completed?	Y	N	Commencement Date:		d	d	m	m	2	0	y	y	
				Completion Date (if applicable):		d	d	m	m	2	0	y	y	
Tendered Value (Contract Sum) OR Sub-Contract Value:		R	Final Contract Price OR Final Value of Sub-Contract:		R									

Contract Scope-of-Work (Type of Project and Works Elements):

Which Works Type(s) best describe the project? (indicate applicable with an "X" in the shaded cells)			
new road construction		gravel to surfaced road upgrades	
road widening/upgrades		access road upgrades	
provision of interim roadway related services to informal settlements		major parking areas	
intersection improvements		major water reticulation projects	
reinforced concrete construction		bridge construction (steel and concrete)	
OTHER: provide a description of the type of project			

(continued on next page)

Which Works Element(s) were included in the project? (it is a requirement that the submission includes a minimum of 5 elements) (indicate applicable with an "X" in the shaded cells)

bulk earthworks		flood/ disaster remediation works	
roadway layer-works		reinforced concrete pedestrian bridges	
asphalt roadway surfacing		reinforced concrete roadway bridges	
concrete surfacing to roads		sidewalk/ walkway construction	
kerbing/ channelling		traffic calming measures	
retaining structures (reinforced concrete, masonry, gabion, proprietary block systems etc)		dealing with underground services (watermains, sewers, electricity, communication infrastructure)	
installation/ repair of stormwater drainage (including manholes and appurtenant works)		Installation/ repair of sewer reticulation (including manholes and appurtenant works)	
OTHER: List works elements included in project			

Projects that will not qualify as relevant experience are:

- road rehabilitation projects
- construction of gravel roads
- road maintenance projects

Confirmation of documentation submitted is to be recorded on Page 51.

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:

EXPERIENCE SUBMISSION #2Reference is to be made to the **Tender Data: C.2.1.3.**

(Where required, in the shaded areas, clearly mark selection with an "X" or circle applicable)

Experience as a:	Sub-Contractor:		Main Contractor:	
-------------------------	------------------------	--	-------------------------	--

Client/ Employer OR (if experience as a sub-contractor) Main Contractor's Details Should the Employer's reasonable attempts to make contact, to verify the information provided, fail (for whatever reason) this experience submission WILL be considered invalid.	Entity Name:												
	Contact Name:												
	Contact Tel:				-				-				
	Contact Cell:				-				-				
	Contact email / other:												
Enter the Client/ Employer's details, OR, if the works was done as a sub-contractor, enter the Main Contractor's Details													

Contract Details	Contract (Reference) Number:													
	Contract Title:													
	Has this Contract been completed?	Y	N	Commencement Date:		d	d	m	m	2	0	y	y	
				Completion Date (if applicable):		d	d	m	m	2	0	y	y	
Tendered Value (Contract Sum) OR Sub-Contract Value:		R	Final Contract Price OR Final Value of Sub-Contract:		R									

Contract Scope-of-Work (Type of Project and Works Elements):

Which Works Type(s) best describe the project? (indicate applicable with an "X" in the shaded cells)			
new road construction		gravel to surfaced road upgrades	
road widening/upgrades		access road upgrades	
provision of interim roadway related services to informal settlements		major parking areas	
intersection improvements		major water reticulation projects	
reinforced concrete construction		bridge construction (steel and concrete)	
OTHER: provide a description of the type of project			

(continued on next page)

Which Works Element(s) were included in the project? (it is a requirement that the submission includes a minimum of 5 elements) (indicate applicable with an "X" in the shaded cells)

bulk earthworks		flood/ disaster remediation works	
roadway layer-works		reinforced concrete pedestrian bridges	
asphalt roadway surfacing		reinforced concrete roadway bridges	
concrete surfacing to roads		sidewalk/ walkway construction	
kerbing/ channelling		traffic calming measures	
retaining structures (reinforced concrete, masonry, gabion, proprietary block systems etc)		dealing with underground services (watermains, sewers, electricity, communication infrastructure)	
installation/ repair of stormwater drainage (including manholes and appurtenant works)		Installation/ repair of sewer reticulation (including manholes and appurtenant works)	
OTHER: List works elements included in project			

Projects that will not qualify as relevant experience are:

- road rehabilitation projects
- construction of gravel roads
- road maintenance projects

Confirmation of documentation submitted is to be recorded on Page 51.

*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: _____

EXPERIENCE SUBMISSION #3Reference is to be made to the **Tender Data: C.2.1.3.**

(Where required, in the shaded areas, clearly mark selection with an "X" or circle applicable)

Experience as a:	Sub-Contractor:		Main Contractor:	
-------------------------	------------------------	--	-------------------------	--

Client/ Employer OR (if experience as a sub-contractor) Main Contractor's Details Should the Employer's reasonable attempts to make contact, to verify the information provided, fail (for whatever reason) this experience submission WILL be considered invalid.	Entity Name:												
	Contact Name:												
	Contact Tel:				-				-				
	Contact Cell:				-				-				
	Contact email / other:												
Enter the Client/ Employer's details, OR, if the works was done as a sub-contractor, enter the Main Contractor's Details													

Contract Details	Contract (Reference) Number:													
	Contract Title:													
	Has this Contract been completed?	Y	N	Commencement Date:		d	d	m	m	2	0	y	y	
Completion Date (if applicable):				d	d	m	m	2	0	y	y			
Tendered Value (Contract Sum) OR Sub-Contract Value:		R	Final Contract Price OR Final Value of Sub-Contract:		R									

Contract Scope-of-Work (Type of Project and Works Elements):

Which Works Type(s) best describe the project? (indicate applicable with an "X" in the shaded cells)			
new road construction		gravel to surfaced road upgrades	
road widening/upgrades		access road upgrades	
provision of interim roadway related services to informal settlements		major parking areas	
intersection improvements		major water reticulation projects	
reinforced concrete construction		bridge construction (steel and concrete)	
OTHER: provide a description of the type of project			

(continued on next page)

Which Works Element(s) were included in the project? (it is a requirement that the submission includes a minimum of 5 elements) (indicate applicable with an "X" in the shaded cells)

bulk earthworks		flood/ disaster remediation works	
roadway layer-works		reinforced concrete pedestrian bridges	
asphalt roadway surfacing		reinforced concrete roadway bridges	
concrete surfacing to roads		sidewalk/ walkway construction	
kerbing/ channelling		traffic calming measures	
retaining structures (reinforced concrete, masonry, gabion, proprietary block systems etc)		dealing with underground services (watermains, sewers, electricity, communication infrastructure)	
installation/ repair of stormwater drainage (including manholes and appurtenant works)		Installation/ repair of sewer reticulation (including manholes and appurtenant works)	
OTHER: List works elements included in project			

Projects that will not qualify as relevant experience are:

- road rehabilitation projects
- construction of gravel roads
- road maintenance projects

Confirmation of documentation submitted is to be recorded on Page 51.

*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: _____

EXPERIENCE SUBMISSION #4Reference is to be made to the **Tender Data: C.2.1.3.**

(Where required, in the shaded areas, clearly mark selection with an "X" or circle applicable)

Experience as a:	Sub-Contractor:		Main Contractor:	
-------------------------	------------------------	--	-------------------------	--

Client/ Employer OR (if experience as a sub-contractor) Main Contractor's Details Should the Employer's reasonable attempts to make contact, to verify the information provided, fail (for whatever reason) this experience submission WILL be considered invalid.	Entity Name:												
	Contact Name:												
	Contact Tel:				-				-				
	Contact Cell:				-				-				
	Contact email / other:												
Enter the Client/ Employer's details, OR, if the works was done as a sub-contractor, enter the Main Contractor's Details													

Contract Details	Contract (Reference) Number:													
	Contract Title:													
	Has this Contract been completed?	Y	N	Commencement Date:		d	d	m	m	2	0	y	y	
				Completion Date (if applicable):		d	d	m	m	2	0	y	y	
Tendered Value (Contract Sum) OR Sub-Contract Value:		R	Final Contract Price OR Final Value of Sub-Contract:		R									

Contract Scope-of-Work (Type of Project and Works Elements):

<u>Which Works Type(s) best describe the project?</u> (indicate applicable with an "X" in the shaded cells)			
new road construction		gravel to surfaced road upgrades	
road widening/upgrades		access road upgrades	
provision of interim roadway related services to informal settlements		major parking areas	
intersection improvements		major water reticulation projects	
reinforced concrete construction		bridge construction (steel and concrete)	
OTHER: provide a description of the type of project			

(continued on next page)

Which Works Element(s) were included in the project? (See red text on Page 19 Table 2)
(indicate applicable with an "X" in the shaded cells)

bulk earthworks		flood/ disaster remediation works	
roadway layer-works		reinforced concrete pedestrian bridges	
asphalt roadway surfacing		reinforced concrete roadway bridges	
concrete surfacing to roads		sidewalk/ walkway construction	
kerbing/ channelling		traffic calming measures	
retaining structures (reinforced concrete, masonry, gabion, proprietary block systems etc)		dealing with underground services (watermains, sewers, electricity, communication infrastructure)	
installation/ repair of stormwater drainage (including manholes and appurtenant works)		Installation/ repair of sewer reticulation (including manholes and appurtenant works)	
OTHER: List works elements included in project			

Projects that will not qualify as relevant experience are:

- road rehabilitation projects
- construction of gravel roads
- road maintenance projects

Confirmation of documentation submitted is to be recorded on Page 51.

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:

EXPERIENCE SUBMISSION #5Reference is to be made to the **Tender Data: C.2.1.3.**

(Where required, in the shaded areas, clearly mark selection with an "X" or circle applicable)

Experience as a:	Sub-Contractor:		Main Contractor:	
-------------------------	------------------------	--	-------------------------	--

Client/ Employer OR (if experience as a sub-contractor) Main Contractor's Details Should the Employer's reasonable attempts to make contact, to verify the information provided, fail (for whatever reason) this experience submission WILL be considered invalid.	Entity Name:												
	Contact Name:												
	Contact Tel:				-				-				
	Contact Cell:				-				-				
	Contact email / other:												
Enter the Client/ Employer's details, OR, if the works was done as a sub-contractor, enter the Main Contractor's Details													

Contract Details	Contract (Reference) Number:													
	Contract Title:													
	Has this Contract been completed?	Y	N	Commencement Date:		d	d	m	m	2	0	y	y	
Completion Date (if applicable):				d	d	m	m	2	0	y	y			
Tendered Value (Contract Sum) OR Sub-Contract Value:		R	Final Contract Price OR Final Value of Sub-Contract:		R									

Contract Scope-of-Work (Type of Project and Works Elements):

Which Works Type(s) best describe the project? (indicate applicable with an "X" in the shaded cells)			
new road construction		gravel to surfaced road upgrades	
road widening/upgrades		access road upgrades	
provision of interim roadway related services to informal settlements		major parking areas	
intersection improvements		major water reticulation projects	
reinforced concrete construction		bridge construction (steel and concrete)	
OTHER: provide a description of the type of project			

(continued on next page)

Which Works Element(s) were included in the project? (it is a requirement that the submission includes a minimum of 5 elements) (indicate applicable with an "X" in the shaded cells)

bulk earthworks		flood/ disaster remediation works	
roadway layer-works		reinforced concrete pedestrian bridges	
asphalt roadway surfacing		reinforced concrete roadway bridges	
concrete surfacing to roads		sidewalk/ walkway construction	
kerbing/ channelling		traffic calming measures	
retaining structures (reinforced concrete, masonry, gabion, proprietary block systems etc)		dealing with underground services (watermains, sewers, electricity, communication infrastructure)	
installation/ repair of stormwater drainage (including manholes and appurtenant works)		Installation/ repair of sewer reticulation (including manholes and appurtenant works)	
OTHER: List works elements included in project			

Projects that will not qualify as relevant experience are:

- road rehabilitation projects
- construction of gravel roads
- road maintenance projects

Confirmation of documentation submitted is to be recorded on Page 51.

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: _____

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

The Bill of Quantities in Part C2.2 will be used as the **Tender Assessment Schedule** mentioned in C.3.11 of the Tender Data. The **"OFFER"** below is to be the **TOTAL** of the **Bill of Quantities** (incl. VAT).

The Offer will be used as the basis for the calculation of the **"Price Points"** in terms of the **Preference Points System** specified in C.3.11 of the Tender Data.

Note: * Indicates what information is mandatory.

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

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

Contract No: **1A-33566**

Contract Title: **As and When, Rates Based Contract for Disaster Response in the West 2 Region of the eThekweni Municipality, for 36 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 TOTAL of the Bill of Quantities, 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) :

(Continued on next page)

(Continued from previous page)

Address :

:

Telephone :

Witness:

Signature : **Date** :

Name (*in capitals*) :

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 fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this Agreement.

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

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

Name (*of signatory in capitals*) :

Capacity (*of Signatory*) :

Name of Employer (*organisation*) :

Address :

:

Witness:

Signature : **Date** :

Name(*in capitals*) : :

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

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

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

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

FOR THE TENDERER

FOR THE EMPLOYER

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

C1.2: CONTRACT DATA

C1.2.1 CONDITIONS OF CONTRACT

C1.2.1.1 GENERAL CONDITIONS OF CONTRACT

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

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

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

C1.2.2 CONTRACT DATA

Note: Works, when required, will be executed by the issuing of **TASK ORDERS**. The Task Order documentation will contain Contract Data specific to the Works included in the Task Order. The Task Order Contract Data is to be read together with the Contract data below. Should there be any ambiguity then the Contract Data in the Task Order shall take precedence.

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, will be specified in the Task Order.
- 1.1.1.14 The **time for achieving Practical Completion**, from the Commencement Date, will be specified in the Task Order.
- 1.1.1.15 The Employer is the eThekweni Municipality as represented by:
Deputy Director: **OPERATIONS MANAGEMENT**
- 1.2.1.2 The address of the Employer will be specified in the Task Order.
- 1.1.1.16 The **name of the Employer's Agent** will be specified in the Task Order.
- 1.2.1.2 The address of the Employer's Agent will be specified in the Task Order.
- 1.1.1.26 The **Pricing Strategy** will be specified in the Task Order.
- 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 Division (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 the minimum value specified in Table 1 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, in a Task Order, 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)
- Sub-Contracting Implementation Plan (if applicable)
- If required to be registered, in terms of the Occupational Injuries and Diseases Act (130 of 1993 as amended), the Contractor 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. Should the Contractor’s Letter of Good Standing be expired, but an application for renewal has been made, the Contractor is to submit the expired Letter of Good Standing AND proof of an application for renewal.

5.3.2 The **time to submit the documentation** required before commencement with the works will be specified in the Task Order.

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 will be specified in the Task Order.

5.8.1 The **non-working days** will be specified in the Task Order.

(5.1.1) The **special non-working** will be specified in the Task Order.

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 will be specified in the Task Order.

5.14.1 The **requirements for achieving Practical Completion** will be specified in the Task Order.

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

6.2.1 **Security (Performance Guarantee)** will be specified in the Task Order.

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 **2024 = 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 **RUBIS Asphalt South Africa 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:** will be specified in the Task Order.

The following will normally apply in Task Orders:

- 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 will be specified in the Task Order.

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

8.6.1.4 **Ground Support Insurance:** will be specified in the Task Order.

8.6.1.5 Furthermore, the insurance cover effected by the Contractor shall meet the following requirements which will be specified in the Task Order.

The following Insurance requirements will be specified in the Task Order.

- Third Party Insurance (Public Liability)
- Principal's own surrounding Property Insurance
- Insurance of Works

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:

.....

.....

.....

.....

1.2.1.2 The Physical address of the Contractor is:

.....

.....

.....

.....

The Postal address of the Contractor is:

.....

.....

.....

.....

The contact numbers of the Contractor are:

Telephone:

Fax:

The E-Mail address of the Contractor is:

.....

C1.2.3 ADDITIONAL CONDITIONS OF CONTRACT

C1.2.3.1 COMMUNITY LIAISON OFFICER

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

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

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

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

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

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) applicable**. 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

SUB-CONTRACTING percentages will be determined on a Task Order specific basis, depending on the nature of works and SUB-CONTRACTING potential. The following provisions shall generally apply to issued Task Orders:

- Value greater than R750k, up to R1m: Minimum 5% SUB-CONTRACTING.
- Value greater than R1m, up to R3m: Minimum 10% SUB-CONTRACTING.
- Value greater than R3m, up to R5m: Minimum 20% SUB-CONTRACTING.
- Value greater than R5m: Minimum 30% SUB-CONTRACTING.

The successful tenderer shall sub-contract to an EME or QSE which is at least 51% owned by black people. These Enterprises must be from the ward(s) where work is taking place in the first instance and, if the Contractor cannot procure such enterprises from the ward(s), this may be achieved by sub-contracting with such qualifying Enterprises located within adjacent wards, failing which the sub-contractors may be sourced within the jurisdiction of eThekweni Municipality.

SUB-CONTRACTING may be to:

- Contractors who are registered with the Construction Industry Development Board in the Grades ranging from 1 to 4,
- Material and equipment suppliers who meet the requirements of an EME or QSE as detailed above.

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

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

For any work being sub-contracted, documents of the relevant sub-contractor must be submitted to the Employer's Agent in writing for approval well in advance before commencement of any of the activities on the programme. Subcontractors shall be approved by the Employer. The Employer is under no obligation to accept the proposed Subcontractor, and rejection by the Employer does not absolve the Contractor of their SUB-CONTRACTING responsibilities in terms of this contract.

No additional costs will be entertained for compliance with this requirement.

Submission of SUB-CONTRACTING Plan

At the commencement of each Task Order, the Contractor shall provide a Sub-Contracting Plan for the Sub-Contracting using the Scope of Work and its related cost to demonstrate how the stipulated SUB-CONTRACTING targets will be achieved.

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

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

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

C1.2.3.4 FTE (Full Time Equivalent) EMPLOYMENT INFORMATION

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

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

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

- Category of Employment

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

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

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

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

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

C1.2.3.5 PERFORMANCE MONITORING OF SERVICE PROVIDERS

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

Appropriate key performance indicators (KPIs) for the contract must be set by the Municipality as a yardstick for measuring performance. These will be specified in the Task Order documentation.

C1.2.3.6 EXCEPTED RISKS (Clause 8.3)

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

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

C1.2.3.7 WORK ALLOCATION METHODOLOGY

It will be the conditions of this contract that work distribution or method of assigning work to service providers shall be as follows

1. There will be five (5) Service Providers, one per region.
2. Initial instructions for works will be given through the JDE contract generation method. Only JDE generated orders will be recognised as official instruction of works, up to inclusive of the maximum CIDB grading of the service provider.
3. Each Task Order generated must be signed by the project manager/engineer, approved by the immediate supervisor, the Deputy Director and the Director. The amount of each Task Order shall determine, in terms of delegations, the approval of the Executive Director.
4. The Employer reserves the right to issue Task Orders to the most suited of the Regional Contractors, albeit that the Works may not fall within that Contractor's region.

C1.2.3.8 CIDB BUILD PROGRAMME

Should a **Task Order** trigger the requirements of the CIDB B.U.I.L.D. Programme in terms of either:

- The Standard for Indirect Targeting for Enterprise Development through Construction Works Contracts published in Gazette Notice No. 36190 of 25 February 2013, or
- The Standard for Developing Skills through Infrastructure Contracts published in Gazette Notice No. 48491 of 28 April 2023,

then the requirements will be specified in the Task Order documentation.

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 C.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, as included in the downloaded EXCEL file, follows.

PART C3: SCOPE OF WORK

	<u>PAGE</u>
C3.1 PROJECT DESCRIPTION AND SCOPE OF CONTRACT	82
C3.2 PROJECT SPECIFICATIONS	83
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	
PS.11 Site Security	
PS.12 As-Built Drawings	
PS.13 Materials	
PS.14 Weather Limitations	
PS.14 Site Condition	
C3.3 STANDARD SPECIFICATIONS	99
C3.3.1 Listing of the Standard Specifications	
C3.3.2 Amendments to the Standard Specifications	
C3.4 PARTICULAR SPECIFICATIONS	218
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	221
C3.5.1 Contract Drawings / Details	
C3.5.2 Standard Drawings	

C3.1: PROJECT DESCRIPTION AND SCOPE OF CONTRACT

C3.1.1 Description of Works

The Employer seeks to establish 6 (six) regional managing contractors in the Ethekwini Municipality to respond to emergency repairs arising out of disasters. The scope of works under this contract will entail rates-based contracting for infrastructure repairs, on an as and when required basis, with no guarantee of any quantum of work.

Works issued under this contract will be on a Task Order basis as the needs arise. These Works will be overseen by various infrastructure Divisions (previously Departments) in the Municipality. These Divisions include Roads Provision, Roads and Stormwater Maintenance, Coastal and Stormwater Catchment Management, Water and Sanitation, and any other Divisions that would require Contractors to respond to an emergency.

The Regions, as indicated on the Region Map on page 223, are defined as follows

- North
- South
- Central
- West (1)
- West (2)

The Works description for a specific Task Order will be stated in the Task Order documentation.

C3.1.2 Description of Site and Access

The Description of Site and Access for a specific Task Order will be stated in the Task Order documentation.

C3.1.3 Nature of Ground and Subsoil Conditions

The Nature of Ground and Subsoil Conditions for a specific Task Order will be stated in the Task Order documentation.

C3.1.4 CIDB B.U.I.L.D. Programme (Employer's objectives)

Should the Task Order(s) trigger the requirements for the **CIDB B.U.I.L.D. Programme** then the Employer's Objectives will be included in the Task Order documentation.

C3.2(a): PROJECT SPECIFICATION**Notes:**

- 1) The words **CONTRACT** and **TASK ORDER** refer to either the formation of the various PANELS, or the **WORKS** to be executed through the Contract using **TASK ORDERS** respectively. The words take on the meaning within the context in which they are used.
- 2) Works, when required, will be executed by the issuing of **TASK ORDERS**. The Task Order documentation will contain **PROJECT SPECIFICATION** specific to the Works included in the Task Order. The Task Order Project Specification is to be read together with the Project Specification below. Should there be any ambiguity then the Project Specification in the Task Order shall take precedence.

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.

	<u>Page</u>
PS.1 Programme, Method of Work, and Accommodation of Traffic	84
PS.2 SERVICES	87
PS.3 WATERMAINS	89
PS.4 SEWERS	90
PS.5 STORMWATER	91
PS.6 ELECTRICAL PLANT	92
PS.7 TELKOM S.A. LIMITED / NEOTEL PLANT	93
PS.8 CCTV PLANT	93
PS.9 MANAGEMENT OF THE ENVIRONMENT	94
PS.10 OCCUPATIONAL HEALTH AND SAFETY	95
PS.11 SITE SECURITY	97
PS.12 AS BUILT DRAWINGS	97
PS.13 MATERIALS	98
PS.14 WEATHER LIMITATIONS	98
PS.15 SITE CONDITION	98

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 the Task Order a preliminary programme on the prescribed form (see **T2.2: Preliminary Programme**). 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 Task Order.

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 Task Order 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 Task Order 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. These will be documented in the Task Order Project Specification.

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 possibility of numerous existing services in the Task Order area. Although every effort will be made to depict these services accurately the positions shown must be regarded as approximate.

The Task Order Documentation will, if necessary, detail any major services in the Task Order Scope.

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 Task Order will be described in the Task Order Scope.

PS.2.4 Accommodation of Services

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

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

The Tenderer's attention will be drawn to any specific requirements regarding the watermains to be installed as part of Task Orders in the Task Order documentation.

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 Ethekeeni Water Services Directorate. 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 Compaction Equipment

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

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

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

PS.4 SEWERS

The requirements for any specific Sewer related works will be included in the Task Order Scope.

The Contractor is to take note of sewer lines that traverse the site of works and special care to be taken in the proximity to these services. The sewers and connections shall be proved on site by the Contractor prior to any construction work commencing in the vicinity of these services. Under no circumstances will heavy road-making equipment, either heavy plant or vibratory compaction 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.

PS.4.1 Blockage of Foul Water Sewers

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

PS.5 STORMWATER

The requirements for any specific Stormwater related works will be included in the Task Order Scope.

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

The requirements for any Electricity related Plant will be included in the Task Order Scope.

PS.6.1 General

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

PS.6.2 Street Lighting

If necessary, the existing lighting will be removed in stages and replaced after Civil Works completion. Relocation may take place during this contract and be executed by eThekwini Electricity or their agents. It is a requirement that the street lighting be operational at all times.

PS.6.3 MV / LV Cables

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

PS.6.4 Relocation of Existing Services

Should it be necessary to adjust the line, level and / or position of any service not catered for in the Task Order 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

The requirements for any Telkom/ Neotel Plant will be included in the Task Order Scope.

PS.8 CCTV PLANT

The requirements for any CCTV Plant will be included in the Task Order Scope.

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**

The requirements for OH&S will be included in the Task Order Scope.

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 Task Order stage only a brief overview of the Tenderer's perception on the safety requirements for this contract will be adequate. This will be attached to **T2.2: Contractor's Health and Safety Plan**.

The Contractor 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** (see Task Order Scope) and must cover at least the following:

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

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

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

A generic plan will not be acceptable.

PS.10.3 Cost of compliance with the OHSA Construction Regulations

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

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

PS.11 SITE SECURITY

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

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

The Contractor is to take note of the prevailing security rate in the eThekweni area together with the allowable PSIRA rates for security when pricing this item.

The process of negotiation will not be deemed as work stoppage.

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

PS.12 AS BUILT DRAWINGS

The Survey for, and Preparation of As-Built drawings is to be done by professionally registered Surveyor in accordance with the eThekweni Municipality, Land Surveying Branch: Engineering Surveys standard. The guidelines and examples are available. (See http://www.durban.gov.za/City_Services/engineering%20unit/Surveying_Land_Information/Pages/default.aspx)

If required, payment for the above will be made under the applicable items as scheduled in the Preliminary & General Section of the Bill of Quantities referencing this clause.

The Tenderer shall note the lump sum item 6. Part AB. General specifications in the Schedule of Quantities covering the survey co-ordination of all valves, manholes, catchpits and cable duct markers within the contract area. The Contractor shall supply the Engineer with a list of co-ordinates and scaled plan of these services within two weeks of commencement of the works. A sepia copy of the plan shall be supplied by the Department for this purpose.

PS.13 MATERIALS**PS.13.1 Material and Borrow Pits**

The gravel material to be used under this contract shall comply with the requirements as per TRH20. The material will be confined to zone E and the upper portion of zone B of TRH20 for re-gravelling. The material to be used for gravel upgrading shall comply with the requirements as per Layerworks table attached to this document. All material shall be from approved sources. Should the tenderer enter into any special agreements with any landowner for the acquisition/procurement of material, same shall comply with all statutory requirements pertaining to extraction of such material. A test certificate of all material to be used will be required.

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

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

No burning of vegetation will be permitted.

PS.14 WEATHER LIMITATIONS

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

PS. 15 SITE CONDITION

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

C3.3a: STANDARD SPECIFICATIONS

C3.3.1 The Specifications on which this contract is based are the eThekiwini 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
AH	Occupational Health and Safety		
B	Site Clearance	March	1990
C	Concrete Work	February	1987
DA	Earthworks: Bulk	January	1985
DB	Earthworks for Pipe Trenches	July	1992
DD	Earthworks for Structures	January	1984
EB	Graded Crushed Stone	December	1988
ED	Road Asphalt	July	1992
EF	Kerbs and Haunches	July	1992
EG	Sidewalks, Footpaths and Median Areas	July	1992
EH	Steel Guardrails & Conc. Median Barriers	July	1992
EL	Dumprock Subgrade Improvement	July	1992
F	Protection Works	July	1992
PG	Non Pressure Pipelines and Pc Culverts	July	1992
PH	Manholes and Appurtenant Drainage Works	July	1992
S	Reinstatement	March	1993
TA	Road Signs	October	1989
TB	Road Markings	October	1989

Non-Standard Specification

GM Gravel Road Maintenance

Other specifications include:

- COLTO: Various Sections (see pages 171 and 174).

C3.3.2 AMENDMENTS TO THE STANDARD SPECIFICATIONS

Note: The following are the generally used Amendments to the Standard Specifications and are applicable to Task Orders. Task Order documentation may revise these amendments, in which case the Task Orders documentation shall take precedence.

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.

<u>Part</u>	<u>Description</u>	<u>Page</u>
PS AA	Preliminaries	102
PS AB	General Specifications	103
PC AH	Occupational Health and Safety Unit Specification	107
PS B	Site Clearance.....	108
PS C	Concrete Work	111
PS DA	Earthworks: Bulk	114
PS DB	Earthworks for Pipe Trenches.....	107
PS DD	Earthworks for Structures	121
PS EB	Graded Crushed Stone	124
PS ED	Road Asphalt.....	125
PS EF	Kerbs and Haunches	137
PS EL	Dumprock Subgrade Improvement.....	139
PS F	Protection Works.....	140
PS GM	Gravel Road Maintenance	142
PS PG	Non Pressure Pipelines and Pc Culverts	143
PS PH	Manholes and Appurtenant Drainage Works.....	145
PS S	Reinstatement.....	148
PS TA	Road Signs	149
PS TB	Road Markings	151

Project Specifications specific to Departments are as follows:

ROADS and STORMWATER MAINTENANCE

Part ED Road Asphalt	153
AA.ED Road Asphalt	160
COLTO Specification	171

WATER NETWORKS

Disaster Specification.....	216
Technical Specification	216

PS.AA PRELIMINARIES

No applicable items.

PS.AB GENERAL SPECIFICATION**PS.AB.1 SITE FACILITIES****PS.AB.1.1 Temporary Offices for Engineer and Staff**

No offices are required for the exclusive use by the Engineer and/or his staff.

PS.AB.1.2 Contractor's Camp Site and Depot

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

(a) Contractor's Camp Site / Store Yard

The recommended position of the camp site/store yard will be pointed out by the Engineer. However, the Contractor may, if he prefers to have a camp site at another location of the work, site it elsewhere provided that he first obtains the written permission of the landowner, and subsequently the Engineer, to do so.

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

The following conditions shall apply:

- (i) None of the existing roads shall be damaged in any way.
- (ii) No waterborne sewerage facilities or potable water connection are available on the site. The Contractor shall make his own arrangements in this regard.
- (iii) No electrical facilities exist on site.
- (iv) It shall be the responsibility of the Contractor to make good any damage caused to the camp site area or any improvements on it, including services, and for reinstating it to its former condition when vacated. The standard of reinstatement must be to the satisfaction of the Engineer; Head: Real Estate and/or Head of Parks, Recreation and Beaches Department; or other owner. Particular attention should be directed to these requirements and written clearances from the relevant Departments or other owners will be required.

PS.AB.1.3 Accommodation of Employees

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

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

No informal housing or squatting will be allowed.

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

PS.AB.1.4 Power Supply, Water and other Services

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

(a) Water for Works

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

(b) Power Supply for Works

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

PS.AB.2 SERVICES CONNECTION FEE

Should the Contractor require either additional connection or an increased power supply any additional costs shall be to the Contractor's account.

PS.AB.3 TELEPHONE

No requirement for telephone.

PS.AB.4 PROGRESS PHOTOGRAPHS

No Progress Photographs will be required.

PS.AB.5 NOTICE BOARD

The typical notice board layout is given as an Annexure.

PS.AB.6 SETTING OUT

The engineer shall establish the basic reference pegs and benchmarks on the site and give to the contractor the particulars thereof in sufficient time to enable the contractor to meet his approved programme.

After compliance by the engineer with the provisions of the above paragraph, the contractor shall be responsible for the true and proper setting out of the works and for the provisions of all necessary instruments, appliances and labour connection therewith.

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

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

PS.AB.7 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.

PS.AB.8 Contractors superintendence including transport and communication

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

PS.AB.9 Provision for a Community Liaison Officer

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

PS.AB.10 Accommodation of traffic

This item shall cover the accommodation of traffic as per the Southern African Development Community Roads Traffic Manual Volume 2 and in accordance with RTI at all times. The tendered rate shall include full compensation for the provision of all signs, traffic cones, delineators and flagmen as required for each worksite. The unit of measurement shall be per month.

PS.AB.11 Repairing of existing services

This item covers all necessary excavations, repairs to existing water reticulation pipes damaged while executing the works and backfilling as required.

Trenches must be 400mm wide and a minimum of 800mm below the finished road level. The pipe bedding (river sand) to be 300mm thick.

The tendered rate shall include the supply of all materials as required and the repairs to damaged pipes.

PS.AB.12 Lowering of existing services

This item covers all necessary excavations, lowering of existing pipes and backfilling of the trenches, for existing water reticulation pipes that require lowering.

Trenches must be 400mm wide and a minimum of 800mm below the road. The pipe bedding (river sand) to be 300mm thick.

The tendered rate shall include supply of all material required and the repairs to damaged pipes.

PS.AB.13 Stream diversion/ Management

The tendered rate shall include full compensation for stream diversions for the creation of working space.

The unit of measurement shall be per number (no.).

PS.AB.14 DAYWORKS: Provision of labour

The contractor shall be required to provide labour resources (skilled, unskilled, ganger and flagmen as per the bill of quantities) upon instruction from the engineer. The tendered rate shall include full compensation for the cost of employment to the contractor.

The unit of measurement shall be hours (hr).

PS.AB.15 DAYWORKS: Provision of Equipment

The tendered rate shall include for full compensation for provision of equipment and machinery as per the bill of quantities, upon instruction from the engineer.

The unit of measurement shall be hours (hr).

PS.AH OCCUPATIONAL HEALTH AND SAFETY UNIT SPECIFICATION

PS.AH.1 OCCUPATIONAL HEALTH AND SAFETY UNIT SPECIFICATION

The contractor shall allow in their cost provision for complying with all the requirements as covered in the:

1. Site Specific Health and Safety Specification in terms of 2014 Construction Regulations, referenced C3.6.2
2. Baseline Risk assessment document in terms of Construction Regulation 5.1 (a), referenced C3.6.3

These documents are found under Part C3: Scope of Works, subheading C3.4: Particular Specifications.

PS.B SITE CLEARANCE

- PS.B.1 REMOVAL OF STREET SIGNS AND POSTS
- PS.B.2 REMOVAL OF FENCES
- PS.B.3 REMOVAL OF EXISTING PRECAST KERB
- PS.B.4 DEMOLITION AND REMOVAL OF EXISTING STRUCTURES
- PS.B.5 REMOVAL OF ROADWAYS TO TIP
- PS.B.6 REMOVAL AND GRUB LARGE TREES AND STUMPS
- PS.B.7 REMOVAL DISUSED PIPES, 300-500mm DIAMETER AND SPOIL AT TIP

PS.B.1 REMOVAL OF STREET SIGNS AND POSTS

The unit of measurement shall be number (No.) and the rate shall include for the labour and plant necessary for the careful removal of the signs, loading and either:

- (a) storing on site for re-use, or;
- (b) transporting to the approved tip and dumping.

PS.B.2 REMOVAL OF FENCES

The unit of measurement shall be linear metre (m) and the rate shall include for the labour and plant necessary for the careful removal of the fence, removing the fence posts, loading, transportation, and storing on site for re-use.

PS.B.3 REMOVAL OF EXISTING PRECAST KERB

The unit of measurement shall be linear metre (m) and the rate shall include for the labour and plant necessary for the removal of the existing precast kerb and transporting to the approved tip and dumping.

PS.B.4 DEMOLITION AND REMOVAL OF EXISTING STRUCTURES**PS.B.4.1 SCOPE**

This specification covers the work in connection with the demolition of part or entire members of a structure.

PS.B.4.2 INTERPRETATION

Definitions

- (i) Structures: All references to structures shall include mass concrete, un-reinforced, reinforced, bricks, wood, metal and concrete blocks.
- (ii) Demolition of structure: Demolition means the breaking up and removal of an entire structural members.

PS.B.4.3 MATERIALS

All devices used to remove structure or to demolish structural members, shall be handled, stored and used strictly in accordance with the manufacturer's instructions and current safety regulations.

PS.B.4.4 PLANT AND EQUIPMENT**(a) General**

All plant, equipment, tools and devices used for the demolition of structures or the removal of portions of existing structure shall be based on proven and accepted technology within the industry. The plant, equipment, tools and accessories shall be inspected and maintained on a regular basis to ensure that they remain in good working order, function efficiently, and that safety is not compromised. All cutting and breaking tools shall be kept sharp to reduce the force required to break out any member of the structure to a minimum.

The plant, equipment, tools and devices used for the demolition or removal process shall be of the accepted type and capacity for the relevant application. The suitability of the chosen method shall be demonstrated on a representative test section identified by the engineer prior to the execution of any programmed work.

(b) Access structures and working platforms

Where necessary, the contractor shall provide suitable and safe temporary access structures, working platforms, debris collection and removal chutes and bins, including protection screens where required, at each location where structure has to be demolished or removed.

The temporary structures, platforms, chutes, etc must be stable and of sufficient strength and rigidity to safely carry the imposed temporary loads arising from the work activity.

PS.B.4.5 CONSTRUCTION**(a) Sequence of execution**

The method and sequence of demolition or removal of structure shall be in accordance with the method statement submitted by the contractor and approved by the engineer.

Any temporary propping specified in the approved method statement and the drawings shall be securely positioned in accordance with each stage of the demolition or removal sequence prior to commencement of the following stage.

(b) Site preparation and access

The necessary access and temporary support structures shall be in place prior to the commencement of demolition or removal of structure. Screening and protective measures shall be established around the work area as necessary to ensure acceptable environmental, health and safety conditions.

(c) Demolition of concrete members

The demolition of entire structures or major elements of a structure shall employ techniques that do not damage adjacent structures or structural elements, nor contaminate the surrounding environment.

The contractor shall ensure that any nuisance associated with his work activity is minimised by implementing appropriate precautions and measures to the approval of the engineer. Common nuisances associated with demolition and concrete removal include fumes, noise,

dust, flying fragments, heat and vibration.

Structural members which are to be demolished completely shall be broken into suitably sized fragments to allow easy removal from site to an approved dump area.

Recommended demolition techniques include the use of percussion breakers, chisels or other approved mechanical equipment, the use of thermal or hydraulic cutting techniques or by non-explosive chemical means, to ensure minimal damage (e.g. micro-cracking) to the existing concrete. Demolition by explosive means will not be acceptable.

(d) Disposal of waste material

All waste materials, rubble, scrap and rubbish arising from the contractor's presence on site and/or the execution of the works shall be disposed of weekly to a disposal site identified by the contractor and approved by the engineer.

PS.B.4.6 MEASUREMENT AND PAYMENT

A PC Sum amount has been included for full compensation for all labour, material, screening of the structure for safety and environmental protective measures, equipment and plant as well as for all work and incidentals required to complete the work as specified and required to demolish the structural member and to load, transport and dump the structural segments and rubble at the nearest approved dumping site.

PS.B.5 REMOVAL OF ROADWAYS TO TIP

The unit of measurement is square metre (m²). The Contractor shall make allowance in his rate for the neat trimming of the existing roadworks where the new road is to tie into the existing road and the rate shall include all haulage to an approved tip. Separate items will be provided where materials are to be carefully removed and stored on site for re-use.

PS.B.6 REMOVAL AND GRUB LARGE AND STUMPS

Refer to Clause B.8.4

PS.B.7 REMOVAL OF DISUSED PIPES, 300-500mm DIAMETER AND SPOIL AT TIP

Refer to Clause B.8.4

PS.B.8 Removal of Boundary Hedging

Where instructed by the engineer, the contractor will be required to remove existing fence to access site and/or to accommodate working space.

The unit of measurement shall be in metres (m).

PS.C CONCRETE WORKS

- PS.C.1 NEW SABS SPECIFICATION FOR PORTLAND BASED CEMENT
- PS.C.2 PLACING OF CONCRETE
- PS.C.3 PROTECTION OF CONCRETE
- PS.C.4 CONCRETE LINED V-DRAIN

- PS.C.8.7 SUPPLY AND LAY PRECAST 1.2 X 1.2 PORTAL CULVERT
- PS.C.8.8 SUPPLY AND LAY PRECAST 1.5 X 1.5 PORTAL CULVERT
- PS.C.8.9 SUPPLY AND LAY PRECAST 2.1 X 2.1 PORTAL CULVERT
- PS.C.8.10 SUPPLY AND LAY PRECAST 2.4 X 2.4 PORTAL CULVERT

PS.C.1 NEW SABS SPECIFICATION FOR PORTLAND BASED CEMENT

The new SABS ENV. 197-1 (adopted in 1996): Cement - composition, specification and conformity criteria Part 1: Common Cement, replaces SABS 471 - 1979, SABS 626 - 1971 and SABS 831 - 1971 in Clause C.2 of Part C: Concrete Work. The minimum strength for concrete blinding is 15MPa. Concrete Strength and size are specified on the attached drawing.

PS.C.2 PLACING OF CONCRETE

No concrete is to be placed in the excavations until this has been approved by the Engineer or his Representative.

PS.C.3 PROTECTION OF THE CONCRETE

The Contractor shall take precautions in the form of barricading and watchmen to keep pedestrians, cyclists, animals etc., off the freshly placed concrete, particularly outside normal working hours.

PS.C.4 CONCRETE LINED V-DRAIN

A 600mm wide x 150mm deep or 1200mm wide x 100mm deep "V" drain comprising 25/19 cast in-situ concrete shall be laid where so shown in the drawings or instructed by the Engineer. The top edges shall be flush with the finished road level and finished with a wood float. Details of the drain are shown on Typical Details (1).

The unit of measurement shall be the meter (m) and the rate shall include for excavation, shuttering joints and the supply, placing, finishing the concrete, provision of mesh reinforcement and material for the expansion joints, curing and protecting the work on completion.

It is drawn to the contractor's attention that it is vital that both edges of this drain are parallel, perfectly straight (or perfectly curved if on a curve) and this will be insisted upon. Provision must therefore be made in the rate for suitable shutters, supports, workmanship and intense supervision to achieve the required standards. Deviations from tolerances will not be accepted.

The horizontal alignment of the edges shall not deviate from the prescribed alignment by more than 5mm and the rate of deviation from the design line or lines shall not exceed 1 in 500 when tested over any section of length exceeding 10m. Surface irregularities (line or level) when tested with a 3m straight edge shall not exceed 3mm. For vertical alignment, the tolerances in level shall not exceed those specified in the wearing course.

PS.C.8.4 COFFER DAMING

The Contractor shall be responsible for the design, installation, maintenance and removal of whatever temporary works are necessary to support the face of the excavated ground to ensure the safety of workmen and to secure any structure, roads, services or private properties adjacent to the excavations, the contractor is also responsible to prevent any water from the ocean from accessing the working area and the tenderer is also responsible for the dewatering of the area.

PS.C.8.5 SHEET PILING

The tenderer shall include in their rate all labour, plant and materials required for the design, installation and maintenance of a cofferdam and ground lateral support system. Further to that the Contractor shall be responsible for the design, installation, maintenance and removal of whatever temporary works are necessary to support the face of the excavated ground to ensure the safety of workmen and to secure any structure, roads, services or private properties adjacent to the excavations.

PS.C.8.6 DOWEL BARS

The unit of measure shall be the number of dowel bars installed. Contractor is expected to drill dowel Y20 Hot Dip Galvanised high tensile steel bars into bedrock. The hole is to have a minimum depth of 1000mm and diameter 32mm. Grout to be 40MPa non-Shrinkable grout to be approved by engineer and installed according to manufacturer's instructions.

Drilled holes in rock to be thoroughly cleaned before installation of dowels. The tendered rate shall include compensation for supplying all materials, excluding steel and include all labour, equipment and incidentals required for installing dowel/guides in between barriers as detailed in construction and tender drawings.

PS.C.8.7 SUPPLY AND LAY PRECAST 1.2 X 1.2 PORTAL CULVERT

The unit of measurement for this item shall be no.

The rate shall include for the labour and all plant to install the portal culvert.

PS.C.8.8 SUPPLY AND LAY PRECAST 1.5 X 1.5 PORTAL CULVERT

The unit of measurement for this item shall be no.

The rate shall include for the labour and all plant to install the portal culvert.

PS.C.8.9 SUPPLY AND LAY PRECAST 2.1 X 2.1 PORTAL CULVERT

The unit of measurement for this item shall be no.

The rate shall include for the labour and all plant to install the portal culvert.

PS.C.8.10 SUPPLY AND LAY PRECAST 2.4 X 2.4 PORTAL CULVERT

The unit of measurement for this item shall be no.

The rate shall include for the labour and all plant to install the portal culvert.

PS.C.8.11 Concrete lined open drains

Refer to clause C.8.1 of EThekweni Municipality Civil Engineering specifications, with the grade being 20/19.

PS.C.8.12 Expansion Joints

The tendered rate shall include for the supply of all necessary material, labour and construction of expansion joints.

The unit of measurement shall be in metres (m).

PS.C.8.13 Construction Joints

The tendered rate shall include for the supply of all necessary material, labour and cutting of construction joints.

The unit of measurement shall be in metres (m).

PS.C.8.14 Blinding Layer

The tendered rate shall include full compensation for supplying and casting grade 15/19 blinding layer up to 50mm.

PS.DA EARTHWORKS: BULK

- PS.DA.1 INTERPRETATIONS
- PS.DA.2 GEOTECHNICAL INFORMATION
- PS.DA.3 EXCAVATION OF MATERIAL FROM SITE
- PS.DA.4 EXCAVATE UNSUITABLE MATERIAL BELOW EMBANKMENTS OR FORMATION
- PS.DA.5 IMPORT SUITABLE FILL MATERIAL
- PS.DA.6 COMPACTION OF FILL
- PS.DA.7 COMPACTION OF G7 SELECTED LAYER
- PS.DA.8 FORMATION
- PS.DA.9 TOLERANCES
- PS.DA.10 GEOFABRIC BLANKET
- PS.DA.11 OVERHAUL
- PS.DA.12 STOCKPILE HANDLING
- PS.DA.13 ALLOW FOR TESTING OF SUBGRADE BY SANAS ACCREDITED SPECIALISTS LABORATORY

PS.DA.1 INTERPRETATIONS

The following shall be added to the list of definitions.

Top of earthworks: The top of earthworks shall be defined as the underside of the subbase or selected layers under roads, the base under sidewalks and the underside of the topsoil layer under verges and embankments.

PS.DA.2 GEOTECHNICAL INFORMATION

Tenderer's attention is drawn to Part C4.2 of this contract document, "Site Information", which describes the geology of the area and the associated material properties.

PS.DA.3 EXCAVATION OF MATERIAL FROM SITE

- (a) Further to Clauses DA.8.1 and DA.8.3 Tenderer's are to note that the measurement of excavation of material on site is based on the cut volumes in place before excavation between the original ground levels after stripping of topsoil and the top of earthworks calculated from cross sections as described in Clause DA.8. No allowance will be made for bulking or shrinkage and it shall be assumed that 1 cubic metre of excavated material from the site shall form 1 cubic metre of compacted fill.
- (b) The nature of the roadworks is such that a considerable amount of the excavation shall be in restricted conditions. No additional payment shall be made for such excavation and the Tenderer shall therefore make due allowance in the rates for Bulk Earthworks for any additional work or hand excavation.
- (c) The Contractor's attention is drawn to the presence of watermain in the road reserve area. The Contractor shall limit the size and type of construction plant used in this area so as not to damage the existing watermain. Any damage to the watermain due to the size and type of construction plant used will be to the Contractor's account.

No additional payment will be made for compliance with this clause and Tenderer's shall include in the relevant rate for all extra plant, labour and materials required to work in these areas.

PS.DA.4 EXCAVATE UNSUITABLE MATERIAL BELOW EMBANKMENTS OR FORMATION

Further to Clause DA.8.3 the rate shall also include for trimming the area excavated to the required level and compaction of the in-situ material.

PS.DA.5 IMPORT SUITABLE FILL MATERIAL / SELECTED LAYER

The fill material / selected layer material shall conform to the requirements for a G7 material as described in TRH 14 with the following Amendments:

The material shall be free of weathered shale and will be subject to the approval of the Engineer.

No allowance will be made for bulking or shrinkage, and it shall be no points that 1 cubic metre of excavated material from the site shall form 1 cubic metre of compacted fill. The Contractor is to make allowance for bulking and shrinking in his rates.

The unit of measurement shall be the cubic metre (m³). The rate shall include for:

- (a) the import, placing and spreading of G7 material for subgrade improvement including in restricted conditions
- (b) the import, placing and spreading of G7 material for fill including in restricted conditions
- (c) the import, placing and spreading of G7 material for the selected layer including in restricted conditions.

PS.DA.6 COMPACTION OF FILL

- (a) The second paragraph of Clause DA.8.5 is to be amended by substituting "top of earthworks" for 'formation' where it occurs.

PS.DA.7 COMPACTION OF G7 SELECTED LAYER

The rate for the compaction of the G7 selected layer shall comply with Clause EB: 5 - 8

PS.DA.8 FORMATION

The Tenderers shall make full allowance in the rates for areas of formation in cut or where the fill layer thickness is less than 150 mm.

PS.DA.9 TOLERANCES

Clause DA.6 shall be amended to read as follows:

The allowable tolerances shall be:

- (a) the design angle ± 2 degrees for the angle of the cut or fill slope;
- (b) not less than the design width, nor more than 300 mm greater than the design width for the transverse horizontal embankment width at any level; and

- (c) the layer thickness ± 20 mm for topsoil;
- (d) For the formation, the Contractor will be required to place level pegs longitudinally at 10 m intervals on the road construction contract and elevation tolerances shall be taken on a section of the works. (When a portion of the works is less than 500 m², one tolerance reading per 10 m² shall be taken).

In any section the average of the elevations taken shall be such that the average thickness of the succeeding layer or layers above the formation shall be not less than that specified/nor greater than that specified plus 20 mm.

The standard deviation of the differences between the actual and design levels shall not be greater than 10 mm.

PS.DA.10 GEOFABRIC BLANKET

The geofabric shall comply with Clause PG.3.8.

The unit of measurement shall be the square metre (m²). The rate shall include for the supply of the material, laying, joining, cutting and waste.

PS.DA.11 OVERHAUL

Notwithstanding the requirements of Clause DA.8.10 no additional payment shall be made for overhaul.

PS.DA.12 STOCKPILE HANDLING

Tenderers are to note that no stockpile handling will be payable on this contract. Cut material suitable for fill, shall be placed directly into fill without being stockpiled. If this is not possible, the Tenderer shall include in the bulk earthworks rates, any costs that he would incur in stockpiling and subsequent rehandling of material.

PS.DA.13 ALLOW FOR TESTING OF SUBGRADE BY SANAS ACCREDITED SPECIALISTS LABORATORY

A PC Sum amount has been provided for the appointment of a SANAS accredited specialists laboratory for the testing of the insitu subgrade up to a depth of 300mm below the formation level at various positions along the full length of the proposed road upgrade as directed by the Employer's Agent. The appointment of the SANAS accredited specialist laboratory shall be subject to the approval of the Employer's Agent.

The Contractor shall tender a percentage allowance (%) which shall be held to cover costs for the tasks required for the procurement, liaison, clerical work, superintendence and any related tasks.

PS.DB EARTHWORKS FOR PIPE TRENCHES

- PS.DB.1 BEDDING AND BACKFILL MATERIALS
- PS.DB.1.1 General
- PS.DB.1.2 Stormwater Pipes
- PS.DB.2 EXCAVATION AND BACKFILLING - EXISTING SERVICES
- PS.DB.3 EXCAVATION, BACKFILLING AND REINSTATEMENT OF TRENCHES
(CLAUSE DB.5.3.2)
- PS.DB.4 SHORING OF TRENCHES TO EXCAVATIONS
- PS.DB.5 EXCAVATION FOR SERVICES TO BE LAID BY OTHERS
- PS.DB.6 EXCAVATION IN ROAD AND PAVED AREAS
- PS.DB.7 RESTRICTED EXCAVATION
- PS.DB.8 COMPACTION OF TRENCHES
- PS.DB.9 BACKFILLING OF SERVICE TRENCHES
- PS.DB.10 OVERHAUL
- PS.DB.11 GEOFABRIC BLANKET
- PS.DB.12 DESILTING OF EXISTING STORMWATER MANHOLES

PS.DB.1 BEDDING AND BACKFILL MATERIALS**PS.DB.1.1 General**

- 1) The measurement for bedding shall be the total through length along the centre of the pipeline measured HORIZONTALLY with deductions made for stormwater manholes.
- 2) The unit of measurement for bedding shall be the Linear Metre (m), and the rate shall include for the placing and compacting of the bedding material up to the underside of the backfill for the various pipe diameters.
- 3) Separate items have been included in the Bill of Quantities for the provision of bedding material from a Contractor's commercial source.
- 4) Backfill materials shall comply with Clause DB.3.4. An item has been allowed in the Bill of Quantities for the importation of backfill material where so ordered by the Engineer.
- 5) The Contractor shall allow for haulage in the rate for provision of imported bedding and backfill. No overhaul will be paid for these items.

PS.DB.1.2 Stormwater Pipes

- 1) All bedding to stormwater pipes on this Contractor shall be either Type "B" or Type "C" as is specified in Part DB of the Departmental Technical Specification.

PS.DB.2 EXCAVATION AND BACKFILLING - EXISTING SERVICES

The Tenderer's attention is drawn to the presence of existing services in the area. The Contractor may find it impractical to use mechanical plant for excavation on some portions of the works due to conditions caused by the presence of these services.

The Tenderer's attention is further drawn to the fact that his rates for excavation and backfilling must include for all costs associated with working around these existing services and their protection and accommodation, as no claim for extra payment will be accepted for increased working space or for the inability to use plant in any circumstances.

PS.DB.3 EXCAVATION, BACKFILLING AND REINSTATEMENT OF TRENCHES (CLAUSE DB.5.3.2)

Further to and notwithstanding the requirements of the Departmental Specification, Part DB, the following requirements in respect of trench excavation, backfilling and reinstatement shall be adhered to:

- 1) It is considered that portion of the excavated material will not comply with the specification for material suitable for backfilling. It will be the Contractor's responsibility to use selective methods of excavation to ensure that this unsuitable material does not contaminate other materials suitable for reuse.
- 2) It is anticipated that a portion of the material excavated for trenches in existing natural ground is likely to be classified as "Rock" in terms of Part DB of the Departmental Technical Specification, and that blasting methods will be employed to facilitate excavation. Tenderers are to note that the unit of measurement shall be the linear metre (m), and that the rate tendered shall be inclusive of all work or operations necessary to drill, blast, excavate, backfill, spoil or stockpile the material.
- 3) Where the Contractor chooses to trench by open excavation e.g. battering sides of the trenches, this over-excavation shall not be backfilled with unsuitable excavated material but shall be backfilled with the same imported material as used for the pay-width of the trench. Payment for the imported backfill shall be limited to the pay-width of the trench only and the Contractor shall allow in his rates for any extra backfill material that may be required as a result of over-excavating
- 4) Notwithstanding the method of trench excavation adopted by the Contractor, the restriction on the maximum trench width as defined in specification Clause DB.6.1 - must be strictly adhered to. Should the Contractor over-excavate the trench then he will be responsible for increasing the pipe strength and / or bedding class to be used, all to his cost.

The measurements for excavation shall be the total through-length along the centre-line of a pipeline measured HORIZONTALLY with deductions for manholes. In addition, trench depth will be measured vertically on the centre-line of the pipeline from the existing ground level to the invert level.

PS.DB.4 SHORING OF TRENCHES TO EXCAVATIONS

The Contractor shall be responsible for the design and installation of all shoring where applicable, which must not only comply with all of the relevant safety regulations pertaining to the provision of safe working conditions in earthwork excavations but also will provide sufficient lateral support to minimise any damage to adjacent structures, services or road surfaces.

In addition to the above and the requirements of Clause DB.5.3.2 (a) all excavations in road reserves and adjacent to structures and where excavations are in excess of 1,5 m in depth shall be supported with close shoring and no open or intermittent shoring of any description will be permitted.

The minimum requirements for shoring of these trench excavations shall be as follows:

- 1) Either ribbed steel trench sheeting of suitable thickness with an edged return for interlocking or suitably sized timber poling boards or runners are to be used. Adequate

sized walings at suitable intervals are to be provided. Struts shall consist of either adjustable tubular steel jacks or timber suitably sized for the load application.

- 2) The shoring for the excavations shall be progressively installed as the excavation proceeds. Care being taken to ensure the soil is not removed within a minimum 300 mm of the toe of the runners.
- 3) Installation of shoring after the trench has been excavated to a depth in excess of 1,5 m is not acceptable.
- 4) Details of the proposed shoring must be supplied to the Engineer at least two weeks before the operation commences. During the backfilling, the sides of the trench including the road layers above any over-excavated sections are to be cut back to a point behind the over excavation.
- 5) No separate item has been allowed for in the Bill of Quantities and the Contractor shall allow in his excavation rates for shoring as necessary.

The cutting back of the trench sides shall be to the Contractor's account. Payment for reinstatement of the road hardening shall be based on the widths given in Clause DB.8.3.3.

PS.DB.5 EXCAVATION FOR SERVICES TO BE LAID BY OTHERS

Where indicated, the Contractor shall be required to excavate a trench for the installation of services by others. (Depth and width of trench shall be confirmed on site). The trench bottom shall be trimmed to comply with the tolerances specified under Clause DB.6.3, after which it shall be taken over by the service organisation. After installation of the services the trench shall be backfilled as part of the bedding operation to approximately 300 mm above the service.

Thereafter the Contractor shall continue the backfilling utilising suitable material from the trench excavation, in 150 mm layers which shall be compacted to 95% Mod. A.A.S.H.T.O. density.

The unit of measurement shall be the cubic metre (m³) and the rate shall cover the work described under Clause DB.8.1.

PS.DB.6 EXCAVATION IN ROAD AND PAVED AREAS

Further to Clause DB.8.7 the rate tendered shall include for saw cutting the existing road asphalt.

PS.DB.7 RESTRICTED EXCAVATION

The nature of the trench excavations are such that a considerable amount of the excavation shall be in restricted conditions. No additional payment shall be made for such excavation and the Tenderer shall therefore make due allowance in the rates for any additional work or hand excavation.

PS.DB.8 COMPACTION OF TRENCHES

Further to Clause DB.8.5, Tenderers are to note that in all cases the compaction of the trench bottom and the trench backfill shall be to 95% Mod. A.A.S.H.T.O. An extra-over item has not been included in the Bill of Quantities and tenderers shall include for these costs under the relevant excavate and backfill items.

PS.DB.9 BACKFILLING OF SERVICE TRENCHES

As part of the bedding operation, services laid or relocated by others will be backfilled by them to approximately 300 mm above the service. The backfill shall then be continued by the Contractor up to the original level. The backfilling shall be carried out using suitable material from the trench excavation, in 150 mm layers which shall be compacted to 95% Mod. A.A.S.H.T.O. density.

The unit of measurement shall be the cubic metre (m³) and the rate shall include for all plant and labour required to select, place and compact the material as specified.

PS.DB.10 OVERHAUL

Notwithstanding the requirements of Clauses DB.8.1 and DB.8.17 no additional payment shall be made for haulage.

PS.DB.11 GEOFABRIC BLANKET

The geofabric to stone bedding must comply with Clause PG.3.8 of Part PG : Non-Pressure Pipelines and Precast Concrete Culverts.

The unit of measurement shall be the square metre (m²). The rate shall include for its supply, laying, joining, cutting and waste.

PS.DB.12 DESILTING OF EXISTING STORMWATER MANHOLES

The unit of measurement shall be the cubic metre (m³) and the rate shall include for all labour, plant and equipment required for:

- a) the careful removal of the concrete cover and store on site for re-use;
- b) removal of silt/ debris from within the manhole to spoil.

PS.DD EARTHWORKS FOR STRUCTURES

- PS.DD.1 GENERAL
- PS.DD.2 ANTICIPATED EXCAVATION CONDITIONS
- PS.DD.3 BACKFILLING OF EXCAVATION AND WORKING SPACE
- PS.DD.4 EARTHWORKS FOR STRUCTURES
- PS.DD.5 CEMENT STABILISED BACKFILL
- PS.DD.6 EXCAVATION TO SPOIL
- PS.DD.7 OVERHAUL

PS.DD.1 GENERAL

Excavations for the retaining structures shall be carried out in accordance with the Departmental Specification Part DD - Earthworks for Structures.

Tenderers shall note that the excavation for structures is measured to the neat dimensions of the foundation in plan as if excavated with vertical or battered sides, according to the type of wall constructed.

No extra over payment shall be made for restricted excavation. The Tenderer shall note the instances where the nature of the excavation is restricted and shall make allowance in the excavation rates.

No payment will be made for stockpile handling. Cut material suitable for fill shall be placed directly into fill without being stockpiled. If this is not possible, the Tenderer shall include in the earthworks rate for any costs that he may incur as a result of stockpiling and the subsequent re-handling of the material.

The unnecessary stockpiling of excavated material adjacent to the roadway will not be permitted. The Contractor will make due allowance for this in his rates.

Over-excavation for the concrete base of the retaining structure will be in-filled with grade 25/26 mass concrete at the Contractor's own expense. The Contractor shall take due precaution to ensure this does not occur.

PS.DD.2 ANTICIPATED EXCAVATION CONDITIONS

It is anticipated that excavation of hard material as well as rock may be required. Excavation into the rock surface will be difficult due to its hardness. Blasting followed by pneumatic tool excavation may be required to achieve the desired line and level.

Tenderers shall note that the maximum allowable vibration limit shall be 25 mm per second in the vicinity of structures for areas of blasting.

All blasting operations shall comply with the requirements of Clause DD.5.3 of the Standard Engineering Specification.

PS.DD.3 BACKFILLING OF EXCAVATION AND WORKING SPACE

The unit of measure shall be cubic metres (m³) and the rate shall cover the work described under Clause DD.8.3.

The rate for the imported clean coarse sand must also include all royalties and all haulage costs.

No extra payment shall be made for river sand or imported material not authorised or placed outside the pay width.

No extra payment shall be made for work outside the pay width.

PS.DD.4 EARTHWORKS FOR STRUCTURES

Excavation shall be carried out in accordance with the Departmental Specification Part DD - Earthworks for Structures.

Full lateral support shall be required where the depth of excavation is greater than 1.5m if the embankments are not battered back to at least 1 in 1.5 and the Contractor is to allow for this in his/her normal excavation rates.

Excavated material shall be stockpiled on site for use as backfill. No material shall be taken to spoil unless the Engineer shall have issued written confirmation that the material is deemed unsuitable for re-use.

Excavation shall be classified under the headings as described in Clause DD.3.1. The excavation through alluvial or river deposits containing boulders shall be classified as soft excavation. An extra over measurement for rock/bedrock shall only be allowed should blasting or the use of explosives be utilized.

Tenderers shall note that unless indicated otherwise excavation for structures is measured to the neat dimensions of the foundation in plan as if excavated with vertical sides.

Where the sides of footings are specified as being cast against rock, the excavation overbreak outside the neat foundation dimensions shall be made up in concrete and tenderers shall make allowance for this in their excavation or concrete rates.

The backfilling and compaction shall be done with due regard to Clauses DD.5.6 and DD.8.3. Compaction is to be 95% Mod. AASHTO in layers of no deeper than 300mm.

PS.DD.5 CEMENT STABILISED BACKFILL

Where directed by the Engineer, backfill material shall be stabilised as specified in Clause DB.3.5. Payment shall be as per Clause DB.8.14 but shall be measured as an extra over for Backfilling and Compaction as defined in Clause DD.8.3.

PS.DD.6 EXCAVATION TO SPOIL

Clause DD.8.2 (12) shall be replaced by the following:

The unit rate for excavation to spoil shall include for separation from suitable material, loading, deposition and spreading of excess and unsuitable material.

PS.DD.7 OVERHAUL

Notwithstanding the requirements of Clause DD.8.2 and DD.8.3 no additional payment shall be made for overhaul.

PS.EB GRADED CRUSHED STONE**PS.EB.1 BASE AND SUB-BASE****PS.EB.2 PRIMING****PS.EB.1 BASE AND SUB-BASE**

- (a) Details of the source of the supply of the base and sub-base material are required by the Engineer before roadworks commence.

A Certificate of Acceptance for these layers will only be issued by the Engineer when levels and densities are correct.

- The material for the graded crushed stone base shall conform to the requirements for a G2 graded crushed stone material as described in TRH 14 and will be subject to the prior approval of the Engineer's Representative.
- The material for a graded crushed stone sub-base shall conform to the requirements for a G5 graded crushed stone material as described in TRH 14 and will be subject to the prior approval of the Engineer's Representative.
- The material for a natural gravel sub-base shall conform to the requirements for a G5 natural gravel material as described in TRH 14 and will be subject to the prior approval of the Engineer's Representative.
- No additional payment shall be made for restricted conditions, and the Tenderer shall therefore make due allowance in the rate for the graded crushed stone layer for any additional work (including hand work) required to place, spread, process and compact the layer in restricted conditions.

PS.EB.2 PRIMING

After the issue of the Certificate of Acceptance referred to in PS.EB.1, the sub-base shall then be primed with an Inverted Emulsion Primer conforming to S.A.B.S. 1260 of 1979 and applied at the rate of 0,6 l/m².

PS.ED ROAD ASPHALT

- PS.ED.1 SMOOTHNESS APPLICABLE TO WEARING COURSE (CLAUSE ED.6.2)
- PS.ED.2 RESTRICTION ON PLACING OF ASPHALT
- PS.ED.3 PATCHING OF EXISTING SURFACE
- PS.ED.3.1 Construction
- PS.ED.3.2 Materials
- PS.ED.3.3 Measurement and Payment
- PS.ED.4 WEARING COURSE – HOT/WARM MIX ASPHALT MIXES AND DESIGN
- PS.ED.5 ASPHALT PRODUCTION
- PS.ED.6 LAYING OF ASPHALT
- PS.ED.7 LONGITUDINAL AND TRANSVERSE JOINTS
- PS.ED.8 SAW CUT TO LONGITUDINAL AND TRANSVERSE JOINTS

PS.ED.1 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). A Category "C" Road is required for the Upgrade of Nyonikayiphumuli and Lunguza Road.

PS.ED.2 RESTRICTION ON PLACING OF ASPHALT

The Contractor shall, wherever possible, complete the earthworks and compaction to sidewalks prior to the laying of the wearing course on the adjacent section of road so as to prevent construction plant and equipment from damaging the freshly laid wearing course.

PS.ED.3 PATCHING OF EXISTING SURFACE

Where existing roads are to be patched, or prior to resurfacing existing roads, those areas of the existing asphalt pavement which require patching will be marked by the Engineer.

PS.ED.3.1 CONSTRUCTION

In the areas to be patched the in-situ asphalt surfacing shall be removed to a depth of 100 mm. The sides shall be cut vertically with the edges square. The exposed surface shall be swept of all loose material, a tack coat applied to the bottom and sides and then patched with asphalt base course. After compaction the surface of the patch shall be flush with the adjacent road surface.

PS.ED.3.2 MEASUREMENT AND PAYMENT

The unit of measurement shall be the square metre (m²) and the rate shall include for removal of the in-situ layers, trimming the sides, compaction, application of the tack coat, supply and laying of the asphalt, loading and haulage to the tip of excess material.

PS.ED.4 WEARING COURSE: HOT/WARM MIX ASPHALT MIXES AND DESIGN

PS.ED.4.1 Asphalt Mix Requirements

There are a total of 9 mixes:

- 9 sand skeleton mixes (i.e. continuously graded mixes)

The required asphalt mixes are depicted in Table 5. However, traffic condition risk profiles require additional higher levels of design for particular mixes (Table 6).

Sand Skeleton Mixes (Sa)		Nominal Maximum Particle Size		
Traffic Condition Category		10.0	14.0	20.0
S	Standard Conditions	Sa-S10	Sa-S14	
H	Heavy Conditions	Sa-H10	Sa-H14	Sa-H20
V	Very Heavy Conditions		Sa-V14	Sa-V20
E	Extreme Conditions		Sa-E14	Sa-E20
Design Level	Mix Types			
Level I	Sa-S10, Sa-S14			
Level II	Sa-H10, Sa-H14, Sa-H20, Sa-V14, Sa-V20			
Level III	Sa-E14, Sa-E20			

Table 5 Asphalt Mix Requirements

Traffic Volume (million E80's)	Traffic Condition Category		
	Traffic Speed (km/h)		
	< 20	20 - 70	> 70
< 3	H	S	S
3 to 10	V	H	H
10 to 30	E	V	V
> 30	E	E	E

Table 6 Traffic Condition Risk Profiles

The typical use of various mix types and mix NMPS is portrayed in Table 7..

Asphalt Mix Use			Mix Type
Mix Nominal Maximum Particle Size (NMPS)			
10.0	14.0	20.0	
Patching/ Handwork			Sa
Wearing Course (Paved)			Sa, SMA
	Base Course (Paved)		Sa, EME

Table 7 Typical Mix Use

PS.ED.4.2 Asphalt Mix Design

Asphalt mix designs are required for every mix supplied. Mix designs for each mix type are to be conducted in accordance with the guidelines noted in Table 8.

Sand Skeleton Mixes	Sabita Manual 35	Design and use of asphalt in road pavements
Stone Mastic Asphalt (SMA)	Sabita Manual 35	Design and use of asphalt in road pavements (Appendix B)
Enrobé à Module Élevé (EME)	Sabita Manual 33	Interim design procedure for high modulus asphalt

Table 8 Asphalt Mix Design Guideline Documents

The mix design process shall consist of a laboratory design and a plant trial. Once satisfied that the laboratory design and plant trial meet the specified mix requirements, the contractor is to document the final mix parameters (i.e. the Job Mix Formula (JMF)). These parameters will be used for production quality control and acceptance purposes (see Table 9).

Grading
Voids in the Mix (@ design compaction)
Binder Content

Table 9 Mix Parameters for the Job Mix Formula

The contractor shall also include the following “mix characteristics” as a part of his mix design submission :-

- A unique identification number for every mix design
- The binder storage constraints (e.g. maximum storage times, etc.)
- The type of modifier used and the modified binder characteristics to TG1 (if applicable)
- Binder classification in terms of the SA PG Binder Classification System
- Whether the asphalt mix is using a Warm Mix Asphalt technology/additive. The contractor shall comment on any modifications to the “standard” mix design process consequential to the use of the Warm Mix Asphalt technology/additive.
- The maximum mix temperature in the truck at the exit from the plant (in line with industry norms)
- The minimum mix temperature in the truck on delivery (in line with industry norms)
- The minimum recommended mix temperature for compaction of the mix on site (in line with industry norms)
- Comment on any asphalt mix characteristics that should be brought to the attention of the asphalt paving/laying team on site (e.g. EME asphalt mix longitudinal joint construction)

Should substantial changes to material types and properties occur, the asphalt mix designs for affected mixes shall be reviewed and where necessary re-constituted and re-submitted for approval.

PS.ED.4.2.1 Sand Skeleton Mixes

Designs of sand skeleton asphalt mixes are to be conducted in accordance with the guidelines set out in Sabita Manual 35 “Design and use of asphalt in road pavements”. Designs are to be conducted in accordance with the appropriate level (i.e. I, II and III) as indicated in Table 5.

PS.ED.4.2.1.1 Level I Design

The Level I design is aimed primarily at verification of the mix volumetrics. However, a Level I design is a pre-requisite for the Level II and III designs.

Asphalt mixes shall achieve the volumetric criteria noted in Table 11 at the compaction effort noted in Table 10 with a design air void content of 4%.

Traffic Condition Category ¹	Marshall	Gyratory
	SANS 3001 AS1	AASHTO T 312
	No. Blows	N _{design}
Standard (S)	75+45	75

Table 10 Volumetrics Compaction Requirements (Level I)

	NMPS		
	10	14	20
VMA (min.)	15	14	13
VFB	65 - 75	65 - 75	65 - 75

Table 11 Mix Design Requirements (Level I)

Asphalt mixes designed at Level I shall meet the requirements for the empirical performance tests noted in Table 12.

Test	Requirement	Test Method
Modified Lottman (TSR)	0.8 min.	ASTM D 4867 M
Indirect tensile strength (@ 25°C)	900 kPa - 1 650 kPa	ASTM D 6931-07
Dynamic creep (@ 40°C)	10 MPa min.	CSIR RMT 004
Water permeability	0.1mm/s - 4 mm/s	EN 12697-19
Air Permeability (@ 7% Voids) (x 10 ⁻⁸ cm ²)	1.0 max.	TRH 8 App C
Marshall Stability, Flow and Quotient	Report	SANS 3001-AS2

Table 12 Empirical Performance Tests (Level I)

PS.ED.4.2.1.1.1 Particular Mix Requirements – Mix Sa-S10

Mix Sa-S10 is to be utilized for lightly trafficked residential streets and patching (handwork). Due attention should be paid to the recommendations of Sabita Manual 27 “Guidelines for thin hot mix asphalt wearing courses on residential streets “ in the design of mix “Sa-S10”. The additional mix characteristics noted in Table 13 are also required.

	NMPS
	10
Filler/Binder Ratio (Max.)	1.3
Binder Film Thickness (Min.)	7.5

Table 13 Mix Design Requirements

PS.ED.4.2.1.2 Level II Design

The compaction requirements for the Level I design as a precursor to the Level II performance design shall be as noted in Table 14. The design air void content shall be 4%.

Traffic Condition Category ¹	Marshall	Gyratory
	SANS 3001 AS1	AASHTO T 312
	No. Blows	N _{design}
Heavy (H) & Very Heavy (V)	-	100

Table 14 Volumetrics Compaction Requirements (Level II)

In addition to meeting the mix requirements outlined in the Level I design, the mix design at Level II shall meet the performance characteristics noted in Tables 15 and 16.

Property	Test conditions	Specification	Test method
Workability	Superpave gyratory compactor - air voids after 25 gyrations (max.)	7%	ASTM D 6925
Durability	Modified Lottman test conditions (min.)	0.8	ASTM D 4867M
Stiffness/ (dynamic modulus)	AMPT dynamic modulus @ 20°C Loading frequencies of 0.1, 0.5, 1, 5, 10, 25 Hz	Report	AASHTO TP 79
Permanent deformation	HWTT at relevant number of passes	See Table 16	AASHTO T 324
Fatigue	Four-point beam fatigue test @ 10°C, 10Hz to 50% stiffness reduction Strain levels 200, 400, 600µε	Report	AASHTO T 321

Table 15 Performance Tests (Level II)

Temperature Zone	HWTT Specification	
PG 58 Zone	6mm Rut	Stripping Point
No. of Passes (Min.)	16 000	10 000

Table 16 Hamburg Wheel Tracking Test Specifications

PS.ED.4.2.1.3 Level III Design

The compaction requirements for the Level I design as a precursor to the Level III performance design shall be as noted in Table 17. The design air void content shall be 4%.

Traffic Condition Category ¹	Marshall	Gyratory
	SANS 3001 AS1	AASHTO T 312
	No. Blows	N _{design}
Extreme (E)	-	125

Table 17 Volumetrics Compaction Requirements (Level III)

In addition to meeting the mix requirements outlined in the Level I design, the mix design at Level III shall meet the performance characteristics noted in Tables 15 and 16 with the additional test temperatures for Stiffness and Fatigue as indicated in Table 18.

Property	Test conditions	Specification	Test method
Stiffness (dynamic modulus)	AMPT dynamic modulus @ -5, 5, 20, 40, 55°C Loading frequencies of 0.1, 0.5, 1, 5, 10, 25 Hz	Report	AASHTO TP 79
Fatigue	Four-point beam fatigue test @ 5, 10 and 20°C, 10Hz to 50% stiffness reduction Strain levels 200, 400, 600µε	Report	AASHTO T 321

Table 18 Additional Temperatures for Stiffness and Fatigue Tests (Level III)

PS.ED.4.2.2 Warm Mix Asphalt

Should a Warm Mix Asphalt be used in the mix, the mix design shall incorporate the use of such a technology/additive in the mix design process. Any consequential deviations from the guidelines set out in Sabita Manual 35 “Design and use of asphalt in road pavements – Appendix B”, Sabita Manual 33 “Interim design procedure for high modulus asphalt” or standard industry practice shall be brought to the attention of the Roads Provision Department and shall be documented in the mix design report.

PS.ED.4.2.3 Mix Design Approval

No mixes may be supplied without approval of the mix design by the Senior Manager : Pavement & Geotechnical Engineering, Roads Provision Department.

The contractor shall label every mix design with a unique identification number to facilitate traceability of mixes using the mix design.

PS.ED.4.2.3.1 Mix Design Approval Process

The contractor shall submit his proposed mix design to the Roads Provision Department for acceptance of the mix design at least 2 weeks prior to initial supply of any particular mix.

Upon request by the Roads Provision Department, the contractor shall also supply samples of raw materials. The minimum sample sizes shall be 50 kg for each aggregate type/size and 5 litres of bitumen/binder. The contractor shall also supply any other relevant information as may be requested.

Once satisfied with the content of the mix design, the Senior Manager : Pavement & Geotechnical Engineering (or his nominee) will give signed approval for the mix.

PS.ED.4.2.4 Mix Design Review

Every mix design is to be reviewed at least annually or whenever there is a substantial change to material types and properties. The review should include verification of the asphalt mix through testing of at least the following characteristics:-

- (a) Binder compliance with SANS 4001-BT1
- (b) Modified binder compliance with TG1
- (c) Binder classification in terms of the SA PG Binder Classification System
- (d) Aggregate and filler compliance with Table 1
- (e) Aggregate BRD, ARD and water absorption
- (f) Mix binder content
- (g) Mix BRD and MTRD and voids
- (h) Particular mix type characteristics
 - a. Sand skeleton mixes
 - i. Level I design mix volumetrics
 1. All requirements in Table 11 and Table 13 (as applicable)
 - ii. Level I design mix performance characteristics

1. All requirements in Table 12
- iii. Level II design mix performance characteristics (Table 15)
 1. Workability
 2. Durability
 3. Permanent deformation
- iv. Level III design mix performance characteristics (Table 15)
 1. Workability
 2. Durability
 3. Permanent deformation

PS.ED.5 ASPHALT PRODUCTION

PS.ED.5.1 Mixing Plant

Asphalt shall be manufactured through a batch-mixing or drum-mixing plant (approved by the Roads Provision Department) such that the requirements of this specification can be met in full. The plant shall be operated and kept in a well maintained condition as directed by the Quality Management System. Records of such maintenance shall be made available on request.

All cold aggregates shall be stockpiled in a manner that precludes the possibility of aggregate contamination. At the very least aggregate stockpiles shall be physically separated on concrete slabs. Undue wetting/saturation of (particularly fine) aggregates shall also be prevented through covering (particularly fine) aggregate stockpiles with reinforced waterproof covers 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 cold feed hoppers.

Sufficient binder storage tanks shall be provided to ensure that adequate reserves are maintained for each binder type held without risk of contamination of binders. Binder storage tanks shall be heated in such a manner that the binder is not degraded during heating. The tanks shall also incorporate a circulating system for the binder.

The plant control panel shall enable the plant operator to have simultaneous view of the critical components of the plant inclusive of :-

1. Binder storage temperature
2. Cold hopper feed settings
3. Hot aggregate bin masses (as appropriate)
4. Binder feed rate
5. Plant speed (as appropriate)
6. Mixing temperature

The plant and its operation shall also conform to the requirements of the following legislation:-

- 1 Occupational Health and Safety Act
- 2 National Environmental Management : Air Quality Act

PS.ED.5.2 Quality Control

The quality of mix produced shall be monitored as directed in the contractor's Quality Management System. The asphalt mix constituents (i.e. binder and aggregates), and the asphalt mix produced shall be checked for compliance and consistency on a regular bases through routine process control testing. The results of such testing shall be available for review by the Roads Provision Department at all times.

PS.ED.5.3 Quality Management System

The Quality Management System (QMS) should include documentation outlining the asphalt mix design process, the annual mix review process and processes pertaining to delivery of the asphalt mix.

The QMS shall also include any agreed frequency of split sampling of either raw mix constituents or asphalt mixes (prepared as agreed) with the Roads Provision Department. Such samples are to be delivered to the eThekweni Municipality's Bitumen and Asphalt Laboratory located at the Roads Provision Asphalt Plant in uMhlathuzana Road. All samples shall be adequately and uniquely labeled so that the location of any related mix is readily traceable.

The QMS shall also document the processes to be followed whenever a deviation from specifications is identified. The Contractor shall provide full rectification of any work undertaken with such asphalt mix or materials.

Where applicable, testing is to be conducted using the SANS 3001 series of test methods.

The plant laboratory should be SANAS accredited for the tests undertaken. However, should the laboratory not be SANAS accredited, the Roads Provision Department will need to approve the laboratory for any test result to be considered valid.

In line with these processes, the QMS should include as a minimum per mix design, the material characterisation tests included in Table 21.

Quality Control Tests			Minimum Test Frequency
Binder	Penetration		Every batch delivered
	Softening Point		Every batch delivered
	SA PG Binder Classification		1 per 3 months
Aggregate	Coarse Aggregate	Aggregate Grading	Every batch delivered
		Flakiness Index (Max.)	1 per month
		Aggregates BRD, ARD and Water Absorption	1 per month
		ACV, 10%FACT	1 per month
		Polished Stone Value (Coarse Aggregates)	1 every year per stone type and source
	Fine Aggregate	Aggregate Grading	Every batch delivered
		Aggregates BRD, ARD and Water Absorption	1 per month
		Sand Equivalent (Fine Aggregates)	Every batch delivered
		Methylene Blue Adsorption Value	1 per month
Asphalt Mix	Temperature of Mix	In the truck at the exit weighbridge	Every load
		In the truck at the point of delivery	Every load
	Bitumen Content		1 test per 200 tons of output or part thereof per day
	Extracted Mix Aggregate Grading Analysis		1 test per 200 tons of output or part thereof per day
	Voids Analysis (Bulk Relative Density and Maximum Theoretical Relative Density)		1 test per 200 tons of output or part thereof per day

Table 21 Test Frequencies

PS.ED.5.2.2 Process Control

The mix temperature of the mix taken in the truck at the exit to the plant shall not exceed the value stated in the mix design. Furthermore, the temperature of the mix taken in the truck on delivery shall not be less than the value stated in the mix design.

Quality checks on mix production will be based on the Job Mix Formula (JMF) for the approved mix design. Tolerances on variation from the JMF are given in Table 22.

			Permissible Deviation from JMF (%)	
			Individual Results	Average of 3 Consecutive Results
Aggregate Fraction - Grading	Sieve Size (mm)	28	± 5.0	± 3.0
		20	± 5.0	± 3.0
		14	± 5.0	± 3.0
		10	± 5.0	± 3.0
		7.1	± 5.0	± 3.0
		5	± 4.0	± 2.5
		2	± 4.0	± 2.5
		1	± 4.0	± 2.5
		0.6	± 4.0	± 2.5
		0.3	± 3.0	± 2.0
		0.15	± 2.0	± 1.5
		0.075	± 1.0	± 1.0
Voids in the Mix (@ design compaction)		± 1.5	± 1.0	
Binder Content		± 0.3	± 0.2	

Table 22 Mix Production Property Limits

All process control testing undertaken by the contractor shall be signed off by the responsible person identified in the QMS and shall be made available to the Roads Provision Department.

1. All process control test results shall be referenced back to the unique Mix Design reference number.
2. Mix extraction gradings shall be made available within 48 hours of the asphalt being manufactured.
3. Binder content and void content shall be made available by 08:00am on the day following manufacture of the asphalt.

Should the test results not be provided as required or should the results fall outside the applicable specifications, the Roads Provision Department reserves the right to suspend any supply until the results are produced and the mix is accepted.

The Contractor shall be responsible for rectification of any work completed (or partially completed) with asphalt mix that does not meet the specification to the satisfaction of the Roads Provision Department. The processes related to the rectification of such work shall be outlined in the QMS.

PS.ED.5.2.3 Acceptance Testing

After reviewing the results of the process control testing, the Roads Provision Department may elect to conduct their own testing of the binder, aggregates or asphalt mix produced. A copy of test results will be submitted to the Contractor as soon as they are available.

Should the acceptance tests indicate that the mix (or any part thereof) is not to specification, the cost of any re-test by the Council shall be to the Contractor's account and shall be deducted from any payments owed to the Contractor.

PS.ED.5.2.4 On Site Mix Problems

The contractor shall also make himself available on site should the workability and compaction of the mix during the paving/laying operation be problematic in order to assist in troubleshooting the cause of such problems. If the root cause of the problem is related to the asphalt mix design, the contractor shall re-evaluate his mix design to correct such issues and re-submit his mix design for approval.

PS.ED.6 LAYING OF ASPHALT

- (a) The Contractor shall supply the Engineer with the name of the asphalt Sub-Contractor before asphalt is laid.

The asphalt shall be laid by an approved paving machine. Hand-laying shall be permitted at the Engineer's discretion when the area involved is small. The asphalt shall not be laid if its temperature is below 140°C.

The asphalt shall be rolled in accordance with the method described in chapter VI of the Asphalt Institute Paving Manual (MS-8). The density of the layer shall satisfy the following:

$X \geq 93\% \text{ Maximum Theoretical Relative Density (Rice S.G.)} + 0.5 S$ where:

X - arithmetic means of densities

S - standard deviation

and the maximum density at any point shall not be greater than 97% MTRD

An acceptance certificate for this layer will be issued by the Engineer's inspector when all requirements have been met.

- (b) In the event that there is a dispute between the Contractor and Council's test results, the layer shall be tested in accordance with Clause 6.5 of SANS 3001-AS10:2011, irrespective of the % voids, to determine its density.
- (c) Further to Clause ED.8.1, the rate tendered shall include for all extra work required to lay and compact the asphalt base and make-up courses in restricted areas.

PS.ED.7 LONGITUDINAL AND TRANSVERSE JOINTS

Tenderers are to note that the tendered rate per Section 3 Item ED.1 are not to include for saw cutting. If the Engineer requires the joint to be saw cut, the saw cutting to the longitudinal joint and transverse joint will be paid for under Section 3 Item ED.3.

A longitudinal joint is to be formed by cutting into the existing road surface by a width of 300 mm to a depth of 50 mm where the new surface is to be tied longitudinally into the adjacent existing pavement as shown on Typical Details (2). 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.

The unit of measurement shall be linear metre (m). The rate tendered shall cover the neat cutting of the joint, the cutting of the additional 150 mm step into the existing adjacent asphalt base layers as shown on Typical Details (2) and the removal of all the old asphalt to tip off site inclusive of haulage.

PS.ED.8 SAW CUT TO LONGITUDINAL AND TRANSVERSE JOINTS

The saw cut shall be cut with a diamond cutter to a neat uniform line 50 mm deep along the edge of the existing road where directed by the Engineer.

The unit of measurement for the saw cut shall be linear metre (m) and the rate shall cover the overall depth of cut.

PS.ED.9 Repair of existing surface (patching and pothole repairs)

(a) Category B

The existing asphalt surface (160mm) and crusher run (150mm) layer to be saw cut vertically and removed to spoil, a new layer of crusher run (G2) shall be laid and compacted to 98% Mod AASHTO to a final thickness of 150mm (i.e. compacted thickness). The formation will be compacted prior to placing of the crusher run layer.

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 0,6l/m² to the bottom and the sides and then patched with minimum two layers of the wearing course layer to a final thickness of 160mm. After compaction the surface of the patch shall be flush with the adjacent road surface.

(b) Category C

The existing wearing course (80mm) and crusher run (150mm) layer to be saw cut vertically and removed to spoil. A new layer of crusher run (G2) shall be laid and compacted to 98% Mod AASHTO to a final thickness of 150mm (i.e. compacted thickness). The formation will be compacted prior to placing of the crusher run layer.

The surface of this newly laid crusher run layer to be swept of all loose material, a 60% anionic stable emulsion grade track coat applied at an application rate of 0,6l/m² to the bottom and the sides and then patched with a 80mm layer of asphalt wearing course. After compaction the surface of the patch shall be flush with the adjacent road surface.

(c) Category D

The existing wearing course (50mm) and crusher run (150mm) layer to be saw cut vertically and removed to spoil. A new layer of crusher run (G2) shall be laid and compacted to 98% Mod AASHTO to a final thickness of 150mm (i.e. compacted thickness). The formation will be compacted prior to placing of the crusher run layer.

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 0,6l/m² to the bottom and the sides and then patched with a 50mm layer of asphalt wearing course. After compaction the surface of the patch shall be flush with the adjacent road surface.

(d) Category E

The existing wearing course (25mm) and crusher run (100mm) layer to be saw cut vertically and removed to spoil. A new layer of crusher run (G2) shall be laid and compacted to 98% Mod AASHTO to a final thickness of 100mm (i.e. compacted thickness). The formation will be compacted prior to placing of the crusher run layer.

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 0,6l/m² to the bottom and the sides and then patched with a 25mm layer of asphalt wearing course. After compaction the surface of the patch shall be flush with the adjacent road surface.

(e) Extruded Asphalt Haunch

Asphalt to comply with Clause EG.3.1 of the EtheKwini Municipality Standard Departmental Engineering Specification. Standard 150mm high mould to be used with extrusion machine.

The tendered rates shall include for removal of the existing haunch/kerbing to spoil, supplying, processing, laying and compacting 150mm high extruded asphalt haunch, applying prime/tack coat as required. The unit of measurement shall be in metres (m).

PS.EF KERBS AND HAUNCHES

- PS.EF.1 TYPE A BARRIER KERB AND CHANNEL / FILLET
- PS.EF.2 EXCAVATION FOR KERB AND CHANNEL / FILLET IN EXISTING GRADED STONE LAYER
- PS.EF.3 ADDITIONAL CONCRETE TO KERB FOUNDATION
- PS.EF.4 EXCAVATION FOR KERB AND CHANNEL / FILLET IN EXISTING ASPHALT LAYERS

PS.EF.1 TYPE A BARRIER KERB AND CHANNEL/FILLET

The kerbing to be used for this contract shall be a modified Type A barrier kerb and channel/fillet as detailed on Typical Details (2).

PS.EF.2 EXCAVATION FOR KERB AND CHANNEL/FILLET IN EXISTING GRADED STONE LAYER

The unit of measurement shall be the cubic metre (m³). The rate shall include all the materials, labour and plant necessary to scabble the existing G2 Graded Crushed Stone layer the width of the kerb base to be laid, the excavating, loading and transporting of surplus material to stockpile. The payment depth shall be 50 mm.

Over-excavation is likely to occur and this is to be made up in mortar (3 sand, 1 cement) Further to the above the rate tendered shall include for all additional mortar required to make up the over-excavated areas.

PS.EF.3 ADDITIONAL CONCRETE TO KERB FOUNDATION

The rates tendered for kerbs Type A and B shall be based on the minimum dimensions indicated on Typical Details (2). Where the asphalt layers necessitate an increase in the kerb foundation thickness, the supply of this additional concrete shall be paid for separately. The unit of measurement shall be the cubic metre (m³) and shall cover the supply and placing of the concrete, compaction and any formwork that may be required.

PS.EF.4 EXCAVATION FOR KERB AND CHANNEL/FILLET IN EXISTING ASPHALT LAYERS

The unit of measurement shall be the cubic metre (m³). The rate shall include all the materials, labour and plant necessary to cut two parallel joints in the existing asphalt the width of the kerb base to be laid, the excavating, loading and transporting of surplus material to the approved tip. Saw cutting, if necessary, shall be measured separately.

PS.EF.5 PRECAST CONCRETE KERB (TYPE E AND F)

Precast concrete kerbs shall be laid on the final asphalt surface with minimum 13 mm vertical joints and pressed onto a mortar bed so as to squeeze out surplus mortar giving a minimum final horizontal joint of 20 mm.

The kerbs supplied shall have a roughened surface on the face to be bonded.

The grade and level of the kerbs shall be maintained by the use of an approved cord or line. The Contractor shall place sufficient pegs to ensure that the kerbs are laid on an even grade and do not necessarily follow any uneven deflections in the road surface.

All horizontal and vertical joints shall be filled with mortar for their full width and depth. Expansion joints shall be provided at ± 18 m intervals as specified in clause EF.5.

The mortar mix shall be 3 sand : 1 cement.

Once the kerbs have been laid, a 100 mm x 100 mm "cast in situ" grade 20/13 concrete fillet shall be trowelled in neatly behind the kerbs so as to form a solid backing.

The unit of measurement shall be the metre (m) and the rate shall cover the supply of all precast items, including transporting, loading, setting out, laying and jointing, "cast in situ" concrete fillet, supervision, plant, testing, labour, equipment, materials, protection and incidentals necessary to complete the work as specified.

A reinforced precast transition kerb 0,5 m long shall be provided on either side of vehicle entrance scoops and pedestrian crossings.

PS.EL DUMPROCK SUBGRADE IMPROVEMENT**PS.EL.1 DUMPROCK**

Clause EL.3 shall be amended to read as follows:

The dumprock shall consist of fresh to slightly weathered ungraded waste rock from mining activities, blasting or rock excavation. Shales, slates or other laminated mudrocks shall not be accepted.

Dumprock shall have a maximum size not more than two-thirds of the compacted thickness of the layer. The rock shall otherwise be ungraded but shall contain less than 10% passing the 37,5 mm sieve when spread on site.

Dumprock shall have a minimum 10% FACT value of 100 KN when dry and 40 KN when tested drained after 24 hours soaking.

PS.F PROTECTION WORKS

- PS.F.1 TOPSOILING
- PS.F.1.1 Materials
- PS.F.1.2 Measurement and Payment
- PS.F.2 OVERHAUL
- PS.F.3 RE-ERECTING WIRE MESH FENCING
- PS.F.4 CONCRETE FOR FOOTINGS TO RETAINING WALL
- PS.F.5 INTERLOCKING EARTH RETAINING SYSTEMS / WALL

PS.F.1 TOPSOILING

PS.F.1.1 Materials

The soil shall be loamy with a well-defined crumb structure, neither too sandy nor too clayey. It shall contain evidence of fibrous plant roots and shall be free from perennial weed root stocks, stone, glass, metallic and plastic substances.

The imported topsoil shall be obtained from a source approved by the Engineer.

A sample of the topsoil shall be submitted to a SANAS accredited laboratory for testing as prescribed by the Engineer. Test results are to be forwarded to the Engineer for approval 4 weeks before the topsoiling operation commences.

PS.F.1.2 Measurement and Payment

The unit of measurement shall be the square metre (m²). Further to Clause F.8.1 and F.8.2, the rate shall include for the purchase, supply, transport, mixing, distributing, spreading, trimming and finishing of the topsoil and compost mixture.

PS.F.2 OVERHAUL

Notwithstanding the requirements of Clause F.8.1 and Clause F.8.2, no additional payment shall be made for haulage. The rates tendered for items in Part F of the Bill of Quantities shall include the cost of haulage.

PS.F.3 RE-ERECTING WIRE MESH FENCING

The unit of measurement shall be linear metre (m) and the rate shall include for the re-erection of the wire mesh fence previously stored on site.

The rate shall also allow for disposal to tip of all excavated material and leaving the area in a tidy and clean condition.

PS.F.4 CONCRETE FOR FOOTINGS TO RETAINING WALL

Clause F.8.7 (C): Concrete in footing shall be measured in m.

PS.F.5 INTERLOCKING EARTH RETAINING SYSTEMS / WALL

Approved GEOLOK 300 / GEOLOK 400 or similar SANS:508:2012 Standards approved drystack interlocking earth retaining system as detailed in Typical Details (2) and as directed by engineer on site. The materials required for the full construction of the retaining wall shall comply with the relative SANS:508:2012 / SABS standards. The rates shall be measured in square metres squared (m²) of slope area. The rate shall cover the supply and transport of suitable and approved retaining blocks filled with clean coarse sand, all materials including geofabric, 50mm diameter weepholes, excavation, preparation, backfilling behind wall and construction of the retaining wall fully as detailed on Typical Details (2).

The rate tendered shall be applicable to the SANS:508:2012 Standards approved dry-stack interlocking earth retaining system used for the construction of the retaining wall.

PS.F.6 A4 Geofabric or equivalent

The tendered rate shall include full compensation for supplying and placing A4 geofabric. The unit of measurement shall be in square meters (m²).

PS.GM GRAVEL ROAD MAINTENANCE**PS.GM.1 Supply and construct subsoil drainage**

The tendered rate shall include for the supply of all necessary material and construction of the subsoil drain as per attached drawing (Drawing No. 38575).

The unit of measurement shall be in metres (m).

Heavy Re-Gravelling**PS.GM.2 Rip and re-compact existing road surface**

Where instructed, the existing road surface shall be ripped full width to a depth of 150mm. All stones larger than 100mm in diameter shall be removed and disposed of. The material shall then be mixed; water added if necessary, placed and compacted to the specified MOD AASHTO to the correct shape profile with regards to cross-section. The unit of measurement shall be per km of road ripped and reworked.

PS.GM.3 Supply, place and process gravel material

Where instructed, the contractor shall be required to import, place, process and compact 150mm thick (after compaction) gravel selected pavement layer to the specified MOD AASHTO, to the correct shape profile with regards to cross-section on the road bed. The material shall comply with the requirements of specified gravel material quality (Refer to Table RSWM 1).

The tendered rate shall include full compensation for all costs associated with procuring the material, supply of material from an approved source, placing, processing, and compaction.

Haulage of the material is to be included in the tendered rate. The unit of measurement shall be in cubic meters (m³).

PS.PG NON-PRESSURE PIPELINES AND PRECAST CONCRETE CULVERTS

- PS.PG.1 SUBSOIL PIPES
- PS.PG.2 SUBSOIL DRAINS AND OUTLETS
- PS.PG.2.1 Connection of Subsoil Drains to Existing Stormwater System
- PS.PG.2.2 Subsoil Termination Stub
- PS.PG.3 STONE FOR SUBSOIL DRAIN FILTER
- PS.PG.4 RIVER SAND BACKFILL FOR SUBSOIL DRAIN FILTER
- PS.PG.5 GEOFABRIC BLANKET

PS.PG.1 SUBSOIL PIPES

The following clause shall replace Clause PG.3.5.

"These shall be "Geopipe" or equally approved plastic subsoil pipes complying with SABS 791 as amended.

- Hole Size : 5 ± 1 mm Diameter
- Diameter of Pipe : 100 ± 10 mm.
- Pipe Invert : 25% of the circumference of the pipe is to be free from slots or holes to form an invert to the pipe."

PS.PG.2 SUBSOIL DRAINS AND OUTLETS

Positions and type of subsoil drains have not been shown on the plans but will be indicated on site by the Engineer.

Subsoil drains shall be Type A, B or C as detailed on standard drawing No. 38575.

Subsoil pipes shall be "Geopipe" or equally approved plastic pipes conforming to SABS 791. The outfall end of each run of subsoil drain shall be built into the nearest inlet/manhole or headwall in accordance with Clause PG 5.5, or into a special outlet structure as detailed on the project drawings and measured under part PH.

PS.PG.2.1 CONNECTION OF SUBSOIL DRAINS TO EXISTING STORMWATER SYSTEM

Where subsoil pipes require to be built into an existing stormwater inlet/manhole or headwall, the unit of measurement shall be number (No.)

The rate tendered shall include for all labour and materials to construct the connection in accordance with Clause PG.5.5. and for trimming the geofabric at the connection.

PS.PG.2.2 SUBSOIL TERMINATION STUB

The final 1 metre length of the subsoil drain before the manhole/catchpit shall be 100 mm diameter non-perforated U.P.V.C. pipe.

The unit of measurement shall be number (No.). The rate shall include for the supply and laying of the pipe, and for all work necessary to tie into the stormwater manhole/catchpit.

PS.PG.3 STONE FOR SUBSOIL DRAIN FILTER / RETAINING WALL

The following clause shall replace Clause PG.3.10.

"The stone aggregate used for the subsoil drain filter shall consist of 19.0 mm crushed stone conforming to the following grading:

Sieve size mm	19.0	13.2	9.5	6.7	4.75
% Passing	100	85 - 100	0 - 50	0 - 25	0 - 5

PS.PG.4 RIVER SAND BACKFILL FOR SUBSOIL DRAIN FILTER

The following clause shall replace Clause PG.3.11.

"River sand for subsoil drain filter shall consist of clean river sand conforming to the following grading:

Sieve size mm	67	475	150	75
% Passing	100	90 -100	0 - 15	0 - 3

and having a Fineness Modulus of 2,0 - 3,5."

PS.PG.5 GEOFABRIC BLANKET

The geofabric shall comply with Clause PG.3.8 and the rate tendered shall include for wrapping the geofabric around either the subsoil pipe, subsoil drain or stone bedding.

PS.PG.6 Lower existing stormwater pipes: All sizes

The tendered rate shall include full compensation for all excavation, removing existing pipes, storing existing pipes, and relaying the pipes as per Engineer's instruction including for the backfilling thereof.

The unit of measurement shall be per meter (m).

PS.PH MANHOLES AND APPURTENANT DRAINAGE WORKS

- PS.PH.1 MANHOLES AND INLETS
- PS.PH.2 MANHOLES AND APPURTENANT WORKS: REVISED DRAWING NUMBERS
- PS.PH.3 BRICKS
- PS.PH.4 MANHOLES WITH TYPE S1, S2 AND D3 INLET COVERS
- PS.PH.5 INLET AND OUTLET HEADWALLS
- PS.PH.6 BRICK HEADWALLS TO DUCTS
- PS.PH.7 CONSTRUCTION OF MANHOLE / INLET OVER EX. STORMWATER PIPE
- PS.PH.8 CONVERT EXISTING MANHOLE TO TYPE S2 OR D3 INLET
- PS.PH.9 BREAK INTO EXISTING BRICK MANHOLE/INLET FOR STORMWATER PIPE

PS.PH.1 MANHOLES AND INLETS

Tenderers are to note that manholes and inlets shall be measured according to type and varying depth only. The rate tendered for the manholes/inlets shall include for the different pipe sizes and benching configurations.

The Contractor shall note that the rate for inlets shall include the cost of the graded channel in front of the inlet and / or splay and the cost of the transition kerb and channel upstream and downstream from each inlet. This will not form part of the payment for kerb and channel.

PS.PH.2 MANHOLES AND APPURTENANT WORKS: REVISED DRAWING NUMBERS

Clause PH.3.2.1.1 second paragraph is replaced by the following:

Details of the precast concrete components of standard manholes are shown on standard drawings 38570 for both foul-water sewers and stormwater drains, 38574 for foul-water sewers and 38571 for stormwater drains.

Clause PH.5.11 first paragraph:

Standard drawing 21701 is replaced by drawing 38574.

PS.PH.3 BRICKS

Clause PH.3.1 first paragraph shall be replaced by the following:

"Burnt clay masonry units for foul-water and stormwater sewer manholes, stormwater inlets and inspection chambers shall be Non-Facing Extra (NFX) with a nominal compressive strength of 14 MPa to S.A.B.S. 227:1986.

PS.PH.4 MANHOLES WITH TYPE S1, S2 AND D3 INLET COVERS

A number of Type "A" and "B" stormwater manholes with various types of inlet covers have been scheduled on this contract. The manholes are scheduled by type and in depth increments of 500 mm.

The unit of measurement shall be number (No.) and the tendered rate for each type shall include for the supply of all labour, plant and materials required to construct the manhole complete in accordance with the Standard Drawings and Specification, and inlet type cover as is specified in the contract drawings.

PS.PH.5 INLET AND OUTLET HEADWALLS

Drawing number 38576 shows details of outlet headwalls. The unit of measure for these headwalls shall be Number (No.) and shall include for all labour, plant and materials required for the construction of the headwall inclusive of the base and cut-off walls.

The construction of brickwork shall be as specified in Clause F.5.6.3. Mortar shall conform to mix Class A as defined in the latest edition of the Standard Building Regulations.

PS.PH.6 BRICK HEADWALLS TO DUCTS

Ducts shall have brick headwalls constructed at each end of the ducts, as shown on standard Drawing No. 38581. Bricks for these headwalls shall be Non-Facing Extra (NFX) with a nominal compressive strength of 14 MPa to S.A.B.S. 227:1986. Construction of brickwork shall be as specified in clause F.5.6.3. Mortar shall conform to mix Class A as defined in the latest edition of the Standard Building Regulations.

PS.PH.7 CONSTRUCTION OF MANHOLE / INLET OVER EXISTING STORMWATER PIPE

The unit of measurement shall be Number (No.).

Further to Clauses PH.8.2 and PH.8.3 the rate shall include for:

- (a) Breaking into the existing pipe
- (b) Cutting and reinstating the ends of the existing/new pipe.
- (c) The restricted working around the existing pipe.
- (d) Disposal of any spoil etc., to the tip.

PS.PH.8 CONVERT EXISTING MANHOLE TO TYPE S2 OR D3 INLET

The unit of measurement shall be Number (No.).

Further to Clauses PH.8.2 and PH.8.3 the rate shall include for:

- (a) Excavation for new splay sections
- (b) Add / demolish ex. brickwork to suit new road levels.
- (c) Add concrete & brickwork to new splay sections and apron
- (d) New precast concrete covers
- (e) Disposal of any spoil etc., to the tip.

PS.PH.9 BREAK INTO EXISTING BRICK MANHOLE/INLET FOR STORMWATER PIPE

The unit of measurement shall be Number (No.). Separate items have not been scheduled for each diameter of pipe to be connected to a manhole. The unit rate for breaking into a brick manhole to connect a stormwater pipe shall include for all the materials, labour and plant necessary for:

- (a) The breaking into the existing manhole, including the demolition of the benching necessary to accommodate the pipe.
- (b) The building in of the stormwater pipe, including the re-shaping and making good of benching and the disposal of all resultant rubble to approved tip.

PS.PH.10 Clearing and grubbing at inlet and outlet of existing Stormwater structures:

Upon instruction from the engineer, the existing inlet and outlet areas to existing stormwater pipe crossings shall be cleared to ensure smooth and uninterrupted flow of stormwater. The tendered rate shall include full compensation of removal to spoil of all excess material, trimming and shaping of the inlet and outlet area.

The unit of measurement shall be the number (No.) of inlet and outlet areas cleared.

PS.PH.11 Removal of silt and sand by excavation at inlet and outlet Stormwater structures:

Upon instruction from the engineer, the contractor shall remove all silt and sand build up at the existing inlet and outlet areas to existing stormwater pipe crossings, by excavation, to ensure smooth and uninterrupted flow of stormwater. The tendered rate shall include full compensation of all excavation and removal to spoil of all excess material, trimming and shaping of the inlet and outlet area.

The unit of measurement shall be in cubic metres (m³) removed and disposed of.

PS.PH.12 Unblocking and cleaning of existing stormwater pipe crossings:

Upon instruction from the engineer, the existing stormwater pipe crossings (all sizes) that are blocked with sand and debris shall be cleared and cleaned thus ensuring smooth, uninterrupted flow of stormwater. The rate tendered shall include the disposing of the excavated material to spoil.

The unit measurement shall be the length (m) of pipe cleared.

PS.PH.13 Construct inlet or outlet type “A’ headwall structure to existing or new pipe crossings as per attached drawing (Drawing No. 38576).

The tendered rate shall include full compensation for constructing inlet or outlet type “A’ headwall structure to existing or new pipe crossings as per attached drawing (Drawing No. 38576).

The unit of measurement shall be the number of inlet or outlet headwalls constructed per crossing.

PS.S REINSTATEMENT

PS.S.8.1 Re-instate Fencing

The tendered rate shall include for full compensation for re-instating fencing removed as the result of the upgrade.

The unit of measurement shall be in meters (m).

PS.TA ROAD SIGNS

- PS.TA.1 GENERAL
- PS.TA.2 ROAD SIGN BOARDS
- PS.TA.3 RE-ERECT ROAD SIGNS
- PS.TA.4 TEMPORARY ROAD SIGNS
 - PS.TA.4.1 Materials
 - PS.TA.4.2 Erection
- PS.TA.5 TIMBER POSTS
- PS.TA.6 DRUMS
- PS.TA.7 PROTECTION AND MAINTENANCE

PS.TA.1 GENERAL

The Tenderer shall make allowance in the time related rates under Section 1.AB in the Bill of Quantities rates, repositioning, covering/uncovering, relocating or removing temporary signs and other forms of road furniture as required during the progress of the works.

PS.TA.2 ROAD SIGN BOARDS

Further to Item TA.8.1, Tenderers are to note that the signs measured under this item are the various type of standard regulatory signs (e.g. stop, yield, keep left etc.).

Notwithstanding the requirements of Clause TA.8.1 the unit of measure shall be number (No.).

PS.TA.3 RE-ERECT ROAD SIGNS

The unit of measurement is number (No.) which shall consist of one pole and one sign.

The rate shall cover the cost of collecting the pole and sign from the site yard and planting of the pole in the PVC sign sleeve or ground, together with compacting the soil around the pole.

PS.TA.4 TEMPORARY ROAD SIGNS**PS.TA.4.1 Materials**

All temporary signs shall be manufactured from Chromadek steel plate as detailed under Clause TA.3.3 and retroflective material as follows:

Black	semi-matt finish
Yellow background (with no red material)	Class I
Yellow background (if red material used)	Class II
Red	Class I

With the exception of signs R1, R2, R3, R1.5A and R1.5B, the temporary road signs shall be in accordance with the colour code for temporary road signs.

PS.TA.4.2 Erection

The temporary road signs shall be erected in a manner such that the face of the sign is not defaced, obscured or deflected in any way.

Where necessary, for high visibility, the temporary signs shall be erected on 100 mm creosoted gum posts such that the underside of the sign is not less than 2,2 m above ground level. The post/s shall be supported in a drum/s which shall be ballasted and braced or stayed so that the sign cannot be blown over. In all other instances, the temporary signs shall be adequately secured to a drum.

PS.TA.5 TIMBER POSTS

The timber posts for the temporary sign supports shall be 100 mm diameter creosote gum posts.

PS.TA.6 DRUMS

All drums shall be white painted, 200 litre drums or similar approved by the Engineer. Drums shall not be used for delineation purposes.

PS.TA.7 PROTECTION AND MAINTENANCE

The Contractor shall protect and maintain all road furniture (road signs, delineators, drums, barriers, barricades etc.) throughout the course of the contract and shall be responsible for the cost of replacing any road furniture that may be damaged or stolen.

PS.TB ROAD MARKING

- PS.TB.1 PLASTIC ROAD MARKING MATERIAL
 PS.TB.2 LETTERING, SYMBOLS AND TRAFFIC ISLAND MARKING
 PS.TB.3 SANDBLASTING

PS.TB.1 PLASTIC ROAD MARKING MATERIAL

Further to Clause TB.3.1(c) the plastic road marking material shall comply with the requirements of Specification BS.3262, 1987 Part 3.

- (a) The material shall consist of a light-coloured aggregate, pigment and extender, bound together with a thermoplastic resin, plasticised as necessary.

The approximate composition of the material as laid is dependent on the appropriate specification, but for example shall be:

Aggregate	40 parts
Solid Glass Beads	20 parts
Pigment and Extender	20 parts
Binder	20 parts

The proportioning of the various ingredients shall be such that the material, when in a molten state, can be sprayed readily onto the road surface to give an even line of good definition.

- (b) Aggregate
 The aggregate shall consist of white silica sand, crushed calcite calcined flint, quartz, or other approved aggregate.
- (c) Reflectorisation
 The solid glass beads incorporated in the mixture shall comply with the Class A category of BS 6088 (1981), that is:

Sieve	% Retained
0,18 mm	0 - 3
0,850 mm	5 - 20
0,425 mm	65 - 95
Below 0,425 mm	0 - 10

Minimum of spherical beads by number 70%

- (d) Luminance
 The luminance factor of white SPRAYPLASTIC shall be not less than 70.
- (e) Flow resistance
 The percentage decrease in the height of the cone of SPRAYPLASTIC shall not be more than 25 after testing for 48 hours at 23 C (temperate grade) or 40 C (semi-tropical or tropical grades).

- (f) Low Temperature Impact Resistance
SPRAYPLASTIC shall pass the impact test when tested at -10 C (temperate grade) or -1 C (semi-tropical or tropical grades).
- (g) Abrasion resistance
The abrasive wear of SPRAYPLASTIC shall typically be less than 0,5 g per 100 revolutions.

PS.TB.2 LETTERING, SYMBOLS AND TRAFFIC ISLAND MARKING

Notwithstanding the requirements of Clause TB.8.1.2, traffic island marking shall be measured under Clause TB.8.1.1 lines.

PS.TB.3 SANDBLASTING

Where directed, the Contractor shall remove existing lane lines and painted islands by sandblasting. The Contractor shall ensure that the method of sandblasting used will not damage the road surface permanently.

The Contractor shall take all necessary precautions to avoid damage to the public traffic during the removal of existing markings.

All loose material remaining on the road after obliteration of markings shall be suitably disposed of to avoid clogging the drainage systems.

The unit of measurement shall be the square metre (m²). The rate shall include for the successful removal of the paint on the road surface, the continual sweeping and removal of grit and the screening of the sand blasting apparatus to ensure that the dust from the operation does not become a hazard.

PART ED : ROAD ASPHALT (Applicable to Gravel Road Maintenance)**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.3.3 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.3.6 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

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

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

ED.8 MEASUREMENT AND PAYMENT

ED.8.1 Asphalt Base Course

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

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

ED.8.2 Asphalt Wearing Course

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

ED.8.3 Tie in Joints

ED.8.3.1 Transverse Joint

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

ED.8.3.2 Longitudinal Joint

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

ED.8.3.3 Feathered Transverse Joint

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

ED.8.4 Tack Coat

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

GRAVEL ROAD MAINTENANCE AMENDMENTS TO THE STANDARD 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 Ethekweni 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 Ethekweni 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 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 a new, for each day that the asphalt is to be collected.*

All correspondence is to be addressed to The Asphalt Manufacture / Paving Superintendant 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 Ethekweni 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 $4,7 \pm 0,3\%$.

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 APHALT 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

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

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

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 tack coat applied at an application rate of 0,3l /m² to the bottom and the sides and then patched with a 80 mm layer of asphalt wearing course. After compaction the surface of the patch shall be flushed with the adjacent road surface.

(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 tack coat applied at an application rate of 0,3l /m² to the bottom and the sides and then patched with a 50 mm layer of asphalt wearing course. After compaction the surface of the patch shall be flushed with the adjacent road surface.

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).

AAED.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

COLTO SPECIFICATIONS**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 3rd edition 2015 published by the South African Institution of Civil Engineering (SAICE), together with the Special Conditions of Contract form part of the contract.

All references in the COLTO Standard Specifications for Road and Bridge Works are to the COLTO General Conditions of Contract for Road and Bridge Works for State Road Authorities. Consequently, all references in the COLTO Standard Specifications 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 3rd edition 2015 applicable for this Contract.

Whereas every effort has been made to include all of the affected clauses in the table, there may be some omissions. In every case, however, the SAICE General Conditions of Contract for Construction Works 3rd edition 2015 reference, as amended by the Special Conditions of Contract in the Contract Data, shall apply and the Contractor shall be responsible for interpretation of the equivalent clause.

TABLE B1115: REFERENCES IN COLTO STANDARD SPECIFICATIONS TO THE COLTO GENERAL CONDITIONS OF CONTRACT AND RELEVANT SAICE GENERAL CONDITIONS OF CONTRACT FOR CONSTRUCTION WORKS 3rd EDITION 2015

COLTO Standard Specification		COLTO General Conditions of Contract 1998		SAICE General Conditions of Contract for Construction Works 3 rd edition 2015	
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)	Certificate of practical completion	514.1	Certificate of Practical Completion
		54(2)		514.2	
		54(3)		514.3	
1212(l)	1200-7	49:		6.8:	
		49(2)	Contract Price Adjustment Factor	6.8.2	Contract Price Adjustment Factor
1215	1200-9	45	Extension of time for completion	5.12	Extension of time for completion
1217	1200-10	35	Care of the Works	8.2	Care of the Works
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

COLTO Standard Specification		COLTO General Conditions of Contract 1998		SAICE General Conditions of Contract for Construction Works 3 rd edition 2015	
Clause No	Page No	Clause No	Description or Reference	Clause No	Description or Reference
		53	Variations exceeding 20%	6.11	Variations exceeding 15%
1303	1300-2	12 & 45: 12 45	Commencement of Works and Commencement Date Extension of time for completion	5.3 & 5.12: 5.3.1 5.12	Commencement of the Works Extension of time for completion
1403 (c)(ii)	1400-4	40(1)	Valuation of variations	6.4.1	Valuation of variations
1505	1500-3	40: 40(1)	Valuation of variations	6.4 6.4.1	Valuation of variations
1507 Items: 15.08 15.09 15.11	1500-8	48: 48.1	Provisional Sums	6.6: 6.6.1	Provisional Sums
3108 Note (2)	3100-4	40: 40(1)	Valuation of variations	6.4: 6.4.1	Valuation of variations
3204 (b)(iii)	3200-2	40: 40(1)	Valuation of variations	6.4: 6.4.1	Valuation of variations
3303(b)	3300-2	2	Engineer and Engineer's Representative	3	Engineer and Engineer's Representative
5803(c)	5800-3	40: 40(1)	Valuation of variations	6.4: 6.4.1	Valuation of variations
5805(d)	5800-4	40: 40(1)	Valuation of variations	6.4: 6.4.1	Valuation of variations
5809 Item 58.10	5800-10	48: 48.1	Provisional Sums	6.6: 6.6.1	Provisional Sums
8103(c)	8100-1	40: 40(1)	Valuation of variations	6.4: 6.4.1	Valuation of variations
8117 Item 81.03	8100-26	22	Clearance of site on completion	5.15	Clearance of site

SECTION 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:

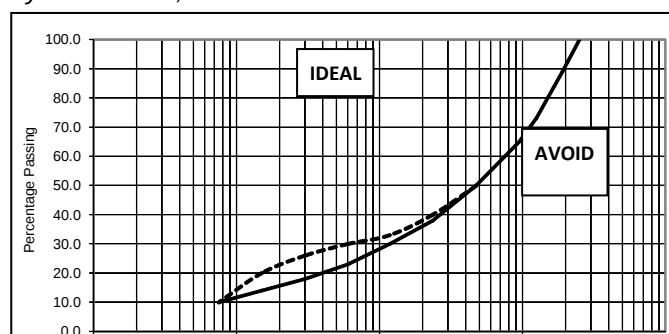
- The extent of the recycling work in terms of length and width to be recycled;
- Traffic accommodation during construction;
- The depth to which the materials in the existing pavement are to be recycled;
- The different materials that will be encountered in the recycling horizon;
- The degree of pulverisation 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 $\pm$ 200mm 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 ($\pm$ 5m) 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 tired 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.

B10111.2 Pre-pulverising material in the existing pavement using a milling machine

- (i) **Milling to break down asphalt layers in excess of 101 but not more Than 160mm.....square metre (m²)**

The unit of measurement shall be the square metre of existing road surface that is pre-pulverised in situ, as instructed by the engineer, regardless of the hardness or type of material encountered in the existing pavement. The quantity shall be calculated from measurements of the actual width pre-pulverised and shall not be increased to include any allowance for overlaps between adjacent cuts, nor for the number of cuts required to cover the width of pre-pulverising.

The tendered rate shall include full compensation for setting out the works, for pre-pulverising all types of material in the existing pavement structure, for controlling the depth of pre-pulverising, for the addition of water whilst pre-pulverising, for mixing, placing, cutting levels and compacting the material to a nominal density of 95% of the modified AASHTO density.

B10111.3 New material imported for modification of existing pavement layers:

- | | |
|---|------------------|
| (a) Crushed stone (G2) from commercial sources | tonne (t) |
| (b) Crusher dust from commercial sources | tonne (t) |

The unit of measurement shall be the tonne of new material imported on to the road, as instructed by the Engineer. The quantity shall be taken from delivery notes, unless instructed by the Engineer that the quantity be determined from cross-sections.

The tendered rate shall include full compensation for procuring the material, from commercial sources, for loading and transporting to site, for dumping, spreading, mixing by grader with water (if required), cutting levels and compacting the material to a nominal density of 95% of the modified AASHTO density.

The rate tendered for material obtained from commercial sources shall include for all transport costs, regardless of the distance the material is hauled.

Note. No additional payment shall be made for working in restricted widths of 1.0m on the shoulders and the tendered rates shall make provision for working in such restricted widths.

B10111.4 New pavement layer constructed by in situ recycling:**(a) Subbase layers (all materials), compacted to the specified density, stabilised:**

(i)	150mm to 200mm.....	cubic meter (m ³)
(ii)	201mm to 250mm.....	cubic meter (m ³)
(iii)	251mm to 300mm.....	cubic meter (m ³)

(b) Base layers (all materials), compacted to the specified density, stabilised:

(i)	100mm to 150mm	cubic meter (m ³)
(ii)	151mm to 200mm	cubic meter (m ³)

The unit of measurement shall be the cubic metre of completed stabilised layer. The quantity shall be calculated in accordance with the authorised dimensions of the layer. The quantity shall not be increased to include any allowance for overlaps between adjacent cuts, nor for the number of cuts required to cover the width of the road.

The rates tendered shall include full compensation for setting out the works and for all plant, labour, materials and other incidentals required for recovering and breaking down the material to the prescribed depth, regardless of whether the recovered material consists entirely of in situ pavement material, a blend of in situ material and pre-treated material and/or new imported material and regardless of the hardness or type of in situ material; for mixing the recovered material with stabilising agents, active filler (excluding the provision of the stabilising agents and active filler which shall be measured and paid for separately) and water (including the provision of water); for placing, spreading and compaction; for cutting levels, final compaction and finishing off the layer. The rates shall also include for protection and maintenance of the new layer (excluding the application of the fog spray) and for conducting all quality control inspections, measurements and tests.

B10111.6 Stabilising agents:**(a) Cementitious stabilising agents (and active fillers)**

(i)	Cem II 32.5	ton (t)
(ii)	Road lime	ton (t)

(b) Bituminous stabilising agents

(i)	Bitumen emulsion (type specified).....	ton (t)
(ii)	Foamed bitumen from 70/100 Pen-grade bitumen	ton (t)

The unit of measurement shall be the ton of stabilising agent/dispersing agent actually consumed in the recycling / stabilising process. Measurement shall be based on assized weighbridge tickets issued for each and every tanker load of bitumen consumed in the recycling process. The measured quantity shall not exceed the calculated theoretical quantity by more than 5%. The measurement for bitumen stabilising agents shall provide for double treatment over a nominal 100mm overlap width along longitudinal joints.

The tendered rates for cementitious stabilising agents shall include full compensation for procuring and providing the stabilising agent or active filler on site, for all handling and temporary storage requirements, for setting out and spotting bags/pockets in a grid matrix along the line of cut, for opening, emptying and spreading the contents of the bags/pockets accurately within the confines of the relevant cells, for collecting and disposing of all empty bags/pockets, for all wastage and for adhering to all safety measures whilst handling the bags/pockets.

The tendered rate for bituminous stabilising agents/active fillers shall include full compensation for procuring and transporting the material to site, for transfer into storage tanks, storage, heating and transfer into tankers for coupling to the recycling train, for all transport on site, for issuing the required assized weighbridge ticket showing the mass of bitumen contained in the tanker, for any re-heating required, for all wastage and for strict adherence to all safety measures required when handling warm or hot bitumen. For foamed bitumen, the rate shall include for foaming the bitumen on the recycler, including the water and any other additive that may be required to achieve the minimum foaming characteristics and for injecting the foamed bitumen in to the recycled material. The rate shall exclude for slushing with a dilute bitumen emulsion, which will be paid separately if requested/the need arises

The tendered rate shall include full compensation for gathering the surplus material by windrowing or pushing it into heaps, for loading and transporting to a designated spoil or stockpile site within a 10 km radius, for offloading and either spreading the material or placing in neat stockpiles.

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

"The unit of measurement shall be the cubic meter of material processed/mixed in a Static Plant recycler – KMA or similar and used in construction, measured in place after compaction.

"The tendered rates shall include full compensation for processing/mixing the bitumen recycled reclaimed asphalt material in a mobile mixing plant – KMA 200 or similar, addition of bitumen and 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.....number (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.*

WATER NETWORKS INSTALLATION AND REPAIRS - RELATED STRUCTURES PROJECT SPECIFICATIONS

Disaster Specification – Water Networks Operations

This document outlines the scope and specifications for *As-and-When* disaster-related response contracts about water networks operations, with a specific focus on flood management. The aim is to ensure rapid, efficient, and professional intervention if flooding affects water infrastructure across bulk and reticulation systems.

Key areas include damage to servitudes, embankments, slopes, and foundations caused by erosion, landslides, and soil settlement. Additionally, the contract encompasses the restoration of pipework, distribution networks, treatment facilities, and bulk infrastructure. Critical components such as electrical systems, SCADA networks, and water storage tanks are also covered for repair, replacement, or decontamination as needed.

This specification serves as the basis for emergency response measures to ensure the continuity of water services during and after flood-related disasters.

Technical Specification

Water Networks Operations – Bulk Division & Construction

In the event of natural disasters such as floods, the operations of water networks are significantly impacted, often alongside sanitation infrastructure. Due to the common practice of laying water and sanitation pipelines within the same trenches—frequently intersecting and running parallel—damage to one system often affects the other. In such scenarios, particularly during flood recovery, it is typically necessary to repair sewer lines prior to addressing water supply lines to ensure safety and functionality. As a result, the restoration of sanitation infrastructure becomes a critical priority. This highlights the importance of coordinated response efforts among various departments, including water services, sanitation, and civil works, to ensure the effective and efficient reinstatement of public infrastructure.

Component	Specification (Damage/Repair Focus)	Standard (SABS / Applicable)
Pipes (All types & sizes)	Bursts, ruptures, displacements, joint leaks	SABS 966, SANS 10268
Pipe fittings & joints	Damage, dislocation, leaks, corrosion	SABS 664, SANS 50976
Pipe bridges/pipes on bridges	Pipe movement, breaks due to vibration or flooding	SANS 1200, DWS Bridge Guidelines
Scour valves	Erosion damage, valve failure, or blockages	SANS 664, OEM Standards
Water meters	Damage, destruction, or displacement	SANS 1529
Valves (including PRVs)	Failure due to pressure surges, water hammer, flooding	SABS 664, OEM Standards
Water kiosks	Structural damage, disconnection from main supply, vandalism	Municipal Design Standards

Water chambers / valve boxes	Flooding, access blockage, debris accumulation, structural damage	SANS 1200 GA
Distribution pipelines	Damage, misalignment, contamination	SANS 10125, SANS 10268
Reticulation network	Local supply interruptions due to flooding, leaks, or blockages	Municipal Engineering Guidelines
Reservoirs	Contamination, overflow, structural erosion, wall damage	SANS 10252, DWS Reservoir Guidelines
Treatment plants	Inundation, equipment failure, chemical contamination	SANS 241, DWS Guidelines
Raw/treatment pump stations	Electrical/mechanical failure, pump damage	SANS 10142, OEM Specs
SCADA systems	Communication or control failure, data loss	OEM/System Integrator Standards
Electrical infrastructure	Substations, panels, control circuits damaged by water ingress	SANS 10142, SANS 141
River crossings	Washed out supports, pipe exposure, erosion	SANS 1200 GE, DWS Specs
Road servitudes & layers	Surface washouts, slope failure, access loss	SANS 1200 ME, SANRAL Guidelines
Earthworks	Erosion of slopes, loss of compaction, landslides	SANS 1200 DA, SANS 2001
Gabion mattresses	Washed out, destabilized, or collapsed erosion control systems	SANS 1200 DK
Backfilling material supply	Replacement of eroded soil in trenches and servitudes	SANS 1200 DM
Standpipes & fire hydrants	Damage from debris, water hammer, dislodgement	SANS 1128
Relays of damaged pipelines	Reinstallation and realignment of pipes due to irreparable damage	SABS 966, SANS 10268
Re-routing of pipelines	Emergency diversion of water mains around inaccessible or destroyed zones	Municipal Engineering Practice
TLB usage	Excavation for pipe repair, backfilling, trenching	OEM / Safety Standards
Excavators' usage	Deep excavation, removal of debris, slope stabilization	OEM / Plant Safety Regulations

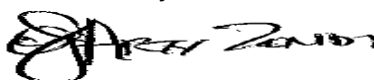
C3.4: PARTICULAR SPECIFICATIONS

In addition to the Standardized and Project Specifications the following Particular Specifications / Policies shall apply to this contract:

C3.4.1 Part AH - OHSA 1993 Safety Specification**ETHEKWINI MUNICIPALITY**

Occupational Health & Safety Unit

**37.2 Agreement in terms of Occupational Health and Safety Act No. 85 of 1993**

Document Title	37.2 Agreement in terms of OHS Act of 1993
Client	eThekwini Municipality – Programme Management Directorate
Project Name	As and when rates-based contract for Disaster response in the Central Region for 36 months
Contract Number	1A – 33571
Revision	01
Date	18/09/2025
Internal Reference no.	37.2 AGM/098/09/2025
Compiled by (Safety officer)	Name and surname: Siya Nkosi Signature:  Date: 18 September 2025
Reviewed by (Manager: Safety & Risk)	Name and surname: Arty Zondi Signature:  Date: 18 September 2025

ETHEKWINI MUNICIPALITY
OCCUPATIONAL HEALTH AND SAFETY



**OCCUPATIONAL HEALTH AND SAFETY ACT 1993, (ACT NO. 85 OF 1993)
MANDATORY AGREEMENT – 37.2**

Service Provider Acknowledgement of Responsibility in terms of the Occupational Health and Safety Act

Written agreement between ETHEKWINI Municipality (the “employer”)
And

(the “Service Provider”)

as provided for in terms of Section 37 (2) of the Occupational Health and Safety Act No.85 of 1993 as amended by Act 181 of 1993.

I hereby declare that I,, am authorised to represent the “Service Provider” and acknowledge that the “Service Provider” is an employer in its own right with all duties and responsibilities as prescribed in the Occupational Health and Safety Act no. 85 of 1993.

I agree to ensure that all work performed, or machinery and plant used by the “Service Provider” on any ETHEKWINI Municipality premises shall be in accordance with the provisions of the said Act.

Furthermore, I agree the “Service Provider” shall comply with all ETHEKWINI Municipality site rules and safety, health, and environmental requirements as may be communicated or stipulated by ETHEKWINI Municipality prior to and during any Contract awarded to the “Service Provider” by ETHEKWINI Municipality.

Furthermore, I undertake to ensure that ETHEKWINI Municipality is timeously informed should the “Service Provider”, for whatever reason, be unable to perform in terms of this agreement.

The Service Provider’s driver must obey the traffic signs and speed limit within eThekwinI Municipality premises.

The Service Provider shall ensure his/her vehicles are in good working condition.

The Service Provider must ensure that all his or her employees have a valid medical certificate of fitness.

The Service Provider shall ensure that all employees under his/her control are wearing the appropriate Personal Protective Equipment.

The Service Provider shall be familiar with the Programme Management Directorate emergency evacuation plan in the event of any emergency.

The Service Provider must be registered and in good standing with the Compensation for Occupational Injuries and Diseases Commissioner or Person Accident Cover.

Signed thisday of20.....

On behalf of the “Service Provider” (print)

(sign)

On behalf of the “employer” (print)

(sign)

C3.5: CONTRACT AND STANDARD DRAWINGS

C3.5.1 CONTRACT DRAWINGS / DETAILS

If required, the Engineer will deliver to the Contractor copies of any drawings and any instructions required for the commencement of the works. From time to time thereafter during the progress of the works, the Engineer may issue further drawings for construction purposes as may be necessary for adequate construction, completion and defects correction of the works.

All drawings and specifications and copies thereof remain the property of the Employer, and the Contractor shall return all drawings and copies thereof to the Employer at the completion of the contract.

DRAWING TITLE	DRAWING TITLE
Typical Details	Typical Details (1)
	Typical Details (2)

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
43120	Typical Details of Grid Inlets	February	1990

PART C4: SITE INFORMATION

C4.1 LOCALITY PLAN

The locality plan will be included in the Task Order documentation.

C4.2 CONDITIONS ON SITE

The specific geotechnical information or other site information will be included in the Task Order documentation.

C4.3 TEST RESULTS

Any no specific test results will be included in the Task Order documentation.

C4.4 REGION EXTENTS

The Regions, North, Central, South, West 1, and West 2, are indicated on the next page.

Region Map