



police, roads and transport

Department of
Police, Roads and Transport
FREE STATE PROVINCE

FREE STATE PROVINCIAL GOVERNMENT DEPARTMENT OF POLICE, ROADS AND TRANSPORT

TENDER NUMBER: PR&T/BID06/2022/23

**APPOINTMENT OF A CONTRACTOR WITH CIDB GRADING 6CE PE OR HIGHER FOR THE
UPGRADING OF THABA NCHU PUBLIC TRANSPORT ROUTE**

CLOSING DATE: 16 SEPTEMBER 2022

A CIDB GRADING MINIMUM: 6 CEPE OR HIGHER

CONTRACT NUMBER C.....2022

VOLUME 1: PROJECT DOCUMENT

ISSUED BY:



police, roads and transport

Department of
Police, Roads and Transport
FREE STATE PROVINCE

Department of Police, Roads & Transport
P.O. Box 119
Medfontein Building
3rd Floor, Room 325
St Andrews Street
BLOEMFONTEIN

Contract Manager :
Mr. T.J. Mosianedi
Tel: (051) 409 8595
E-mail: mosianedit@freetrans.gov.za

PREPARED FOR:



police, roads and transport

Department of
Police, Roads and Transport
FREE STATE PROVINCE

Department of Police, Roads & Transport
P.O. Box 119
Medfontein Building
3rd Floor, Room 325
St Andrews Street
BLOEMFONTEIN
9300

TENDERER:

TENDER AMOUNT (INCL. VAT):

(from C2.4.1: Summary of Bill of Quantities, page C2-8)

LIST OF CONTRACT DOCUMENTS

The following documents form part of this contract:

Volume 1: The **GCC 2015** – New Engineering Contracts issued by the South African Institute of Civil Engineering (see Note 1 below).

Volume 2: The **COTO** Standard Specifications for Road and Bridge Works 1998, issued by the Committee of Transport Officials which the tenderer shall purchase himself / herself (see Note 2 below).

Volume 3: The **Project Document**, containing the tender notice, Conditions of Tender, Tender Data, Returnable Schedules, general and particular conditions of contract, project specifications, Pricing Schedule, Form of offer and Site Information is issued by the Employer (see Note 3 below).

The Employer's Form of Acceptance and any correspondence from the selected tenderer, performance security-demand guarantee and all addenda issued during the period of tender will also form part of this volume once a successful tenderer has been appointed.

This volume also includes the Environmental Management Plan and details of the Materials Investigation (if applicable).

Volume 4: The road works drawings (if applicable).

Notes to Tenderer:

Note 1: Volume 1 is obtainable from SAICE, Private Bag X200, Halfway House, 1685.
Tel: (011) 8055947/8, e-mail: civilinfo@saice.org.za.

Note 2: Volume 2 is obtainable from SAICE, Private Bag X200, Halfway House, 1685.
Tel: (011) 8055947/8, e-mail: civilinfo@saice.org.za.

Note 3: Volume 3 is issued at tender stage by the Head: Department of Police, Roads and Transport and contains the following files:

At Contract stage Volume 3 will be a bound signed paper copy containing the following documents:

- Returnable schedules relevant to the project
- Agreements and Contract Data
- Pricing Data
- Scope of Work
- Site Information

Note 4: Information provided by a tenderer over and above the above elements of volume 3 shall be treated as information only and will only be bound into the document if the tenderer notes on Form A4: Schedule of Variations or deviations that the information has a bearing on the tender price.

Note 5: For alternative offers the tenderer shall submit the following additional documentation, clearly marked as ALTERNATIVE, in a separate neatly bound file in the following order:

- Form of Offer and state "Alternative Form of Offer";
- All returnable schedules applicable to alternative offer, as is appropriate;
- Alternative Pricing Schedule;
- Other relevant information.

THE UPGRADING OF THABA NCHU PUBLIC TRANSPORT ROUTE FOR 10 KM'S

CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE</u>	<u>COLOUR</u>
	FOREWORD	(ii)	White
<u>THE TENDER</u>			
PART T1	TENDERING PROCEDURES	T1-2	
T1.1	TENDER NOTICE AND INVITATION TO TENDER	T1-3	White
T1.2	STANDARD CONDITIONS OF TENDER	T1-4	Pink
T1.3	TENDER DATA	T1-14	Pink
PART T2	RETURNABLE DOCUMENTS	T2-1	
T2.1	LIST OF RETURNABLE DOCUMENTS	T2-2	Yellow
T2.2	RETURNABLE SCHEDULES	T2-3	Yellow
T2.2.1	RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES	T2-3	Yellow
T2.2.2	PREFERENTIAL PROCUREMENT SCHEDULES AND AFFIDAVIT	T2-33	Yellow
T2.2.3	PRO-FORMS TO BE SUBMITTED BY SUCCESSFUL TENDERER	T2-34	Yellow
<u>THE CONTRACT</u>			
PART C1	AGREEMENT AND CONTRACT DATA	C1-1	
C1.1	FORM OF OFFER AND ACCEPTANCE	C1-3	Yellow
C1.2	CONTRACT DATA	C1-7	Yellow
PART C2	PRICING DATA	C2-1	
C2.1	PRICING INSTRUCTIONS	C2-2	Yellow
C2.2	BILL OF QUANTITIES	C2-5	Yellow
PART C3	SCOPE OF WORK	C3-1	
C3.1	STANDARD SPECIFICATIONS	C3-3	Blue
C3.2	PROJECT SPECIFICATIONS	C3-4	Blue
C3.3	PARTICULAR SPECIFICATIONS	C3-76	Blue
PART C4	SITE INFORMATION	C4-1	C4.1
	LOCALITY PLAN	C4-3	Green

FOREWORD

This document consists of two sections, namely the **TENDER** and the **CONTRACT**.

THE TENDER consists of two parts, namely:

- **T1: Tendering Procedures** Volume 1
- to be complied with by every Tenderer submitting a tender offer,
- and
- **T2 : Documents to be returned by the Tenderer** Volume 1
- including the returnable schedules and forms to be completed by each Tenderer, some of which will eventually be incorporated into the contract between the successful Tenderer and the Employer.

THE CONTRACT consists of four parts, namely:

- **C1: Agreements and Contract Data** Volume 1
- **C2: Pricing Data** Volume 1
-
- **C3: Scope of Work** Volume 1
(Specifications and Project Specifications)
- and
- **C4 : Site Information** Volume 1

THE UPGRADING OF THABA NCHU PUBLIC TRANSPORT ROUTE FOR 10 KM'S

THE TENDER

PART T1 : TENDERING PROCEDURES

PART T: TENDERING PROCEDURES

CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
T1.1	TENDER NOTICE AND INVITATION TO TENDER	T1-3
T1.2	STANDARD CONDITIONS OF TENDER	T1-4
T1.3	TENDER DATA	T1-14

T1.1 TENDER NOTICE AND INVITATION TO TENDER

T1.1.1 The Department of Police, Roads and Transport, Free State Provincial Government, invites tenders for **“THE UPGRADING OF THABA NCHU PUBLIC TRANSPORT ROUT FOR 10 KM’S”**

T1.1.2 Tenderers should have a **CIDB** Contractor grading designation of 6CE PE or higher.

T1.1.3 Tenderers must be registered with the **CIDB** in a **CE** class of construction works.

T1.1.4 Preferences

The Tender will be subjected to **B-BBEE** preferential procurement policy framework as amended.

A minimum of 30% of the Contract Value **MUST** be sub-contracted to **local Contractors**.

Evaluation and Adjudication of bids: bid will be evaluated and adjudicated in terms of the Department of Police, Roads and Transport *Supply Chain Management Policy and Preferential Procurement Framework Act No. 5 of 2000. The 90/10 in preferential procurement points system as outlined in the bid document will apply. Preferential points will be given in terms of the Preferential Procurement Regulations, 2017.*

T1.1.5 Tender Documents

The tender documents will be given to the respective contractors on the day of tender briefing

Queries relating to the issues of these documents may be addressed to:

Mr. V. Ntaka
Tel no. 051 409 8687
Fax no.051 409 8683
E-mail: ntakav@freetrans.gov.za

T1.1.6 Compulsory Briefing Session with representatives of the Employer will take place at:

Date: 2 September 2022

Time: 10:00

Venue: 26 Hartley Street, Hamilton, Bloemfontein, 9300

T1.1.7 The closing time, date and venue for receipt of tenders will be at 11:00 AM on **16 September 2022** at the Ground Floor, Perm Building, 45 Charlotte Maxeke street, Bloemfontein, 9300. **NO LATE TENDERS WILL BE ACCEPTED.**

T1.1.8 Telegraphic, telephonic, telex, facsimile and late tenders will not be accepted. Requirements for sealing, addressing, delivery, opening and assessment of tenders are stated in the Tender Data

**PART A
INVITATION TO BID**

SBD 1

YOU ARE HEREBY INVITED TO BID FOR THE REQUIREMENTS OF THE DEPARTMENT OF DEPARTMENT OF POLICE, ROADS AND TRANSPORT				
BID NUMBER:	PR&T/BID06/2022/23	CLOSING DATE:	CLOSING TIME:	11H00
DESCRIPTION	UPGRADING OF THABA NCHU PUBLIC TRANSPORT ROUTE FOR 10 KM'S			

BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX

SITUATED AT *(STREET ADDRESS)*

DEPARTMENT OF POLICE, ROADS AND TRANSPORT				
45 PERM BUILDING, CHARLOTTE MAXEKE STREET				
TENDER BOX GROUND FLOOR (SECURITY ENTRANCE)				
BLOEMFONTEIN				
9323				
SUPPLIER INFORMATION				
NAME OF BIDDER				
POSTAL ADDRESS				
STREET ADDRESS				
TELEPHONE NUMBER	CODE		NUMBER	
CELLPHONE NUMBER				
FACSIMILE NUMBER	CODE		NUMBER	
E-MAIL ADDRESS				
VAT REGISTRATION NUMBER				
	TCS PIN:		OR	CSD No:
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE [TICK APPLICABLE BOX]	☐ Yes		B-BBEE STATUS LEVEL SWORN AFFIDAVIT	☐ Yes
	☐ No			☐ No
IF YES, WHO WAS THE CERTIFICATE ISSUED BY?				
AN ACCOUNTING OFFICER AS CONTEMPLATED IN THE CLOSE CORPORATION ACT (CCA) AND NAME THE APPLICABLE IN THE TICK BOX	☐	AN ACCOUNTING OFFICER AS CONTEMPLATED IN THE CLOSE CORPORATION ACT (CCA)		
	☐	A VERIFICATION AGENCY ACCREDITED BY THE SOUTH AFRICAN ACCREDITATION SYSTEM (SANAS)		
	☐	A REGISTERED AUDITOR		
	☐	NAME:		
[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/SWORN AFFIDAVIT (FOR EMEs& QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]				

ARE YOU THE ACCREDITED? REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ No [IF YES ENCLOSE PROOF]	ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ No [IF YES ANSWER PART B:3 BELOW]
SIGNATURE OF BIDDER	.....	DATE	
CAPACITY UNDER WHICH THIS BID IS SIGNED (Attach proof of authority to sign this bid; e.g. resolution of directors, etc.)			
TOTAL NUMBER OF ITEMS OFFERED		TOTAL BID PRICE (ALL INCLUSIVE)	
BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO:		TECHNICAL INFORMATION MAY BE DIRECTED TO:	
DEPARTMENT/ PUBLIC ENTITY	DEPARTMENT OF POLICE, ROADS AND TRANSPORT	CONTACT PERSON	TJ MOSIANEDI
CONTACT PERSON	Mr T. Makhetha	TELEPHONE NUMBER	082 0599 738
TELEPHONE NUMBER	051 409 8891	FACSIMILE NUMBER	
FACSIMILE NUMBER	N/A	E-MAIL ADDRESS	MakhethaT@freetrans. gov.za
E-MAIL ADDRESS			

TERMS AND CONDITIONS FOR BIDDING**1. BID SUBMISSION:**

- 1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.
- 1.2. ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED--(NOT TO BE RE-TYPED) OR ONLINE
- 1.3. BIDDERS MUST REGISTER ON THE CENTRAL SUPPLIER DATABASE (CSD) TO UPLOAD MANDATORY INFORMATION NAMELY: (BUSINESS REGISTRATION/ DIRECTORSHIP/ MEMBERSHIP/IDENTITY NUMBERS; TAX COMPLIANCE STATUS; AND BANKING INFORMATION FOR VERIFICATION PURPOSES). B-BBEE CERTIFICATE OR SWORN AFFIDAVIT FOR B-BBEE MUST BE SUBMITTED TO BIDDING INSTITUTION.
- 1.4. WHERE A BIDDER IS NOT REGISTERED ON THE CSD, MANDATORY INFORMATION NAMELY: (BUSINESS REGISTRATION/ DIRECTORSHIP/ MEMBERSHIP/IDENTITY NUMBERS; TAX COMPLIANCE STATUS MAY NOT BE SUBMITTED WITH THE BID DOCUMENTATION. B-BBEE CERTIFICATE OR SWORN AFFIDAVIT FOR B-BBEE MUST BE SUBMITTED TO BIDDING INSTITUTION.
- 1.5. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER LEGISLATION OR SPECIAL CONDITIONS OF CONTRACT.

2. TAX COMPLIANCE REQUIREMENTS

- 2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.
- 2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VIEW THE TAXPAYER'S PROFILE AND TAX STATUS.
- 2.3 APPLICATION FOR TAX COMPLIANCE STATUS (TCS) OR PIN MAY ALSO BE MADE VIA E-FILING. IN ORDER TO USE THIS PROVISION, TAXPAYERS WILL NEED TO REGISTER WITH SARS AS E-FILERS THROUGH THE WEBSITE WWW.SARS.GOV.ZA.
- 2.4 BIDDERS MAY ALSO SUBMIT A PRINTED TCS TOGETHER WITH THE BID.
- 2.5 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE PROOF OF TCS / PIN / CSD NUMBER.
- 2.6 WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.

3. QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS

- 3.1. IS THE BIDDER A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?
YES NO ☐ ☐
- 3.2. DOES THE BIDDER HAVE A BRANCH IN THE RSA?
YES NO ☐ ☐
- 3.3. DOES THE BIDDER HAVE A PERMANENT ESTABLISHMENT IN THE RSA? ☐ ☐
YES NO
- 3.4. DOES THE BIDDER HAVE ANY SOURCE OF INCOME IN THE RSA?
YES NO

IF THE ANSWER IS “NO” TO ALL OF THE ABOVE, THEN, IT IS NOT A REQUIREMENT TO OBTAIN A TAX COMPLIANCE STATUS / TAX COMPLIANCE SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 ABOVE.

NB: FAILURE TO PROVIDE ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID

T1.2 **STANDARD CONDITIONS OF TENDER**

The Conditions of Tender are the Standard Conditions of Tender as contained in Annexure F of the CIDB Standard for Uniformity in Construction Procurement.

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.

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

Clause

number Wording

F.1 GENERAL

F.1.1 Actions

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 F.2 and F.3, timeously and with integrity, and behave equitably, honestly and transparently.

F.1.2 Tender documents

The documents issued by the Employer for the purpose of a tender offer are listed in the Tender Data.

F.1.3 Interpretation

F.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.

F.1.3.2 These Conditions of Tender, the Tender Data and Tender Schedules, which are only required for tender evaluation purposes, shall not form part of any contract arising from the invitation to tender.

F.1.3.3 For the purposes of these conditions for the calling for expressions of interest, the following definitions apply:

- a) **comparative offer** means the Tenderer's financial offer after the factors of non-firm prices, all unconditional discounts and any other tendered parameters that will affect the value of the financial offer have been taken into consideration
- b) **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; and
- c) **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

F.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 read, copied and recorded. Writing 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.

F.1.5 The Employer's right to accept or reject any tender offer

F.1.5.1 The Employer may accept or reject any variation, deviation, tender offer, or alternative tender offer, and may cancel the tender process and reject all tender offers at any time before the formation of a contract. The Employer shall not accept or incur any liability to a Tenderer for such cancellation and rejection, but will give reasons for such action upon written request to do so.

F.1.5.2 The Employer may not, subsequent to the cancellation or abandonment of a tender process or the rejection of all tender offers, re-issue a tender covering substantially the same scope of work within a period of six months unless only one tender was received and such tender was returned unopened to the Tenderer.

F.2 TENDERER'S OBLIGATIONS

F.2.1 Eligibility

Submit a tender offer only if the Tenderer complies with 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.

F.2.2 Cost of tendering

Accept that 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 satisfy requirements.

F.2.3 Check documents

Check the tender documents on receipt for completeness and notify the Employer of any discrepancy or omission.

F.2.4 Confidentiality and copyright of documents

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.

F.2.5 Reference documents

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.

F.2.6 Acknowledge addenda

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.

F.2.7 Site visit and clarification meeting

Attend, where required, a site visit and 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.

F.2.8 Seek clarification

Request clarification of the tender documents, if necessary, by notifying the Employer at least five working days before the closing time stated in the Tender Data.

F.2.9 Insurance

Be aware that the extent of insurance to be provided by the Employer (if any) may 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.

F.2.10 Pricing the tender offer

F.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 14 days before the closing time stated in the Tender Data.

F.2.10.2 Show VAT payable by the Employer separately as an addition to the tendered total of the prices.

F.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.

F.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.

F.2.11 Alterations to documents

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. Erasures and the use of masking fluid are prohibited.

F.2.12 Alternative tender offers

F.2.12.1 Submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted. The alternative tender offer is to be submitted with the main tender offer together with a schedule that compares the requirements of the tender documents with the alternative requirements the Tenderer proposes.

F.2.12.2 Accept that an alternative tender offer may be based only on the criteria stated in the Tender Data or criteria otherwise acceptable to the Employer.

F.2.13 Submitting a tender offer

F.2.13.1 Submit a tender offer to provide the whole of the works, services or supply identified in the Scope of Work, unless stated otherwise in the Tender Data.

F.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 in black ink.

- F.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.
- F.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.
- F.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.
- F.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.
- F.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.
- F.2.13.8 Accept that the Employer shall 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.

F.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.

F.2.15 Closing date and time

- F.2.15.1 Ensure that the Employer receives the tender offer at the address specified in the Tender Data not later than the closing date and time stated in the Tender Data. Proof of posting shall not be accepted as proof of delivery. The Employer shall not accept tender offers submitted by telegraph, telex, facsimile or e-mail, unless stated otherwise in the Tender Data.
- F.2.15.2 Accept that, if the Employer extends the closing date stated in the Tender Data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.

F.2.16 Tender offer validity

- F.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 date stated in the Tender Data.
- F.2.16.2 If requested by the Employer, consider extending the validity period stated in the Tender Data for an agreed additional period.

F.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 total of the prices or substance of the tender offer is sought, offered, or permitted.** The total of the prices stated by the Tenderer shall be binding upon the Tenderer.

F.2.18 Provide other material

F.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.

F.2.18.2 Dispose of samples of materials provided for evaluation by the Employer, where required.

F.2.19 Inspections, tests and analysis

Provide access during working hours to premises for inspections, tests and analysis as provided for in the Tender Data.

F.2.20 Submit securities, bonds, policies, etc.

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 Contract Data.

F.2.21 Check final draft

Check the final draft of the contract provided by the Employer within the time available for the Employer to issue the contract.

F.2.22 Return of other tender documents

If so instructed by the Employer, return all retained tender documents within 28 days after the expiry of the validity period stated in the Tender Data.

F.2.23 Certificates

Include in the tender submission or provide the Employer with any certificates as stated in the Tender Data.

F.3 THE EMPLOYER'S UNDERTAKINGS

F.3.1 Respond to clarification

Respond to a request for clarification received up to five working days prior to the tender closing time stated in the Tender Data and notify all Tenderers who drew procurement documents.

F.3.2 Issue addenda

If necessary, issue addenda that may amend or amplify the tender documents to each Tenderer during the period from the date of the Tender Notice until seven days before the tender closing date stated in the Tender Data.

If, as a result a Tenderer applies for an extension to the closing date stated in the Tender Data, the Employer may grant such extension and, will then notify it to all Tenderers who drew documents.

F.3.3 Return late tender offers

Return tender offers received after the closing date or time stated in the Tender Data, unopened, (unless it is necessary to open a tender submission to obtain a forwarding address), to the Tenderer concerned.

F.3.4 Opening of tender submissions

F.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 Tender Data. Tender submissions for which acceptable reasons for withdrawal have been submitted will not be opened.

F.3.4.2 Announce at the opening held immediately after the opening of tender submissions, at a venue indicated in the Tender Data, the name of each Tenderer whose tender offer is opened, the total of his prices, preferences claimed and time for completion, if any, for the main tender offer only.

F.3.4.3 Make available the record outlined in F.3.4.2 to all interested persons upon request.

F.3.5 Two-envelope system

F.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.

F.3.5.2 Evaluate the quality 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 quality evaluation above the minimum number of points for quality stated in the Tender Data, and announce the score obtained for the Technical Proposals and the total price and any preferences claimed. Return unopened Financial Proposals to Tenderers whose Technical Proposals failed to achieve the minimum number of points for quality.

F.3.6 Non-disclosure

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.

F.3.7 Grounds for rejection and disqualification

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.

F.3.8 Test for responsiveness

F.3.8.1 Determine, on opening and before detailed evaluation, whether each tender offer properly received:

- a) meets the requirements of these Conditions of Tender,
- b) has been properly and fully completed and signed, and
- c) is responsive to the other requirements of the tender documents.

F.3.8.2 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) Detrimently affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,
- b) 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.

F.3.8.3 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.

F.3.9 Arithmetical errors

F.3.9.1 Check responsive tender offers for arithmetical errors, correcting them in the following manner:

- a) Where there is a discrepancy between the amounts in figures and in words, the amount in words shall govern.
- b) If a Bill of Quantities (or Schedule of Quantities or Schedule of Rates) applies 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.
- c) 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 will be corrected.
- d) **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 a Bill of Quantities applies) to achieve the tendered total of the prices.**

F.3.9.2 Consider the rejection of a tender offer if the Tenderer does not correct or accept the correction of his arithmetical errors in the manner described above.

F.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.

F.3.11 Evaluation of tender offers

F.3.11.1 General

Appoint an evaluation panel of not less than three persons. Reduce each responsive tender offer to a comparative offer and evaluate it using the tender evaluation method that is indicated in the Tender Data and described below:

Method 1 : Financial offer (N/A)	1) Rank tender offers from the most favourable to the least favourable comparative offer. 2) Recommend highest ranked Tenderer for the award of the contract, unless there are compelling and justifiable reasons not to do so.
Method 2 : Financial offer and preferences	1) Score tender evaluation points for financial offer. 2) Confirm that Tenderers are eligible for the preferences claimed and if so, score tender evaluation points for preferencing. 3) Calculate total tender evaluation points. 4) Rank tender offers from the highest number of tender evaluation points to the lowest. 5) Recommend Tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.
Method 3 : Financial offer and quality (N/A)	1) Score quality, rejecting all tender offers that fail to score the minimum number of points for quality stated in the Tender Data. 2) Score tender evaluation points for financial offer. 3) Calculate total tender evaluation points. 4) Rank tender offers from the highest number of tender evaluation points to the lowest. 5) Recommend Tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.
Method 4 : Financial offer, quality and preferences (N/A)	1) Score quality, rejecting all tender offers that fail to score the minimum number of points for quality stated in the Tender Data. 2) Score tender evaluation points for financial offer. 3) Confirm that Tenderers are eligible for the preferences claimed, and if so, score tender evaluation points for preferencing. 4) Calculate total tender evaluation points. 5) Rank tender offers from the highest number of tender evaluation points to the lowest. 6) Recommend Tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.

Score financial offers, preferences and quality, as relevant, to two decimal places.

F.3.11.2 Scoring financial offers

Score the financial offers of remaining responsive tender offers using the following formula:

$$N_{FO} = W_1 \times A \text{ where :}$$

N_{FO} = the number of tender evaluation points awarded for the financial offer.

W_1 = the maximum possible number of tender evaluation points awarded for the financial offer as stated in the Tender Data.

A = a number calculated using either formulas 1 or 2 below as stated in the Tender Data.

Formula	Basis for comparison	Option 1	Option 2
1	Highest price or discount	$(1 + \frac{(P - P_m)}{P_m})$	P/P_m
2	Lowest price or percentage commission/fee	$(1 - \frac{(P - P_m)}{P_m})$	P_m/P

Where :

P_m = the comparative offer of the most favourable tender offer.
P = the comparative offer of tender offer under consideration.

F.3.11.3 Scoring quality (functionality)

Score quality in each of the categories stated in the Tender Data and calculate total score for quality.

F.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.

F.3.13 Acceptance of tender offer

F.3.13.1 Accept tender offer only if the Tenderer satisfies the legal requirements stated in the Tender Data.

F.3.13.2 Notify the successful Tenderer of the Employer's acceptance of his tender offer by completing and returning one copy of the Form of Offer and Acceptance before the expiry of the validity period stated in the Tender Data, or agreed additional period. Providing the Form of Offer and Acceptance does not contain any qualifying statements, it will constitute the formation of a contract between the Employer and the successful Tenderer as described in the Form of Offer and Acceptance.

F.3.14 Notice to unsuccessful Tenderers

After the successful Tenderer has acknowledged the Employer's notice of acceptance, notify other Tenderers that their tender offers have not been accepted.

F.3.15 Prepare contract documents

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 :

- addenda issued during the tender period,
- inclusion of some of the returnable documents,
- other revisions agreed between the Employer and the successful Tenderer, and
- the Schedule of Deviations attached to the Form of Offer and Acceptance, if any.

F.3.16 Issue final contract

Prepare and issue the final draft of contract documents to the successful Tenderer for acceptance as soon as possible after the date of the Employer's signing of the Form of Offer and Acceptance (including the Schedule of Deviations, if any).

Only those documents that the conditions of tender require the Tenderer to submit, after acceptance by the Employer, shall be included.

F.3.17 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.

F.3.18 Provide copies of the contract

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.

T1.3 TENDER DATA

T1.3.1 GENERAL

The Conditions of Tender in Section T1.2 are the Standard Conditions of Tender as contained in Annexure F of SANS 294 – *Construction Procurement Processes, Methods and Procedures* which contain references to the Tender Data for details that apply specifically to this tender. The Tender Data in this Section T.1.3 shall be read with the Standard Conditions of Tender in order to expand on the Tenderer's obligations and the Employer's undertakings in administering the tender process in respect of the project under consideration. The Tender Data hereafter shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender. Each item of Tender Data given below is cross-referenced to the relevant clause in the Standard Conditions of Tender.

T1.3.2 TENDER DATA APPLICABLE TO THIS TENDER

<u>Clause number</u>	<u>Wording</u>

F1.	GENERAL

F.1.2	Tender documents

The tender documents issued by the Employer comprise of:

a) **VOLUME 1: PROJECT DOCUMENT**

This volume is the Project Document for the identified contract number C..... and contains the following sections:

THE TENDER

PART T1 : TENDERING PROCEDURES

T1.1 TENDER NOTICE AND INVITATION TO TENDER
T1.2 STANDARD CONDITIONS OF TENDER
T1.3 TENDER DATA

PART T2 : RETURNABLE DOCUMENTS

T2.1 LIST OF RETURNABLE DOCUMENTS
T2.2 RETURNABLE SCHEDULES

THE CONTRACT

PART C1: AGREEMENTS AND CONTRACT DATA

C1.1 FORM OF OFFER AND ACCEPTANCE
C1.2 CONTRACT DATA

PART C2: PRICING DATA

C2.1 PRICING INSTRUCTIONS
C2.2 BILL OF QUANTITIES

PART C3: SCOPE OF WORK

- C3.1 STANDARD SPECIFICATIONS
- C3.2 PROJECT SPECIFICATIONS
- C3.3 PARTICULAR SPECIFICATIONS

PART C4: SITE INFORMATION

c) VOLUME 2: BOOK OF DRAWINGS

There is no Volume 2 - Book of Drawings for C.....

The following documents also form part of the tender and contract, but must be purchased by each of the Tenderers themselves:

- d) VOLUME 3:** GCC 2015 (General Conditions of Contract, 2015) is obtainable from SAICE, Private Bag X200, Halfway House, 1685.
- e) VOLUME 4:** COTO Standard Specifications for Road and Bridge Works for South African Road Authorities (2020 Edition)
- f) *The Occupational Health and Safety Act No 85 and Amendment Act No 181 of 1993, and the Construction Regulations GNR.929 of 25 June 2014 (Government Gazette No 25207 of 18 July 2003, Notice No R1010).*** This document is obtainable separately, and Tenderers shall obtain their own copies.
- g)** 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 participation of targeted enterprises and labour.
 - (i) The Construction Industry Development Board Act No 38 of 2000 and the Regulations in terms of the CIDB Act 38/2000, Government Notice No 692 of 9 June 2004, and amendments
 - (ii) SANS 10396:2003 Implementing Preferential Construction Procurement Policies using Targeted Procurement Procedures
 - (iii) SANS 1914:2003 Targeted Construction Procurement, Parts 1 to 6, dealing with Participation of Targeted Enterprises, Joint Ventures, Targeted Labour etc.

The Project Document and the drawings shall be obtained from the Employer or his authorized representative at the physical address stated in the Tender Notice, upon payment of the deposit stated in the Tender Notice.

 - (iv) Asphalt Academy May 2009 publication "TG2 Second Edition, Technical guideline: Bitumen Stabilised Materials".

F.1.4 Communication and Employer's Agent

The Employer's Agent is: Mr. V. Ntaka

Address: Medfontein Building 303, St. Andrew Street, BLOEMFONTEIN.
Tel no : 051 409 8687
Fax no : 051 409 8683
e-mail : ntakav@freetrans.gov.za

The Engineer: T.J. Mosianedi

Address : Room 311, Third Floor, Medfontein, St. Andrew Street, BLOEMFONTEIN.
Tel no : 051 409 8687
Fax no : 051 409 8683
e-mail : tholangm@icloud.com

F2.1 Eligibility

F2.1.1 Only those Tenderers who have in their employ management and supervisory staff satisfying the requirements of the Scope of Work for labour intensive competencies for supervisory and management staff are eligible to submit tenders. NQF Level 5 will be a minimum requirement for supervisors.

F2.1.2 The following Tenderers who are registered with the CIDB, or are capable of being so registered prior to the evaluation of submissions, are eligible to submit tenders:

- a) contractors who have a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered for **6 CEPE OR HIGHER** class of construction work; and
- b) contractors registered as potentially emerging enterprises with the CIDB who are registered in one contractor grading designation lower than that required in terms of a) above
- c) Tenderers need to ensure that they are registered in the grading in which they tender if their tender price differs from the grading as specified

F2.1.3 Joint Ventures are eligible to submit tenders provided that:

- a) Every member of the joint venture is registered with the CIDB;
- b) The lead partner has a contractor grading designation in the 6CEPE or higher class of construction work; or
- c) The combined contractor grading designation calculated in accordance with the Construction Industry Development Board Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a **6 CEPE** class of construction work.

F2.7 Site visit and clarification meeting

The arrangements for a compulsory clarification meeting are as stated in the Tender Notice and Invitation to Tender.

NOTE : NON-ATTENDANCE OF THIS MEETING WILL DISQUALIFY THE TENDER

- (a) The Attendance List will be accepted as the official attendance of the clarification meeting. Signing the Attendance List of this meeting is the responsibility of the Tenderer attending the meeting and site inspection.

It is important for prospective Tenderers to note that the name of the company on the Attendance List will be accepted as the legitimate Tenderer, which was represented by the person who signed the Attendance List.

- (b) Addenda of additional or changed contractual information will only be forwarded to Tenderers who attended the official site visit and clarification meeting.

F2.12. Alternative tender offers

Should a Tenderer wish to submit an alternative tender offer, the only criteria permitted for such alternative tender offer is that it demonstrably satisfies the Employer's standards and requirements, the details of which may be obtained from the Employer's Agent.

Calculations, drawings and all other pertinent technical information and characteristics as well as modified or proposed Pricing Data must be submitted with the alternative tender offer to enable the Employer to evaluate the efficacy of the alternative and its principal elements, to take a view on the degree to which the alternative complies with the Employer's standards and requirements and to evaluate the acceptability of the pricing proposals. Calculations must be set out in a clear and logical sequence and must clearly reflect all design assumptions. Pricing Data must reflect all assumptions in the development of the pricing proposal.

Acceptance of an alternative tender offer will mean acceptance in principle of the offer. It will be an obligation of the contract for the Tenderer, in the event that the alternative is accepted, to accept full responsibility and liability that the alternative offer complies in all respects with the Employer's standards and requirements.

The modified Pricing Data must include an amount equal to 0% of the amount tendered for the alternative offer to cover the Employer's costs of confirming the acceptability of the detailed design before it is constructed.

F2.13 Submitting a tender offer

F2.13.5 Tender offers shall be submitted as an original only.

F2.13.7 **The Employer's address:**

The Head
Department of Police, Roads and Transport
P O Box 690
Room 226
Medfontein Building
St Andrew Street
BLOEMFONTEIN
9300

Location of tender box: Perm Building, 45 Charlotte Maxeke, Bloemfontein, 9300

Identification details: Contract no:

Description of project : "THE UPGRADING OF THABA NCHU PUBLIC TRANSPORT ROUT FOR 10 KM'S"

F2.15 Closing date and time

Ensure that the Employer receives the tender offer at the address specified in the Tender Data not later than the closing date and time stated in the Tender Data. Proof of posting shall not be accepted as proof of delivery. The Employer shall not accept tender offers submitted by telegraph, telex, facsimile or e-mail, unless stated otherwise in the Tender Data.

The closing date for submission of tender offers is as stated in the Tender Notice and Invitation to Tender.

F2.16 Tender offer validity

The tender offer validity period is **180 calendar** days from the closing date for submission of tenders.

F.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 total of the prices or substance of the tender offer is sought, offered, or permitted.*** The total of the prices stated by the Tenderer shall be binding upon the Tenderer .

F2.18 Provide other material

The Tenderer shall, when requested by the Employer to do so, submit the names of all management and supervisory staff that will be employed to supervise the labour-intensive portion of the works with satisfactory evidence that such staff members satisfy the eligibility requirements.

F2.23 Certificates

The following certificates need to be included in the Tender:

- a) A valid Tax Clearance Certificate for the Tenderer or for each of the JV partners if tendered in a Joint Venture, issued by the South African Revenue Services;
- b) The Tenderer's CIDB Registration Certificate or the Joint Venture's members' CIDB Registration Certificates with an indication of the senior partner.

F3.4 Opening of tender submissions

Tender submissions will be opened at 45 Charlotte Maxeke Street, Room 219, Perm Building, Bloemfontein.

F3.5 Two-envelope system

The two-envelope system will not be followed for this contract.

F3.11 Evaluation of tender offers

EVALUATION CRITERIA

MANDATORY REQUIREMENTS

valid Tax Clearance Certificate, or a unique security Personal Identification number (PIN) issued by the South African Revenue Services (where Consortium / Joint Venture / Sub- Contractors are involved, each party to the association must submit a separate Valid Tax Clearance Certificate or a unique security personal Identification number).

- ✓ Bidders must return all completed and duly signed standard bidding documents (SBD). All documents must be completed with a black ink non-erasable pen and attached all returnable documents.
- ✓ Bidders must submit a Certificate of **CIDB Grading 6CE PE and Higher**.
- ✓ Bidders must be registered on the centralised supplier database-CSD print out must be attached or Bidders must provide a CSD registration number (MAAA.....)
- ✓ **Attach a valid BBBEE contributor level 1 certificate as a proof BBBEE status REQUEST**
In the case of a Joint Venture the Bidder must attach:
 - A joint venture agreement duly signed by both parties, and Certificate of Authority for Signature (Power of Attorney).
 - In the case of a joint venture, bidders must submit CIDB grading issued in the name of the joint venture as determined by CIDB.

The Bids will be evaluated on a Three Stage Process:

- Stage 1: Pre-Qualification for Preferential Procurement
- Stage 2: Functionality – 45 Points
- Stage 3: 90/10 Preference Points System (Price and B-BBEE Status)

Stage 1

Pre-qualification for preferential procurement

- BBBEE Contributor Level 1

Tenderer who fail to meet the above pre-qualifying criteria will be disqualified

Stage 2

Functionality

Bidders must achieve the minimum of 60% (27 points) for functionality in order to be considered for further evaluation in stage 3

Criterion	Description of criteria	Scoring			Points	Total Points Allocation
Experience	Bidders must submit Copies of Appointment Letters and completion certificates from 1 January 2014, with traceable references to be attached as proof.	5 Projects of similar type			15	15
	Appointment letters & Completion Certificates will only be considered valid if they meet the following criteria: ✓ If on an official client letterhead, ✓ If it refers to provision of similar goods or services provided. ✓ If not older than 6 years, ✓ If contains contact details, signed, and dated by authorised personnel.	3-4 Projects of similar type			10	
		1-2 Projects of similar type			5	
		0 Projects of similar type			0	
Capacity	Contracts Manager -Years of experience and qualification in Civil Engineering B. Tech or Degree. CV's and certified copies of qualifications of key personnel must be attached to substantiate points claimed. Failure to attach will result in no points being allocated.					10
	Contracts Manager - Years of experience with qualification in Civil Engineering- B.Tech or Degree etc.	9 years' and more experience & certified copy of qualifications on similar works done.			10	
		4-8 years' experience & qualification			6	
		Less than 4 years' experience & qualification			2	
	Site Agent -Years of experience with qualification in Civil Engineering: N.Dip, B.Tech, Degree etc.	9 years' experience			5	5
		4-8 years' experience			3	
		Less than 4 years' experience			1	
	Equipment/ Resources Registration Certificates or lease agreements to prove ownership of plant its critical and Bidders must attach proof thereof / In case of rental a lease agreement must be attached and registration certificates.	Graders	2 Graders	4	4	12
			1 Grader	2		
			0 Grader	0		
		Water Tanker	2 Tankers	4	4	
			1 Tanker	2		
			0 Tanker	0		
Chip Spreader		2 Chip spreaders	4	4		
		1 Chip spreader	2			
	0 Chip spreader	0				
Locality: Locally based within borders of South Africa	Municipal services (water, sanitation, rates, and electricity) clearance certificate or Lease Agreement with a Current Bill of Account not owing more than Ninety (90) days must be attached to substantiate points claimed.	Provincially based offices			3	3
		Outside Free State Province based offices			1	
		Outside the country			0	
Maximum possible score					45	

Stage 3

The Bids will be evaluated on a 90/10 process as follows:

Price and B-BBEE Status

Assessment for Price is based on:

- Price : 90
- B-BBEE Status Level : 10
- The following 90/10 formula is used to calculate the points (Maximum 90 Points):

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

P_s = Points scored for price of tender under consideration

P_t = Rand value of tender under consideration

$P_{\min}$ = Rand value of lowest acceptable tender

B-BBEE Status Level: 10

- Points will be awarded to bidders for attaining the B –BBEE status level of contributor in accordance with the table below:

B-BBEE Status Level of Contributor	Number of points (90/10 system)
1	10
2	9
3	8
4	5
5	4
6	3
7	2
8	1
Non-compliant contributor	0

- Bidders to submit a valid and original (or certified copy) of the B-BBEE Status Level Verification Certificate substantiating their B-BBEE rating issued by a Registered Auditor approved by SANAS or a Verification Agency accredited by SABS.

F3.13 Acceptance of tender offer

F3.13.1 Tender offers will only be accepted if:

- a) the tender offer is signed by a person authorized to sign on behalf of the Tenderer;
- b) the Tenderer submitted an original valid Tax Clearance Certificate issued by the South African Revenue Services ;
- c) Tenderer's declaration of compliance with the Occupational Health and Safety Act No 85 of 1993 and the Construction Regulations 2014 is included with his tender submission ;
- d) a Tenderer who submitted a tender as a Joint Venture has included an acceptable Joint Venture Agreement with his tender;
- e) the Tenderer or a competent authorized representative of the contractor who submitted the tender has attended the compulsory clarification meeting or site inspection;
- f) the Tenderer included with its tender the contractor's CIDB Registration Certificate (or certified copy thereof) as proof that it is registered in accordance with the Construction Industry Development Board Act No. 38 of 2000 and the Regulations 2003 promulgated in terms of the Act.
- g) the Tenderer or any of its directors is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector; and
- h) 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
- i) has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the Tenderer's ability to perform the contract in the best interests of the Employer or potentially compromise the tender process.

F3.18 Provide copies of the contract

The Employer will provide the successful Tenderer, now the Contractor, with one copy of the complete, signed contract document.

**F3.19 THE FOLLOWING CONDITIONS FORM PART OF SPECIAL CONDITIONS OF BID /
CONDITIONS OF ACCEPTANCE.**

- ✓ Bids must be valid for 180 days
- ✓ Municipal services (water, sanitation, rates, and electricity) clearance certificate or Lease Agreement with a Current Bill of Account not owing more than Ninety (90) days
- ✓ The service providers shall bear the cost associated with the preparation and submission of the proposals.
- ✓ The Department of Police, Roads and Transport selection of qualifying tenders will be as per Department's Supply Chain Management policy and will be final.
- ✓ The Department is not bound to accept any proposal and reserves the right to annul the selection process at any time prior to contract award, without incurring any liability to the bidders.
- ✓ The Department reserves the right to appoint more than one service provider.
- ✓ Bidders who falsify any information will be disqualified-If it's discovered during the contract period, the Department reserves the right to terminate the contract immediately
- ✓ 30% of the total contract amount will be subcontracted to the local emerging Civil Engineering contractors.
- ✓ Full Computation of the 30% subcontracting amount

THE UPGRADING OF THABA NCHU PUBLIC TRANSPORT ROUTE FOR 10 KM'S

PART T2: RETURNABLE DOCUMENTS

CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
T2.1	LIST OF RETURNABLE DOCUMENTS	T2-2
T2.2	RETURNABLE SCHEDULES	T2-3
	T2.2.1 RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES	T2-3
	T2.2.2 PREFERENTIAL PROCUREMENT SCHEDULES AND AFFIDAVIT	T2-25
	T2.2.3 FORMS TO BE SUBMITTED BY SUCCESSFUL TENDERER	T2-36

T2.1 LIST OF RETURNABLE DOCUMENTS

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

All the certificates and forms to be provided with the tender are listed in the Tender Data under F2.23: Certificates, and under the returnable schedules and forms in T2.2 hereafter.

The list of returnable documents comprises the following:

1. All the certificates listed in the Tender Data under F2.23: Certificates;
2. All the returnable schedules and forms listed in T2.2.1: Returnable Schedules Required for Tender Evaluation Purposes;
3. All the returnable documents listed in T2.2.2: Preferential Procurement Schedules and Affidavits that will be incorporated into the Contract;
4. All the agreements and forms listed in T2.2.3: Forms to be completed by the successful Tenderer;
5. All the forms and agreements in the Contract Data in C1.2, where some of the forms (agreements) need to be completed only by successful Tenderer;
6. Pricing Data in C2.2 : Bill of Quantities.

T2.2 RETURNABLE SCHEDULES

T2.2.1 RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
SCHEDULE A	CERTIFICATE OF AUTHORITY	T2-5
SCHEDULE B	COMPULSORY ENTERPRISE QUESTIONNAIRE	T2-8
SCHEDULE C	PROPOSED SUBCONTRACTORS	T2-15
SCHEDULE D	TENDERER'S KEY PERSONNEL	T2-17
SCHEDULE E	PRELIMINARY PROGRAMME	T2-19
SCHEDULE F	AMENDMENTS, QUALIFICATIONS AND ALTERNATIVES	T2-21
SCHEDULE G	TENDERER'S HEALTH AND SAFETY PLAN AND DECLARATION	T2-23
SCHEDULE H	TAX CLEARANCE CERTIFICATE/S	T2-28
SCHEDULE I	PREFERENCIAL PROCUREMENT REGULATIONS 2017	T2-30
SCHEDULE J	DECLARATION OF INTEREST	T2-36
SCHEDULE K	DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES	T2-44
SCHEDULE L	CERTIFICATE OF INDEPENDENT BID DETERMINATION	T2-46
SCHEDULE M	INVITATION TO BID	T2-50

**T2.2.2 PREFERENTIAL PROCUREMENT SCHEDULES AND AFFIDAVITS THAT
WILL BE INCORPORATED INTO THE CONTRACT** T2-25

T2.2.3 FORMS TO BE SUBMITTED BY THE SUCCESSFUL TENDERER T2-36

NOTE: The Tenderer is required to complete each and every schedule and form listed above to the best of his ability, as the evaluation of tenders and the eventual contract will be based on the information provided by the Tenderer.

Failure of a Tenderer to complete the schedules and forms to the satisfaction of the Employer will inevitably prejudice the tender and may lead to rejection on the grounds that the tender is not responsive.

The same applies to the Preferential Procurement Schedule in T2.2.2.

SCHEDULE A : CERTIFICATE OF AUTHORITY

Indicate the status of the Tenderer by ticking the appropriate box hereunder. The Tenderer must complete the certificate set out below for the relevant category.

(i) COMPANY	(ii) CLOSE CORPORATION	(iii) PARTNERSHIP	(iv) JOINT VENTURE	(v) SOLE PROPRIETOR

(i) CERTIFICATE FOR COMPANY

I, ..., Managing Director of the Board of Directors of, hereby confirm that by resolution of the Board (copy attached) taken on 20....., Mr/Mrs, acting in the capacity of, was authorized to sign all documents in connection with this tender and any contract resulting from it, on behalf of the company.

Managing Director :

(ii) CERTIFICATE FOR CLOSE CORPORATION

We, the undersigned, being the key members in the business trading as hereby authorise Mr/Ms....., acting in the capacity of....., to sign all documents in connection with this tender..... and any contract resulting from it, on our behalf.

NAME	ADDRESS	SIGNATURE	DATE

Note : This certificate is to be completed and signed by all of the key members upon whom rests the direction of the affairs of the Close Corporation as a whole.

(iii) CERTIFICATE FOR PARTNERSHIP

We, the undersigned, being the key partners in the business trading as, ...

..... hereby authorize Mr/Ms
 acting in the capacity of
, to sign all documents in
 connection with this tender and any contract resulting from it, on our behalf.

NAME	ADDRESS	SIGNATURE	DATE

Note : This certificate is to be completed and signed by all of the key partners upon whom rests the direction of the affairs of the Partnership as a whole.

(iv) CERTIFICATE FOR JOINT VENTURE

We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorize Mr/Ms
, authorized signatory of
 the company, acting in the capacity of lead partner, to
 sign all documents in connection with this tender offer and any contract resulting from it, on our
 behalf.

This authorization is evidenced by the attached power of attorney signed by legally authorized
 signatories of all the partners to the Joint Venture.

NAME OF FIRM	ADDRESS	AUTHORIZING SIGNATURE, NAME AND CAPACITY
Lead partner		

Note : This certificate is to be completed and signed by all of the key partners upon whom rests the direction of the affairs of the Partnership as a whole.

(v) CERTIFICATE FOR SOLE PROPRIETOR

I, ..., hereby confirm that I am the sole owner
of the business trading
as.....

Signature of sole owner :

REGISTRATION CERTIFICATE / AGREEMENT / ID DOCUMENT

Important note to Tenderer:

Registration Certificates for Companies, Close Corporations and Partnerships, or Agreements and Powers of Attorney for Joint Ventures, or ID documents for Sole Proprietors, all as referred to in the foregoing forms and in T2.1, must be attached here.

SCHEDULE B : ` COMPULSORY ENTERPRISE QUESTIONNAIRE

The following particulars must be furnished. In the case of a Joint Venture, separate enterprise questionnaires in respect of each partner must be completed and submitted.

Section 1 : Name of enterprise :

Section 2 : VAT registration number :

Section 3 : CIDB registration number :

Section 4 : Particulars of sole proprietors and partners in partnerships :

Name*	Identity number*	Personal income tax number*

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

Section 5 : Particulars of companies and close corporations

Company registration number

Close corporation number

Tax reference number

Section 6 : Record of service of the state

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

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

If any of the above boxes are marked, disclose the following :

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

Note : Insert separate page if necessary

Section 7 : Record of spouses, children and parents in the service of the state

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

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

If any of the above boxes are marked, disclose the following :

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

Note: Insert separate page if necessary

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

- i) confirms that 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;
- ii) 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;
- iii) 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;
- iv) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

Signed _____

Date _____

Name _____

Position _____

Enterprise
name

SCHEDULE C : PROPOSED SUBCONTRACTORS

I/We hereby notify you that it is my/our intention to employ the following subcontractors for work in this contract.

If I/we am/are awarded a contract I/we agree that this notification does not change the requirement for me/us to submit the names of proposed subcontractors in accordance with requirements of the contract for such appointments. If there are no such requirements in the contract, then your written acceptance of this list shall be binding between us.

a) Subcontractors : CIDB grading 5CE to 7CE

NAMES OF PROPOSED SUBCONTRACTORS	NATURE AND EXTENT OF WORK TO BE SUBCONTRACTED	CIDB GRADING	AMOUNT

b) Subcontractors : CIDB grading 1CE to 4CE and unregistered ABE's if available

NAMES OF PROPOSED SUBCONTRACTORS	NATURE AND EXTENT OF WORK TO BE SUBCONTRACTED	CIDB GRADING	AMOUNT

SIGNATURE :

ATTACH PRE-TENDER AGREEMENTS HERE

SCHEDULE D : TENDERERS' KEY PERSONNEL

NAME	POSITION	NQF QUALIFICATION

SIGNATURE :

**ATTACH COPIES OF NQF CERTIFICATES FOR LABOUR INTENSIVE CONSTRUCTION OF
RELEVANT SUPERVISORS**

SCHEDULE E : PRELIMINARY PROGRAMME

The Tenderer shall detail below or attach a preliminary programme reflecting the proposed sequence and tempo of execution of the various activities comprising the work for this Contract. The programme shall be in accordance with the information supplied in the Contract, requirements of the Project Specifications and with all other aspects of his Tender.

PROGRAMME														
ACTIVITY	MONTHS													

[Note: The programme must be based on the completion time as specified in the Contract Data. No other completion time that may be indicated on this programme will be regarded as an alternative offer, unless it is listed in Table (b) of Form I hereafter and supported by a detailed statement to that effect, all as specified in the Tender Data]

SIGNATURE :

ATTACH PRELIMINARY PROGRAM HERE

SCHEDULE F : AMENDMENTS, QUALIFICATIONS AND ALTERNATIVES

The Tenderer should record any amendments and alternatives he may wish to make to the tender documents in this schedule. Alternatively a Tenderer may state such amendments and alternatives in a covering letter to his tender and reference such letter in this schedule.

The Tenderer's attention is drawn to clause F3.3 if the Standard Conditions of Tender referenced in the Tender Data regarding the Employer's handling of material deviations and qualifications.

These amendments and qualifications, if accepted by the Employer, will be incorporated in the Form of Offer and Acceptance, Schedule of Deviations.

(a) AMENDMENTS AND QUALIFICATIONS

PAGE	CLAUSE OR ITEM NO	PROPOSED AMENDMENT AND QUALIFICATIONS

[Notes: (1) Amendments to the General and Special Conditions of Contract are not acceptable;

(2) The Tenderer must give full details of all the financial implications of the amendments and qualifications in a covering letter attached to his tender.

(b) ALTERNATIVES

PROPOSED ALTERNATIVE	DESCRIPTION OF ALTERNATIVE

[Notes: (1) Individual alternative items that do not justify an alternative tender, and an alternative offer for time for completion should be listed here.

(2) In the case of a major alternative to any part of the work, a separate Bill of Quantities, programme, etc, and a detailed statement setting out the salient features of the proposed alternatives must accompany the tender.

(3) Alternative tenders involving technical modifications to the design of the works and methods of construction shall be treated separately from the main tender offer.]

SIGNATURE :

ATTACH ALTERNATIVES HERE

SCHEDULE G : CONTRACTOR'S HEALTH AND SAFETY PLAN AND DECLARATION

In terms of Clause 4(4) of the OHSA 1993 Construction Regulations 2014 (referred to as "the Regulations" hereafter), a Contractor may only be appointed to perform construction work if the Employer is satisfied that the 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 authorized 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 2003.
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 hereby undertake, if my 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 5(1) of the Construction Regulations, which plan shall be subject to approval by the Employer.
4. I confirm that copies of my company's approved Health and Safety Plan, the Employer'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 Contractor's personnel, the Employer's personnel, the Engineer, visitors, and officials and inspectors of the Department of Labour.
5. I hereby confirm that adequate provision has been made in my 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, including the cost for specific items that may be scheduled in the Bill of Quantities.
6. I hereby confirm that I will be liable for any penalties that may be applied by the Employer in terms of the said Regulations for failure on my part to comply with the provisions of the Act and the Regulations as set out in Regulation 30 of the Regulations.
7. I agree that my failure to complete and execute this declaration to the satisfaction of the Employer will mean that I am unable to comply with the requirements of the OHSA 1993 Construction Regulations 2014, and accept that my tender will be prejudiced and may be rejected at the discretion of the Employer.
8. I am aware of the fact that, should I be awarded the contract, I must submit the notification required in terms of Regulation 3 of the OHSA 1993 Construction Regulations 2014 before I will be allowed to proceed with any work under the contract.

SIGNATURE :

CONTRACTOR'S SAFETY PLAN

The Tenderer shall attach to this page (or submit it separately) the Contractor's Health and Safety Plan as required in terms of Regulation 5 of the Occupational Health and Safety Act 1993 Construction Regulations 2014, and referred to in Form K.

The Contractor's Health and Safety Plan shall cover at least the following aspects as applicable:

1. Safety of subcontractors (Refer Construction Regulations 2014 Clause 5: Principal Contractors and Contractors)
 - Methods to ensure the approval, implementation and maintenance of all health and safety aspects regarding his subcontractors.
2. Monitoring the health and safety on the construction site on a regular basis (Refer Clause 6: Supervision of Construction Work)
 - Details of the Construction Supervisor and his appointed assistants (if any);
 - Details of the Construction Safety Officer, full-time or part-time;
 - Details of the suitability and competency of the Construction Supervisor and Construction Safety Officer regarding health and safety aspects of the construction works.
3. Assessment of risks on the construction site (Refer Clause 7: Risk Assessment)
 - Details of a proper risk assessment on which his health and safety plan is based;
 - Ways in which all construction employees are informed, instructed and trained regarding the work procedures and the related hazards.
4. Risk items (Refer Clauses 8 to 28: Risk items to be addressed)
 - Details of the design, management, responsibilities, worker training, work methods, procedures, maintenance and any other requirements necessary for him and his subcontractor, if applicable, to work safely and in a healthy environment as stipulated in these clauses.

5 LEGISLATIVE COMPLIANCE

The Company is required to maintain this COVID-19 BASIC WORK PLAN within the following legislative framework. The legislation directing this document is:

- The Disaster Management Act, Act 57 of 2002
- Cooperative Governance and Traditional Affairs (Cogta) – Regulation 1 Dated 29 April 2020
- Cooperative Governance and Traditional Affairs (Cogta) – Regulation 2 Dated 30 April 2020
- Draft Framework for Sectors 25 April 2020 • Labour Department Regulations 29 April 2020

Contractor's OHS Management System checklist

1. OHS Policy and Management

		Yes	No
1.1	Is there a written company health and safety policy?		
1.2	Does the company have an OHS Management System?		
1.3	Is there a company OHS Management Manual or Plan?		
1.4	Are health and safety responsibilities clearly identified for all levels of staff?		

2. Safe Work Practices and Procedures

		Yes	No
2.1	Has the company prepared safe operating procedures or specific safety instructions relevant to its operations?		
2.2	Does the company have any permit to work systems?		
2.3	Is there a documented incident investigation procedure?		
2.4	Are there procedures for maintaining, inspecting and assessing the hazards of plant operated/owned by the company?		
2.5	Are there procedures for storing and handling hazardous substances?		
2.6	Are there procedures for identifying, assessing and controlling risks associated with manual handling?		

3. OHS Training

		Yes	No
3.1	Is health and safety training conducted in the company?		
3.2	Is a record maintained of all training and induction programs undertaken for employees in the company?		

4. Health and Safety Workplace Inspection.

		Yes	No
4.1	Are regular health and safety inspections at worksites undertaken?		
4.2	Are standard workplace inspection checklists used to conduct health and safety inspections?		
4.3	Is there a procedure by which employees can report hazards at workplaces?		

5. Health and Safety Consultation.

		Yes	No
5.1	Is there a workplace health and safety committee?		
5.2	Are employees involved in decision making over OHS matters?		
5.3	Are there employee elected health and safety representatives?		

6. OHS Performance Monitoring.

		Yes	No
6.1	Is there a system for recording and analyzing health and safety performance statistics?		
6.2	Are employees regularly provided with information on company health and safety performance?		
6.3	Has the company ever been convicted of an occupational health and safety offence?		

7. Does your company's health and safety plan contain the following elements?

		Yes	No
7.1	Description of the contract		
7.2	OHS Structure of work undertaken under this contract		
7.3	Induction and safety training		
7.4	Safe work practices and procedures for specific work undertaken		
7.5	Risk assessments for specific works undertaken		
7.6	Workplace inspection schedule for duration of contract		
7.7	OHS consultative processes to be followed		
7.8	Emergency procedure for this specific contract		
7.9	Incident recording and investigation on procedures		
7.10	Health and safety performance monitoring arrangements to be implemented during contract		

SCHEDULE H : TAX CLEARANCE REQUIREMENTS

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

1. In order to meet his requirement bidders are required to complete in full the attached form TCC 001 "Application for a Tax Clearance Certificate" and submit it to any SARS branch office nationally. The Tax Clearance Certificate Requirements are also applicable to foreign bidders / individuals who wish to submit bids.
2. SARS will then furnish the bidder with a Tax Clearance Certificate that will be valid for a period of 1 (one) year from the date of approval.
3. The original Tax Clearance Certificate must be submitted together with the bid. Failure to submit the original and valid Tax Clearance Certificate will result in the invalidation of the bid. Certified copies of the Tax Clearance Certificate will not be acceptable.
4. In bids where Consortia / Joint Venture / Sub-contractors are involved, each party must submit a separate Tax Clearance Certificate.
5. Copies of the TCC 001 "Application for a Tax Clearance Certificate" form are available from any SARS branch office nationally or on the website www.sars.gov.za.
6. Applications for the Tax Clearance Certificates may also be made via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za.

1. Name of taxpayer / bidder:.....
2. Trade name:.....
3. Identification number:.....
4. Company / Close Corporation registration number:.....
5. Income tax reference number:.....
6. VAT registration number (if applicable):.....
7. PAYE employer's registration number (if applicable):.....

Name.....

Address:

.....

.....

PLEASE NOTE THAT THE COMMISSIONER FOR THE SOUTH AFRICAN REVENUE SERVICE (SARS) WILL NOT EXERCISE HIS DISCRETIONARY POWERS IN FAVOUR OF ANY PERSON WITH REGARD TO ANY INTEREST, PENALTIES AND / OR ADDITIONAL TAX LEVIABLE DUE TO THE LATE OR UNDER PAYMENT OF TAXES, DUTIES OR LEVIES OR THE RENDITION RETURNS BY ANY PERSON AS A RESULT OF ANY SYSTEM NOT BEING YEAR 2000 COMPLIANT

BIDDER'S DISCLOSURE**1. PURPOSE OF THE FORM**

Any person (natural or juristic) may make an offer or offers in terms of this invitation to bid. In line with the principles of transparency, accountability, impartiality, and ethics as enshrined in the Constitution of the Republic of South Africa and further expressed in various pieces of legislation, it is required for the bidder to make this declaration in respect of the details required hereunder.

Where a person/s are listed in the Register for Tender Defaulters and/or the List of Restricted Suppliers, that person will automatically be disqualified from the bid process.

2. Bidder's declaration

- 2.1 Is the bidder, or any of its directors/trustees/shareholders/members/partners or any person having a controlling interest¹ in the enterprise, employed by the state? **YES/NO**

- 1.1.1 If so, furnish particulars of the names, individual identity numbers, and, if applicable, state employee numbers of directors/trustees /shareholders/members/ partners or any person having a controlling interest in the enterprise, in table below.

Full Name	Identity Number	Name of State institution

- 2.2 Do you, or any person connected with the bidder, have a relationship with any person who is employed by the procuring institution? **YES/NO**

- 2.2.1 If so, furnish particulars:

.....

- 2.3 Does the bidder or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are bidding for this contract? **YES/NO**

¹ the power, by one person or a group of persons holding the majority of the equity of an enterprise, alternatively, the person/s having the deciding vote or power to influence or to direct the course and decisions of the enterprise.

2.3.1 If so, furnish particulars:

.....
.....

3 DECLARATION

I, the undersigned, (name)..... in submitting the accompanying bid, do hereby make the following statements that I certify to be true and complete in every respect:

- 3.1 I have read and I understand the contents of this disclosure;
- 3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;
- 3.3 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 consortium² will not be construed as collusive bidding.
- 3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.
- 3.4 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.
- 3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.
- 3.6 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.

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 1, 2 and 3 ABOVE IS CORRECT.

I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 6 OF PFMA SCM INSTRUCTION 03 OF 2021/22 ON PREVENTING AND COMBATING ABUSE IN THE SUPPLY CHAIN MANAGEMENT SYSTEM SHOULD THIS DECLARATION PROVE TO BE FALSE.

.....
Signature

.....
Date

.....
Position

.....
Name of bidder

SCHEDULE J:

² 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.

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2017

This preference form must form part of all bids invited. It contains general information and serves as a claim form for preference points for Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution

NB: BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017.

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to all bids:

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

1.2

- a) The value of this bid is estimated to not exceed R50 000 000 (all applicable taxes included) and therefore the 80/20 preference point system shall be applicable; or
- b) Either the 90/10 preference point system will be applicable to this tender.

1.3 Points for this bid shall be awarded for:

- (a) Price; and
- (b) B-BBEE Status Level of Contributor.

1.4 The maximum points for this bid are allocated as follows:

	POINTS
PRICE	
B-BBEE STATUS LEVEL OF CONTRIBUTOR	
Total points for Price and B-BBEE must not exceed	100

1.5 Failure on the part of a bidder to submit proof of B-BBEE Status level of contributor together with the bid, will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

1.6 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. DEFINITIONS

- (a) **"B-BBEE"** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;
- (b) **"B-BBEE status level of contributor"** means the B-BBEE status of an entity in terms of a code of good practice on black economic empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;
- (c) **"bid"** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the provision of goods or services, through price quotations, advertised competitive bidding processes or proposals;
- (d) **"Broad-Based Black Economic Empowerment Act"** means the Broad-Based Black

Economic Empowerment Act, 2003 (Act No. 53 of 2003);

- (e) **“EME”** means an Exempted Micro Enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;
- (f) **“functionality”** means the ability of a tenderer to provide goods or services in accordance with specifications as set out in the tender documents.
- (g) **“prices”** includes all applicable taxes less all unconditional discounts;
- (h) **“proof of B-BBEE status level of contributor”** means:
 - 1) B-BBEE Status level certificate issued by an authorized body or person;
 - 2) A sworn affidavit as prescribed by the B-BBEE Codes of Good Practice;
 - 3) Any other requirement prescribed in terms of the B-BBEE Act;
- (i) **“QSE”** means a qualifying small business enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;
- (j) **“rand value”** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;

3. POINTS AWARDED FOR PRICE

3.1 THE 80/20 OR 90/10 PREFERENCE POINT SYSTEMS

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

80/20

or

90/10

$$P_s = 80 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right) \quad \text{or} \quad P_s = 90 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$$

Where

P_s = Points scored for price of bid under consideration

P_t = Price of bid under consideration

$P_{\min}$ = Price of lowest acceptable bid

4. POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTOR

- 4.1 In terms of Regulation 6 (2) and 7 (2) of the Preferential Procurement Regulations, preference points must be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table below:

B-BBEE Status Level of Contributor	Number of points (90/10 system)	Number of points (80/20 system)
1	10	20
2	9	18
3	6	14
4	5	12
5	4	8
6	3	6
7	2	4
8	1	2
Non-compliant contributor	0	0

5. BID DECLARATION

5.1 Bidders who claim points in respect of B-BBEE Status Level of Contribution must complete the following:

6. BBEE STATUS LEVEL OF CONTRIBUTOR CLAIMED IN TERMS OF PARAGRAPHS 1.4 AND 4.1

6.1 B-BBEE Status Level of Contributor: . = ...(maximum of 10 or 20 points)

(Points claimed in respect of paragraph 7.1 must be in accordance with the table reflected in paragraph 4.1 and must be substantiated by relevant proof of B-BBEE status level of contributor.

7. SUB-CONTRACTING

7.1 Will any portion of the contract be sub-contracted?

(Tick applicable box)

YES		NO	

7.1.1 If yes, indicate:

- i) What percentage of the contract will be subcontracted.....%
- ii) The name of the sub-contractor.....
- iii) The B-BBEE status level of the sub-contractor.....
- iv) Whether the sub-contractor is an EME or QSE

(Tick applicable box)

YES		NO	

- v) Specify, by ticking the appropriate box, if subcontracting with an enterprise in terms of Preferential Procurement Regulations,2017:

Designated Group: An EME or QSE which is at last 51% owned by:	EME ✓	QSE ✓
Black people		
Black people who are youth		
Black people who are women		
Black people with disabilities		
Black people living in rural or underdeveloped areas or townships		
Cooperative owned by black people		
Black people who are military veterans		
OR		
Any EME		
Any QSE		

8. DECLARATION WITH REGARD TO COMPANY/FIRM

8.1 Name of company/firm:.....

8.2 VAT registration number:.....

8.3 Company registration number:.....

8.4 TYPE OF COMPANY/ FIRM

- ☐ Partnership/Joint Venture / Consortium
- ☐ One person business/sole propriety
- ☐ Close corporation
- ☐ Company
- ☐ (Pty) Limited

[TICK APPLICABLE BOX]

8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

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

8.6 COMPANY CLASSIFICATION

- ☐ Manufacturer
☐ Supplier
☐ Professional service provider
☐ Other service providers, e.g. transporter, etc.
[TICK APPLICABLE BOX]

8.7 Total number of years the company/firm has been in business:.....

8.8 I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBE status level of contributor indicated in paragraphs 1.4 and 6.1 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we acknowledge that:

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
- iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;
- iv) If the B-BBEE status level of contributor has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have –
 - (a) disqualify the person from the bidding process;
 - (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
 - (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
 - (d) recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
 - (e) forward the matter for criminal prosecution.

WITNESSES

1.
2.

.....
SIGNATURE(S) OF BIDDERS(S)

DATE:
ADDRESS
.....
.....

THE UPGRADING OF THABA NCHU PUBLIC T

PART C1: AGREEMENT AND CONTRACT DATA

THE CONTRACT

PART C1 : AGREEMENTS AND CONTRACT DATA

PART C2 : PRICING DATA

PART C1 : AGREEMENTS AND CONTRACT DATA

CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
C1.1	FORM OF OFFER AND ACCEPTANCE	C1-3
C1.2	CONTRACT DATA	C1-7

C1.1 Form of Offer and Acceptance

OFFER

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

"THE UPGRADING OF THABA NCHU PUBLIC TRANSPORT ROUTE FOR 10 KM'S"

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

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

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS:

..... Rand (in words);

R (in figures)

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 Bidder before the end of the period of validity stated in the Bid Data, whereupon the Bidder becomes the party named as the Contractor in the Conditions of Contract identified in the Contract Data.

For the Bidder

.....
Signature

.....
Name

.....
Capacity

Name and address of organization

.....

Signature and Name of Witness

Signature.

Name.

Date:

ACCEPTANCE

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the Bidder'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 Bidder's Offer shall form an agreement between the Employer and the Bidder 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: Agreements and Contract Data, (which includes this Agreement)
Part C2: Pricing Data
Part C3: Scope of Work.
Part C4: Site Information

and 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 Bid Data and any addenda thereto as listed in the Bid Schedules as well as any changes to the terms of the Offer agreed by the Bidder 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 representative(s) of both parties.

The Bidder 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. 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 Bidder receives one fully completed original copy of this document, including the Schedule of Deviations (if any). Unless the Bidder (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.

For the Employer:

.....
Signature

.....
Name

.....
Capacity

Name and address of organisation:

.....

.....

Signature and name of witness:.....
Signature

.....
Name

Date:

Schedule of Deviations

Notes:

1. The extent of deviations from the Bid documents issued by the Employer prior to the Bid closing date is limited to those permitted in terms of the Conditions of Bid,
2. A Bidder's covering letter shall not be included in the final contract document. Should any matter in such, letter, which constitutes a deviation as aforesaid become the subject of agreements reached during the process of, offer and acceptance, the outcome of such agreement shall be recorded here,
3. Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to Bid documents and which it is agreed by the Parties becomes and obligation of the contract shall also be recorded here,
4. Any change or addition to the Bid documents arising from the above agreements and recorded here, shall also be incorporated into final draft or the Contract,

1. Subject

Details

2. Subject

Details

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

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

For the Bidder:

Signature

For the Employer:

Signature.....

.....	Name	.....
.....	Capacity	.....
Name and address of organisation:	Name and address of organisation:	
.....		
.....		
.....		
.....	Witness Signature	.....
.....	Witness Name	.....
.....	Date	.....

Confirmation of Receipt

The Bidder, (now Contractor), identified in the Offer part of this Agreement hereby confirms receipt from the Employer, identified in the Acceptance part of this Agreement, of one fully completed original copy of this Agreement, including Schedule of Deviations (if any) today:

the(day)

of(month)

20(year)

at(place)

For the Contractor:
Signature

.....
Name

.....
Capacity

Signature and name of witness:

.....
Signature

.....
Name

C1.2 CONTRACT DATA

CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
C1.2.1	CONDITIONS OF CONTRACT	C1-8
C1.2.2	CONTRACT SPECIFIC DATA	C1-10
C1.2.3	DATA PROVIDED BY THE TENDERER	C1-16

C1.2 CONTRACT DATA

Clause	Statement	Data
The <i>conditions of contract</i> are the core clauses and the clauses for main Option based on the GCC 2015 – (General Conditions of Contract, 2015)		
	Dispute resolution Option and secondary Options of the General Conditions of Contract, 2015.	W1: Dispute resolution procedure X1: Price adjustment for inflation X2 Changes in the law X5 Sectional Completion X7: Delay damages X13: Performance Bond X16: Retention X18: Limitation of liability Z: <i>Additional conditions of contract</i>
10.1	The Employer is	Free State Provincial Government represented by Head of Department: Department of Police, Roads and Transport
	Address	<u>Physical:</u> 45 Charlotte Maxeke Street Bloemfontein 9300 <u>Postal:</u> P.O Box 690 Bloemfontein 9300 Telephone No: (051) 409 8575
	The Project Manager is:	TJ Mosianedi <u>Physical:</u> Medfontein Building Bloemfontein 9300 E-Mail: tholangm@icloud.com Tel No: 082 0599 738 Fax No:

11.2(13)	The works are:	THE UPGRADING OF THABA NCHU PUBLIC TRANSPORT ROUTE FOR 10 KM'S
11.2(14)	The following matters will be included in the Risk Register:	^ Underground water conditions ^ Working in close proximity of operations ^ Damages to existing infrastructure ^ Material supply & logistics ^ Traffic Management
11.2(16)	The Site Information is in	Part C4
11.2(19)	The Works Information is in	Part C3
12.2	The <i>law of the contract</i> is the law of	The Republic of South Africa subject to the jurisdiction of the Courts of South Africa
13.1	The <i>language of this contract</i> is	English
13.3	The <i>period for reply</i> is	14 calendar days from the issuing of the package order.
3	Time	
30.2(3)	The <i>completion date</i> for the whole of the <i>works</i> is	The Duration of the contract shall be 24 months from the date of site handover
31.1	The <i>Contractor</i> is to submit a program for acceptance within	14 calendar days from the issuing of the package order.
31.2.	The <i>starting date</i> is	The date of the site handover meeting
32.2	The <i>Contractor</i> submits revised programs at intervals no longer than	14 days from receiving request from the project manager
35.1	The <i>Employer</i> is not willing to take over the <i>works</i> before the Completion Date	
4	Testing and Defects	

43.2	The <i>defect correction period</i> is	2 weeks
5	Payment	
50.1	The <i>assessment interval</i> is monthly on the	Last week of the month (fourth week) day of each successive month
51.1	The <i>currency of this contract</i> is the	South African Rand
51.2	The period within which payments are made is	Payment be effected within 30 (thirty days) following the submission of valid Tax Invoice, Progress reports, Correct signed EPWP reports and appointment letter
6	Compensation events	
60.1	Claims caused by the following will not be regarded for the purpose of this contract: 1. Inclement weather 2. Community and Labour unrests 3. Political instability 4. Material unavailability The above mentioned delays on the contract shall only carry an additional time extension and no additional cost to the project. Refer to the signed general framework contract.	
63	Assessing the claim	
	The assessment shall be done with conditions of this contract and that of the general framework contract and their respective GCC 2015 modules. Clauses detailed in the general framework contract shall govern over those of the package order.	
8	Risks and Insurances	

80.1	These are additional <i>Employer's risks</i>	1. No additional risks are accepted by the <i>Employer</i> other than those which are provided for in this contract. 2. The employer shall furthermore be exonerated from any loss of or damage to works, plant and materials due to strikes, riots and civil commotion not confined to the contractor's employee's, the contractor is thus required to allow for such risks. 3. (the contractor will be liable for any risk due to his non- compliant)
80.1	<i>Contractor's risk</i>	From the starting date until the Defects Certificate has been issued, the risks which are not carried by the Employer are carried by the Contractor
84.1	<i>Employer insurances</i>	The Employer does not provide any insurance for the project
84.1	The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract for any one event is	R5,000,000-00 per claim, number of claims unlimited
9.	Termination	
91.1	Reasons for termination	Additional reasons for termination are those stipulated in the General Framework contract signed by the contractor and employer, these conditions shall govern over those stipulated in this clause.

		Further termination of the framework contract may result due as stipulated in the Framework agreement.
10	Data for main option clause	
B	Option B	Priced Contract with Bill of Quantities
60.6	The <i>method of measurement</i> is	- COTO Standard Specifications for Road and Bridge Works for South African Road Authorities (2020 Edition)
11	Data for Option W1	
W1.1	The <i>Adjudicator</i> is	Both parties will agree as and when a dispute arises. If the parties cannot reach an agreement on the <i>Adjudicator</i>, the chairman of the Association of Arbitrators will appoint an <i>Adjudicator</i>
W1.2(3)	The <i>Adjudicator nominating body</i> is:	The Chairman of the Association of Arbitrators (Southern Africa) If no <i>Adjudicator nominating body</i> is entered, it is: The Association of Arbitrators (Southern Africa)
W1.4(2)	The <i>tribunal</i> is:	Arbitration
W1.4(5)	The <i>arbitration procedure</i> is	The Rules for the Conduct of Arbitrations of the Association of Arbitrators (Southern Africa) The place where arbitration is to be held is Bloemfontein The person or organization who will choose an arbitrator - if the Parties cannot agree a choice or - if the arbitration procedure does not state who selects an arbitrator, is The Chairman of the Association of Arbitrators (Southern Africa)

X1	Price adjustment for inflation (CPA)	
X1.1	Defined terms	The calculation of CPA shall be as per the attached specification for calculating CPA.
X1.3	Compensation Events	The following values for the different factors are to be used: X = 0.10 a = 0.10 - Labour b = 0.55 - Equipment c = 0.15 - Material d = 0.20 - Fuel The different values for the calculation of the price adjustment factor shall be for the area of Free State: Other urban areas. The Diesel index shall be for the Witwatersrand Area. The Base month is one month prior to submission of quotations or as stipulated in the General Framework contracts. Only applicable for contract duration of more 12 months of commencement date.
X13	Performance bond	
X13.1	The amount of the performance bond is	10% of the contract value including VAT
X14	Advanced payment to the Contractor	
X14.1	Advanced Payment	There will be no advanced payment made to the contractor
X16	Retention	
X16.1	The <i>retention percentage</i> is	1. 10% of the Contract Amount, two retention guarantees (5% each) are required from the contractor within 14 days of site handover of which one will be handed over to the contractor upon works completion (Practical Completion) 2. Upon submission of the required guarantees, no retention shall be

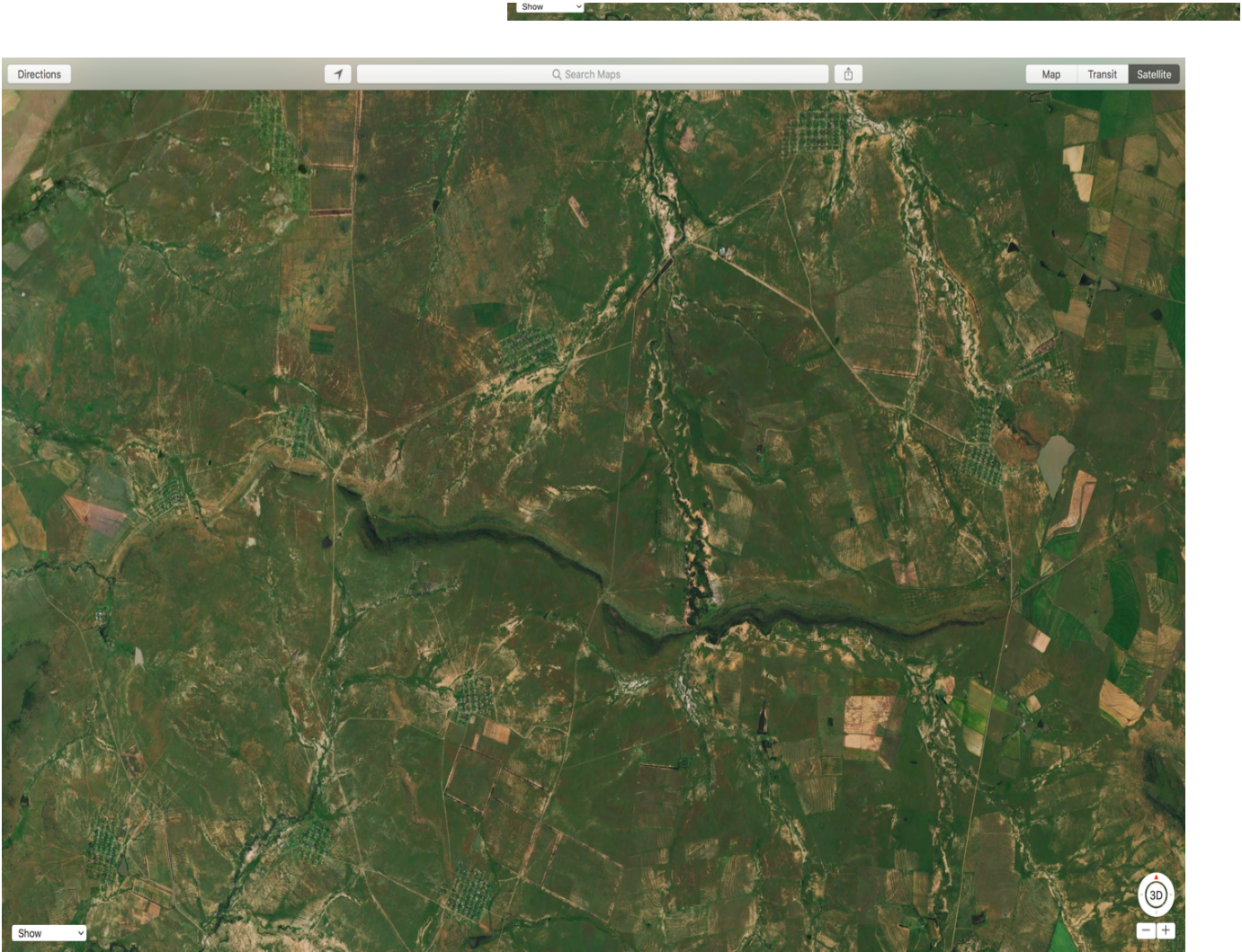
		subtracted from interim payments made to the contractor.
Z	<i>Additional conditions of contract</i>	
	The <i>additional conditions of contract</i> are:	
Z 1	Non-working times	The non-working times are Sundays. The special non-working days are the construction industry year end break, all foreseeable statutory election days as declared by National Government, and the following statutory public holidays as declared by National Government: New Year's Day, Human Rights Day, Good Friday, Family Day, Freedom Day, Workers' Day, Youth Day, National Women's Day, Heritage Day, Day of Reconciliation, Christmas Day and the Day of Goodwill. The construction industry year end break commences on the first working day after 15 December and ends on the first working day after 5 January of the following year.
Z2	Extension of time for completion	In general, extension of time for the completion of Works will, in terms of the General conditions of Contract, be granted only for additional work and for circumstances which could not have been foreseen, and are beyond the control of the Contractor. No extension of time for completion will be granted on account of normal inclement weather, but extension of time shall be determined for abnormal rainfall or wet conditions in accordance with the formula given below, separately for each calendar month or part thereof.

Z2.1	Penalty for the delays	The penalty for failing to complete the Works is 0,05% of the Contract Sum per day, up to a maximum limit of twenty-five thousand rand per day (R25,000,00 per day).
Z3.1	Special Material	Price adjustments for variations in the costs of special materials are allowed. Special materials shall be limited to bitumen and bitumen products only.
Z3.2	Material on site	The percentage advance on materials not yet built into the Permanent Works is 80%.
Z3.3	Quality of materials and workmanship	The source of supply of all materials including all stone, sand, gravel or soil or any other natural material required in the execution of the Works shall be located by the Contractor. No material shall be used until it has been approved by the Engineer
Z3.4	Defects	In the event of the Contractor not completing all the outstanding work within the period specified by the Employer in terms of the contract, the Employer shall have the right to extend the Period of Maintenance by the additional time taken by the Contractor to complete such outstanding work to the satisfaction of the Employer. The full retention applicable to the Period of Maintenance shall apply to such extension.
Z4	Contract participation target	The Contract Participation Target for Targeted Enterprises is <u>30%</u>
Z5	Targeted Subcontractors (ABE's)	Part C3: Scope of Works: C3.7.1.2 (3.1) - 30% of Contract Value (Excl. Contingencies) must be subcontracted to Local & CDP Contractors approved / appointed by the Department and the Works should only be executed by Subcontractors and should be paid within 30 days as per Section B of BOQ.

Z6	Targeted Local labour	1. Minimum Labour Employment for this contract is 12 people per million of Contract Value (Excl.VAT, Contingencies and CPA) should be appointed with a minimum of six months at a payment rate of R166/day. 2. 25% of labour may be retained for the entire duration of the contract. 3. Recruitment of labour for annual targets shall be conducted as follows ^ 30% - at the beginning of Financial year ^ 30% - three months after the initial appointment ^ 40% - midway into the financial year 4. The employment demographics are as follows: ^ Youth – 55% ^ Female – 60% ^ Disabled – 2% 5. Wherever feasible labour will be deployed to Local Municipalities for service delivery at the cost of the Contractor.
Z7	Temporary Suspension of Works	Planned Annual allocated budget available can be reduced at the Employer's discretion. In the event that annual budget is reduced or exhausted, the Contractor shall not be allowed stop the Works and or claim interest on the unpaid Works. No claim shall be submitted to the Department once the budget is depleted.
Z8	Works Schedule	Activities specified on the Bill of Quantities under Section A should include all work items and

		provisional sums and should be priced by the tenderer evenly. Tender amount should be calculated according Section A of the Bill of Quantities. Items listed under section B of the Bill of Quantities are subcontractor related items and should amount to 30% of the contract amount (excl. Contingencies).
Z9	Socio – Economic of Community	1% of Contract Value shall be invested into local Community.
Z10	Skills Development	-Two (2) Civil Engineering Students shall be appointed for experiential Training with stipend of R10000.00 each per month, signed off reports must be submitted to respective Departmental Project Managers. - Members of Community must also be trained in Labour Intensive Works

LOCALITY MAP



THE UPGRADING OF THABA NCHU PUBLIC TRANSPORT ROUTE FOR 10 KM'S

PART C1: AGREEMENT AND CONTRACT DATA

THE CONTRACT

PART C1 : AGREEMENTS AND CONTRACT DATA

PART C2 : PRICING DATA

PART C1 : AGREEMENTS AND CONTRACT DATA

CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
C1.1	FORM OF OFFER AND ACCEPTANCE	C1-3
C1.2	CONTRACT DATA	C1-7

C1.1 Form of Offer and Acceptance

OFFER

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

THE UPGRADING OF THABA NCHU PUBLIC TRANSPORT ROUTE FOR 10 KM'S

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

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

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS:

..... Rand (in words);

R (in figures)

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 Bidder before the end of the period of validity stated in the Bid Data, whereupon the Bidder becomes the party named as the Contractor in the Conditions of Contract identified in the Contract Data.

For the Bidder

.....
Signature

.....
Name

.....
Capacity

Name and address of organization

.....

Signature and Name of Witness

Signature

.....
Name

Date:

ACCEPTANCE

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the Bidder'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 Bidder's Offer shall form an agreement between the Employer and the Bidder 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: Agreements and Contract Data, (which includes this Agreement)
Part C2: Pricing Data
Part C3: Scope of Work.
Part C4: Site Information

and 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 Bid Data and any addenda thereto as listed in the Bid Schedules as well as any changes to the terms of the Offer agreed by the Bidder 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 representative(s) of both parties.

The Bidder 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. 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 Bidder receives one fully completed original copy of this document, including the Schedule of Deviations (if any). Unless the Bidder (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.

For the Employer:

.....
Signature

.....
Name

.....
Capacity

Name and address of organisation:

.....

.....

Signature and name of witness:.....
Signature

.....
Name

Date:

Schedule of Deviations

Notes:

1. The extent of deviations from the Bid documents issued by the Employer prior to the Bid closing date is limited to those permitted in terms of the Conditions of Bid,
2. A Bidder's covering letter shall not be included in the final contract document. Should any matter in such, letter, which constitutes a deviation as aforesaid become the subject of agreements reached during the process of, offer and acceptance, the outcome of such agreement shall be recorded here,
3. Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to Bid documents and which it is agreed by the Parties becomes and obligation of the contract shall also be recorded here,
4. Any change or addition to the Bid documents arising from the above agreements and recorded here, shall also be incorporated into final draft or the Contract,

1. Subject

Details

2. Subject

Details

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

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

For the Bidder:

.....

Signature

For the Employer:

.....

.....	Name	.....
.....	Capacity	.....
Name and address of organisation:	Name and address of organisation:	
.....		
.....		
.....		
.....	Witness Signature	.....
.....	Witness Name	.....
.....	Date	.....

Confirmation of Receipt

The Bidder, (now Contractor), identified in the Offer part of this Agreement hereby confirms receipt from the Employer, identified in the Acceptance part of this Agreement, of one fully completed original copy of this Agreement, including Schedule of Deviations (if any) today:

the(day)

of(month)

20(year)

at(place)

For the Contractor:
Signature

.....
Name

.....
Capacity

Signature and name of witness:

.....
Signature

.....
Name

PART C2 PRICING DATA

**DEPARTMENT OF POLICE, ROADS AND
TRANSPORT**

THE UPGRADING OF THABA NCHU PUBLIC TRANSPORT ROUTE FOR 10 KM'S

C2 –PRICING

DATA C2.1 PRICING INSTRUCTIONS

This Bill of quantities forms part of the contract documents and must be read in conjunction with all the other documents comprising the contract documents. For the purposes of this bill of quantities, the following words shall have the meanings hereby assigned to them.

Unit: The unit of measurement for each item of work as defined in the standard specifications or the project specifications.

Quantity: The number of units of work for each item.

Rate : The payment per unit of work for which the tenderer tenders to do the work. Amount:

The product of the quantity and the rate tendered for an item.

Lump Sum: An amount tendered for an item, the extent of which is described in the schedule of quantities, the specifications or elsewhere, but of which the quantity of work is not measured in units.

Bill of
Quantities

- 1 Measurement and payment shall be in accordance with the relevant provisions of the COTO Standard Specifications for Road and Bridge Works for South African Road Authorities (2020 Edition), subject to the following amendments and additions:
- 2 The units of measurement described in the Bill of Quantities are metric units. Abbreviations used in the Bill of Quantities are as follows:

mm	=	millimetre
m	=	metre
km	=	kilometre
m2	=	square metre
m2.pass	=	square metre-pass
ha	=	hectare
m3	=	cubic metre
m3.km	=	cubic metre-kilometre
l	=	litre
kl	=	kilolitre
MPa	=	megapascal
h	=	hour
kg	=	kilogram
t	=	ton (1000 kg)
No.	=	number
sum	=	lump sum
MN	=	meganewton
MN.m	=	meganewton-metre

P C sum	=	Prime Cost sum
Prov sum	=	Provisional sum
%		
	=	per cent
kW	=	Kilowatt
man-month	=	Man per Month
man-shift	=	Man per Shift
Person.Month	=	Person per Month

3 For the purposes of the Bill of Quantities, the following words shall have the meanings hereby assigned to them:

- Unit: The unit of measurement for each item of work as defined in the COTO Standard Specifications for Road and Bridge Works for South African Road Authorities (2020 Edition), Quantity: The number of units of work for each item.
- Rate: The agreed payment per unit of measurement.
- Amount: The product of the quantity and the agreed rate for an item.
- Lump sum: An agreed amount for an item, the extent of which is described in the Bill of Quantities but the quantity of work of which is not measured in any units.

- 4 Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance is made for waste. Attention is directed to the provisions of clause 1220 of the standard specifications regarding the measurements of quantities for payment. Except where specified otherwise than in clause 1220, the net measurement or mass of the finished work in place shall be taken for payment, and any volume or mass of work in excess of that prescribed, shall be excluded.

- 5 The prices and rates to be inserted in the Bill of Quantities are to be the full inclusive prices for the work described under the several items. Such prices and rates shall cover all costs and expenses that may be required in and for the execution of the work described, and for all the risks, obligations and responsibilities specified in the general conditions of contract, special conditions of contract, standard specifications and project specifications shall be considered as provided for collectively in the items of payment given in the bill of quantities.

Such prices and rates shall also cover full compensation for completing and maintaining, during the defects liability period, all the work shown on the drawings and specified in the standard specifications and project specifications and the cost of all general risks, liabilities, and obligations set forth or implied in the Contract Data, as well as overhead charges and profit. Reasonable prices shall be inserted, as these will be used as a basis for assessment of payment for additional work that may have to be carried out.

- 6 A price or rate is to be entered against each item in the Bill of Quantities, whether the quantities are stated or not. An item against which no price is entered shall not be paid for but will be considered to be covered by other prices or rates elsewhere in the Bill of Quantities.

If the tenderer should group a number of items together and tender one lump sum for each group of items, this single tendered lump sum shall apply to that group of items and not to each individual item, or should he indicate that full compensation for any item has been included in the rate for another item, the rate for the item included in another item shall be deemed to be nil.

The tendered lump sums and rates shall be valid irrespective of any change in the quantities during the execution of the contract

- 7 Reasonable compensations will be received where no pay item appears in respect of work required in terms of the Contract, which is not covered in any other pay item.
- 8 The short descriptions of the items of payment given in the Bill of Quantities are only for the purposes of identifying the items. More details regarding the extent of the work under each item appear in the scope of work, Reference shall, inter alia, be made to the drawings, standard specifications, project specifications, general conditions of contract and special conditions of contract for more detailed information regarding the extent of work entailed under each item.
9. The item numbers appearing in the Bill of Quantities refer to the corresponding item numbers in the COTO Standard Specifications for Road and Bridge Works for South African Road Authorities (2020 Edition),. Item numbers prefixed by the letter B refer to payment items described under part B of the project specifications, those with C to payment items described under part C, and so on for further parts of the project specifications.

Item numbers in schedule B of the schedule of quantities are, in addition, preceded by the number of each separate part of schedule B of the schedule of quantities, e.g. payment item 62.02 described in the standard specifications (clause 6210), when used in part 3 of schedule B of the schedule of quantities, would be numbered 3/62.02, and if this payment item had been amended in part B of the project specifications, the payment item would be indicated as 3/B62.02.

- 10 The quantities set out in the schedule of quantities are only approximate quantities. The quantities of work finally accepted and certified for payment, and not the quantities given in the schedule of quantities, will be used to determine payments to the Contractor

The validity of the contract shall in no way be affected by differences between the quantities in the schedule of quantities and the quantities finally certified for payment. Work is valued at the rates or lump sums tendered, subject only to the provisions of sub clause 1209 (a) of the standard specifications.

- 11 The amount of work or the quantities of material stated in the schedule of quantities shall not be considered as restricting or extending the amount of work to be done or quantity of material to be supplied by the Contractor
- 12 The statement of quantities of material or the amount of work in the schedule of quantities shall not be regarded as authorization for the Contractor to order material or to execute work. The Contractor shall obtain the Engineer's detailed instructions for all work before ordering any materials or executing work or making arrangements in this regard
- 13 The provisions of clause 10.1 of the general conditions of contract shall apply to provisional sums and prime cost sums.
- 14 Subject to the conditions stated in paragraph 15 below, the rates and lump sums filled in by the tenderer in the schedule of quantities shall be final and binding with regard to submitting the tender, and may not be adjusted should there be any mistakes in the extensions thereof and in the total sums appearing in the tender. Should there be any discrepancies between the tender sum and the correctly extended and totalled bill of quantities, the tendered sum will be regarded as being correct, and the Employer shall have the right to make adjustments to the tender rates to reconcile the tender sum with the total of the bill of quantities. In such an event the Contractor will be consulted but, failing agreement between the parties, the decision of the Employer shall be final and binding. Adjustment of the tender rates will take place prior to the signing of the contract. In their own interest tenderers must make doubly sure of the correctness of their tendered rates, the extensions and the tender sum.
- 15 A tender may be rejected if the unit rates or lump sums for some of the items in the schedule of quantities are, in the opinion of the Employer, unreasonable or out of proportion, and if the tenderer fails, within a period of seven (7) days of having been notified in writing by the Employer to adjust the unit rates or lump sums for such items, to make such adjustments.
- 16 Those parts of the contract to be constructed using labour-intensive methods have been marked in the bill of quantities with the letters LI in a separate column filled in against every item so designated. The works, or parts of the works so designated are to be constructed using labour-intensive methods only. The use of plant to provide such works, other than plant specifically provided for in the scope of work, is a variation to the contract. The items marked with the letters LI are not necessarily an exhaustive list of all the activities, which must be done by hand, and this clause does not over-ride any of the requirements in the generic labour intensive specification in the Scope of Works.
- 17 Payment for items which are designated to be constructed labour-intensively (either in this schedule or in the Scope of Works) will not be made unless they are constructed using labour-intensive methods. Any unauthorized use of plant to carry out work, which was to be done labour-intensively will not be condoned, and any works so constructed will not be certified for payment.

C2.2 BILL OF QUANTITIES**CONTENTS**

PART	HEADING	PAGE NO.
C1.2	GENERAL REQUIREMENTS AND PROVISIONS	
C1.3	CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS	
C1.4	FACILITIES FOR THE ENGINEER	
C1.5	ACCOMODATION OF TRAFFIC	
C1.6	CLEARING AND GRUBBING	
C1.7	LOADING AND HAULING	

SERVICES

C2.1	GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES	

DRAINAGE

C3.1	DRAINS 3 BRIDGES / MAJOR CULVERTS	

EARTHWORKS AND PAVEMENT LAYERS MATERIALS

C4.3	EXISTING ROAD MATERIALS	
C4.4	COMMERCIAL MATERIALS	

EARTHWORKS AND PAVEMENT LAYERS CONSTRUCTION

C5.3	ROAD PAVEMENT LAYERS	
C5.4	STABILISATION	
C5.5	RECONSTRUCTION OF PAVEMENT LAYERS	

PRETREATMENT AND REPAIR EXISTING LAYERS

C8.1	PRIME COAT	
C8.2	COVER SPRAYS, FOG SPRAYS AND REJUVINATOR SPRAYS	
C8.4	RUT AND/OR DEPRESSION CORRECTION	

ASPHALT LAYERS

C9.1	ASPHALT LAYERS	

SURFACE TREATMENT

C10.1 GENERAL REQUIREMENTS FOR THE SURFACE TREATMENTS

ANCILLIARY WORKS

C11.1 PITCHING, STONWORK, CAST IN SITU CONCRETE FOR PROTECTION AGAINST EROSION

C11.2 NON-STRUCTURAL GABIONS

C11.3 GUIDE STRUCTURAL AND KILOMETER MARKERS

C11.4 ROAD RESTRAINED SYSTEMS

C11.5 FENCING

C11.6 ROAD SIGNS

C11.7 ROAD MARKINGS AND ROAD STUDS

C11.9 FINISHING THE ROAD AND ROAD RESERVE AND GREATING OLD ROADS

QUALITY ASSURANCE

C20.1 TESTING MATERIAL AND JUDGEMENT OF WORKMANSHIP

SECTION D: STAKEHOLDER AND COMMUNITY LIASON, AND TARGET LABOUR AND TARGETED ENTERPRISES UTILISATION AND DEVELOPMENT.

D1010 TRAINING, COACHING, GUIDANCE, MENTORING AND ASSISTANCE

C1.2

GENERAL REQUIREMENTS AND PROVISIONS

ITEM	DESCRIPTION	UNIT	QTY	RATE		AMT	
C1.2.1	Environmental Management						
C1.2.1.1	Monitoring of compliance with and reporting on the EMP	month	15				
C1.2.1.2	Dedicated environmental officer <i>(if specified in the Contract Documentation)</i>	month	15				
C1.2.3	Routine road maintenance of existing public roads within the Site of the Works or other public roads outside the Site of the Works which are used as detours						
C1.2.3.9	Grading of temporary gravel deviations and existing roads used as detours	(km)	10				
C1.2.3.10	Watering of temporary gravel deviations and existing roads used as detours	(kℓ)	10000				
C1.2.3.12	Handling cost, profit and all other charges in respect of item C1.2.3.11	percentage (%)	R -				
C1.2.3.13	Liaison with the routine road maintenance contractor	month	15				
C1.2.4	Stakeholder liaison	month	15				
C1.2.5	Safety						
C1.2.5.1	Health and safety plan	lump sum	Lump	R	50 000,00	R	50 000,00
C1.2.5.2	Implementation of health and safety plan	month	15				
C1.2.8	Dayworks						
C1.2.8.1	Personnel						
	Unskilled labourer	h	88,32				
	Semi-skilled labourer	h	88,32				
	Skilled labourer	h	88,32				
	Gang leader	h	44,16				
	Foreman	h	22,08				
	Skilled artisan	h	22,08				
	Motor grader	h	55				
	Vibratory roller	h	55				
	Pneumatic roller	h	55				
	Front end loader	h	110				
	Tractor loader backhoe	h	55				
	Excavator	h	55				
	Compressor	h	55				
	Other equipment <i>(specify)</i>	h					
	Vehicles <i>(specify size)</i>						
	Light delivery vehicle	(km)	4000				
	Flatbed truck	(km)	4000				

	Dump truck	(km)	4000		
	Other vehicles (<i>specify</i>)	(km)	4000		
	Materials				
	Procurement of materials	provisional sum	Prov	R 100 000,00	R 100 000,00
	Contractor's handling costs, profit and all other charges in respect of item C1.2.8.4(a)	(%)	R 100 000,00	5,00%	R 5 000,00
PC1.2.10	Dispute Adjudication Board (DAB)	Note to compiler: If a DAB will be appointed add this payitem C1.2.10 for 50% of the estimated cost of the DAB			
	Employer's contribution to DAB (50%)	ne cost (PC) s	Prime	Cost	R 100 000,00
TOTAL CARRIED FORWARD TO SUMMARY					

C1.3

CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS						
ITEM			DESCRIPTION	UNIT	QTY	AMT
PC1.3.1			The Contractor's general obligations			
	C1.3.1.1		Fixed obligations	lump sum	1	
	C1.3.1.3		Time-related obligations	Month	15	
C1.3.2			Contract sign boards	(m ²)	30	
TOTAL CARRIED FORWARD TO SUMMARY						

C1.4

FACILITIES FOR THE ENGINEER

ITEM	DESCRIPTION	UNIT	QTY	RATE		AMT
C1.4.1	Site accommodation					
C1.4.1.1	Offices and conference room	(m ²)	140			
C1.4.1.2	Laboratories	(m ²)	140			
C1.4.1.3	Open concrete working floors and verandas	(m ²)	200			
C1.4.1.4	Roofs over open concrete working floors and verandas	(m ²)	90			
C1.4.1.5	Store rooms inside the laboratory	(m ²)	50			
C1.4.1.6	Car ports	(No.)	5			
C1.4.1.7	Ablution unit (<i>equipped as specified</i>)	(No.)	2			
C1.4.1.8	Change room with a shower	(No.)	2			
C1.4.1.9	Kitchen unit (<i>equipped as specified</i>)	(No.)	2			
C1.4.1.10	Type A prefabricated house (<i>equipped as specified</i>)	(No.)				
C1.4.1.11	Type B prefabricated house (<i>equipped as specified</i>)	(No.)				
C1.4.1.12	Type C prefabricated house (<i>equipped as specified</i>)	(No.)				
C1.4.1.13	Rented housing paid for by the Contractor	Pro sum	1	R	84 000	R 84 000
C1.4.1.14	Contractor's handling costs, profit and all other charges in respect of item C1.4.1.13	(%)	R 84 000,00	R	0	R 8 400
C1.4.2	Items measured by area					
C1.4.2.1	Shelving as specified, complete with brackets	(m ²)	10			
C1.4.2.2	Work benches with a concrete slab top	(m ²)	15			
C1.4.2.3	Work-benches with a wooden top	(m ²)	15			
C1.4.2.4	Constant-temperature baths of concrete and/or plastered brick	(m ²)	10			
C1.4.2.5	Concrete footings and pedestals for laboratory equipment	(m ²)	10			
C1.4.2.6	Roller blinds, opaque type	(m ²)	10			
C1.4.2.7	Venetian blinds	(m ²)	10			
C1.4.2.8	Notice boards	(m ²)	10			
C1.4.2.9	White boards	(m ²)	10			
C1.4.2.10	Galvanised wire mesh fencing for store rooms	(m ²)	10			
C1.4.2.11	Galvanised wire mesh store room gate with a padlock	(m ²)	10			
C1.4.3	Items measured by number					
C1.4.3.1	Office swivel chair	(No.)	2			
C1.4.3.2	Office chair	(No.)	10			
C1.4.3.3	Draughtsman's stool	(No.)	1			
C1.4.3.4	Laboratory high chair	(No.)	4			
C1.4.3.5	Office desk with 3 drawers (<i>at least one lockable drawer</i>)	(No.)	3			
C1.4.3.6	Typist desk (<i>L-shaped</i>)	(No.)	1			

C1.4.3.7	Drawing table	(No.)	1		
C1.4.3.8	Conference table	(No.)	1		
C1.4.3.9	Bookcase	(No.)	1		
C1.4.3.10	Filing cabinet	(No.)	3		
C1.4.3.11	General purpose steel cabinet with shelves	(No.)	2		
C1.4.3.12	Wall mounted pivot plan filing system	(No.)	2		
C1.4.3.13	220/250 volt power outlet plug point	(No.)	2		
C1.4.3.14	400/231 volt 3-phase power outlet plug point	(No.)	2		
C1.4.3.15	Single 1500m, 58 watt fluorescent tube ceiling light	(No.)	10		
C1.4.3.16	Single 1500mm, 22 watt LED tube ceiling light	(No.)	10		
C1.4.3.17	11 watt compact fluorescent bulb ceiling light	(No.)	10		
C1.4.3.18	7 watt LED bulb ceiling light	(No.)	5		
C1.4.3.19	Wash-hand basin	(No.)	2		
C1.4.3.20	Laboratory basin	(No.)	1		
C1.4.3.21	Extractor fan	(No.)	2		
C1.4.3.22	Fume cupboard	(No.)	2		
C1.4.3.23	Fire extinguisher 9,0 kg, dry powder type	(No.)	3		
C1.4.3.24	Air-conditioning unit	(No.)	2		
C1.4.3.25	Heater	(No.)	2		
C1.4.3.26	Concrete specimen curing bath	(No.)	3		
C1.4.3.27	Waste paper basket	(No.)	2		
C1.4.3.28	UPS / Voltage stabiliser	(No.)	2		
C1.4.3.29	A3 / A4 colour printer, copier, scanner	(No.)	2		
C1.4.3.30	A4 colour printer, copier, scanner	(No.)			
C1.4.3.31	Rain gauge	(No.)	3		
C1.4.3.32	Minimum/maximum atmospheric temperature gauge	(No.)	2		
C1.4.3.33	Digital thermometer	(No.)	2		
C1.4.3.34	Mobile outdoor weather station	(No.)	2		
C1.4.3.35	3,0m aluminium straight edge complete with two measuring wedges	(No.)	2		
C1.4.3.36	Measuring wheel	(No.)	2		
C1.4.3.37	First aid kit	(No.)	2		
C1.4.3.38	Standpipe complete with 30m of 19mm dia. heavy duty hose pipe	(No.)	2		
C1.4.4	Prime cost items				
C1.4.4.1	Cell phones costs, including pro-rata rentals, for calls made in connection with contract administration	(PC) sum	prime	R 35 000	R 35 000
C1.4.4.2	Handling costs and profit in respect of item C1.4.4.1	(%)	R 35 000,00	R 0	R 1 750
C1.4.4.5	The provision of internet connectivity and WiFi data for Engineer's site staff	(PC) sum	prime	R 48 000	R 48 000
C1.4.4.6	Handling costs and profit in respect of item C1.4.4.5	(%)	R 48 000,00	R 0	R 2 400
C1.4.4.7	The provision of paper and ink for a combination colour printer/copier/scanner	(PC) sum	prime	R 25 000	R 25 000

C1.4.4.8	Handling costs and profit in respect of item C1.4.4.7	(%)	R 25 000,00	R 0	R 1 250
C1.4.4.9	The provision of a complete 220/250 volt single phase electrical power installation, including all poles, insulators, wiring, switchboards, mains connections, meters etc.	(PC) sum	prime	R 30 000	R 30 000
C1.4.4.10	Handling costs and profit in respect of item C1.4.4.9	(%)	R 30 000,00	R 0	R 1 500
C1.4.4.11	The provision of a complete 440/231 volt three phase electrical power installation, including all poles, insulators, wiring, switchboards, mains connections, meters etc.	(PC) sum	prime	R 35 000	R 35 000
C1.4.4.12	Handling costs and profit in respect of item C1.4.4.11	(%)	R 35 000,00	R 0	R 1 250
C1.4.4.13	Provision of a 440/231 volt three phase electricity generator if electricity from a power supply authority is not available on site	(PC) sum	prime	R 45 000	R 45 000
C1.4.4.14	Handling costs and profit in respect of item C1.4.4.13	(%)	R 45 000,00	R 0	R 1 250
C1.4.4.15	The provision of all gas installations required at the site offices, laboratories and at the Engineer's staff accommodation (if required), including gas storage cylinders, tubing, regulators, gas burners and shut-off cocks	(PC) sum	prime	R 80 000	R 80 000
C1.4.4.16	Handling costs and profit in respect of item C1.4.4.15	(%)	R 80 000,00	R 0	R 1 250
C1.4.5	Services at site offices, laboratories and site accommodation				
C1.4.5.1	Fixed costs	lump sum	lump	R 84 000	R 84 000
C1.4.5.2	Running costs	month	15		
C1.4.6	Office staff				
C1.4.5.1	Secretary / receptionist	month	15	R 8 000	R 120 000
C1.4.5.2	Technical assistant	month	15		
C1.4.7	Site inspection transport				
C1.4.7.1	Provision of a bus, mini-bus or combi van for site inspection purposes (<i>specify type and size of vehicle</i>)	per day	15	R 8 000	R 120 000
C1.4.7.2	Travel on site	(km)	60		
C1.4.8	Site security measures for the Engineer's facilities				
C1.4.8.1	Supply and installation of all required security measures at the Engineer's site offices and laboratories	lump sum	lump	R 60 000	R 60 000
C1.4.8.3	Supply and installation of all required security measures at the Engineer's site accommodation	lump sum	lump	R 60 000	R 60 000
TOTAL CARRIED FORWARD TO SUMMARY					

C1.5

ACCOMMODATION OF TRAFFIC

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
	<i>The applicable payment items required for the construction of temporary deviations shall be taken from the relevant chapters and sections in Chapters 1, 3, 5, 9 and 10 and inserted into the Pricing Schedule here. Each payment item for the construction of temporary deviations shall be preceded by the main payment item number C1.5.4 / followed by the payment number for the applicable payment item</i>	(km)	10		
C1.5.5	Maintenance of temporary deviations				
C1.5.5.1	Grass cutting	(ha)	8		
C1.5.5.2	Drain cleaning	(km)	40		
C1.5.5.3	Cleaning out culverts	(m ³)	500		
C1.5.5.8	Replacement of damaged guardrails	(m)	80		
C1.5.5.9	Grading of temporary deviations and existing roads used as detours	(km)	10		
C1.5.5.10	Watering of temporary deviations and existing roads used as detours	(kl)	20		
C1.5.5.11	Other road maintenance work ordered by the Engineer	Prov sum	Prov	R 200 000	R 200 000
C1.5.5.12	Handling cost, profit and all other charges in respect of item C1.5.6.11	(%)	R 200 000	R 0	R 10 000
C1.5.6	Removal of temporary deviations	(km)	80		
C1.5.7	Temporary traffic control facilities				
C1.5.7.1	Delineators including mounting bases and ballast:				
	Single sided, reversible left or right (<i>size indicated</i>)	(No.)	1320		
	Double sided, reversible left or right (<i>size indicated</i>)	(No.)	2280		
C1.5.7.2	Traffic cones, minimum height 750mm	(No.)	380		
C1.5.7.3	Flagmen	man-shift	12040		
C1.5.7.4	Traffic controllers	man-shift	48		
C1.5.7.5	Provision of illuminated traffic signs:				
	Sign mounted flashing amber lights (<i>2 lights with the specified power supply</i>) mounted on a backing board which is:				
	900mm wide x 150mm high	(No.)	2		
	1200mm wide x 200mm high	(No.)	2		
	Flashing LED illuminated arrow board	(No.)	2		
	Illuminated road sign – R & TR series	(No.)	30		
	Illuminated road sign – TW series	(No.)	30		
	Mobile variable message sign	(No.)	2		

	Mobile variable message sign with a speed measuring and display capability	month	15		
C1.5.7.6	Maintenance of illuminated traffic signs:				
	Sign mounted flashing amber lights (<i>a pair of two lights mounted on a separate backing board</i>)	month	15		
	Flashing LED illuminated arrow board	month	15		
	Illuminated road sign – R & TR series (<i>diameter indicated</i>)	month	15		
	Illuminated road sign – TW series (<i>length of sides indicated</i>)	month	15		
	Mobile variable message sign	month	15		
	Mobile variable message sign with a speed measuring and display capability	month	15		
C1.5.7.7	Traffic calming devices:				
	25mm high x 100mm wide asphalt rumble strips	(m)	390		
	50mm high x 500m wide asphalt rumble strips	(m)	390		
	150mm high x 3m wide asphalt speed control humps	(m)	390		
C1.5.7.8	Traffic control stations	month	24		
C1.5.7.9	Cleaning of traffic control facilities	month	48		
C1.5.8	Traffic safety officer	man-month	30		
C1.5.9	Traffic safety vehicle	month	15		
C1.5.10	Tow trucks				
C1.5.11	Provision of safety equipment for visitors				
	Provision of reflective safety vests for visitors	(No.)	100		
	Provision of hard hats for visitors	(No.)	100		
TOTAL CARRIED FORWARD TO SUMMARY					

C1.6

CLEARING AND GRUBBING					
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C1.6.1	Clearing				
C1.6.1.1	Clearing with machines and some hand labour where necessary	(ha)	8		
C1.6.2	Grubbing				
C1.6.2.1	Grubbing with machines and some hand labour where necessary	(ha)	8		
C1.6.10.1	Disposal of hazardous waste material at an approved hazardous waste material facility	provi sum	Prov	R 50 000,00	R 50 000,00
C1.6.10.2	Handling cost, profit and all other charges in respect of item C1.6.10.1	(%)	R 50 000,00	5%	R 2 500,00
TOTAL CARRIED FORWARD TO SUMMARY					

C1.7**LOADING AND HAULING**

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C1.7.1	Loading				
C1.7.1.2	Loading from heaps or windrows using machines and/some hand labour where necessary	m ³	10000		
C1.7.2	Hauling				
C1.7.2.1	Hauling material for use in the Works and off-loading it on the site of the Works:				
	Gravel for pavement layer material	m ³ - km	750000		
TOTAL CARRIED FORWARD TO SUMMARY					

C2.1
GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMT
C2.1.1		Location, identification, protection and relocation of existing services				
C2.1.1.1		Contractor's obligations	lump sum	lump	R 200 000	R 200 000
C2.1.1.2		Permanent services relocation or protection work by others	(PC) sum	prime	200000	R 200 000
C2.1.1.3		Handling costs and profit in respect of item C2.1.1.2 above	(%)	R 200 000	5%	R 10 000
C2.1.2		Existing services location, detection and verification				
C2.1.3		Obtaining construction or work permits	lump sum	lump	R 100 000	R 100 000
C2.1.4		Provision of guarantees or deposits for services				
C2.1.4.1		Providing guarantees and deposits	(PC) sum	prime	200000	R 200 000
C2.1.4.2		Handling costs and profit in respect of item C2.1.4.1 above	(%)	R 200 000	5%	R 10 000
C2.1.5		Provision of record drawings and applicable data	lump sum	lump	R 50 000	R 50 000
C2.1.6		Trench excavation (in soft material)				
	(a)	Up to 1,0m deep	m ³	300		
	(b)	Over 1,0m and up to 2,0m deep	m ³	300		
	(c)	Over 2,0m deep etc. to be inserted, increased by additional 1,0m depths as required	m ³	300		
C2.1.6.2		Trenches over 1,0m and up to 2,0m wide				
	(a)	Up to 1,0m deep	m ³	450		
	(b)	Over 1,0m and up to 2,0m deep	m ³	550		
	(c)	Over 2,0m deep etc., increased by additional 1,0m depths as required	m ³			
C2.1.6.3		Trenches over 2,0m wide and up to 3,0m etc., increased by additional 1,0m widths as required				
	(a)	Up to 1,0m deep	m ³	400		
	(b)	Over 1,0m and up to 2,0m deep	m ³	400		
	(c)	Over 2,0m deep etc., increased by additional 1,0m depths as required	m ³	400		
C2.1.7		Extra over items C2.1.6, C2.1.8 and C2.1.16 for excavating in:				
C2.1.7.1		Hard material irrespective of depth	m ³	200		
C2.1.7.2		Stabilised material irrespective of depth	m ³	200		
TOTAL CARRIED FORWARD TO SUMMARY						

C3.1
DRAINS

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMT
C3.1.1		Excavation for open drains:				
C3.1.1.1		Excavating all material situated within the following depth ranges below the surface level using conventional methods:				
	(a)	0m to 1,5m	m ³	1500		
	(b)	Exceeding 1,5m and up to 3,0m	m ³	300		
	(c)	Etc. in increments of 1,5m	m ³	250		
C3.1.1.2		Extra over sub-item C3.1.1.1 for excavation in hard and boulder material, irrespective of depth	m ³	300		
C3.1.1.3		Extra over sub-item C3.1.1.1 for excavation in stabilised existing road layers, irrespective of depth	m ³	100		
C3.1.1.4		Excavating soft material situated 0m to 1,5m below the surface level using labour enhanced construction methods	m ³	100		
C3.1.1.5		Excavating intermediate material situated 0m to 1,5m below the surface level using labour enhanced construction methods	m ³	100		
C3.1.2		Clearing, shaping and disposal of accumulated sediment in existing unlined open drains				
C3.1.2.2		Using labour enhanced construction methods	m ³	5000		
C3.1.3		Excavation, clearing and disposal of accumulated sediment in existing lined drains and drainage systems:				
C3.1.3.1		Using conventional methods (up to 1,5m):				
	(a)	Manholes and inlet and outlet structures	m ³	100		
	(b)	Culvert barrels	m ³	100		
C3.1.15		Repairing or replacing existing drainage systems	provi sum	Prov	sum	R300 000,00
C3.1.24		Submission of as built drawings by the Contractor	provi sum	Prov	sum	R 100 000,00
TOTAL CARRIED FORWARD TO SUMMARY						

C3.2**CULVERTS**

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C3.2.1	Excavation for culvert structures:				
C3.2.1.1	Excavating in all material situated within the following depth ranges below the surface level:				
C3.2.1.2	Excavating soft material 0m to 1,5m below the surface level using labour enhanced construction methods, or instructed by hand under Clause A3.2.7.2(d)	m ³	129,6		
C3.2.3	Concrete pipe culverts:				
C3.2.3.1	On Class A bedding (<i>Concrete Pipes @ 600mm diameter</i>)	m ³	370		
C3.2.5	Rectangular culverts with prefabricated elements:				
C3.2.5.1	Prefabricated portal culverts; wall and roof combination (<i>1,2m x 1,2m</i>)	m	108		
C3.2.5.2	Prefabricated floor slabs (<i>250mm 30 MPA RI Concrete Floor</i>)	m	216		
C3.2.5.3	Prefabricated roof slabs (<i>250mm 30 MPA RI Concrete Slab</i>)	m	216		
C3.2.6	Extra over items C3.2.3, C3.2.4 and C3.2.5 for constructing inclined culverts	m	0		Rate Only
C3.2.16	Brickwork (Engineering bricks):				
C3.2.16.2	230mm thick	m ²	1300		
TOTAL CARRIED FORWARD TO SUMMARY					

C3.3

CONCRETE KERBING AND CHANNELING, ASPHALT BERMS,
CHUTES, DOWNPIPES, AS WELL AS CONCRETE, STONE
PITCHED AND GABION LININGS FOR OPEN DRAINS

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMT
C3.3.1		Concrete kerbing:				
	(a)	As shown on drawing	m	500		
TOTAL CARRIED FORWARD TO SUMMARY						

C4.4

COMMERCIAL MATERIALS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C4.4.2	Commercial materials identified by the Contractor from commercial, private or other non-commercial suppliers				
	Type G6 to a depth of 150mm to be used as an upper selected layer	m ³	16500		
C4.4.4	Cementitious stabilising agents				
C4.4.4.2	Road lime	t	2051		
C4.4.7	Sampling and material testing by a commercial laboratory for the stabilisation designs				
C4.4.7.1	Cost of sampling and material testing	prov sum	Prov		R 4 000 000
C4.4.7.2	Handling cost and profit in respect of item C4.4.7.1	(%)	R 4 000 000	5%	R 200 000
TOTAL CARRIED FORWARD TO SUMMARY					

C5.1

ROADBED

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMT
C5.1.1		Roadbed construction and compaction:				
C5.1.1.2		Compaction of in-situ material to 93% of MDD	m ³	9000		
C5.1.1.3		Compaction of imported material to 90% of MDD	m ³	9000		
C5.1.2		Excavate material to spoil sites designed by the Employer:				
C5.1.2.1		Excavate material to spoil from roadbed construction, material obtained from:				
		Soft excavation	m ³	9000		
C5.1.11		Construction of roadbed comprising a pioneer layer	m ³	3600		
TOTAL CARRIED FORWARD TO SUMMARY						

C5.3

ROAD PAVEMENT LAYERS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C5.3.1	Compiling and implementing M&U plans for the construction of all the pavement layers.	No.	1		
C5.3.2	Construction of pavement layers				
	Gravel shoulder layer (<i>using G6 at 150mm depth that is commercially obtained</i>) compacted to 95% of MDD	m ³	1500		
	G6 crushed rock/boulder subbase layer (<i>using G6 at 150mm depth</i>) compacted to 97% of MDD obtained commercially	m ³	7500		
	G1 crushed stone base layer at 150mm depth compacted to 88% of AD obtained commercially	m ³	12000		
C5.3.10.3	Crushed stone layer	m ³	240		
C5.3.11	Riding quality measurements:				
C5.3.11.1	Using a 3,0m straight edge	km	10		
TOTAL CARRIED FORWARD TO SUMMARY					

C5.4

STABILISATION					
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C5.4.2	Chemical stabilisation:				
C5.4.2.1	Chemical stabilisation (<i>using a new G6 to a depth of 150mm</i>) of pavement layers (<i>to a C3 Subbase</i>)	m ³	15000		
	Cement (for pavement layer)	t	837		
C5.4.10	Provision and application of water for curing	kℓ	20000		
C5.4.14	Trial section for a chemically stabilised layer	m ³	276		
TOTAL CARRIED FORWARD TO SUMMARY					

C6.2

SEGMENTAL BLOCK PAVING LAYERS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C6.2.1	Segmental block paving				
C6.2.1.1.	Concrete block paving (80 mm thick interlocking paving blocks)	m ²	44400		
TOTAL CARRIED FORWARD TO SUMMARY					

C8.1

PRIME COAT					
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C8.1.1	Prime coat:				
C8.1.1.2	MC -30 cut-back bitumen	(ℓ)	72000		
C8.1.2	Aggregate for blinding:				
C8.1.2.1	Natural sand	(m ³)	4000		
C8.1.2.2	Crusher sand	(m ³)	8000		
C8.1.3	Extra over item C8.1.1 for applying the prime coat accessible only to hand-held or light equipment	(ℓ)	1350		
TOTAL CARRIED FORWARD TO SUMMARY					

C8.2

COVER SPRAYS, FOG SPRAYS AND REJUVENATION SPRAYS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C8.2.1	Cover sprays, fog sprays and rejuvenation				
	Indicate dilution (Diluted 50% Emulsion 50% Water)	(ℓ)	40000		
TOTAL CARRIED FORWARD TO SUMMARY					

C9.1

ASPHALT LAYERS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C9.1.1	Asphalt mix designs				
C9.1.1.1	Stone skeletal mixes:				
	Continuously graded base or surfacing ((40mm nominal thickness and A-E2 grade binder)	lump sum	lump	50000	R 50 000
C9.1.5	Asphalt surfacing				
C9.1.5.1	New construction				
	Stone skeletal mix – continuously graded as defined ((40mm nominal thickness and A-E2 grade binder))	(m ²)	1920		
C9.1.6	Extra over pay items C9.1.4.1 and C9.1.5.1 for placing small quantities of asphalt of less than 10 tons specially produced as specified in terms of Clause A9.1.7.1(d)	(t)	10		
C9.1.9.1	By means of chip spreader	(m ²)	1350		
C9.1.13	Coring of asphalt layers				
C9.1.13.1	100mm diameter	(No.)	6		
TOTAL CARRIED FORWARD TO SUMMARY					

C10.1**GENERAL REQUIREMENTS FOR SURFACE TREATMENTS**

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C10.1.3	Multiple stone seals including a cover spray, if specified using:				
C10.1.3.1	20mm and 10mm aggregate (<i>using a hot applied type SE-1 homogeneous modified binder</i>)	(m ²)	80000		
C10.1.4	Embargo period effects				
C10.1.4.1	Re-establishment of sealing team after embargo period	lump sum	lump	R 200 000	R 200 000
C10.1.9.11	Precoating fluid (<i>Petrleum Based Products</i>)	(ℓ)	20000		
C10.1.10	Aggregate variation (state grade) :				
C10.1.10.3	10mm aggregate	(m ³)	300		
C10.1.10.5	20mm aggregate	(m ³)	300		
C10.1.11.3	Diluted Cationic spray-grade emulsion (A 60% cationic spray-grade emulsion (diluted with 50% water) fog spray as final binder	(ℓ)	40000		
C10.1.16	Addition of wetting agent:				
C10.1.17	Aggregate for blinding:				
C10.1.18.2	Crusher sand	(m ³)	3000		
C10.1.19	Extra over item for work in areas inaccessible to mechanical equipment:				
C10.1.19.1	Single seals	(m ³)			
C10.1.19.2	Multiple stone seals	(m ³)	10000		
C10.1.26	Trial sections for all seal types specified (See Section C10.1.3.1)	lump sum	lump	R300 000	R 300 000
C10.1.27	Provision of Performance Guarantee in respect of the Surfacing	lump sum	lump	50000	R 50 000
TOTAL CARRIED FORWARD TO SUMMARY					

C11.1

**PITCHING, STONEMWORK, CAST IN SITU CONCRETE FOR
PROTECTION AGAINST EROSION**

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C11.1.2.2	Grouted stone pitching with mortar	(m ²)	900		
C11.1.6	Concrete edge beams (<i>class 30/19 concrete</i>)	(m ³)	8,64		
C11.1.7	Provision of approved herbicide and ant poison:				
C11.1.7.1	Provision of materials	(PC) sum	Prime	20000	R 20 000
C11.1.7.2	Contractor's charges and profit added to the prime cost sum	(%)	R 20 000	5%	R 1 000
TOTAL CARRIED FORWARD TO SUMMARY					

C11.3

GUIDE BLOCKS AND KILOMETRE MARKERS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C11.3.3	Kilometre markers mounted on concrete reinforced pipes <i>(diameter to be specified)</i>	(No.)	10		
TOTAL CARRIED FORWARD TO SUMMARY					

C11.4**ROAD RESTRAINT SYSTEMS**

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C11.4.1	Erecting of guardrails at 3,81m spacing				
C11.4.1.1	Complete galvanized system compliant to SANS 1350:				
	On timber posts (<i>Drawing reference</i>)	(m)	372		
C11.4.6	Reflective plates				
C11.4.6.1	Steel plates	(No.)	500		
C11.4.7	Removing existing guardrails:	(m)	372		
TOTAL CARRIED FORWARD TO SUMMARY					

C11.5**FENCING**

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C11.5.1	Supply and erect new fencing material for new fences and for supplementing material in existing fences which are being repaired or removed:				
C11.5.1.1	Zinc-coated barbed wire (3.2 x 2.5mm high tensile grade single strand)	(km)	10		
C11.5.1.7	Standards (1850 x 2.5 kg/m "Y" section complete with holes at 50 mm c/c)	(No.)	150		
C11.5.1.8	Droppers (1400 x 0.56 kg/m Ridgeback Pattern)	(No.)	10000		
	Steel stays and anchors (2130 x 60 x 3mm mild steel tubing)	(No.)	50		
TOTAL CARRIED FORWARD TO SUMMARY					

C11.6
ROAD SIGNS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C11.6.1	Road signboards with painted or coloured semi-matt background. Symbols, lettering and borders in semi- matt black or in Class I retro-reflective material, where the sign board is constructed from:				
C11.6.1.3	Prepainted galvanized steel plate: (chromadek or approved equivalent)				
	Area exceeding 0,5 m ² but not 2,0 m ²	(m ²)	50		
	1200mm size (<i>signboard material, background and symbol retro-reflective class indicated</i>)	(No.)	55		
C11.6.3.2	Timber (<i>diameter and type indicated</i>)	(m)	688		
C11.6.4	Kilometre Markers				
C11.6.4.1	Kilometre markers on posts (<i>triangular concrete post (Class 25/13) embedded in 1200mm high x 450mm</i>)	(No.)	21		
C11.6.4.2	Replace marker boards on existing kilometre posts	(m ²)	20		
C11.6.5	Excavation and backfilling for road sign supports (not applicable to kilometre posts)				
C11.6.5.1	Excavating soft material and backfilling	(m ³)			
C11.6.5.2	Excavating soft or intermediate material and backfilling using labour enhanced construction methods	(m ³)	10		
C11.6.5.3	Extra over item C11.6.5.1 and C11.6.5.2 for cement-treated soil backfill	(m ³)	5		
C11.6.5.4	Extra over item C11.6.5.1 for hard material excavation	(m ³)	5		
C11.6.5.5	Imported backfill material from commercial sources	(m ³)	6		
C11.6.6	Dismantling, storing and re-erecting road signs with a surface area of:				
C11.6.6.1	Area 0 to 0,5 m ²	(m ²)			
C11.6.6.2	Area exceeding 0,5 m ² but not 2,0 m ²	(m ²)	50		
C11.6.6.3	Exceeding 2,0 m ² but not 10 m ²	(m ²)			
C11.6.6.4	Exceeding 10 m ²	(m ²)			
C11.6.7	Dismantling and storing of road signs and overhead signs				
C11.6.8	Danger plates at culverts/structures				
C11.6.8.2	Size 200 x 800mm ((<i>Galvanised Square Tubing Post (50 x 50 x 2)</i>))	(No.)	64		
C11.6.8.3	Size 300 x 1200mm (<i>state post type and reflective material</i>)	(No.)	70		
C11.6.9	Installation of traffic signals				
C11.6.9.1	Specialist installation of traffic signals	(PC) sum	Prime	R 50 000	R 50 000
C11.6.9.2	Handling cost, profit and all other charges of sub item C11.6.9.1	(%)	#####	5%	R 2 500
C11.6.10	Disposing of road signs with a surface area of:				

C11.6.10. 1	Area 0 to 0,5 m ²	(m ²)	50		
C11.6.10. 2	Area exceeding 0,5 m ² but not 2,0 m ²	(m ²)	50		
C11.6.10. 3	Exceeding 2,0 m ² but not 10 m ²	(m ²)	50		
C11.6.10. 4	Exceeding 10 m ²	(m ²)	50		
TOTAL CARRIED FORWARD TO SUMMARY					

C11.7

ROAD MARKINGS AND ROAD STUDS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C11.7.1	Road marking:				
C11.7.2	Retro-reflective road marking:				
C11.7.2.1	White lines broken or unbroken (<i>Retro-reflective road-marking paint at 150mm wide</i>)	(km)	40		
C11.7.2.2	Yellow lines broken or unbroken (<i>Retro-reflective road-marking paint at 150mm wide</i>)	(km)	60		
C11.7.2.3	Red lines broken or unbroken (<i>paint type and width of line indicated</i>)	(km)			
C11.7.2.4	White lettering and symbols (<i>Retro-reflective road-marking paint at 150mm wide</i>)	(m ²)	50		
C11.7.2.5	Yellow lettering and symbols (<i>Retro-reflective road-marking paint at 150mm wide</i>)	(m ²)	90		
C11.7.5	Variations in rate of application:				
C11.7.5.1	White paint	(ℓ)	200		
C11.7.5.2	Yellow paint	(ℓ)	200		
C11.7.7	Road studs				
C11.7.7.2	Permanent road studs compliant to SANS 1463 (<i>classification & colours stated</i>)	(No.)	1500		
C11.7.8	Setting out and premarking the lines (excluding traffic island markings, lettering and symbols)	(km)	120		
C11.7.9	Re-establishing the painting unit during the defects notification period and at other instances on instruction of the Engineer	(No.)	2		
TOTAL CARRIED FORWARD TO SUMMARY					

C11.9

FINISHING THE ROAD AND ROAD RESERVE AND TREATING
OLD ROADS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C11.9.1	Finishing the road and road reserve:				
C11.9.1.2	Single carriageway road	(km)	10		
C11.9.2	Treatment of old roads and temporary deviations				
C11.9.2.1	Conventional construction methods	(km)	10		
TOTAL CARRIED FORWARD TO SUMMARY					

C20.1

TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
C20.1.1	Special tests on elastomeric bearings (150% vertical load and 150% shear distortion)	(No.)			
C20.1.2.2	Employer's contribution to other special tests				
	... (Specify test)	(PC) sum	Prime	Cost	R 500 000
	Handling costs and profit in respect of item C20.1.2.2(a)	(%)	R 500 000	10%	R 50 000
C20.1.3	Providing testing equipment:				
C20.1.3.1	Core drill	(No.)	6	R 1 000	R 6 000
PC20.1.5	Financial contribution for an independent site laboratory	month	15	R 1 000	R 15 000
PC20.1.6	Payment of independent site laboratory	<i>Note to compiler: Add this pay item C20.1.6 if the site laboratory is to be paid by the contractor (See Clause C4.7 of the Site laboratory pro-forma document):</i>			
C20.1.6.1	Direct payment by contractor	(PC) sum	Prime	Cost	R 1 000 000
	Handling cost and profit in respect of item C20.1.6.1	(%)	R 1 000 000	10%	R 100 000
TOTAL CARRIED FORWARD TO SUMMARY					R 1 671 000

SECTION D - D1000		TRAINING, COACHING, GUIDANCE, MENTORING AND ASSISTANCE			
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMT
D10.01	Target Group Participation				
	Contract Participation Performance bonus	(PC) sum	Prime	Cost	R 200 000
D10.02	Stakeholder and Community Liaison and Social Facilitation				
	Cost of liaison, social facilitation and PLC support	(PC) sum	Prime	Cost	R 200 000
	Handling cost and profit in respect of sub-item D10.02(a)	(%)	R200 000	10%	R 20 000
D10.03	Tender Process for Targeted Enterprises				
	Contractor's charge for the management and execution of the Targeted Enterprise procurement process:				
	Procurement process for the totality of all tenders concluded for the appointment of Targeted Enterprise subcontractors of CIDB 1 and 2 contractor grading	(No.)	5	10000	R 50 000
	Procurement process for the totality of all tenders concluded for the appointment of Targeted Enterprise subcontractors of CIDB 3 and 4 contractor grading	(No.)	5	10000	R 50 000
	Procurement process for the totality of all tenders concluded for the appointment of Targeted Enterprise subcontractors of CIDB 5 and higher contractor grading	(No.)	1	2000	R 2 000
	Procurement process for the totality of all tenders concluded for the appointment of Targeted Enterprise suppliers	(No.)	1	10000	R 10 000
	Targeted Enterprise Procurement Coordinator	month	2	50000	R 100 000
D10.04	Responsibilities of the Contractor towards Targeted Enterprises				
	Contractor's establishment, management, management support, assistance, coaching, guidance, mentoring and supervision of Targeted Enterprises	month	15	20000	R 300 000
	Targeted Enterprise Construction Manager	Person.Month	15	15000	R 225 000
	Targeted Enterprise Site Supervisors	Person.Month	15	10000	R 150 000
D10.05	Construction Works by Targeted Enterprises				
	Payments associated with the construction works carried out by Targeted Enterprise subcontractors of CIDB 1 and 2 contractor grading designation appointed in terms of Section D	prov sum	Prov	Sum	R 100 000
	Handling costs and profit in respect of payment associated with sub-item D10.05(a)	(%)	R100 000	10%	R 10 000
	Fluctuation between the main contractor's rates and that of the Targeted Enterprise subcontractors	lump sum	lump	sum	R 300 000

	Preliminary and General Obligations of Targeted Enterprise sub-contractors appointed in terms of Section D	lump sum	lump	sum	
D10.06	Training, coaching, guidance, mentoring and assistance				
	Training Costs				
	Accredited NQF training	prov sum	Prov	Sum	R 150 000
	Accredited generic skills training	prov sum	Prov	Sum	R 150 000
	Community skills training	prov sum	Prov	Sum	R 150 000
	Handling cost and profit in respect of subitems D10.06(a)(i), (ii) and (iii)	(%)	R 450 000	10%	R 45 000
	Student experiential training				
	Student stipends	(PC) sum	Prime	Cost	R 480 000
	Provision of experiential training	Person.Mont h	30	2000	R 60 000
	Other costs during training	prov sum	Prov	Sum	
	Training venue	lump sum	lump	sum	R 10 000
TOTAL CARRIED FORWARD TO SUMMARY					R 2 762 000

C2.3 SUMMARY OF PRICING SCHEDULE

CONTRACT : C..... POLICE, ROADS AND TRANSPORT
FOR: UPGRADING OF THABA NCHU PUBLIC TRANSPORT ROUTE

GENERAL

- C1.2 GENERAL REQUIREMENTS AND PROVISIONS
- C1.3 CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS
- C1.4 FACILITIES FOR THE ENGINEER
- C1.5 ACCOMMODATION OF TRAFFIC
- C1.6 CLEARING AND GRUBBING
- C1.7 LOADING AND HAULING

SERVICES

- C2.1 GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES

DRAINAGE

- C3.1 DRAINS
- 3 BRIDGES / MAJOR CULVERTS

EARTHWORKS AND PAVEMENT LAYERS MATERIALS

- C4.4 COMMERCIAL MATERIALS

EARTHWORKS AND PAVEMENT LAYERS CONSTRUCTION

- C5.3 ROAD PAVEMENT LAYERS
- C5.4 STABILISATION
- C5.5 RECONSTRUCTION OF PAVEMENT LAYERS

PRETREATMENT AND REPAIR EXISTING LAYERS

- C8.1 PRIME COAT
- C10.1 GENERAL REQUIREMENTS FOR SURFACE TREATMENTS
- C11.3 GUIDE BLOCKS AND KILOMETRE MARKERS
- C11.4 ROAD RESTRAINT SYSTEMS
- C11.5 FENCING
- C11.6 ROAD SIGNS
- C11.7 ROAD MARKINGS AND ROAD STUDS
- C11.9 FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS

QUALITY ASSURANCE

- C20.1 TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP

SECTION D: STAKEHOLDER AND COMMUNITY LIAISON, AND
TARGET LABOUR AND TARGETED ENTERPRISES UTILISATION AND

- D1010 TRAINING, COACHING, GUIDANCE, MENTORING AND ASSISTANCE

SUBTOTAL A

Note to compiler: Insert the following if the contract works period exceeds 12 months. In addition, add a formula for the amount to be calculated automatically as 5.35% of the total tender amount:

CONTRACT SKILLS DEVELOPMENT GOAL:

0.25% of Subtotal A

SUBTOTAL B

(Contingencies @10%)

SUBTOTAL C

CPA@ 5%

SUBTOTAL D

Disbursements @ 3%

SUBTOTAL E

VALUE ADDED TAX:

15% of Subtotal

TOTAL CARRIED TO C.1.1.1 : FORM OF OFFER

SIGNED BY TENDERER:

UPGRADE OF S110 - THABA NCHU: 3 BRIDGES

Item No:	Description	Unit	Quantity	Rate	Amount
1	Contractor's Fixed P&G	Sum	3,00		
2	Contractor's Time-related P&G	Month	4,0		
3	Construct temporary bypass, as instructed by Engineer	Sum	3,0		
4	Construct coffer dam and temporary water diversion	Sum	3,0		
5	Break down existing structure and dispose	Sum	3,0		
6	Excavate for new foundations in soft material	m³	450,0		
7	Excavate for new foundations in intermediate material	m³	90,0		
8	Excavate for new foundations in hard rock material	m³	45,0		
9	Rockfill, as instructed by Engineer (3 bridges)	m³	417,0		
10	500mm G5 Gravel layer compacted to 93% MOD AASHTO	m³	417,0		
11	Blinding layer for new foundation	m³	91,3		
12	30 Mpa Concrete floor for new culverts	m³	61,9		
13	30 Mpa Concrete wingwalls for new culverts	m³	26,4		
14	30 Mpa Concrete headwalls for new culverts	m³	30,6		
15	30 Mpa Concrete slab for roadway	m³	24,8		
16	20 Mpa Mass Concrete below roadway slab to correct road alignment	m³	118,8		
17	Shutters	m²	460,0		
18	Steel reinforcing	ton	15,9		
19	Class 1 surface finish on head-and-wingwalls	m²	120,0		
20	Class 2 surface finish on roadway slab	m²	297,0		
21	Special curing for roadway slab	m²	297,0		
22	Precast concrete culverts (2,4m x 2,4m)	m	86,4		
23	Backfill at new bridge (cement stabilized)	m³	900,0		
24	Earth and layerworks for new road alignment	m³	7 200,0		
25	Erosion protection (Stonepitching)	m²	1 560,0		
26	Rehabilitaion of coffer dam and bypass	sum	3,0		
27	Finishing	sum	3,0		
Sub-Total (1) =					
TOTAL =					

Department of Police, Roads and Transport

PART C3 SCOPE OF WORKS

PART C3: SCOPE OF WORK

TABLE OF CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE NO.</u>
SECTION C3.1	STANDARD SPECIFICATIONS	C3-3
SECTION C3.2	PROJECT SPECIFICATIONS	C3-4
PART A : GENERAL		C3-5
PS1	EMPLOYER'S OBJECTIVES	C3-5
PS2	LOCATION OF THE WORKS	C3-5
PS3	EXTENT OF THE WORKS	C3-5
PS4	NATURE OF GROUND AND SUBSOIL CONDITIONS	C3-7
PS8	OCCUPATIONAL HEALTH AND SAFETY	C3-9
PART B: PROJECT SPECIFICATION AMENDMENTS TO COTO SPECIFICATIONS		C3-12

PART C3 SCOPE OF WORKS

SECTION C3.1 STANDARD SPECIFICATIONS

COTO Standard Specifications for Road and Bridge Works for South African Road Authorities (2020 Edition)

The following SANS specifications are also referred to in this document and the Contractor is advised to obtain them from Standards South Africa (a division of SABS) in Pretoria

SANS 1914-1 to 6 (2002): Targeted Construction Procurement

SANS 1921-1 (2004): Construction and Management Requirements for Works Contracts Part 1 : General Engineering and Construction Works and where accommodation of traffic is involved.

SANS 1921-2 (2004): Construction and Management Requirements for Works Contracts; and Part2: Accommodation of Traffic on Public Roads Occupied by the Contractor.

All references to SABS Standards which are replaced with corresponding SANS Specifications, have to be read in their new format.

SECTION C3.2: PROJECT SPECIFICATIONS

The Project Specifications, consisting of two parts, form an integral part of the Contract and supplements the Standard Specifications.

PART A contains a general description of the works, the site and the requirements to be met.

PART B contains variations, amendments and additions to the Standard Specifications and, if applicable, the Particular Specifications.

In the event of any discrepancy between a part or parts of the Standardized or Particular Specifications (Part A) and the Project Specification (Part B), 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 Engineer before the execution of the work under the relevant item.

PART A: GENERAL

PS1 EMPLOYER'S OBJECTIVES

The Employer's general objective is to upgrade repair Primary Road P99/1 to a safe standard for public use.

The project offers employment opportunities and upliftment of the local community.

This project has the following particular objectives:

- To improve road safety
- Create as many job opportunities for local people as economically feasible
- Create employment opportunities for local small contractors
- To provide training for local labour in social as well as in labour intensive construction skills.
-

PS2 LOCATION OF THE WORKS

Refer to the locality plan included in Part C4 of this document.

THE UPGRADING OF THABA NCHU PUBLIC TRANSPORT ROUTE FOR 10 KM'S is classified as gravel roads around the "Trusts" of Thaba Nchu based within Mangaung Metropolitan Municipality. they link the different trusts of Thaba Nchu. They are in a very poor condition, barely drivable, and now for years the Department has been receiving complaints from the road users about their poor conditions, particularly Interstate Bus Lines.

Position	South	East
Start km 0.0		
End km 10.0		

Refer to PART C4 for the Site Locality Plan.

PS3 EXTENT OF THE WORKS

This section of the Project Document is a basic outline of the works, and does not limit the work to be carried out under this contract.

The works required under this contract consist of the following activities:

- Establishment on site
- Accommodation of traffic

The roads will be constructed in full-widths both in fills and flat terrain. The traffic will be accommodated on the existing road reserve where possible.

- **Construction of pavement layers:
Thaba Nchu Public Transport Route**
 1. **SURFACING:**
 - a) Double Seals: All sections of the Thaba Nchu Public Transport Route will be surfaced utilizing a 20/10 double seal.
 2. **BASE LAYER:**
 - a) In general, the existing alignment will be lifted to allow for a new G1 Base with adjustments to the vertical and horizontal alignment.
 3. **SUBBASE LAYER**
 - a) The subbase will be constructed by spreading 150 mm of G5A quality material that is obtained commercially onto the existing lower subbase. The layer will be stabilized using cement to produce 150 mm subbase of C3 quality.
 4. **UPPER SELECTED LAYER**
 - a) The upper selected layer will be constructed using the G6 material that is obtained commercially.
 5. **REFURBISHMENT OF 2 BRIDGES**
 - a) This activity consists of lifting and widening of the two (2) bridges and sides of the bridges
- Clearing and grubbing the road reserve
- Clearing out of existing hydraulic structures
- Repair or construction of concrete-lined storm water channels
- Installation of kerbing and channeling
- Minor road structure/surface repairs
- Construction of erosion protection (gabions/stone pitching)
- Erection/repair of guardrails
- Erection/repair of fencing
- Extending concrete culverts and construction of inlet/outlet structures
- Erection/repair of road signs
- Road markings
- Finishing off road reserve

Where required, material from local Departmental borrow pits will be required to reconstruct road layers and eroded shoulders. In addition, all excess material from finishing operations shall be disposed of at approved spoil sites. Special attention must be given to the finishing off of existing borrow pits used for construction

PS4 NATURE OF GROUND AND SUBSOIL CONDITIONS

Ground and subsoil conditions will be evaluated during the construction phase.

Existing publication:

The new COTO Standard Specifications for Road and Bridge Works for South African Road Authorities was approved by COTO on 18 August 2020 as a Draft Standard (DS) and will be replacing the COLTO Standard Specifications for Road and Bridge Works for State Road Authorities (1998 Edition).

Existing contracts and tenders in the design phases based on the COLTO Standard Specifications (1998 Edition) will remain unaffected but will be phased out during the next 6 months and the COTO Standard Specifications (2020 Edition) will be mandatory for use in procurement documents advertised as from 1 March 2021.

A1.2 GENERAL REQUIREMENTS AND PROVISIONS

PART A: SPECIFICATIONS

A1.2.1 SCOPE

This Section covers matters which relate to this Standard Specification and/or the Contract Documentation as a whole. It establishes generic requirements that may also be applicable to other sections of this Standard Specification to avoid repetition in the other sections.

It includes payment items for general items that are not included elsewhere in this Chapter 1 or in the other Chapters and for day works that are applicable to all the Chapters.

A1.2.2 DEFINITIONS

Acceptance Quality Control - encompasses those actions carried out by the Employer and/or the Engineer to inspect, sample, test and measure each constructed part or section of the Works to determine whether the quality and workmanship is acceptable in terms of the Specifications.

Process Quality Control -encompasses those actions carried out by the Contractor to assess and control materials and construction processes to ensure that the quality of the final product/s meets all the specified requirements. It includes a quality plan with defined actions, inspections, sampling, testing and measurement for each construction process to ensure that the quality control process is carried out effectively.

Stakeholder liaison - the process whereby the Employer and the Contractor engage with interested and affected parties, in particular the local authorities, local residents, schools etc., in order to inform them how the Works will affect the local community, to discuss how any adverse effects of the Works on the local community and/or environment can be eliminated or alleviated and to provide any health and safety information that is relevant to the local community regarding construction of the Works.

A1.2.3 GENERAL

The following Clauses include specifications for various general items which are not included in any of the other specific Chapters and Sections.

A1.2.3.1 Contractor's activities in respect of property outside the road reserve provided by the Employer

The Contractor may occupy and make use of property outside the road reserve that is provided by the Employer for purposes of executing the contract, on condition that:

- The Contractor complies strictly with the requirements of such statutory provisions, particularly with respect to the matters relating to serving written notice to the owner before the Contractor enters the property.

- The Contractor shall provide the Engineer with a copy of the written notice and inform the Engineer of any further consultations that may have taken place, or additional agreements reached, with the property owner.
- The Contractor adheres to all the written agreements made by the Employer with owners of the property outside the road reserve in respect of the following matters:
 - The location, extent and use of borrow pits, haul roads, construction roads and bypasses outside the road reserve,
 - any compensation paid by the Employer or the Contractor, if applicable, for land or materials taken or for land temporarily used or occupied,
 - the reinstatement of property occupied, used, damaged or destroyed, or compensation therefor in lieu of reinstatement,
 - the procedures for the moving of fencing, services and any other items and
 - any similar matter directly related to the Contractor's activities on the property.

The Contractor shall comply with all the environmental requirements and all other current legislation and regulations which are applicable to the land outside the road reserve which is being used by the Contractor for carrying out the Works.

On completion of his operations the Contractor shall obtain from the owner concerned a written statement to the effect that:

- The Contractor has fulfilled his obligations under any written agreement that the Employer has made with the owner.
- The owner is satisfied that all property occupied, including borrow pits, haul roads and construction roads, has been properly restored and is in a satisfactory condition.
- With respect to fences, services or any other items moved, altered, damaged or affected in any way the owner is satisfied that everything has been handed back to him by the Contractor in a satisfactory condition.

All such statements shall be signed and dated and copies shall be delivered to the Engineer. The obtaining of any such written statements will not relieve the Contractor of the execution of any of his obligations to the satisfaction of the Employer or the owner or authority concerned.

A1.2.3.2 Contractor's activities in respect of property which is not provided by the Employer

Should the Contractor use property which is not provided by the Employer, for haul roads, site offices and workshops, the Engineer's offices and laboratory, or for storing of equipment or materials required for construction or disposal, it shall be subject to the following:

- The Engineer shall agree to the use of any property selected for this purpose.
- Such property shall be physically separated from any production plant or activities and suitably fenced in.
- The area used for the aforesaid purpose shall be surveyed, and, where the land does not belong to the Contractor, he shall sign a lease agreement with the owner of such property in respect of the full period for which such property shall be used for such purpose. The lease agreement shall stipulate that the property owner shall not have any right whatsoever to any material stockpiled on such property during the duration of the contractual lease agreement.
- A lease agreement shall be concluded by the Contractor with the owner or owners of such property for the full period that such property is required. The lease agreement shall provide for possible extensions to match the duration of the contract. The lease agreements shall also provide for the contract being terminated by Contractor's default or liquidation and the resulting possibility for the lease agreement to be taken over by a succeeding Contractor.
- Copies of all lease agreements shall be submitted to the Engineer for comment prior to signature by the signing parties and copies of the final signed agreements shall be lodged with the Engineer. Notwithstanding the Engineer's comments on the conditions of a lease the Contractor shall be solely responsible for adherence to the terms of the lease agreements.
- Suitable permanent reference beacons shall be placed next to any material storage area, at the cost of the Contractor, to demarcate the storage area and, if applicable, for use by the Engineer for taking cross-sections for determining quantities.
- Only material that is to be used for the Works shall be stored on such property.

- The Contractor shall comply with all the requirements of the environmental and any other legislation which is applicable to the property being used.

On completion of his operations, the Contractor shall obtain, from the owner concerned, a written statement to the effect that:

- The Contractor has fulfilled his obligations under any written agreement that he made with the owner.
- The owner has received all the compensation he is entitled to and is also satisfied that all property that was occupied, including borrow pits, haul roads and construction roads, has been properly restored and handed over to the owner in a satisfactory condition.
- With respect to fences, services or any other items moved, altered, damaged or affected in any way the owner is satisfied that everything that was affected has been handed back to him by the Contractor in a satisfactory condition.

All such statements shall be signed and dated and copies shall be delivered to the Engineer. The obtaining of any such written statements will not relieve the Contractor of the execution of any of his obligations to the satisfaction of the Employer or the owner or authority concerned.

A1.2.3.3 Environmental management

The Contractor shall ensure that the project complies with all the requirements that have been set out in the Environmental Authorization (EA), the Environmental Management Plan (EMP), the Water Use Licenses (WUL) for the extraction of water as well as for working within a certain distance of watercourses and their associated specific conditions and permits.

Before any construction may commence the Contractor shall ensure that he has a copy of all licenses and permits required in terms of the EA, the EMP and for the WULs that were obtained by the Employer prior to the Contract being awarded. The Contractor shall also ensure that he obtains all other outstanding permits required to comply with the requirements of the EA, the EMP and the WULs, in particular the WUL for the extraction of the amount of water he requires from rivers and streams. The Contractor shall supply a copy of all required licenses and permits to the Engineer for his records.

A1.2.3.4 Extension of time for delays caused by rainfall

This Clause specifies the conditions under which extensions of time for rainfall delays will be measured. Any delays caused by rainfall shall be determined in terms of one of the three methods given below. The applicable method for a particular contract shall be specified in the Contract Documentation. The rainfall delay determined by using the specified method shall entitle the Contractor to an equivalent extension of the time for completion without the need for formal claim procedures. (If none of the methods given below are specified in the Contract Documentation then any claims for rainfall related extensions of time will be dealt with according to the applicable Conditions of Contract.)

Any other delays caused by exceptionally adverse weather conditions that have not already been taken into account as specified above shall be dealt with in accordance with the applicable Conditions of Contract.

The Contractor shall take cognizance of all the temperature, wind speed, moisture content and curing related limitations and/or restrictions that are applicable to some items of the Works as specified in the relevant clauses of this Standard Specification. No extensions of time will be measured or granted for any delays caused by the Contractor's compliance with these limitations and/or restrictions.

a) Method 1 (Rainfall formula)

If specified in the Contract Documentation the formula below shall be used to calculate separately the delay for each calendar month or part thereof due to rainfall. It shall be calculated each month during the period referred to in the Conditions of Contract as the time for completion of the Works (including any extension thereof that may have been granted), or until the issue date of the Taking-over Certificate, whichever is the shorter period. The delay calculated for a given month shall be used to determine the interim extension of time granted for that month. At the end of the applicable period referred to above, the aggregate of the monthly delays will be taken into account for the final determination of the total extension of time for the Contract. Such determination will not be subject to normal claim procedures.

$$V = (N_w - N_n) + [(R_w - R_n) \times X]$$

If any value of V is negative and its absolute value exceeds N_n, then V shall be taken as equal to minus N_n.

The delay for a part of a month shall be calculated by substituting pro rata values for the variables in the equation.

The symbols in the above rainfall formula shall have the following meanings:

V = Delay due to rain in calendar days in respect of the calendar month under consideration.

Nw = Actual number of days during the calendar month on which a rainfall of Y mm or more per day has been recorded.

Rw = Actual rainfall in mm for the calendar month under consideration.

Nn = Average number of days in the relevant calendar month, as derived from existing rainfall records providing the Contract Documentation, on which a rainfall of Y mm or more per day has been recorded.

Rn = Average total rainfall in mm for the calendar month, as derived from existing rainfall records supplied in the Contract Documentation.

X = 20, unless specified otherwise in the Contract

Documentation. Y = 10, unless specified otherwise in the

Contract Documentation.

A1.2.3.5 Handing-over of the Site of the Works

The Site of the Works will be handed over to the Contractor for construction purposes, subject to such conditions as may be specified in the Contract Documentation regarding matters such as:

- The sequence in which sections of the Works will be handed over and must be completed.
- The maximum total length of temporary deviations that will be allowed to be in operation at any time.
- The number of half or partial width construction sections that will be permitted on the Site of the Works at any one time.
- The minimum length of existing or newly completed full width, unrestricted road sections that must be open to traffic between any half or partial width construction sections.
- Any other matters relating to the Contractor's use and occupation of the road reserve.

A1.2.3.6 Health and safety

The Contractor shall always comply with the requirements of the health and safety plan, drawn up by the Contractor in compliance with all current and applicable health and safety legislation, the Employer's health and safety specification and the Contractor's own health and safety requirements to ensure that the Contractor complies fully with all current legislation and regulations as well as with any additional health and safety requirements that may be specified in the Contract Documentation. The Contractor's health and safety plan shall be developed to address all risks specific to the Works as identified in risk assessments carried out by the Contractor and/or by the Employer.

The Employer and /or his construction health and safety agent may also monitor the Contractor's compliance with the requirements stipulated in the Employer's health and safety specification as well as the requirements set out in the Contractor's health and safety plan.

A1.2.3.7 Legal and contractual requirements and responsibility to the public and the Employer

The Contractor shall comply with all the legislative and regulatory requirements of all the relevant statutory bodies pertaining to his site establishment and to the execution of the Works. The Contractor shall also comply with the requirements given in the Contract Documentation and with his legal and general obligations to the public, particularly with regard to obtaining and maintaining all the insurances and sureties required for the duration of the Contract and the Defects Notification Period.

A1.2.3.8 Tolerances

The work specified in all the chapters of this Standard Specification shall comply with the various dimensional and other tolerances specified in each case. No representation is made that the full specified tolerances will be available independently of each other, and the Contractor is cautioned that the liberal or full use of any one or more tolerances may deprive him of the full or any use of tolerances relating to other aspects of the work. The latter

would apply particularly in respect of level tolerances on layer work and the related requirements regarding layer thicknesses.

Where no tolerances are specified, the standard of workmanship shall be in accordance with normal good practice.

A1.2.3.9 Monthly reports

The Contractor shall prepare monthly reports on progress, delays incurred, plant returns, OHS and EMP compliance, staff training, empowerment, capacity building, small Contractor development, labour and staff returns and any other information required by the Employer and/or the Engineer which is specified in the Contract Documentation. The contractor must also submit to the Engineer the Attendance register for all the employees on monthly basis as well as Proof of Payment for all beneficiaries.

The Contractor's monthly reports shall be submitted to the Engineer at least two working days prior to the applicable scheduled monthly site meetings.

A1.2.3.10 Notices, signs and advertisements

The Contractor shall not erect any signs, notices or advertisements on the Works or the site of the Works without the written approval of the Engineer.

Details of the official contract sign boards (if any) that should be erected will be given in the Contract Documentation or issued by the Engineer. These signs are to be erected in positions determined by the Engineer not later than one month after the Contractor has been given access to the site. They shall be maintained in a clean and legible condition throughout the contract and removed immediately upon completion of the Works.

No signboards other than those specified above will be permitted on or adjacent to the Works, except that the Contractor may permit each of his subcontractors to display one signboard, and one only, of less than 2 m² at the Works office. All advertisements, notices and temporary signs shall be removed by the Contractor immediately upon completion of the Works.

A1.2.3.11 Ordering of day work

Day work shall be undertaken strictly in accordance with the provisions of the Conditions of Contract. No daywork shall be undertaken unless specified by the Engineer. Such a written instruction shall include a full description of the work to be carried out. Before commencing any day work the Contractor shall obtain the Engineer's agreement regarding the estimated duration of the day works, the numbers of each category of staff to be employed, the materials to be used and the construction equipment and vehicles that will be required to carry out the work.

The Contractor shall provide the Engineer with a daily report that records the actual duration, numbers of staff and materials, equipment and vehicles used each day for approval of the day works.

A1.2.3.12 Ownership of assets and disposal of non-useable assets

Unless otherwise stated in the Contract Documentation the Employer is the owner of all existing moveable and immoveable assets in the road reserve.

Non-useable assets are assets that have reached the end of their economic life, are no longer needed or need to be replaced. A disposal plan for these non-useable assets will be given in the Contract Documentation. The Contractor shall submit rates for the disposal of each of the identified non-useable assets listed in the Contract Documentation. The tendered rates could be positive or negative depending on the cost of disposing of them against the value that the Contractor may wish to place upon them.

A provisional sum may also be provided to cover the cost of the disposal of any non-useable assets that may be identified during the construction of the Works. A record must be kept of all such non-useable assets that are disposed of. Any income derived from the sale of these assets will be offset against the provisional sum.

A1.2.3.14 Remedial work

The Contractor shall replace, repair or make good any part of the Works or any equipment or material that is found not to conform to the specified requirements, or is damaged so that it no longer conforms to the specified requirements, in accordance with the Conditions of Contract before the Taking-over Certificate will be issued.

A1.2.3.16 Site meetings

The Contractor shall attend regular (at least monthly) meetings on the site with the Employer and the Engineer, at dates and times to be determined by the Employer and/or the Engineer. Such meetings will be held for evaluating the progress of the Works, compliance with the environmental management and the health and safety regulations and for discussing matters pertaining to the contract which any of the parties represented may wish to raise. To this effect the Contractor will be obliged to compile a formal monthly report, drafted in consultation with the Engineer where necessary, and to submit these monthly reports to the Engineer at least two working days before each site meeting.

A1.2.3.17 Site security

The Contractor is responsible for keeping unauthorized persons off the Site of the Works in accordance with the requirements of the Conditions of Contract. The Contractor shall therefore carefully assess the security measures of whatever nature that may be required at the location of the Engineer's site office and laboratory, the Contractor's offices, stores and workshops, the Site of the Works including quarries, borrow pits, stockpile sites and manufacturing yards as well as any traffic accommodation site facilities and equipment which may be placed on the approaches to / exits from the Site of the Works.

A1.2.3.18 Stakeholder liaison

The initial stakeholder liaison required will normally be undertaken by the Employer and/or the Engineer. The outcomes and agreements resulting from all such stakeholder liaison will be taken into account and included in the Contract Documentation. This process may involve the establishment of a Project Liaison Committee (PLC) and the employment of a Project Liaison Officer (PLO) by the Employer.

A1.2.3.19 Temporary drainage and dewatering

The Contractor shall be responsible for the provision of temporary drainage works such as drains, open channels, banks etc., and for providing and operating temporary pumps and such other equipment as may be necessary for adequately protecting, draining and dewatering the Works and any temporary Works, deviations and detours on existing roads if required.

The Contractor shall ensure that any temporary drainage works and/or dewatering operations do not cause erosion or flooding of other parts of the Works or adversely affect the stability of any excavated trenches or slopes. If the Contractor becomes aware of any potential signs of slope / trench instability he shall immediately suspend the work and withdraw all personnel from the area and fence and/or barricade it to prevent access. The Contractor, who remains responsible for compliance with the OHS regulations, shall then propose, design and implement all measures required to rectify the situation.

Unless specifically reflected in the pricing schedule, all such measures shall be deemed to be included in the rates for the Works.

A1.2.3.20 Road safety audits

If stated in the Contract Documentation, two types of road safety audits shall be carried out on the Contract, namely a work zone traffic management audit before any construction work commences and a pre-opening stage road safety audit when the construction work is almost complete.

A1.2.3.21 Water

The Contractor shall make his own arrangements for procuring, transporting, storing, distributing and applying the water needed for construction and other purposes, except where otherwise specified.

Obtaining water from streams, rivers, dams or boreholes shall be subject to the Contractor obtaining the required permit from the relevant authority.

Obtaining water from a municipal or other water supply authority shall be subject to the Contractor entering into a supply agreement with the relevant supply authority.

The suitability of water for construction purposes shall be determined in accordance with the acceptance parameters given in the following clauses of this Standard Specification:

- Water for earthworks and pavement layers
- Water for stabilisation of pavement layers –
- Water for diluting bitumen emulsion –
- Water for grout
- Water for shotcrete
- Water for concrete structures
- Water for cementitious repair mortar or concrete
- Water for sprayed concrete

A1.2.7 EXECUTION OF THE WORKS

A1.2.7.1 Programme of work

a) General

This Clause describes the requirements for the preparation, submittal, update and revision of the Contractor's programme. These requirements are in addition to, or expand upon, the requirements for programming the Works which are given in the Conditions of Contract or elsewhere in the Contract Documentation.

The Contractor's programme shall be used by the Contractor to plan and execute the Works. The programme will also be used by the Engineer to monitor progress and it may be used as the basis for the assessment of extensions of time and the effect of any delays on the progress of the Works.

The Contractor's original baseline programme shall be reviewed and updated monthly, or as required in the Contract Documentation, to ensure that the programme always reflects the actual progress of the Works.

Scheduling of work and monitoring of progress can be done to various degrees. Extensive scheduling has its benefits in controlling progress and in the evaluation of delay claims, but the amount of effort involved in this can be considerable and may not be required on all contracts, especially on relatively small Works. This specification makes provision for two schemes: Scheme 1 where the programme may be kept relatively simple, and Scheme 2 with more extensive requirements for complex or high value projects.

Whether a Scheme 1 or Scheme 2 programme is required will be indicated in the Contract Documentation. Scheme 1 will apply if nothing is indicated in the Contract Documentation. If only a Scheme 1 programme is indicated the Contractor shall still be able to incorporate some or all the requirements applicable to Scheme 2 in the programme if he so wishes.

A1.2.7.2 Setting out of the Works and the protection of beacons

The Contractor shall check the condition of all reference and level beacons provided and shall satisfy himself that they have not been displaced and that they are all correct with respect to both their position and level. If beacons have been destroyed, displaced or damaged before the site is handed over to the Contractor, the Engineer will arrange to have new beacons installed, unless such beacons are declared non-essential. A beacon which has been displaced shall not be used unless its true position and level have been re-established and the new values verified by the Engineer.

A1.2.7.3 Services

The specifications relating to the location, identification, protection of and/or moving and reinstating of existing services that may be affected by the construction of the Works are given in Clause A2.1.3.2 b), c) & d) of Chapter 2.

C1.2 GENERAL REQUIREMENTS AND PROVISIONS

PART C: MEASUREMENT AND PAYMENT

(iii) Items to be measured and paid for using items specified elsewhere in the specifications

For activities in Table C1.2-1 payment items specified in other Chapters or Sections of the specifications, where they relate to work under this Section, will be listed in the Pricing Schedule.

Table C1.2-1: Payment items from other Chapters or Sections

(iv) Items specifically for this Section of the specifications

Item	Description	Unit

C1.2.1 Environmental Management

C1.2.1.1	Monitoring of compliance with and reporting on the EMP	month

C1.2.1.2	Dedicated environmental officer (if specified in the Contract Documentation)	month

The unit of measurement for item C1.2.1.1 is the month or part thereof that the service is required and provided during the approved contract period. The contract rate shall include full compensation for the regular monitoring of compliance with and reporting on the EMP in accordance with the specified requirements.

The unit of measurement for item C1.2.1.2 is the month or part thereof that the service is provided during the approved contract period. The contract rate shall include full compensation for the provision of a dedicated environmental officer including all employment costs, accommodation and transport costs and all other associated overhead costs.

The unit of measurement for item C1.2.2.1 shall be the lump sum. The lump sum shall include full compensation for preparing and submitting a Scheme 1 Programme, including providing software and tutorials to the Engineer if required.

Employer.

Item	Description	Unit
C1.2.5	Safety	
C1.2.5.1	Health and safety plan	lump sum
C1.2.5.2	Implementation of health and safety plan	month

The unit of measurement for item C1.2.5.1 shall be the lump sum. The lump sum shall include full compensation for assessing the risks associated with the Works, reviewing and taking cognizance of the Employer's health and safety specifications and/or requirements, preparing the Contractor's health and safety plan and for the submission of a copy of the plan to the Engineer.

The unit of measurement for item C1.2.5.2 shall be the month, or part thereof for the duration of the approved contract period. Part of a month shall be calculated to two decimal places. The contract rate shall include full compensation for implementing the health and safety plan, including the provision of a dedicated, full time health and safety officer, carrying out all the required site health and safety training and briefings, staff medical evaluations, monitoring and administering the health and safety plan and for supplying all transport, personal protection safety items, other health and safety equipment, safety notices and any other health and safety related items that are required on site. The contact rate shall also include the provision of a monthly health and safety compliance report to the Engineer.

The percentage tendered under item C1.2.9.3 is a percentage of the amount spent under item C1.2.9.2 which shall include full compensation for all handling costs, profit and all other charges in connection with arranging and disposing of the non-useable or not required road furniture assets. If the provisional sum agreed under item C1.2.9.2 is a negative amount, then this item C1.2.9.3 will not be applicable.

A1.3 CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS

PART A: SPECIFICATIONS

A1.3.1 SCOPE

This Section covers the establishment of the Contractor's organization, construction camps and constructional plant and their removal on completion of the contract.

It also includes payment items to cover certain general obligations, risks and liabilities and general items of cost that are included in, but not covered directly by the payment items in the other chapters.

A1.3.3 GENERAL

A1.3.3.1 Construction camps

The Contractor shall establish the construction camps either at the specific sites and borrow areas identified in the Contract Documentation or at locations chosen by the Contractor. The exact location of these facilities shall be subject to the approval of the Engineer and such approval will not be unreasonably withheld.

The Contractor shall make his own arrangements for the use of any property outside the road reserve for erection of the construction camp/s, as well as for the provision of adequate means of access, security and the installation and supply of water, electricity and telephone services required by the Contractor.

Before commencing with the construction of any camps the Contractor shall comply with all the requirements specified in Clauses A1.2.3.2 and/or A1.2.3.3.

If Employer-owned land can be made available for the use of the Contractor for the construction camps, the use of such land will not be treated as a lease but will form part of the contract. In this regard the Contractor shall complete the prescribed agreement and comply with all the conditions thereof as if it is part of the Contract. The availability of any Employer owned land will be indicated in the Contract Documentation.

On completion of the Works, all constructional plant, buildings, fencing and other temporary structures erected by the Contractor shall be removed and the construction camp site shall be restored to its original condition and left neat and tidy. The Contractor shall also comply with all the requirements related to the completion of the operations specified in Clause A1.2.3.2 and/or Clause A1.2.3.3.

A1.3.3.2 Housing

The Contractor shall not erect any housing or other accommodation facilities on the site in urban areas and shall make all the necessary arrangements for accommodation of his personnel and site staff off the site, unless otherwise stated in the Contract Documentation.

The Contractor shall not erect any housing or other accommodation facilities on the site before he has obtained the written permission of the Employer and, where applicable, the land owner and has complied fully with all applicable legislative and regulatory requirements.

A1.3.3.3 Maintenance of the Contractor's facilities

The Contractor shall maintain the construction camps and all the Contractor's other facilities in a clean, neat and tidy condition for the duration of the Contract. The Contractor shall also maintain all the access roads to the Contractor's site facilities including any publicly or privately owned roads that the Contractor is making use of. Depending on the initial condition of the access roads this may entail repairing any potholes and edge breaks of surfaced roads or the re-gravelling of the road and subsequently the regular watering, blading and rolling of the surface to maintain a firm surface without excessive corrugations and loose materials. The Contractor shall ensure that the access roads to the Contractor's facilities are always in a safe and passable condition for normal cars under all weather conditions.

A1.3.3.4 Contractor's own security arrangements

The Contractor shall provide all the security measures required for the Contractor's own facilities and equipment on the Site of the Works, including quarries, borrow pits, and for the traffic accommodation site facilities and equipment, as he deems necessary. The provision of security measures for the duration of the Works shall be included in the Contractor's General Obligations as defined in Clause A1.3.2.

A1.3.8 WORKMANSHIP

The Contractor shall control the quality of materials and workmanship used for the construction and fitting out of the construction camps to ensure that the applicable legislative and regulatory requirements related to building standards and to health and safety are adhered to.

C1.3 CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS

PART C: MEASUREMENT AND PAYMENT

(i) Preamble

The tendered rate for each item shall include full compensation for providing, operating, maintaining and decommissioning upon completion, of all the construction equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the item, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the Conditions of Contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum item. **(ii) Items that will not be measured separately**
There are no activities mentioned in this section that are not measured in this Section.

(iii) Items to be measured and paid for using items specified elsewhere in the specifications

There are no payment related items mentioned in this Section that are measured in other Sections of the specifications. **(iv) Items specifically for this Section of the specifications**

Item	Description	Unit
C1.3.1	The Contractor's general obligations	
C1.3.1.1	Fixed obligations	lump sum
C1.3.1.2	Value-related obligations	
C1.3.1.3	Time-related obligations	lump sum
		month

The lump sums under items C1.3.1.1 and C1.3.1.2 and the contract rate per month for item C1.3.1.3 shall together include full compensation for all the Contractor's costs, charges, overheads and profits in respect of all the Contractor's General Obligations as specified in Clause A1.3.2.

The unit of measurement for item C1.3.1.1 is the lump sum. The lump sum shall include full compensation for the fixed part of the Contractor's general obligations, i.e. that part which is substantially fixed and is not a function of the value of the Works or of the time required for the completion of the Contract.

Payment of this lump sum will be made in three instalments, as follows:

- The first instalment, 50 % of the lump sum, will be paid after the Contractor has completed the establishment of the construction camps, site offices, laboratories and housing, has provided the personnel, staff and equipment required to commence the Works in accordance with all the specified requirements and has made a substantial start with construction of the Works in accordance with the approved programme.

- The second instalment, 35 % of the lump sum, will be paid when the value of the Work done reaches one half of the Contract Amount, excluding contingencies and price adjustments in terms of the Contract Documentation.
- The third and final instalment, 15 % of the lump sum, will be paid when the Works have been completed and taken over by the Employer.

The unit of measurement for item C1.3.1.2 is the lump sum. The lump sum shall include full compensation for that part of the Contractor's general obligations which is a function of only the value of the Works, but not of the period of completion of the Works.

Should the final value of the Works (excluding any contract price and special material adjustment payments made in terms of the Contract Documentation) increase or decrease in relation to the tendered contract price (less any allowances, if any, in the tendered contract price for contract price adjustment and special material adjustment payments), the lump sum for payment item C1.3.1.2 will be increased or decreased accordingly pro rata. The adjusted lump sum will be the full settlement of any difference in value-related general obligations resulting from an increased or decreased value of the work.

Payment of this lump sum will be made in instalments in each payment certificate (usually issued monthly). The value of each instalment will be in proportion to the value of Work done up to the date that the payment certificate is prepared (excluding the value of any price adjustments made in terms of the Contract Documentation).

The unit of measurement for item C1.3.1.3 is the month or part thereof that the services are provided for the approved duration of the contract. Part of a month shall be calculated to two decimal places.

The contract rate shall include full compensation for that part of the Contractor's general obligations which are mainly a function of construction time. The contract rate will be paid monthly, pro rata for parts of a month, from the date of commencement in terms of the Contract Documentation until the end of the original Contract Period specified for completion of the Works.

If the original Contract Period for completion has been extended in terms of the Contract Documentation, then time-related obligations for the extensions shall be compensated for as stipulated by the Contract Documentation.

The following conditions also apply to the time related payment made under item C1.3.1.3:

- Should the Works be certified as having been completed before the original contractual date for completion of the Works the Contractor will then be entitled to payments of the monthly time related amount for the unexpired original Contract Period specified for completion of the Works.
- Should the progress of the Contractor, calculated in terms of the value of the work done to date, be in arrears by more than 10 % relative to the accepted cash flow estimate (suitably adjusted for any change in the scope of work and/or extension of time granted) then the payments in respect of this item may be limited to a total payment to date which is in the same ratio as the actual value of Work done relative to the estimated total value of all the Work that has to be done.

FACILITIES FOR THE ENGINEER

A1.4.1 SCOPE

This Section covers the provision by the Contractor of facilities for the Engineer and the Engineer's staff. These facilities shall include the necessary site accommodation, laboratories and offices, all the necessary furnishings and services, as well as all the arrangements in connection with the property, buildings and/or land, on which the Engineer's facilities will be provided.

The specifications for the site accommodation and the site laboratory and office buildings, together with all the fittings and furnishing required, are specified in this section. If necessary, additional details and requirements will be specified in the Contract Documentation or provided by the Engineer.

A1.4.2 DEFINITIONS

Engineer's site facilities -the Engineer's site accommodation, laboratories and offices are temporary buildings provided on site, or existing buildings on or near the site. Together with the required water, sewage, telecommunication, internet and electricity services these shall be known as the Engineer's site facilities. (The Engineer's site facilities shall be provided by the Contractor for the duration of the Contract to house the Engineer's site personnel, accommodate all the materials testing equipment required to carry out the Engineer's acceptance control testing and to provide office space for the Engineer's site personnel.)

A1.4.3 GENERAL

Where not already provided in the Contract Documentation, the Engineer shall furnish the Contractor with full details, in writing, regarding the number, type, layouts and furnishing of all site accommodation, laboratories and offices required for the use of the Engineer's site personnel.

A1.4.5 MATERIALS

The Contractor shall be responsible for the selection and purchase of all materials required to provide the Engineer's site facilities. The Contractor shall ensure that the specified standards are met and that all applicable legislative and regulatory requirements, building standards and health and safety requirements are complied with.

A1.4.7 EXECUTION OF THE WORKS

A1.4.7.1 Offices and laboratories

a) General

The provision of new structures, and/or the refurbishment and alteration of existing permanent structures, shall be done with approved materials in a manner which will provide adequate lighting, ventilation, insulation, noise damping and fire protection.

b) Offices

The various types of offices required shall be as instructed by the Engineer. Unless otherwise specified in the Contract Documentation, the fittings, furniture and equipment shall conform to the following requirements:

e) Areas around offices and laboratories

The access roads and parking areas at the offices and laboratories shall be treated to make them dust free, either with a layer of crushed stone or with an approved bituminous surfacing. They shall be well drained and kept trafficable and free from mud at all times. Footpaths shall be paved with concrete, interlocking blocks or paving slabs to provide convenient, all weather access to all buildings.

f) Ablution unit

An ablution unit with a clean potable hot and cold water supply and a water-borne sewerage system, including septic tanks if necessary, shall be provided for the Engineer's facilities. The ablution unit shall be established in a position that is easily accessible to both the Engineer's offices and the laboratory buildings. The ablution unit shall have separate rooms for males and females and each room shall have a floor area of at least 6m² with a lockable door and shall be equipped with:

g) Kitchen unit

The Contractor shall supply a kitchen unit with a clean potable hot and cold water supply for the Engineer's offices with a minimum floor area of 6 m² and connected to the Engineer's offices. The kitchen shall be equipped with:

A1.4.7.2 Housing

a) Prefabricated houses

If prefabricated houses are scheduled to be provided by the Contractor the minimum requirements for the different types of houses that may be required are as specified below, unless specified otherwise in the Contract Documentation.

b) Rented accommodation

The Engineer shall usually be responsible for providing suitable accommodation for his site staff in a hotel, guesthouse, rented house or a rented apartment in the nearest town or on a nearby farm.

The Engineer may instruct the Contractor to pay for any hotel or other accommodation or leased houses required. If so instructed by the Engineer the Contractor shall enter into the necessary contracts for the lease of such accommodation as may be required and shall not unreasonably object to the terms and conditions of such leases to be negotiated by the Engineer.

Where appropriate, and in the case where the rented accommodation is not deemed to be the primary residence of the site staff member, the lease agreement shall include full compensation for a periodic garden service.

A1.4.7.3 Services

a) Sanitary arrangements

The Contractor shall be responsible for providing all sanitary services necessary for keeping latrines in a clean, neat and hygienic condition.

When no municipal sewage treatment is available, the Contractor shall provide the necessary septic tanks for all latrines. Waste water and septic-tank effluent shall be taken into properly designed French drains. The Contractor shall also make provision for the removal of all rubbish.

Where the construction of septic tanks or a water-borne sewerage scheme is unfeasible, the Contractor shall provide conservancy tanks and make arrangements for the removal and disposal of sewage.

b) Water, electricity and gas

The Contractor shall provide a constant supply of clean potable water suitable for human consumption as well as the necessary electric power together with the required electrical network to the offices, laboratories and any site housing.

A1.4.7.4 Maintenance of the Engineer's site facilities and accommodation

The Contractor shall maintain the Engineer's office, laboratory and site accommodation facilities in a clean, neat and tidy condition for the duration of the Contract. The Contractor shall also maintain all the access roads to the Engineer's site facilities including any publicly or privately owned roads that the Engineer is making use of. Depending on the initial condition of the access roads this may entail repairing any potholes and edge breaks of surfaced roads or the re-gravelling of the road and subsequently the regular watering, blading and rolling of the surface to maintain a firm surface without excessive corrugations and loose materials. The Contractor shall ensure that the access roads to the Engineer's facilities are always in a safe and passable condition for normal cars under all weather conditions.

The Contractor shall provide all labour, equipment and material which may be necessary for keeping all the buildings in a neat and clean condition. To this end the Contractor shall provide cleaners and sanitary personnel and shall supply all soap, toilet paper, linen roller towels, cleaning aids and a refuse removal service.

The Engineer's offices, laboratory buildings, kitchen, ablution units and any accommodation on site shall be cleaned daily.

Any repairs required shall be made immediately following a request from the Engineer.

A1.4.7.5 Office staff

If specified in the Contract Documentation the Contractor, in consultation with the Engineer, shall appoint an office secretary/receptionist and the requested number of technical assistants to provide a continuous service to the Engineer's site personnel.

These staff shall be paid by the Contractor including the provision of transport and other all other costs and benefits to the same extent as the Contractor provides for his own employees of a similar grade.

The person selected as secretary/receptionist may have limited experience but must have the potential and be willing to receive training (both formal and informal) to develop into a competent secretary / receptionist within a successful probation period of two months after appointment, failing which the person shall be substituted.

The technical assistant/s shall be suitably educated with sufficient mathematical ability to perform the duties of a survey assistant, assistant laboratory technician or an assistant quantity surveyor. Where available the technical assistant/s shall be student technicians who need to fulfil their practical training requirements.

The Engineer shall be at liberty to accept or reject the staff offered.

A1.5 ACCOMMODATION OF TRAFFIC

PART A: SPECIFICATIONS

A1.5.1 SCOPE

A1.5.3 GENERAL

A1.5.3.1 Access to properties

The Contractor shall provide and maintain access to all public and private properties which fall within or adjoin the Works at all times, unless alternate provision is specified in the Contract Documentation.

A1.5.3.2 General requirements

The Contractor may not commence any part of the Works until adequate provision has been made for the accommodation of vehicular, non-motorized and pedestrian traffic. Traffic shall be accommodated in accordance with the requirements given in the Contract Documentation unless the Contractor has submitted an alternative incorporating an amended method of traffic accommodation and this alternate method has been accepted by the Employer.

A1.5.3.3 Lane width

The clear width of any traffic lane which is provided along any section of a detour, a temporary deviation or any partial / half width construction area shall not be less than 3,5 m unless a narrower width is specified in the Contract Documentation or approved by the Engineer in writing. If a lane width less than 3,5 m is specified or approved by the Engineer then temporary width restriction warning signs shall be erected at approved locations along the narrow section of the detour, temporary deviation or partial / half width construction areas.

A1.5.3.4 Late occupation of traffic lanes, interchange ramps and cross roads

If specified in the Contract Documentation the Contractor shall be charged a lane occupation levy for any occupation of traffic lanes, interchange ramps and any cross roads beyond the completion dates and times agreed with the Employer. The lane occupation levies shall be specified in the Contract Documentation and they shall be deducted from payments due on the relevant interim payment certificates. If specified in the Contract Documentation the Contractor shall also be charged a lane occupation levy for traffic lanes, interchange ramps and cross roads occupied by the Contractor for the purpose of carrying out remedial work during or after completion of the Works.

A1.5.3.5 Legal requirements

In addition to the specifications given in the Contract Documentation all traffic accommodation arrangements shall also conform to the specifications and provisions given in the latest edition of the South African Road Traffic Signs Manual (SARTSM) and all other current legislation and regulations.

A1.5.3.6 Other traffic control measures ordered by the Engineer

The Engineer may instruct the Contractor to provide any other road sign, reflective tape, etc. not measured in standard payment items. Such road signs shall conform to the requirements given in Volume 2 of the SARTSM and/or specified in the Contract Documentation or by the Engineer in writing. To ensure that the travelling public is kept fully informed and warned on matters relating to the accommodation of traffic, construction sign posting and the effect of the construction on the free flow of traffic through the site, the Engineer may instruct the Contractor to arrange for advertising in the press, on the local radio stations and/or for other forms of publicity.

A1.5.3.7 Penalty events

Whenever the Contractor fails or refuses to take the necessary steps to ensure the safety and convenience of the public and/or to accommodate the traffic, pedestrians and non-motorised traffic and maintain the temporary detours, deviations, traffic accommodation facilities and traffic safety devices correctly in accordance with all the requirements and specifications given in the Contract Documentation, the Contractor shall be subject to the following penalty conditions:

A1.5.3.8 Property pegs and survey beacons

Temporary deviations shall be constructed so as not to damage or displace existing cadastral beacons or trigonometrical-survey beacons. In exceptional cases where this is not possible, the Contractor shall notify the Engineer in good time so that the Engineer can arrange to have them suitably referenced before they are displaced. Cadastral beacons shall be replaced at the cost of the Contractor, unless removal is specified by the Engineer.

A1.5.3.9 Right of way

The travelling public shall have the right of way on public roads, existing roads used as detours and on all temporary deviations for the entire contract period. The Contractor shall make use of approved methods to control the movement of the construction equipment and vehicles so as not to constitute a hazard on the road or impede the public right of way.

A1.5.3.10 Safety of the travelling public and the Contractor's employees

The safety of the travelling public, and of the Contractor's and the Engineer's employees is of paramount importance and shall take priority over all aspects of the Works. The Contractor shall be responsible for the safe and easy passage of all vehicular, non-motorised and pedestrian traffic past and/or over the Works in a manner which will protect the road users, pedestrians, the Contractor's employees and the Engineer's employees.

A1.5.3. 11 Services

Services affected by temporary deviations shall be located, protected and relocated in a similar manner as services affected by the permanent Works as specified in Clause A2.1.3.2 of Chapter 2. The requirements given in the Contract Documentation shall also be applicable to any services affected by the construction of temporary deviations.

A1.5.3.12 The use of public roads by the Contractor

The Contractor shall have the right to use public roads, including any detours and temporary deviations open to public traffic, subject to the provisions and restrictions specified in Clause A4.1.7.1 of Chapter 4 and in the Contract Documentation.

A1.5.3.13 Traffic over completed pavement layers and structures

Traffic over the completed pavement layers and structures on an uncompleted road shall be restricted to the vehicles and equipment required for the construction of the remaining Works. All construction vehicles will be restricted to the maximum axle loads permitted on public roads by the statutory provisions.

If it is necessary to temporarily accommodate public traffic over the completed pavement layers and structures on an uncompleted road this shall only be done if agreed to by the Engineer.

The Contractor shall be responsible for protecting and maintaining the pavement layers. Any damage to the layers shall be repaired or rectified at the Contractor's own cost unless the Engineer agrees in writing to pay for some or all of these costs.

A1.5.3.14 Vertical clearance

The minimum vertical clearance over any section of a temporary deviation shall be 5,2 m. If the minimum vertical clearance is less than 5,2m then approved warning signage shall be erected at approved locations on the overhead obstruction itself as well as in advance of the obstruction. The advance warning signs shall be erected at distances of 1,0 km, 400 m and 200 m in advance of the overhead obstruction.

A1.5.6.3 Traffic safety vehicle

The traffic safety vehicle to be used for transporting, placing, relocating and removing the traffic accommodation facilities and the traffic safety devices shall be a truck with a load capacity of at least 5 tons fitted with:

A1.5.6.4 Traffic safety officer's vehicle

The traffic safety officer's vehicle shall be provided for his sole use to enable him to carry out his supervisory duties.

A1.5.7.3 Accommodation of traffic where the road is constructed in half or partial widths

Where, for reasons related to traffic, geometric or other restraints, the provision of a detour, or the construction of a temporary deviation alongside or in close proximity to the roadworks, is not possible or impracticable, the Contractor shall construct the Works on a half or partial width of the existing road so as to allow public and construction traffic to use that remainder of the road surface which is currently not under construction.

A1.5.7.6 Maintenance of existing roads used as detours

Where specified in the Contract Documentation, all existing roads used as detours by public traffic, and/or by the Contractor's vehicles, for bypassing the Site of the Works shall be maintained by the Contractor in a good and safe trafficable condition for the entire period during which such roads are used as detours.

Maintenance of these roads used as detours shall include grass cutting, removal of rubbish, cleaning of all drains and culverts and repair of potholes and surface failures as instructed by the Engineer. Unless otherwise specified in the Contract Documentation the maintenance work shall also include the care and maintenance of all road markings, road signs, delineators and guardrails.

A1.5.7.8 Informing the road users

The Contractor shall on a continual basis, and at least one week prior to a major event, inform the road users of the intended road Works, construction period and accommodation of traffic arrangements through press releases in local and provincial newspapers and via local radio channels.

Any temporary road closures required for blasting operations, or for any other reason, shall also be advertised on sign boards erected in appropriate positions along the section of road to be closed at least fourteen calendar days prior to each closure.

A1.5.7.9 Lighting of construction access points during night work

Where work is required to be done during the night the Contractor shall make adequate provision for additional lighting to ensure that all vehicle and equipment entry and exit points are adequately lighted. The Contractor shall provide floodlights to ensure that a minimum 200 lux lighting level is provided at all these areas.

The floodlights must be mounted on masts at least 9m high to ensure that they illuminate the required areas without being directed into the vision of oncoming drivers.

A1.5.7.10 Construction of temporary deviations

a) General

Unless otherwise specified in the Contract Documentation, or instructed by the Engineer in writing, the construction of temporary deviations shall be done in conformance with the requirements and specifications given in this section as well as in other relevant chapters of this Standard Specification as follows:

The proposed location and layout of all temporary deviations, including the signage required, shall be agreed with the Engineer before construction of the temporary deviation commences.

A1.5.7.12 Traffic safety officer

The Contractor shall appoint a knowledgeable, experienced and conscientious person as his traffic safety officer who shall be responsible for the arrangements and maintenance of all accommodation of traffic measures required for the duration of the contract. The Contractor shall submit details of the person's qualifications, training and experience to the Engineer for comment before appointing him.

A1.6 CLEARING AND GRUBBING

PART A: SPECIFICATIONS

A1.6.1 SCOPE

A1.6.2 DEFINITIONS

Clearing -is the removal, loading and disposal of all trees (including designated and protected trees if approved for removal), grass, brush, shrubs, other vegetation, rubbish/litter, rocks and boulders of up to 0,15 m³ in size which are exposed or lying on the surface and all other unsuitable or waste material on or above ground level.

Clearing shall also include the removal of existing buildings, walls and other structures which encroach on or obstruct the Works and which can be broken down and removed with a medium sized bulldozer. (Breaking down of reinforced concrete shall be specified separately in the Contract Documentation if required.)

Removal of temporary works installed by the Contractor shall not be measured or paid for as clearing.

The removal, loading, transport, offloading and stacking (or disposal if specified in the Contract Documentation or by the Engineer) of existing fences, road signs, guardrails, kerbing, channelling etc. shall be carried out as specified in the relevant sections of this Standard Specification.

Designated trees -are indigenous trees or heritage trees that may not be removed without the approval of the relevant local authority.

Designated spoil areas -are spoil or dump sites identified by the Employer in the Contract Documentation or identified by the Engineer on site and those identified by the Contractor in the Contractor's materials management and utilisation plan, as prepared in accordance with the environmental regulations and the environmental management plan.

There are two types of designated spoil areas:

- Unsuitable material spoil areas identified on or near the site of the Works and which have been agreed to by the Engineer. In urban or peri-urban areas the use of the spoil areas shall be approved by the local municipal authority in writing before any general unsuitable material is deposited there.
- Hazardous waste spoil areas which shall be commercial or municipal waste sites that are registered to receive and dispose of hazardous waste material.

Grubbing - is the removal and loading of all stumps and roots in areas where clearing has been carried out and the Engineer has confirmed in writing that grubbing is also required. Grubbing also includes the removal and loading of all non-reinforced building foundations and floor slabs, buried rubbish and other unsuitable or waste material.

Hazardous waste material - material that is cleared and grubbed shall be classified as hazardous waste material if it falls into the hazardous waste categories identified in SANS 10228.

Protected trees - are trees as listed in the Schedule of Protected Trees given in the Government Gazette dated 8th September 2017 (or any later amendments) issued in terms of Clause 15.3 in Chapter 3, Part 3 of the National Forests Act No. 84 of 1988. In terms of this Act protected trees may not be pruned or removed without the permission of the Minister of Agriculture, Fisheries and Forestry.

Stockpile - is a pile of material pushed into a large heaped pile or off-loaded onto a heaped pile so that the material can be temporarily stored for later re-use in the Works. Where specified the material to be placed in a stockpile shall be placed in evenly spread layers of a specified layer thickness, up to the specified maximum height and to the specified shape.

Stockpile site - is a designated site that shall be prepared as specified in Chapter 4, Clause A4.1.7.3a).

Topsoil -is fertile, loamy soil obtained from areas with good soil coverage of natural vegetation, preferably grasses. It shall be free of deleterious matter, such as stiff/heavy clays, large stones, large roots, refuse, rubble and construction material or waste, which will adversely affect its suitability for the planting of grass.

Windrow -is a pile of material which has been excavated and pushed a relatively short distance to a prepared area alongside the borrow pit, quarry, cutting or roadbed area so that the material can be temporarily stored for re-use, usually close to where it is windrowed.

C1.6 CLEARING AND GRUBBING

PART C: MEASUREMENT AND PAYMENT

(i) Preamble

The tendered rate for each item shall include full compensation for providing, operating, maintaining and decommissioning upon completion, of all the construction equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the item, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the conditions of contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum item.

(ii) Items that will not be measured separately

The following required activities will not be measured or paid for separately and the Contractor shall include the cost thereof in other items as deemed appropriate:

1. Loading and offloading of cleared material and grubbed material.
2. Keeping the cleared and grubbed areas free of weeds and alien vegetation until the Works have been completed and have been taken over by the Employer, as specified in Clause A1.6.7.1.
3. Removing deleterious or unsuitable material that was not properly removed during the clearing and grubbing operation from areas where topsoil is to be stockpiled or windrowed, as specified in Clause A1.6.7.6.
4. Keeping topsoil stockpiles and windrows free of weeds, as specified in Clause A1.6.7.6.
5. Re-clearing areas that were cleared and grubbed too far in advance of the Works, as specified in clause A1.6.7.8.

(iii) Items to be measured and paid for using items specified elsewhere in the specifications

For activities shown in Table C1.6-1 payment items specified in other chapters or sections of the specifications, where they relate to work under this section, will be listed in the Pricing Schedule.

Table C1.6-1: Payment items from other Chapters or Sections

Activity	Section 1.6 reference	Section item reference
Clearing and grubbing for site offices, laboratories and site accommodation	A1.6.1	Included in item C1.4.1 of Chapter 1
Hauling of cleared and grubbed material to designated spoil areas	A1.6.7.2, A1.6.7.4, A1.6.7.5	C1.7.2 of Chapter 1
Clearing and shaping accumulated sediment in existing unlined open drains	A1.6.7.2	C3.1.2 of Chapter 3
Excavating and clearing accumulated sediment in existing lined drains and drainage systems	A1.6.7.2	C3.1.3 of Chapter 3
Removal, breaking up, loading, transporting and disposal of concrete kerbing, channelling, down-chutes etc.	A1.6.7.2	C3.3.16 of Chapter 3
Removal, loading, transporting, offloading and stacking of guardrails	A1.6.7.2	C11.4.7 of Chapter 11
Moving or removal and loading, transporting, offloading and stacking of fencing and gates	A1.6.7.2	C11.5.3 & C11.5.4 of Chapter 11
Removal, loading, transporting, offloading and storage of road signs	A1.6.7.2	C11.6.6, C11.6.7 & C11.6.10 of Chapter 11
Replanting of shrubs and trees from a site nursery	A1.6.7.3	C11.8.9.2 of Chapter 11

Preparation of topsoil stockpile sites	A1.6.7.6	C4.1.10 & C4.1.11 of Chapter 11
Reinstatement of topsoil stockpile sites	A1.6.7.6	C4.1.13, C4.1.14 and C4.1.15.1(c) / C4.1.15.2(c) of Chapter 4 as applicable
Hauling topsoil to stockpile	A1.6.7.6	C1.7.2.1(a) of Chapter 1

(iv) **Items specifically for this Section of the Specifications**

Item	Description	Unit
C1.6.1	Clearing	
	C1.6.1.1 Clearing with machines and some hand labour where necessary	hectare (ha)

The unit of measurement for items C1.6.1.1 and C1.6.1.2 is the hectare. The quantity shall be taken as the area (to the nearest 0,01 ha) designated by the Engineer and cleared in accordance with this Standard Specification. Where topsoil can be removed without the necessity of first doing clearing, no payment will be made for clearing.

Item	Description	Unit
C1.6.2	Grubbing	
	C1.6.2.1 Grubbing with machines and some hand labour where necessary	hectare (ha)

The unit of measurement for items C1.6.2.1 and C1.6.2.2 is the hectare. The quantity shall be taken as the area measured in hectares (to the nearest 0,01 ha) as designated by the Engineer in writing and grubbed in accordance with these specifications.

Only the areas confirmed in writing by the Engineer to be grubbed shall be measured for payment.

Item	Description	Unit
C1.6.3	Removal and grubbing of large trees and tree stumps:	
	C1.6.3.1 Girth equal to or exceeding 1,0 m up to and including 2,0 m	number (No)
	C1.6.3.2 Girth exceeding 2,0 m up to and including 3,0 m	number (No)
	C1.6.3.3 Girth exceeding 3,0 m	number (No)

The unit of measurement for items C1.6.3.1 to C1.6.3.3 shall be the number of trees of each size removed. The girth of trees and stumps shall be measured as specified in Clause A1.6.7.1. Trees and stumps with a girth exceeding 1,0 m shall be measured individually and classified in size increments exceeding 1,0 m up to 2,0 m, exceeding 2,0 m up to 3,0 m and exceeding 3,0 m, as indicated in the items above. (Trees with a girth of less than and up to 1,0 m shall not be paid for individually and the cost of removing all small trees and bushes with a girth of less than and up to 1.0 m shall be included in the contract rates for item C1.6.1 and item C1.6.2.)

The contract rates shall include full compensation for all work necessary for the removal and grubbing of trees and stumps of all sizes, including removal of the roots, the backfilling and compaction of the cavities left after the stump and roots have been removed with approved material, and the loading and offloading of the cut timber and grubbed root material. Hauling of the grubbed material to a designated spoil area will be measured from the centroid of loading area to the centroid of the designated spoil area following the shortest practical route. Payment for haulage will be made under item C1.7.2.

Where construction is carried out through forests or plantations, or where the number of trees with a girth exceeding 1,0 m renders individual measurement impracticable, the removal and grubbing of trees in such areas shall be measured under item C1.6.3.4. The quantity shall be taken as the area measured in hectares (to the nearest 0,01 ha) as designated by the Engineer in writing. If this method of measurement is used, the areas where it applies will be shown on the drawings, stated in the Contract Documentation and/or indicated to contractors during the site inspection. The contract rate per hectare shall include full compensation for all work as described for the removal of individual trees above.

A1.7 LOADING AND HAULING

PART A: SPECIFICATIONS

A1.7.1 SCOPE

This Section covers the loading and hauling of construction materials on the site of the Works.

A1.7.2 DEFINITIONS

Hauling -is the moving of loaded construction material from the point of excavation, or from a stockpile or windrow, to the point of use on the site or to designated spoil areas. The hauling operation shall include the off-loading of the material at the point of use on site, at the temporary stockpiles or at the designated spoil sites as applicable.

Haul roads -are temporary roads constructed by the Contractor, or existing public or privately owned roads, or any part or section of the road under construction, used for the purposes of hauling construction materials or for carting material to spoil.

Loading -is the operation of picking up the material from an excavation, stockpile or windrow and placing it in a haul vehicle.

A1.7.3 GENERAL

A1.7.3.1 Measurement of haul distance

The haul distance shall usually be measured from the centre of volume (centroid) of the excavation in the cutting (or part of a cutting), trench or borrow pit, or from the centre of the stockpile position where applicable, to the centroid of the fill (or part of a fill), to the mid-point along the road centreline of the section of the road layer where the material is placed, to the centre of the temporary stockpile position in a borrow pit, quarry or on site or to the centre of the designated spoil area where the material is off loaded as applicable. The haul distance will be measured to the nearest 0,1 km.

For those operations where the material is usually disposed of, and/or reused, near the source of the material the relevant pay item may state that the cost of hauling the material for the first 1,0 km shall be included in the contract rate for that pay item. For these operations the hauling of the material shall only be measured if the actual haul distance exceeds 1,0 km and the haul distance to be measured for payment shall be measured from a point starting 1,0 km from the centre of volume (centroid) of the excavation in the trench or borrow pit, or from the centre of the stockpile position where applicable, up to the centroid of the fill (or part of a fill), up to the mid-point along the road centreline of the section of the road layer where the material is placed or up to the centre of the designated spoil area where the material is off loaded as applicable. The haul distance will be measured to the nearest 0,1 km. The haul distance shall be measured along the shortest route as instructed by the Engineer as being safe and practical. The haul distance shall include any distance that the haul vehicle must travel to make use of a safe turning point or the next off ramp before making the return trip. Should the Contractor choose to haul material over some other longer route, computations for payment shall nevertheless be based on the haul distance measured along the shortest route instructed by the Engineer.

A1.7.3.2 Haul and construction access roads

The construction, use and later closure / reinstatement of any haul roads and construction access roads that are required by the Contractor shall be carried out in accordance with the requirements given in Clause A4.1.7.1 of Chapter 4.

The requirements for the use of any existing public roads by the Contractor to haul material are given in Clause A4.1.7.1a) of Chapter 4.

The requirements for the use of haul roads not on existing public roads are given in Clause A1.2.3.2.

C1.7 LOADING AND HAULING

PART C: MEASUREMENT AND PAYMENT

(i) Preamble

The tendered rate for each item shall include full compensation for providing, operating, maintaining and decommissioning upon completion, of all the construction equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the item, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the conditions of contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum item.

(ii) Items that will not be measured separately

The following required activities will not be measured or paid for separately and the Contractor shall include the cost of these activities in other pay items as already specified for the appropriate pay item or as deemed appropriate by the Contractor:

1. The loading and hauling of commercial materials from either Employer or Contractor identified suppliers/sources shall not be measured for payment.
2. The loading of materials on site will not be measured and paid for separately except for loading already stockpiled material and for loading material that has been placed in heaps or windrows where the relevant payment item in other Chapters specifically states that the loading will be paid for separately.
3. The hauling of materials on site will not be measured and paid for separately where the relevant payment item specifically states that the hauling operation is included in that payment item.
4. The hauling of materials on site over a localised distance of up to 1,0 km will not be measured and paid for separately where the relevant payment item specifically states that the initial haul of the material over a distance of up to 1,0 km is included in the pay item.

(iii) Items to be measured and paid for using items specified elsewhere in the specifications

There are no items mentioned in this section that are measured and paid for elsewhere in this Standard Specification.

(iv) Items specifically for this Section of the specifications

The following payment items will be inserted in the Pricing Schedule under the relevant payment section where loading and/or hauling of materials is applicable. The payment item shall commence with the relevant section number followed by / and then by the applicable loading and hauling payment item numbers given here.

Item	Description	Unit

C1.7.1 Loading

C1.7.1.1	Loading from stockpile using machines and some hand labour where necessary	cubic metre (m ³)

C1.7.1.2	Loading from heaps or windrows using machines and/some hand labour where necessary	cubic metre (m ³)

C1.7.1.3	Loading by hand only from stockpile or heaps when labour enhancement work is specified or	cubic metre (m ³) it is not possible to use machines

Loading is generally considered to be part of the operation that produced the material which is being loaded, such as excavation, grubbing, cleaning, demolition etc., and it is therefore not usually measured separately for payment. Loading shall only be measured separately for payment for loading stockpiled material and for loading material that has been placed in heaps or windrows where the relevant payment item specifically states that the loading will be paid for separately.

The unit of measurement for items C1.7.1.1 to C1.7.1.3 shall be the cubic metre of material loaded into the hauling vehicles. These pay items shall only apply for those activities where the relevant pay item does not specify that the loading is included in the contract rate for that pay item.

The quantity of all soil and gravel materials loaded for hauling for use on the site of the Works shall be the compacted volume of material measured in its final position in the Works calculated using the dimensions given in the Contract Documentation or specified in writing by the Engineer.

The quantity of all materials loaded for hauling to temporary stockpile for later use in the Works, to borrow pits for backfilling purposes or for disposal at designated spoil areas shall be taken as 70% of the measured load volume of the haul vehicle being used to transport soil and gravel material and 50% of the measured load volume of the haul vehicle being used to transport hard material and/or boulders.

The contract rate for item C1.7.1.1 shall include full compensation for loading material from a stockpile and loading it into the hauling vehicles.

The contract rate for item C1.7.1.2 shall include full compensation for loading excavated material from heaps or windrows at the point of collection, including any windrowing and/or localised sorting / stockpiling that may be required, and loading it into the hauling vehicles.

The contract rate for item C1.7.1.3 shall include full compensation for loading excavated material at the point of collection on site or loading it from stockpile by hand and loading it by hand into the hauling vehicles. This item is only applicable when the Contractor has been instructed to load the material by hand in the Contract Documentation or by the Engineer to enhance the labour component of the Works or if it is not practical to use machines due to the restricted nature of the work.

Item	Description	Unit

C1.7.2 Hauling

C1.7.2.1 Hauling material for use in the Works and off-loading it on the site of the Works:

(a)	Soil, gravel, crushed stone and pavement layer material	cubic metre - kilometre (m ³ - km)
(b)	Boulders and hard material	cubic metre - kilometre (m ³ - km)

C1.7.2.2 Hauling material to spoil and off-loading it at a designated spoil or stockpile area:

(a)	Cleared and grubbed material (organic matter and all other unsuitable or waste)	cubic metre - kilometre (m ³ - km}
(b)	Soil and gravel material	cubic metre - kilometre (m ³ - km)
(c)	Boulders, hard material and concrete	cubic metre - kilometre (m ³ - km)

The unit of measurement for items C1.7.2.1 and C1.7.2.2 shall be the cubic metre – kilometre (m³ - km) which is calculated as the product of the quantity of material loaded, as measured in items C1.7.1.1, C1.7.1.2 or C1.7.1.3, multiplied by the applicable haul distance which shall be calculated as defined in Clause A1.7.3.1.

These pay items shall only apply for those activities where the relevant pay item does not specify that all the hauling is included in the contract rate for that pay item.

The quantity of all soil and gravel materials hauled for use on the site of the Works shall be the compacted volume of material measured in its final position in the Works calculated using the dimensions given in the Contract Documentation or specified in writing by the Engineer.

The quantity of all materials hauled to temporary stockpile for later use in the Works, to borrow pits for backfilling purposes or to designated spoil areas shall be taken as 70 % of the measured load volume of the haul vehicle being used to transport soil and gravel material and 50 % of the measured load volume of the haul vehicle being used to transport hard material and boulders.

The quantity of all organic matter hauled to borrow pits or to designated spoil areas shall be taken as 50 % of the measured load volume of the haul vehicle being used.

The contract rate shall include full compensation for hauling the material and off-loading it at the required or designated position.

A2.1 GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES

PART A: SPECIFICATIONS

A2.1.1.2 Location, identification, protection and relocation of existing services

Section A2.1 also covers the work associated with the location and identification of all existing services on the site and the protection and/or relocation of existing services. Existing services shall be located, identified and protected or relocated in accordance with the details shown on the drawings, provided in the Contract Documentation or as directed by the Engineer.

A2.1.3.2 Location, identification, protection and relocation of existing *services*

b) Location of existing services

Before any work can commence the Contractor shall verify the actual position of each known existing service and bring to the attention of the Engineer any previously unknown service that is not recorded in the existing as-built or wayleave records or indicated in the Contract Documentation.

c) Condition of existing services

The Contractor shall acknowledge that he has inspected and examined all known existing services and all existing services subsequently discovered on site and is satisfied that all such services were in an acceptable and serviceable state at the commencement of the works, or alternatively, upon verification thereof as contemplated in Clause A2.1.3.2b). The Contractor shall report all services that are damaged or not in an acceptable and serviceable state to the Engineer.

d) Protection of services

(i) Service owners

Prior to commencing work, the Contractor shall confer with all service owners, authorities and departments concerned and obtain the necessary wayleaves, permits or permissions for both overhead and underground services affected by the works and shall satisfy himself that all the relevant information required to complete the contract has been obtained. Refer to Clause A2.1.3.8 in this regard.

(ii) Protection

During the course of the works all known existing services including traffic signals, water mains, sewers, electricity transmission and communication lines, cables, poles, pipes and ducts as well as any storm water or drainage infrastructure, whether in service or not, shall be protected, supported and maintained to the satisfaction of the service owner, authority or department concerned and the Engineer.

(iii) Damage

The Contractor will be held responsible for any damage caused by him to known existing services, anywhere along the entire lengths of their routes, as may reasonably be deduced from the actual locations at which their positions were verified in accordance with Clause A2.1.3.2b), due cognisance being taken of such deviations in line and level which may reasonably be anticipated, unless the Contractor can prove that reasonable diligence and care had been exercised and that the damage was unavoidable despite all precautions. The Contractor will not be held responsible for any damage caused if the position of a known existing service deviated by more than 1,0 m horizontally or 0,5 m vertically from the position as may reasonably have been determined after the location and verification of the service's position in accordance with Clause A2.1.3.2b).

(iv) Relocation

Whenever services are encountered which interfere with the execution of the works, and which must be moved and relocated, the Contractor shall advise the Engineer, who will determine the extent of the work, if any, to be undertaken by the Contractor in moving, relocating and reinstating or protecting such services.

A2.1.7.3 Railway reserves, bridge and other special crossings

Where services or ducts have to be installed across railway reserves, bridges or other structures or in any other special circumstances the work for such crossings shall be carried out in accordance with the requirements of the Contract Documentation and in accordance with the applicable sections of this specification.

C2.1 GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES

PART C: MEASUREMENT AND PAYMENT

(i) Preamble

The tendered rate for each pay item shall include full compensation for providing, operating, maintaining and decommissioning upon completion, of all the construction equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the pay item as specified, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the conditions of contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum item.

The requirements of Section C1.1 of Chapter 1 shall apply.

Where pay item descriptions include any wording in brackets it is an indication that contract specific information is to be inserted in the Pricing Schedule included in the Contract Documentation.

(ii) Notes on measurement and pay items

1. Unless otherwise ordered or stated in the Contract Documentation, trench depths will be measured from the surface of the ground along the centre-line of the trench to the bottom of the specified bedding layer (as applicable). Where no bedding is required it shall be measured to the underside of the duct or pipe.
2. The ground surface will be that existing after any bulk earthworks have been carried out, i.e. the excavated surface or embankment surface, unless a different sequence of execution has been ordered.
3. Excavations will be measured as if taken out with vertical sides, regardless of whether they have been taken out with sloping sides.
4. The length used for trench computations will be the total through-length of a pipe or duct etc. from end to end and no deduction will be made for manholes or access chambers etc.
5. Wherever volumetric measurement is required, the volume will be computed from the depth determined as indicated in 1. and 2. above and using the authorised width (W) determined in accordance with the specification.
6. Where shoring is specified or ordered, the length of shoring measured for payment will be the length of the centre-line of the trench.

(iv) **Items specifically for this Section of the specification**

Item	Description	Unit
C2.1.2	Existing services location, detection and verification	
C2.1.2.1	Using specialist detection services (ground penetrating radar, radio detection etc.)	prime cost (PC) sum
C2.1.2.2	Handling costs and profit in respect of item C2.1.2.1 above	percentage (%)

The prime-cost item C2.1.2.1 will cover the costs of any specialist detection services used to locate, detect and verify existing services. The use of any specialist detection service providers shall be approved by the Engineer prior to their appointment.

The prime-cost item C2.1.2.3 will cover the costs of any survey services used to determine, fix and record the positions of an existing service after it has been located. The use of any survey service providers shall be approved by the Engineer prior to their appointment.

The prime-cost items C2.1.2.1 and C2.1.2.3 shall be paid for in accordance with the provisions of the conditions of contract. The tendered percentage for items C2.1.2.2 and C2.1.2.4 shall be a percentage of the amount actually spent under the prime-cost item, which shall include full compensation for the handling, supervision and liability costs of the Contractor and the profit in connection with providing the specified service.

A4.1 BORROW MATERIALS

PART A: SPECIFICATIONS

A4.1.1 SCOPE

This Section covers the work requirements for sourcing natural or crushed compliant materials that can be used for the construction of earthworks and road pavement layers from borrow pits and quarries that are developed and operated to supply materials for a specific road construction project or projects. It contains the following specifications:

- Definitions applicable for Chapters 4 and 5.
- Responsibilities and duties of the Employer and the Contractor in providing geotechnical information, and information on the preparation of management and utilisation plans for the borrow pits and quarries.
- The material specifications for the earthworks and road pavement layers.
- The requirements for the control, excavation, selection of material, and closure of borrow pits and quarries, as well as definitions for the different classes of excavation.
- Producing of the road construction materials by crushing and/or screening.
- The preparation of stockpile sites and the stockpiling of materials.

Operations at quarries of commercial suppliers to produce commercial materials are excluded from the requirements in this Section A4.1, except for the material specifications in Clause A4.1.5.

Specifications for aggregate to be used in subsoil drains, asphalt, seals, gabions and concrete are not included in this Chapter 4 but are included in the relevant Chapters where these works are specified.

The sourcing of materials from road cuttings, box cuts and designated excavations, from existing roads, from commercial sources, and the use of alternative materials are covered in the other Sections of this Chapter 4.

Chapter 5 – Earthworks and Pavement layers: Construction, covers the construction of the road pavement layers. SANS test methods published by the South African Bureau of Standards (SABS) are listed in Chapter 20.

A4.1.7.2 Borrow pit and quarry operations

a) General control at the borrow pits and quarries

The Contractor shall be responsible for controlling operations at every borrow pit and quarry to ensure compliance with all the requirements of the statutory authorisation, approvals and the Contract Documentation. Sufficient tests shall be conducted on the excavated material to ensure that the quality of the material complies with the specified requirements for the particular layer for which it will be used. The test results shall be delivered to the Engineer for review.

When specified in the Contract Documentation, the Contractor shall have a full time or part time materials manager to conduct and manage the duties for the control at the borrow pits and quarries. The requirements for the materials manager, whether the person shall be an engineering geologist, engineer, a senior materials technician or a senior general foreman, and the required qualifications and experience of the materials manager, shall then also be specified.

b) Classes of excavation

The excavation of borrow material shall be classified as follows:

(i) Soft excavation

Soft excavation class is excavation of material that can be efficiently removed by the reference construction equipment specified in the Contract Documentation, without prior breaking down.

Very dense granular or sand material and stiff to very stiff cohesive clay material, which can still be removed by the reference construction equipment without prior breaking up as specified for hard material but that do not comply with the definition of efficient removal of the equipment, shall also be classed as soft excavation.

In the absence of any construction equipment specified to reference the efficient removal of the material, a hydraulic crawler excavator in good mechanical order with nett horsepower (flywheel power) generally between 180 kW and 225 kW, also known as a 30 ton excavator, and equipped with a heavy duty bucket shall be the reference construction equipment. A minimum continuous production rate of 160 m³/h of the excavated material will be taken as the benchmark for the excavator's capacity and efficiency.

(ii) Boulder excavation class A

Where material contains in excess of 40 % by volume of boulders, core stones, floaters and lumps of hard material larger than 200 mm but volume less than 20 m³ in size, in a matrix of soft material, then the full volume excavated shall be classed as boulder excavation class A.

Excavation in dolomite formations other than solid dolomite shall also be classed as boulder excavation class A if the formations contain in excess of 40 % by volume of lumps of hard dolomite larger than 200 mm but volume less than 20 m³ in size, in a matrix of softer material or smaller lumps of hard dolomite.

Excavation of fissured or fractured rock shall not be classed as boulder excavation but as soft or hard excavation according to the nature of the material.

(iii) Boulder excavation class B

Where material contains 40 % or less by volume of boulders, core stones, floaters and lumps of hard material larger than 200 mm but volume less than 20 m³ in a matrix of soft material, then the volume of the individual boulders, core stones, floaters and lumps of hard material shall be classed as boulder excavation class B.

The volume of the rest of the material shall be classed as soft excavation.

Selection and excavation of material in borrow pits

Once the material compliant for the works is exposed in a borrow pit, the Contractor shall:

- Plan the utilisation in such a manner that the pioneer and fill material can be selected, excavated and loaded directly for use on the road. Only after approval, where the fill layers cannot be constructed immediately or for reasons beyond the Contractor's control, shall the material be temporarily stockpiled. The Contractor shall cease excavation of the fill material until it can be processed on the road, at no cost to the Employer.
- For all the pavement layer materials the Contractor shall always select, excavate, remove and place the material into compliant separate stockpiles to provide a uniform material, prior to removal of the material to the road. Where it is not feasible to stockpile the material within the borrow pit or borrow pit area the Engineer shall designate other temporary stockpile areas elsewhere outside the borrow pit area. Measurement and payment shall be made for this stockpile activity.

- Control the rehabilitation and closure of the borrow pit.

l) Use of the borrow material

The results of laboratory tests, trial pits and borehole drilling of materials carried out during the design stage are included in the Contract Documentation. The results and other information give a preliminary indication as to the purpose for which and where the material shall be used. The Engineer shall give final instructions during construction regarding the use of the borrow material.

m) Closing of the borrow pits and quarries

The operations and requirements for shaping, finishing, rehabilitation and closure of the borrow pits and quarries after the removal of the road construction material is completed, are contained in the borrow pit and quarry plans approved by the control authority and shall be complied with.

A4.1.7.3 Stockpiles

a) Preparation of the stockpile site

Stockpile sites shall be prepared in positions as indicated on the borrow pit or quarry plans, or at positions agreed to and indicated on the M&U plans.

Stockpiling of the material

The material shall be off-loaded and spread uniformly in layers in the stockpile. Segregation of the material during the handling shall be avoided.

c) Reinstatement of the stockpile site

After the stockpiled material has been removed, the site shall be reinstated as closely as possible to its original condition.

In the absence of any specified conditions in the borrow pit or quarry approvals, or elsewhere in the Contract Documentation the following minimum requirements shall be complied with:

- All surplus stockpiled material shall be removed and disposed of,
- Material used to construct a fill platform and the temporary banks shall be removed and disposed of, unless the Contractor is instructed to leave the banks in place to prevent future erosion,
- The stockpile floor shall be graded to the original natural contours,
- The stockpile floor shall be ripped 100 mm deep to break all compacted in situ material, and
- The stockpile site shall be lightly scarified to promote growth of natural vegetation or shall be covered with a 75 mm to 150 mm thick topsoil layer and vegetated when required in the statutory approvals.
- The daily and monthly product reports of at least the nett weights.

C4.1 BORROW MATERIALS

PART C: MEASUREMENT AND PAYMENT

(i) Preamble

The tendered rate for each item shall include full compensation for providing, maintaining and decommissioning upon completion, of all the plant, equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the item, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the conditions of contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum item.

The requirements of Section C1.1 of Chapter 1 shall apply.

Where pay item descriptions include any wording in brackets, it is an indication that contract specific information is to be inserted in the Pricing Schedule included in the Contract Documentation.

(ii) Items that will not be measured separately

The following required activities will not be measured or paid for separately and the Contractor shall include the cost thereof in items describing the activity or other items as deemed appropriate:

1. Loading and hauling to any of the following borrow pit and quarry operations required to source and produce the material that are carried out within the same borrow pit and quarry areas:
 - Removing, and stockpiling if required, of the topsoil and of the overburden.
 - Moving the excavated material between the point of excavation and the stockpile sites or crushing and screening areas, and between the crushing and screening areas and the stockpile sites as applicable.
 - During rehabilitation of the stockpile sites removal of the surplus material, the fill platform, temporary banks and material generated in the finishing.
2. Separating oversize material to be left in the borrow pit.
3. Moving of the construction equipment from one borrow material location to another.

(iii) Items to be measured and paid for using items specified elsewhere in the specifications

For activities in Table C4.1-1 items specified in other Chapters or Sections of the specification, where they relate to work under this Section, will be listed in the Pricing Schedule.

Table C4.1-1: Payment items from other Chapters or Sections

Activity	Section 4.1 reference	Section item reference
Fencing and gates around the borrow pit and quarry areas	A4.1.7.2a)	Section C11.5 of Chapter 11 - All applicable items
Clearing, grubbing, removal of large trees, and removal of buildings and structures	A4.1.7.2d) and A4.1.7.3a)	C1.6.1 to C1.6.4 of Chapter 1
Conservation (excavating and stockpiling) of topsoil (including overburden less than 200 mm thick)	A4.1.7.2e)	C1.6.9 of Chapter 1
Banks and dykes	A4.1.7.2h) and A4.1.7.3a)	C3.1.6 of Chapter 3
Blasting of hard material	A4.1.7.2j)	C12.10.1 of Chapter 12
Hauling material (when applicable)	A4.1.7.2k) and A4.1.7.3b)	C1.7.2 of Chapter 1
Placing of topsoil, and vegetation	A4.1.7.2m)	Section C11.8 of Chapter 11 - All applicable items

(iv) **Items specifically for this Section of the specifications**

Item	Description	Unit
C4.1.2	Additional material investigations during the supplementary exploration	
	C4.1.2.1 Cost of additional trial pits and/or drilling and laboratory testing	provisional sum
	C4.1.2.2 Handling costs and profit in respect of item C4.1.2.1	percentage (%)
Item	Description	Unit
C4.1.4	Removing of the overburden	
	C4.1.4.1 In borrow pits	cubic metre (m ³)
	C4.1.4.2 In quarries:	
	(a) Soft material	cubic metre (m ³)
	(b) Hard material (by blasting)	cubic metre (m ³)

The unit of measurement shall be the cubic metre of overburden removed.

The quantity shall be measured in place at the borrow pit or quarry before stripping. It shall be based on the thickness of overburden as measured in trial pits, or from topographical surveys carried out after the removal of the topsoil and surveys done after the removal of the overburden. Overburden less than 200 mm thick when removed with the topsoil shall be included in the topsoil measurement.

For removing overburden in borrow pits no distinction shall be made between the classes of excavation of the overburden material.

For removing overburden in quarries distinction shall only be made between removing soft and hard material.

The tendered rates shall include full compensation for excavating the overburden, for moving the material to the outer limits of the borrow pit or quarry or for loading the material for stockpiling as applicable, for replacing the overburden in the borrow pit or quarry after completion of the excavation including loading and hauling from the stockpile when applicable, and for levelling the material.

The tendered rate for item C4.1.4.2b) shall exclude the cost of blasting, which shall be measured and paid for under item C12.10.1 of Chapter 12.

Approved stockpiling of the overburden shall be measured and paid for under item C4.1.12.

Item	Description	Unit
C4.1.5	Excavating of materials in the borrow pits and quarries, material obtained from	
	C4.1.5.1 Soft excavation	cubic metre (m ³)
	C4.1.5.2 Boulder excavation class A	cubic metre (m ³)
	C4.1.5.3 Boulder excavation class B	cubic metre (m ³)

The unit of measurement in each class of excavation shall be the cubic metre of material excavated.

The quantities shall be measured in place in the compacted earthworks or pavement layers. The quantities shall not include excess material, overfill material or additional material placed for bulking (settlement during compaction).

The quantities for earthworks shall be measured from the difference between surveyed cross sections at 20 m maximum intervals taken before and after the construction of the earthworks.

The quantities for pavement layers shall be calculated from the authorised dimensions of the layers. Where the pavement layer materials are placed in stockpile for some time before used on the road, the Engineer and the Contractor shall agree on the interim method of measuring the quantities for this item.

For boulder material the Engineer may approve that the quantities be measured in haul vehicles as an alternative when the boulder material cannot be identified accurately prior to excavating, by taking the volume of the material as equal to 50 % of the loose volume of the material in the haul vehicles.

The tendered rates shall include full compensation for breaking down the materials in the various classes to the specified maximum particle sizes, for excavating, and loading the material.

The tendered rates shall include full compensation for providing the plant, transporting the plant to the project, erecting, commissioning and finally dismantling it, and removing it when it is no longer required for the project.

Payment of this item shall be made in two instalments as follows:

- The first instalment, 85 % of the tendered rate, shall be paid after erection and commissioning of the plant.
- The final instalment, 15 % of the tendered rate, shall be paid after removal of the plant from the contract.

A4.4 COMMERCIAL MATERIALS

PART A: SPECIFICATIONS

A4.4.1 SCOPE

This Section covers:

- The provision of natural or crushed materials for a specific road construction project or projects that are procured from commercial and other private sources. It includes information on the requirements for providing the commercial materials for earthworks and road pavement layers as an alternative to sourcing these materials from borrow pits, from quarries, from cuttings, box cuts and designated excavations or from existing roads.

A4.4.2 DEFINITIONS

The relevant definitions in Chapter 1 and Clause A4.1.2 shall also be applicable to this Section. Additional definitions for this Section are listed below.

Commercial materials -are natural gravel, sand or crushed rock materials:

- Sourced from commercial suppliers. These materials are sold by commercial suppliers and are generally crushed materials acquired from quarry operations or from stockpiles of non-ore containing material excavated during mining operations and shall already comply with the gradation and other material requirements, or
- Sourced from private or other non-commercial suppliers identified by the Employer or the Contractor, or material from the Employer's or Contractor's own sources. These materials are usually natural materials available in excavations or stockpiles, and the primary objective for excavating the material is/was not for road construction purposes. It is distinguished from material sourced from borrow pits and quarries in Section 4.1, in that the excavation or sourcing does not require a mining right or a mining permit in terms of South African legislation, although other legislative approvals may be required. Commercial materials from private or other non-commercial suppliers or from the Employer's own sources may require removal or breaking down of oversize material, screening, crushing or crushing and screening.

Dust palliatives -are products applied to the surface of a wearing course of an unsealed road or worked into the layer to reduce the dust and loss of fines.

Non-traditional stabilising or soil treatment agents -non-traditional stabilisation or soil treatment agents can be:

- Sulfonated petroleum products (SPPs), also known as ionic soil stabilisers.
- Polymers, essentially plastic materials derived from acrylic polymers and commonly used as household glues.
- Nano-technology products that utilise processes at the molecular level within bitumen to improve the material properties.

Non-traditional stabilising or soil treatment agents are sometimes also referred to as proprietary stabilising agents.

Stabilisation - is the treatment of natural or crushed material to enhance the strength (load bearing capacity) and stiffness, and/or to make the material more water resistant to improve the durability. Marginal non-compliant

material can also be made compliant for use after stabilisation. Stabilisation of material may take place by means of mechanical modification, also referred to as granular stabilisation (for example material blending), chemical (for example mainly modification or modification and cementation), electrical (for example ion exchange), or material improvement (for example using bitumen emulsion or foamed bitumen).

Traditional stabilising agents -these are agents that have generally been used through the years to stabilise materials, and are classified as:

- Cementitious stabilising agents (cement and lime}, also referred to as stabilisers.
- Bituminous stabilising agents (added as an emulsion or in a foamed state).

A4.4.3 GENERAL

A4.4.3.1 Employer identified commercial materials

a) Materials from commercial suppliers

The Employer may identify and include test results of compliant materials from commercial suppliers in the Contract Documentation. However, the Contractor shall still be responsible for sourcing the material and for ensuring the sufficiency in quantity and quality of the material intended for use in the contract.

The Employer will usually not conclude any arrangements with these commercial suppliers, and the Contractor shall enter into negotiations with them and conclude contracts for the price, payments, rate of supply and the like.

Once the Contractor has chosen one or more of the commercial suppliers identified by the Employer, further dealings with the supplier and procuring the material shall be undertaken by the Contractor.

b) Materials from private or non-commercial suppliers

The sources and results of any material testing of materials from private or non-commercial suppliers that have been identified by the Employer, will be included in the Contract Documentation. This information is indicative as to the sufficiency in quality and quantity of the material.

The Contract Documentation shall also specify the arrangements made with the suppliers and specifically those that the Contractor must comply with, and any further negotiations that the Contractor shall conclude.

c) Materials from the Employer's own sources

The material is free issued to the Contractor, unless otherwise stated in the Contract Documentation when any conditions of the Employer shall then also be specified.

The results of any material testing will also be included in the Contract Documentation.

A4.4.3.2 Contractor identified suppliers or sources

When no commercial sources are identified by the Employer in the Contract Documentation or if so instructed, the Contractor shall identify compliant material sources. The Contractor can also identify compliant commercial or private / non-commercial material sources, or material from the Contractor's own sources, other than those identified by the Employer for utilisation in the works as an alternative material source.

A4.4.5.8 Quality of materials

It is the Contractor's responsibility to ensure that the commercial materials including the procuring, loading, hauling, and/or further stockpiling if applicable, shall comply with the material specifications.

Any approval or consent given previously for the use of any commercial material may be cancelled, if the material quality has altered so that it does not comply with the specifications anymore.

A4.4.7.2 Storage of stabilising agents on site

a) Cement provided in pockets

Cement delivered in pockets can be kept at the road on pallets or on a raised platform for no longer than two weeks. The pockets shall always be protected from the ingress of any moisture with a waterproof tarpaulin or plastic cover not less than 1,0 mm thick.

For longer storage periods, the cement bags shall be stored in a shed. The requirements for the shed and for storing are:

- Storage sheds shall be watertight and of solid construction.
- The floor shall be waterproof and covered with plastic sheets not less than 1,0 mm thick.
- The pockets shall be stored on the delivery pallets, which must be stacked closely together (to reduce the circulation of air) and away from any outside walls.
- Pockets shall be stored in such a way that older pockets are used first.

- Vertical stacking of loose pockets shall not exceed 12 pockets high.
- Doors and windows shall be kept shut.

The permitted shelf life of cement stored in a shed is 6 months inland and 3 months in coastal areas. Cement which has been properly stored in an approved shed as specified above for longer than these periods, or at the road side for more than two weeks, shall not be used in the stabilisation works.

b) Lime

Lime can be kept at the road for up to six months on pallets or on a raised platform. The pockets shall always be protected from the ingress of any moisture with a waterproof tarpaulin or a plastic cover not less than 1,0 mm thick.

c) Bitumen

The maximum storage temperatures for penetration grade bitumens are given in Table A9.1.7.1 of Chapter 9. Binders stored in a heated condition shall be kept in a container with a securely fitting lid and the circulatory system that is functioning properly. The container shall be provided with a build-in thermometer. Binders which have been heated above the maximum allowed temperatures shall not be used and shall be removed from the site.

Bitumen emulsion shall be stored at ambient temperature in storage tanks fitted with a circulating pump system, which will enable the stored bitumen emulsion to be properly circulated in the static tank, especially when no bitumen emulsion has been drawn or added for a period of 2 to 3 consecutive days. The supplier shall be contacted for the maximum storage period.

d) Placing on the road

Pockets of stabilising agents shall only be placed immediately before the mixing and compaction operations are carried out, and after the gridlines have been marked out on the surface to ensure the correct application rate. Where this is not practical and approved by the Engineer, then pockets shall not be left on the road for longer than one day after placing the pockets prior to spreading the agent, as it may absorb moisture from the underlying layer or be damaged during other construction activities.

When the pockets of stabilising agents are placed on the road during periods of wet weather and get wet before the agent is spread and mixed into the layer, then the agent shall be removed to spoil and replaced with new dry agent at no cost to the Employer.

Where a pocket is broken on the road and mixing and compaction are not done within the specified time, the agent in the broken pocket shall be removed to spoil and replaced with new dry agent at no cost to the Employer.

When the stabilising agent is delivered to site in bulk tankers then the agent may only be dispensed onto the road immediately before the mixing and compaction operations are carried out.

C4.4 COMMERCIAL MATERIALS

PART C: MEASUREMENT AND PAYMENT

(i) Preamble

The tendered rate for each item shall include full compensation for providing, maintaining and decommissioning upon completion, of all the plant, equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the item, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the conditions of contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum item.

The requirements of Section C1.1 of Chapter 1 shall apply.

Where pay item descriptions include any wording in brackets, it is an indication that contract specific information is to be inserted in the Pricing Schedule included in the Contract Documentation.

(ii) Items that will not be measured separately

Loading of the commercial materials at the source, hauling it to the road, and off-loading will not be measured and paid for separately.

(iii) Items to be measured and paid for using items specified elsewhere in the specifications

For commercial materials from private or non-commercial suppliers identified by the Employer and that must still be excavated, produced and/or stockpiled, the Employer may decide to have a cost breakdown of the individual activities such as excavation, crushing and so forth. The pricing of item C4.4.1 will then not be applicable, and measurement and payment shall be made in accordance with the applicable items in Section C4.1.

(iv) Items specifically for this Section of the specifications

Item	Description	Unit

C4.4.1 Commercial materials identified by the Employer from commercial, private or other non-commercial suppliers (specify the source(s))

C4.4.1.1 Pavement layer material:

- (a) Type G1 material cubic metre (m³)
- (b) Type G2 material cubic metre (m³)
- (c) – (l) Etc, for other Type G3 to G9 materials cubic metre (m³)

The unit of measurement shall be the cubic metre of material.

The quantities for items C4.4.1.1 to C4.4.1.4 shall be measured in place in the compacted pavement layers and calculated from the authorised dimensions of the layers.

The tendered rates shall include full compensation for negotiations, taking of samples and laboratory testing of the natural material to prove compliance with the specified properties, procuring and furnishing the commercial materials, for loading the material at the source, hauling it to the road, and for off-loading. Temporary stockpiling of the material after procurement by the Contractor shall not be paid for.

Item	Description	Unit
C4.4.4	Cementitious stabilising agents	
C4.4.4.1	Cement	ton (t)
C4.4.4.2	Road lime	ton (t)

The unit of measurement shall be the ton of stabilising agent.

The quantity of stabilising agent shall be determined in accordance with the authorised application rate. No over application or wastage shall be measured for payment.

The tendered rates shall include full compensation for procuring, transporting and delivering the stabilising agent to the site. No distinction shall be made between providing the stabilising agent in bulk or in pockets.

For providing the stabilising agent in pockets, the tendered rates shall also include full compensation for off-loading the pockets, for short term and/or long term storage.

All haul costs shall be included in the tendered rates of item C4.4.4.

Placing, spreading and mixing in the stabilising agent(s) on the road shall be measured and paid for under the applicable items in Chapter 5.

Item	Description	Unit
C4.4.5	Bituminous stabilising agents	
C4.4.5.1	Penetration grade bitumen (specify grade)	ton (t)
C4.4.5.2	Emulsion stable grade (specify type)	ton (t)

The unit of measurement shall be the ton of bituminous stabilising agent.

The method of calculating the quantity shall be specified in the Contract Documentation or as agreed between the Engineer and the Contractor, and shall be one of the following methods:

- Determined in accordance with the authorised application rate.
- Based on dipstick readings where the dipstick has been calibrated to the tanker, and the quantity measured at the applicable temperature.
- Based on assized weighbridge tickets issued for each and every tanker-load of stabilising agent consumed in the stabilisation process. The quantity thus measured shall not exceed the quantity calculated using the authorised application rate by more than 4 %.

The quantity shall include for a double treatment of stabilising agent over a nominal 150 mm overlap width along longitudinal joints.

The tendered rates shall include full compensation for procuring, transporting and delivering the bituminous stabilising agent to the site, for transfer into storage tanks, storage and heating, for issuing the required assized weighbridge ticket showing the mass of the contents in the tanker if applicable, for any re-heating required, for all wastage and for strict adherence to all safety measures required when handling warm bitumen emulsion or hot bitumen. No distinction shall be made for supplying the stabilising agent in bulk or in drums.

All haul costs shall be included in the tendered rates of item C4.4.5.

Using and applying the bituminous stabilising agent in the road layers shall be measured and paid for under the applicable items in Chapter 5

A5.3 ROAD PAVEMENT LAYERS

PART A: SPECIFICATIONS

A5.3.1 SCOPE

This Section covers the work requirements for loading at the point of supply, the hauling and off-loading at the point of use, the spreading, mixing, watering and levelling and the compaction and finishing of pavement layer material required for the construction of the road pavement layers.

This Section also covers the work requirements for the loading of pavement layer material at the point of supply, the haulage to a central mixing plant to add and mix water and stabilizing agent with the pavement material, hauling the mixed material to a paver at the point of use and then the construction of the pavement layer by paving, compacting and finishing the layer. This operation is known as plant-mixed, paver-laid (PMPL) pavement layer construction.

Material for the road pavement layers is produced as specified in the relevant Sections of Chapter 4.

The addition and mixing of stabilizing agents either as an integral part of the PMPL process or for some of the conventionally placed road pavement layers that require treatment and/or stabilization is specified in Section A5.4.

The reconstruction of existing road pavement layers is specified in Section A5.5.

A5.3.2 DEFINITIONS

The relevant definitions elsewhere in the standard specification are applicable. Additional definitions for this Section are included here.

Single-operation -a single-operation is the amount of work that can normally be carried out during the course of a single work shift using the applicable construction equipment.

A5.3.3 GENERAL

A5.3.3.1 Sources of material

The sourcing of material shall take place as specified in Chapter 4.

Material shall be obtained from approved sources such as borrow areas, cuts, stockpiles or reclaimed road materials from existing road pavement layers. Reclaimed road material shall be processed as specified in Section A4.3 of Chapter 4 to produce a material compliant with the material properties specified in Chapter 4 for the particular intended use of the material, as specified in the Contract Documentation.

Material may also be obtained from compliant commercial and alternative material sources as detailed in the Contract Documentation.

Crushed stone material shall be obtained from approved sources such as quarries, commercial sources and approved cuttings.

A5.3.3.2 Use of material

The Contract Documentation shall detail the proposed layers for which the different materials are suitable, including the proposed use of commercial materials and alternative materials.

Notwithstanding the proposed use of the various sources of materials given in the contract document the Contractor shall ensure that all material used for the pavement layers complies with the relevant material quality as specified in Chapter 4.

A5.3.3.3 Requirements prior to the construction of any pavement layer

The first pavement layer shall not be constructed until the following construction work has been completed:

- Construction of the fill must be completed;
- Construction of the cut must be completed;
- Construction of the roadbed through a cutting in soft or hard material, must be completed;
- All over-built material on fill slopes must be removed.

A5.3.3.4 Compaction of pavement layer material

All material used for the construction of pavement layers shall be mixed with water to the required compaction optimum moisture content prior to being processed and compacted to the specified thickness, level and density. The material shall be compliant with the material requirements for each specific layer.

Compaction shall be carried out in a series of continuous processing and compacting operations covering the full width of the layer concerned. The length of any section of a layer being compacted shall not be more than what can be properly compacted with the available equipment in a single-operation or shorter period when specified in the Contract Documentation.

The Contractor shall reduce the length of any layer compacted in any single-operation, and/or change the compaction process and/or change the number of, or type of, equipment being used, if the specified thickness, level or density of the layer is not being achieved.

The type of compaction equipment used and the amount of rolling done shall be such as to ensure that the specified density, or the specified number of roller-passes, is obtained without damage being done to any of the underlying layers due to breakdown or settlement of the underlying layer.

The compacted layer shall be completed to the required density, thickness, levels, shape and cross-section specified in the Contract Documentation and within the tolerances specified in this Section. All oversize material, lamination layers and any excess material shall be removed from the compacted surface before any further pavement layers or surfacing is carried out.

A5.3.3.5 Existing or newly constructed infrastructure

During the construction of pavement layers, all existing or newly constructed drainage infrastructure such as concrete edging, kerbing and channelling, sidewalks, lined drains, manhole covers, kerb inlets and gratings shall not be displaced or damaged.

Furthermore, no damage shall be caused to any existing or newly constructed structures such as culverts, bridges and buildings or any roadside furniture such as road signs, guardrails, streetlights, fencing, service pipes and cables during the construction of pavement layers.

Where necessary small hand-operated compaction equipment shall be used to ensure that the specified compaction is achieved immediately adjacent to drainage infrastructure, structures and roadside furniture.

Any items damaged during construction shall be replaced or repaired immediately by the Contractor, at no cost to the Employer.

A5.3.3.6 Tie-ins at existing bituminous surfaces

At junctions with existing bituminous surfaces, the existing surfacing and layer work near the tie-in shall be cut back in a neat, straight line so as to ensure that the compacted thickness of the new base layer all the way up to the tie-in point, is not less than 150 mm.

A5.3.3.8 Pavement layer drainage

Each compacted and completed pavement layer shall be adequately drained to prevent water from standing on or along the completed work. Windrows shall be removed immediately after construction to facilitate the drainage of water off the surface and to prevent scouring of the completed work. On steep grades the Contractor may need to provide temporary berms to divert the water off the road surface at regular intervals.

No material for a subsequent layer may be placed if the underlying pavement layer has been softened by moisture. The underlying pavement layer must first be allowed to dry out until the moisture content in the layer is below the optimum compaction moisture content. Any scouring of the pavement layer surface caused by storm water shall be repaired and the repairs approved by the Engineer before any material for the subsequent layer is placed.

If the underlying pavement layer cannot be adequately dried out or the water related damage cannot be satisfactorily repaired the affected layer shall be broken up and reprocessed at no cost to the Employer.

Where pavement layers are replaced over a section of the road width, or where pavement layers are widened and the permeability of the new layer is not the same as the adjacent existing layer, then subsoil drainage shall be installed along and below this interface as detailed and specified in the Contract Documentation.

A5.3.3.9 Pavement layer protection and maintenance

The Contractor shall protect and maintain the completed pavement layers at no cost to the Employer until the next layer or the surfacing has been constructed and thereafter until the works have been taken over by the Employer.

Maintenance shall include the closing off of the constructed pavement layers to all public traffic (except traffic for property access along the route by owners/tenants) and construction traffic except the vehicles hauling in the next layer of construction material and the immediate repair of any damage done to the layer or of any defects in the layer. Repairs shall be carried out as instructed by the Engineer. The Contractor shall ensure that an even and uniform surface is restored after completion of the repair work.

The base layer shall be primed as soon after construction as possible once the base layer has dried out sufficiently to a point where the moisture content, measured at any depth within the base layer, is below 50 % of the optimum moisture content for the material. No public or construction traffic shall be permitted on the completed base layer either before priming the layer or on the primed layer.

A5.3.3.11 Water for pavement layers

Water for the construction of pavement layers shall comply with the requirements of Clause A4.1.5.18 of Chapter 4.

A5.3.5 MATERIALS

A5.3.5.1 Material information

The required material properties for each individual pavement layer for a specific pavement design shall be clearly specified in the Contract Documentation.

The Contract Documentation shall specify which types of materials are to be used for a PMPL layer.

Any anticipated mechanical modification of material shall be stated in the Contract Documentation.

A5.3.5.2 Pavement layer thickness and compaction requirements

a) Pavement layer thickness requirements

The compacted pavement layer thickness shall be as specified in the Contract Documentation.

The thickness tolerances specified in Clause A5.3.8.4b) shall apply.

b) Gravel and soil pavement layer compaction requirements (G4B to G9 material)

The minimum compacted dry density of a gravel or soil pavement layer shall be as specified in Table A5.3.5-1 unless specified otherwise in the Contract Documentation.

Table A5.3.5-1: Minimum compaction densities for gravel and soil pavement layers

Layer	Compaction as % of maximum dry density (MDD)
Lower selected layer	93 %
Upper selected layer	95 % for gravel layers
	100 % for sand layers (97 % when specified in Contract Documentation)
Wearing course layer	95 %
Shoulder layer	95 %
Lower subbase layer	95 % for unstabilised layers
	95 % for chemically stabilised layers
	100 % for sand layers
Upper subbase layer	97 % for unstabilised layers
	95 % for chemically stabilised layers
	100 % for sand layers
Base layer	100 % for unstabilised layers
	97 % for chemically stabilised layers

In restricted areas the compacted dry density of the individual pavement layers shall also comply with the requirements given in Table A5.3.5-1 unless specified otherwise in the Contract Documentation.

c) Crushed stone pavement layer compaction requirements (G1 to G4A and G5A materials)

The minimum compacted dry density of a crushed stone pavement layer shall be as specified in Table A5.3.5-2 unless specified otherwise in the Contract Documentation.

Table A5.3.5-2: Minimum compaction densities for crushed stone pavement layers

Layer	Compaction as % Maximum Dry Density (MDD) or as % Bulk Density (BD) or as % Apparent Density (AD)
G4A and G5A lower subbase layer	95 % of MDD for unstabilised layers
	95 % of MDD for chemically stabilised layers
G3, G4A and G5A upper subbase layer	97 % of MDD for unstabilized layers
	97 % of MDD for chemically stabilised layers
G3 and G4A base layer	98 % to 100 % of MDD (for G3 and G4A) or 85 % of BD for G3 only
G2 base layer	88 % of BD for Road category C and D (TRH 4, Table 1)
	86 % of AD for Road category A and B (TRH 4, Table 1)
G1 base layer	86 % of AD for Road category C and D (TRH 4, Table 1 for road categories)
	88 % of AD for Road category A and B (TRH 4, Table 1 for road categories)
PMPL pavement layer (lean mix concrete)	Cube crushing strength as specified in Contract Documentation. No density requirement.

The density of the compacted crushed stone base layers (G1 and G2 layers only) shall be tested to the full depth of the layer using a nuclear gauge.

In restricted areas the in-situ dry density of the crushed stone subbase and base layers shall also comply with the requirements given in Table A5.3.5-2 unless specified otherwise in the Contract Documentation.

A5.3.7 EXECUTION OF THE WORKS

A5.3.7.4 Processing coarse gravel subbase or base layer

Coarse gravel containing mostly non-plastic or slightly plastic soil fines and used in the construction of a gravel subbase or base layer, shall require slushing and rolling in addition to the specified compaction, in order to obtain a firm, well-knit surface.

After being processed and compacted, the layer may require to be well watered by the Contractor over short sections at a time and then slushed and rolled with pneumatic and/or vibratory compactors. Watering and rolling shall continue over a section until excess fines have been brought to the surface of the layer. Such excess fines shall be uniformly spread over the entire surface of the layer by means of stiff mechanical or hand brooms.

Watering, rolling and brooming shall continue until all surface areas deficient in fines have been corrected. All excess fines shall then be broomed off the surface of the layer without loosening the surface texture of the completed layer.

A5.3.7.5 Construction of gravel shoulder

Shoulder material shall be spread, watered, processed and compacted in accordance with the specifications for a pavement layer.

Where the gravel shoulder layer is to be constructed with the same gravel material as for the base layer, it shall be constructed simultaneously with the base layer.

Where a base is to be constructed with different gravel or with crushed stone material, the shoulders shall first be constructed and then neatly cut to the required line and level to provide lateral support for the edges of the new base layer material while it is being compacted. Care shall be taken not to contaminate the base material with the shoulder material. The Contractor shall ensure that the subbase layer and the base material that has

not yet been compacted is adequately drained at all times by means of temporary drainage channels or pipes passing through the gravel shoulder layer.

Where an asphalt base layer is to be constructed, the shoulders shall be constructed after the completion of the asphalt base layer.

A5.3.7.6 Construction of crushed stone layer

a) Transportation of crushed stone subbase and base material

Compliant crushed-stone material shall be loaded at source, hauled to the road and off-loaded along the middle of the road width being constructed, in a pre-determined heap volume and spacing to ensure sufficient quantity so that the completed layer will comply with all the requirements in regard to layer thickness, level, cross-section and compaction density. Allowance shall also be made when determining the heap volume and spacing for sufficient additional material to be off-loaded to enable the layer to be properly mixed and cut to shape without segregation of the material taking place. Segregation is manifest by fine and/or coarse areas that develop in the exposed surface of the layer. **b) Processing of crushed stone subbase and base layer**

A5.3.7.7 Initial compaction of a G1 crushed stone base layer

Initial compaction of the crushed stone base layer shall commence immediately after completion of the spreading, dampening, mixing and shaping of the material as per Clause A5.3.7.6b). The Contractor shall provide compaction equipment that is capable of compacting the crushed stone layer to the required density using the process specified below.

Only a vibratory smooth drum roller or a combination of smooth drum and pneumatic tyre rollers shall be used for the initial compaction. Normally no grid or pad foot rollers shall be used as these rollers will alter the grading. The first pass of the vibratory roller shall be in static mode in order to smooth out the surface of the layer prior to compaction. Thereafter vibration at low frequency and high amplitude for compaction of the lower part of the layer shall be carried out, followed by vibration at high frequency and low amplitude for final compaction of the upper part of the layer.

To prevent shoving of the crushed stone, rollers shall always initiate compaction of a crushed stone layer from the outside edge of the road adjacent to the shoulder material towards the middle of the layer width on straight sections where there is a cross-fall. In a super elevation in a curve, the compaction shall commence from the lower or inner edge of the road towards the higher or outer edge.

The roller shall cover the entire road width equally. Compaction shall continue until the material is stable and displays no movement under the roller wheels and leaves no tyre marks of the roller in the crushed stone layer.

After the compaction is completed, a final slight full-width cut shall be carried out when necessary to ensure that the layer has no coarse or stony patches but an evenly-graded surface matrix. The layer must then again be rolled with pneumatic tyre or smooth drum static rollers to ensure that it is stable enough and ready for the final slush-compaction. The maximum compacted thickness of any crushed-stone layer compacted in one process shall be 150 mm, unless specified otherwise in the Contract Documentation.

A5.3.7.8 Slush-compaction of a G1 crushed stone base layer

After completion of the initial compaction of the crushed stone base layer, short sections of the layer surface, each section about 40 m to 60 m long, shall be thoroughly watered, rolled and slushed by means of steel wheeled rollers or a combination of steel wheel rollers and pneumatic tyre rollers. The Contractor shall provide compaction equipment that is capable of slush compacting the crushed stone layer to the required density using the process specified below.

Slush-compaction shall start at the high side of the road so that the water can flow to the low side. No movement of the layer under the roller wheels shall be observable during the initiation of the slush-compaction. If the layer becomes unstable, it is an indication that insufficient bearing capacity has been achieved during the initial compaction. The slush-compaction shall then be halted, and the layer allowed to dry and subsequently to receive additional initial compaction before commencing again with the slush-compaction process.

The slush-compaction process shall continue until fines are brought to the surface. Fines shall mean sand or material larger than 0,075 mm up to 5,0 mm, and silt material smaller than 0,075 mm. The slush-compaction process is completed when the slushing water becomes clean and there is subsequently an absence of air bubbles being expelled from the layer.

The slush thus formed, shall be uniformly broomed over the surface to simultaneously correct any areas still deficient in fines, whereupon the excess fines shall be broomed from the surface of the layer. Brooming shall be done by using hand brooms, or by using mechanical rotary brooms with soft to medium stiffness bristles, or a combination of hand and mechanical brooms. Care shall be taken not to dislodge the coarse aggregate in the surface of the layer during the brooming process or otherwise disturb the aggregate mosaic.

During slushing operations, the surface must not be rolled out of shape. The slushing process shall be carried out on each short section in one continuous process, and each section shall be completed before the next section is commenced. After completion of the slushing and brooming process, when the surface of the layer is

wind dry, the surface shall be given a one roller-pass with a static steel-wheeled roller. This finally embeds the surface aggregate.

The completed layer shall be firm and stable with a closely-knit surface of aggregate exposed in a mosaic pattern. The surface must have a good particle distribution without segregated areas of either excessive fines or of coarse material with a shortage of fines. The surface must be free from any lamination layers and free from corrugations. The following characteristics are indicative of a well-constructed crushed stone layer:

- Most of the coarse aggregate lies on its largest surface dimension which is the most stable orientation.
- The exposed surface of the layer, although textured, feels smooth.
- All sizes of coarse aggregate larger than 5,0 mm can be seen.
- The surface has a uniform appearance across and along the road.
- The surface has a tightly interlocked mosaic of the coarse aggregate and less than 5 % of the mosaic area has only fine aggregate visible.
- Less than 5 % breakdown of the larger particles by area.
- The dried slush broomed off the road only comprises P0,075 mm silt.
- Tapping the layer with a geological hammer produces a distinct high frequency or ringing sound.

Slush-compaction of the crushed stone base layer is mandatory and shall be carried out within 48 hours after completion of the initial compaction. Even if the specified density is achieved without slushing or before completion of the slushing process, the full slush-compaction process must still be completed.

A5.3.7.12 Construction of trial sections

a) Trial sections

The trial section shall demonstrate the capability of the Contractor to construct the pavement layer or layers in accordance with the specification. The trial section shall be constructed with the same materials and equipment as those intended for use by the Contractor for the final pavement layer in the works. The surface regularity of any base layer in a trial section shall be checked for compliance.

A trial section shall be a full layer-width and at least 150 m long with a maximum length of 200 m. The minimum quantity of material to be crushed, stockpiled or hauled to site prior to the construction, testing and approval of the trial section shall be determined by the Contractor. Sufficient material should be produced or obtained from commercial sources so that the compliant material shall be representative of what will ultimately be produced for the entire project. The use of compliant material for the trial section shall not relieve the Contractor of the responsibility to produce a compliant finished layer.

The final length and width of the trial section which shall be specified in the Contract Documentation, shall be constructed in one continuous operation and shall then be submitted for approval. The Contractor shall also demonstrate the proposed method(s) to be used for making the construction joints.

The Contractor shall programme to proceed with the construction of the actual pavement layer in the works, at least 10 working days after the completion of the compliant trial section or such earlier time when testing of the trial section has been completed and the trial section has been accepted by the Engineer. In the event of a non-compliant trial section, the Engineer shall instruct the Contractor to construct a further trial section, which shall then be regarded as the initial trial section.

A non-compliant trial section shall be removed and disposed of by the Contractor at no cost to the Employer.

A compliant trial section shall be reimbursed only when it complies with all the requirements of the specification and has been accepted. The mixing process and equipment shall remain unaltered for all subsequent layer construction for which the trial section was constructed, unless otherwise instructed by the Engineer.

When the Contractor:

- changes the method of construction, or
- changes the construction equipment, or
- changes the materials, or
- changes the mix used, or
- changes the rate of paving for the construction of the layers in the works,

after the acceptance of a compliant trial section, the Engineer may instruct that a new trial section be constructed as specified in the Contract Documentation.

b) Compliant supporting layer for a trial section

The trial section for a stabilised layer, a crushed stone layer, a PMPL layer or a BM layer shall be constructed on a compliant supporting selected- or subbase layer. The supporting layer must be properly compacted to the specified density and be free from any defects.

If there are no constructed, compliant lower pavement layers ready to allow for the construction of the specific trial section at the programmed time in terms of the construction programme, the Contractor shall prepare a trial section area off the site of the works. This will enable the construction, testing and approval of a trial section to be carried out before excessive quantities of material are crushed and stockpiled.

The surface of the supporting or lower layer shall be dampened prior to placing and spreading the pavement layer material for the construction of the trial pavement layer on it.

c) Trial section for a stabilised layer

Before commencing the construction of stabilised layers the Contractor shall demonstrate by constructing a trial section that the proposed equipment and procedure to be used will result in constructing the layers in accordance with the specification.

The trial section shall be constructed in its proper position in the pavement. The stabilised material properties used for the trial section will be tested. One of the key properties shall be to establish if the agent is working as per the design. The surface finish obtained, the curing process as well as any potential stabilisation cracking, shall also be monitored and documented. Only when such a trial section has been satisfactorily constructed and accepted shall the Contractor be permitted to proceed with construction of the stabilised layer in the permanent work.

After acceptance of the trial section, the mixing process and equipment shall remain unaltered unless

otherwise approved by the Engineer. **d) Trial section for a crushed stone layer**

Before commencing with the construction of any crushed stone subbase or base layer the Contractor shall construct a trial section. The following Clauses listed in Table A5.3.7-1 are applicable for the construction of this trial section.

Table A5.3.7-1: Clauses applicable to the construction of crushed stone layers

Clause	Description
A5.3.7.6	Construction of crushed stone layer
A5.3.7.7	Initial compaction of a G1 crushed stone layer
A5.3.7.8	Slush-compaction of a G1 crushed stone layer

During the construction of the trial section these Clauses shall be validated and/or modified where necessary. Any resultant modifications of these Clauses shall then be implemented during the subsequent construction of the particular crushed stone layer.

The trial section shall establish or verify the following specific aspects:

- The spacing between the off-loaded heaps of crushed stone;
- Compaction moisture content and the compaction factor;
- Compaction passes, compaction frequency and roller amplitude settings;
- The pre-shape level to allow for settlement during compaction;
- The types and method of operation of compaction equipment during slush-compaction of G1 material;
- How long the slush-compaction process shall continue until there are no more air bubbles, the expelled water is clean and movement or 'heaving' under compaction has ceased;
- Brooming equipment and the brooming process;
- Progressive development of compaction density in the layer;
- Surface finish evaluation;
- Minimum construction base width where there is no shoulder containment, to ensure that the specified density is achieved across the full travelled roadway width;
- Grading and plasticity index, post-construction; and
- Approximate drying out time until the moisture content has been reached to allow the layer to be primed.

- The surface regularity shall be checked for compliance.

C5.3 ROAD PAVEMENT LAYERS

PART C: MEASUREMENT AND PAYMENT

(i) Preamble

The tendered rate for each item shall include full compensation for providing, maintaining and decommissioning upon completion, of all the constructional plant, equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the item, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the conditions of contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum item.

The requirements of Section C1.1 of Chapter 1 shall apply.

Where pay item descriptions include any wording in brackets it is an indication that contract specific information is to be inserted in the Pricing Schedule included in the Contract Documentation.

(ii) Items that will not be measured separately

The following required activities will not be measured or paid for separately and the Contractor shall include the cost thereof in other items as deemed appropriate:

1. All surveying, setting out and level control required for the construction of the pavement layers.
2. Drainage and protection of the pavement layers from all damage that may occur for any reason until the Employer has taken over the works.
3. Protection of all existing or new kerbs, channels, sidewalks, lined drains, catch pits, kerb inlets, gratings, culverts, bridges, structures, buildings, road signs, guard rails, street lights, fencing, service pipes or cables and any other items adjacent to, over or under the road that could be damaged by the Contractor's vehicles, construction equipment, or by public traffic being accommodated on or alongside the pavement layers, during the construction of the pavement layers, until the Employer has taken over the works.
4. Compaction immediately adjacent to existing or new kerbs, channels, sidewalks, lined drains, catch pits, kerb inlets, gratings, culverts, bridges, structures, buildings, road signs, guard rails, street lights, fencing, service pipes or cables etc. using hand operated compaction equipment.
5. Repair of all damage to the pavement layers and any new or existing structures, buildings, road furniture and services that may occur for any reason before, during or after the construction of the pavement layers up until the Employer has taken over the works.
6. Provision of additional material in excess of the compacted volume of the layers calculated using the layer dimensions given in the Contract Documentation for whatever reason including additional material required for the correct placing, mixing, levelling and compaction of the layers.
7. Removal of additional material required for the correct mixing and working of the layers and left in windrow or on the sides of the road.
8. Breaking down and removal of oversize material up to 5 % of the compacted layer volume. Payment will only be made to remove any oversize material in excess of 5 % of the compacted layer volume that cannot be broken down on the road when instructed by the Engineer.
9. Loading and hauling of commercial pavement material identified by the Employer or by the Contractor.
10. Loading and hauling of alternative material identified by the Contractor.
11. Construction of tie-in joints to new or existing road layers or surfacing.

(iii) Items to be measured and paid for using payment items specified elsewhere in the specifications

For activities in Table C5.3-1 payment items specified in other Chapters or Sections of the specification, where they relate to work under this Section, will be listed in the Pricing Schedule.

Table C5.3-1: Payment items from other Chapters or Sections

Activity	Section 5.3 reference	Section item reference
Loading and hauling	A5.3.1	Section C1.7 of Chapter 1 – All applicable items
Stabilisation	A5.3.1	Section C5.4 of Chapter 5 – All applicable items
Subsoil drainage	A5.3.3.8	Section C3.1 of Chapter 3 – All applicable items
Asphalt base layer	A5.3.7.5	Section C9.1 of Chapter 9 – All applicable items
Bound macadam surfacing	A5.3.7.10g)	C10.1.2 of Chapter 10
Construction of edge constraints for BM	A5.3.7.10a)	Section C11.1 of Chapter 11 – All applicable items
Priming	A5.3.3.9 / 10	Chapter 10 – All applicable items
Screening material	A5.4.7.2d)	Section C4.1 of Chapter 4 – All applicable items
Emulsion slurry	Table A5.3.5-4	Section C10.1 of Chapter 10 – All applicable items

(iv) **Items specifically for this Section of the specifications**

Item Description Unit

C5.3.1 Compiling and implementing M&U plans for the construction of all the pavement layers number (no)

The unit of measurement shall be the number of compiled M&U plans for the construction of the pavement layers. Usually only one plan shall be required for each of the layers unless specified otherwise in the Contract Documentation.

The tendered rate shall include full compensation for gathering all information and compiling the plan(s) and for ensuring the implementation of the plan(s) during the construction of the pavement layers.

Item Description Unit

C5.3.2 Construction of pavement layers

C5.3.2.1 Construction of layers using conventional construction methods:

(h)Gravel shoulder layer (layer thickness indicated) compacted to 95 % of MDD cubic metre (m³)

(a)G1 crushed stone base layer (layer thickness indicated) compacted to 88 % of AD cubic metre (m³)

The unit of measurement shall be the cubic metre of material in the compacted layer, calculated using the layer work dimensions given in the Contract Documentation.

The tendered rates shall include full compensation for spreading the material, for breaking down oversize gravel material using one normal grid rolling operation or an equivalent operation, for removal of up to 5 % of the compacted layer volume of oversize material that cannot be broken down, for adding water for compaction purposes, for mixing, for levelling, for compacting to the specified density, for slush-compaction of G1 material layers or other layer that may be specified to receive slush-compaction and for finishing the layers in accordance with the specifications and the Contract Documentation. The tendered rates shall also include for the removal of all material in the windrow after the compaction of the layer has been completed.

Measurement and payment for loading the layer work material from borrow pits, quarries, cuttings, reclaimed material from existing roads and alternative materials identified by the Employer, transporting and then off-loading the material at the point of use is made under items C1.7.1 and C1.7.2 of Chapter 1.

The haul of the imported material shall be measured from the point of loading/collection to the point of off-loading as per Section A1.7 of Chapter 1.

A distinction shall be made between construction using conventional construction methods and labour enhancement.

hauling the material to the point of use, rolling slushing and correcting the layers, and for testing, protecting and maintaining the work all as specified.

Item	Description	Unit

C5.3.9	Construction of a trial section	

C5.3.9.1	Construction of a trial section using conventional methods of construction	

(a)	Stabilised gravel layer trial section	cubic metre (m ³)

The unit of measurement shall be the cubic metre of layer trial section constructed, tested and accepted. The quantity shall be calculated based on the authorised dimensions of the trial section layer.

The tendered rate shall include full compensation for providing all the material and constructing the particular layer for the trial section as specified. The tendered rate shall also include for any costs associated with a delay up to a maximum of ten working days, to allow for testing between completion of the trial section and the acceptance thereof.

A distinction shall be made between construction using conventional construction and labour enhancement.

Item	Description	Unit

C5.3.10	Removal of a completed trial section	

C5.3.10.1	Stabilised layer cubic metre (m ³)	

The unit of measurement shall be the cubic metre of compliant trial section layer removed to a designated site when instructed by the Engineer. The tendered rates shall include full compensation for breaking up the trial section layer and for loading the broken up layer material..

The haul of the material to the designated site as instructed by the Engineer and off-loading the material shall be measured from the point of loading/collection at the trial section to the point of off-loading as per Section A1.7 of Chapter 1.

The removal to spoil of a non-compliant trial section layer shall be done by the Contractor at no cost to the Employer.

A5.4 STABILISATION

PART A: SPECIFICATIONS

A5.4.1 SCOPE

This Section covers the work requirements for the treatment of the material properties of natural roadbed, fill layers or pavement layers and crushed material by stabilisation, all in terms of the definition of Stabilisation in Clause A4.4.2 of Chapter 4.

A5.4.2 DEFINITIONS

The relevant definitions in the standard specifications are applicable. Additional definitions for this Section are included here.

Mechanical modification -mechanical modification, also referred to as granular stabilisation, is a form of stabilisation as defined in Clause A4.4.2 of Chapter 4. Mechanical modification of a pavement layer involves the addition and mixing together of various materials from different sources to produce a uniformly mixed material that is compliant with the properties required for the pavement layer for which the modified material is being used.

Lamination layer - a term used to describe the layer formed when a compacted layer delaminates and forms loose and unbonded layers on top of the layer when incorrect compaction techniques are used. A colloquial term, biscuit layer, is also used for the lamination layers.

Breaking of emulsion -this term describes the process that occurs when the suspended bitumen in the emulsion separates from the water and the water evaporates, leaving behind bitumen. It is also referred to as the setting of the emulsion.

Filler: a filler is a commercially available product. A filler is often a cementitious agent. The quantity added is sufficient to result in improvement of the properties of the material it is added to, but insufficient to result in the stabilisation of the material should the filler have been added in isolation.

A5.4.3 GENERAL

A5.4.3.1 Stabilization agents

The type and quantity of cementitious or bituminous stabilisation agent to be used for each layer of material shall be determined as described in Clauses A4.4.7.1c) and A4.4.7.1d) of Chapter 4.

The different types of cementitious and stabilisation agents are specified in Clauses A4.4.5.2, A4.4.5.3 and A4.4.5.4 respectively of Chapter 4.

Should a non-traditional stabilising or soil treatment agent be proposed by the Contractor, it will only be considered if the requested details specified in Clause 4.4.5.4 of Chapter 4 are provided.

A5.4.3.2 Work in restricted areas

Work in restricted areas is specified in Clauses A1.1.3.2 and A1.2.3.23 of Chapter 1.

Where pavement layers are to be treated or stabilised in restricted areas such as widenings, no cementitious or bituminous agent may be spread or mixed beyond the required width. The Contractor shall not be permitted to mix the material being stabilised on an adjacent paved surface.

Where restricted areas are such that mixing in the restricted area is impractical and mixing on adjacent surfaces is not permitted, mixing shall be done in a central mixing plant. In the case of small quantities, suitable portable concrete mixers may be used.

Treatment and stabilisation of layer work materials in restricted areas shall not be measured separately for payment unless specified otherwise in the Contract Documentation.

A5.4.3.3 Construction limitations

The Contractor shall programme all construction work to take into account all the construction limitations which are applicable to soil treatment and stabilisation work.

a) Size of area

The cementitious and/or bituminous agent shall only be applied to a surface area the size of which will permit all processing, watering, compacting and finishing to be completed within the time periods specified in Table A5.4.3-1.

b) Processing time

The construction methods and programme of the Contractor shall take into account and ensure compliance with the processing times specified in Table A5.4.3-1.

Table A5.4.3-1: Construction time limitations for treatment and stabilisation⁽¹⁾

Chemical agent	Maximum continuous period allowed from the time the application of the chemical agent onto the top of the layer commences up until the completion of the stabilisation process
Material modification	
Lime	10 hours. The treated layer shall subsequently remain undisturbed for 24 hours.
Material cementation	
Cement blends	6 hours until the completion of the compacted layer
Lime	10 hours until the completion of the compacted layer
Material improvement	
Bitumen emulsion	12 hours until the completion of the compacted layer
Bitumen emulsion with cement	8 hours until the completion of the compacted layer
Foamed bitumen with or without cement	10 hours until the completion of the layer
PMPL stabilised crushed stone material	
Cement blends	1 hour until the commencement of compaction plus 4 hours until the completion of the compacted layer.
Wet lean-mix concrete	150 minutes until the completion of the compacted/vibrated layer (reference temperature = 20°C This time shall be reduced by 30 minutes for every 5°C that the mix temperature exceeds 20°C

Note (1): The construction time limitations shall not exceed the field working time established during the stabilisation design in Clause A4.4.7.1 of Chapter 4.

c) Trial section approval and testing time

The construction programme and methods of the Contractor shall take into account and ensure compliance with the limitations applicable to the construction, testing and acceptance of the trial section/s as specified.

d) Weather restrictions

No stabilisation shall be done during windy conditions, wind speed more than 15 km/h (4 m/s), wet weather and cold weather when the air temperature is below 3°C or with falling air temperatures, 7°C and falling.

No stabilisation work shall be commenced if the surface temperature of a compacted stabilised layer may fall below 1°C during the first three (3) days after stabilisation. The Contractor shall take the necessary precautions and the construction programme for the stabilisation work shall take the actual and predicted weather conditions into account.

All stabilised layers damaged by rain, frost or by the formation of ice in the layer shall be removed and replaced by the Contractor at no cost to the Employer.

e) Traffic limitations

No vehicles or construction equipment except that used for mixing the stabilising agent into the layer shall be allowed to travel over the spread stabilising agent.

No traffic or construction equipment except that required for curing or priming shall be allowed to travel over the compacted stabilised layer during the specified curing period as per Clause A5.4.7.6.

A5.4.5 MATERIALS

A5.4.5.1 General

For chemically stabilised layers the natural material or the reclaimed road material, even if previously stabilised, shall comply with the requirements of Table A4.4.5-2 in Chapter 4.

For bitumen stabilised layers the natural material or the reclaimed road material, even if previously stabilised, shall comply with the requirements in Table A4.4.5-3 in Chapter 4.

All commercial materials proposed for use by the Contractor or as specified in the Contract Documentation to be stabilised, shall comply with the requirements of Table A4.4.5-2 or Table A4.4.5-3 in Chapter 4 as applicable.

A5.4.5.2 Material for modification or pretreatment

Material with non-compliant properties, such as the grading, plasticity index and/or CBR strength, that are not compliant for direct use in a stabilised layer, shall first be mechanically modified and/or chemically pretreated as specified in the Contract Documentation or as instructed by the Engineer.

The materials to be modified shall be identified in the Contract Documentation or by the Engineer during construction and shall be modified to produce compliant material before any chemical stabilisation is carried out.

a) Mechanical pretreatment of material before stabilisation

Material requiring mechanical modification to improve the grading and/or moderate the plasticity index and/or to increase the CBR strength, in order for the material to be compliant before stabilisation shall first be prepared and/or treated as specified in Section A5.3.

The mechanically modified compliant material shall then be stabilised with the type and amount of stabilising agent specified in the Contract Documentation or as instructed by the Engineer.

b) Cementitious pretreatment of material before stabilisation

Material requiring modification to reduce the plasticity index in order for the material to be compliant for subsequent stabilisation, shall first be pretreated.

The chemically pretreated, modified and now compliant material shall then be stabilised with the type and amount of cementitious stabilising agent determined as specified in the Contract Documentation or as instructed by the Engineer.

A5.4.5.3 Cementitious stabilising agents

The Contract Documentation shall specify the type of cementitious agent to be used for the specific gravel or crushed stone material being chemically pretreated or stabilised. These nominal contents shall then be verified or adjusted based on the laboratory test results and/or after the construction of a trial section.

A5.4.5.4 Bituminous stabilising agents

The Contract Documentation shall specify the type of bituminous agent to be used for the project for the specific gravel or crushed stone material being stabilised. These nominal contents shall then be verified or adjusted, based on the laboratory test results and/or after the construction of a trial section.

A5.4.5.5 Water for stabilisation

Water for the construction of stabilised layers shall comply with the requirements of Clause A4.1.5.18 of Chapter 4.

A5.4.6 CONSTRUCTION EQUIPMENT

Construction equipment to carry out the stabilisation or modification of layer work material shall comply with the requirements of Clause A1.2.6 of Chapter 1.

When either a rotary mixer or a recycler is used to mix in the stabilising agent and process the layer, this construction equipment must be capable of adding variable but precise amounts of water, and then mixing and placing the material in a single pass in conformance with the design grades and cross falls.

Where specified in the Contract Documentation, the watering for the curing of compacted stabilised layers shall be done by side-spraying tankers travelling off the layer.

A5.4.7 EXECUTION OF THE WORKS

A5.4.7.1 Construction of a trial section

The Contractor shall demonstrate by constructing one or more of the following trial sections that the equipment and procedure to be used will result in the construction of layers in accordance with the specifications. The required trial section(s) shall be in accord with the pricing schedule.

- A trial section for the chemical modification or stabilisation of a layer of material processed on the road shall be constructed in accordance with the relevant requirements of Clauses A5.3.7.12 and A5.4.7 and/or as specified in the Contract Documentation.
- A trial section for the bituminous stabilisation of a layer of material processed on the road shall be constructed in accordance with the requirements of Clauses A5.3.7 and A5.5.7 and/or as specified in the Contract Documentation.
- A trial section for the cementitious stabilisation of PMPL materials shall be constructed in accordance with the requirements of Clause A5.3.7 and/or as specified in the Contract Documentation.

To allow sufficient time to test and assess all aspects of a trial section(s) and to determine the final content of stabilising agent required, the Contractor shall programme to start stabilisation work for the works no sooner than 10 working days after completion of the trial section.

Should the Contractor make any alterations to the methods, processes, equipment or materials used, or if the Contractor is unable to consistently comply with the specifications due to variations in the in-situ material, or for any other reason, further trial sections shall be constructed for assessment before continuing with the construction of the permanent works as instructed by the Engineer.

In the event of a trial section not being accepted due to non-compliance, the Contractor shall remove the trial section and construct a new trial section at no cost to the Employer. The trial section shall be paid for separately only when it complies with all the requirements of these specifications and has been accepted. Once acceptance of the trial section has been obtained, the mixing process and construction equipment shall remain unaltered unless instructed otherwise by the Engineer.

A5.4.7.2 Mechanical modification of pavement layer material

The specific layer material requiring to be mechanically modified shall be specified in the Contract Documentation or instructed by the Engineer.

When two or perhaps three different pavement layer materials need to be blended in order to provide a compliant composite material the proportion of each material type shall be specified based on the test results obtained from site blending trials.

a) Mixing materials from various sources in-situ

This Clause for mixing materials from various sources shall only apply when the smallest component of the materials mixture exceeds 20 % of the total mass of the mixture.

The material from the coarsest material source shall be placed onto the road at the point of use and spread in a layer of uniform thickness after which it shall be lightly rolled with a steel-wheeled roller. The material from the second and possibly third material source shall then be placed on top of the spread layer and then evenly spread on top in a layer of uniform thickness. After spreading each subsequent layer, each layer shall be lightly rolled with a steel-wheeled roller. After evenly spreading the different materials on top of each other, the materials shall be thoroughly mixed together, broken down if required and then spread evenly again to the required thickness.

The Contractor shall take care to avoid segregation from occurring during the mixing and spreading processes. The grading of the mixed material shall then be tested at random locations as instructed by the Engineer and further mixing shall be required if grading tests indicate that the material is not mixed sufficiently.

The finally mixed material shall also be tested for compliance with the specification of all the material

b) Modifying material in-situ by the addition of a soil binder

When the smallest component is less or equal to 20 % of the total mass of the mixture then the process shall be regarded as the addition of a soil binder. The addition of the soil binder may be required to modify the grading or to reduce the plasticity index.

The material to be modified shall be placed onto the road at the point of use and evenly spread in a layer of uniform thickness after which it shall be lightly rolled with a steel-wheeled roller. The specified soil binder material shall then be placed on top of the evenly spread material and then evenly spread in a layer of uniform thickness over the first layer of spread material. The soil binder and material shall be thoroughly mixed together, broken down if required and then spread evenly to the required thickness.

The grading and plasticity index of the mixed material shall then be tested at random locations as instructed by the Engineer and the modified material shall be tested for compliance with the specification for use in the specific layer.

A5.4.7.3 Chemical pretreatment and stabilisation

The material to be stabilised or pretreated shall be prepared and placed as specified in Section A5.3. The surface of the prepared layer shall then be lightly watered until it is damp and given at least one pass with a flat wheel or steel tyre roller.

a) Applying the cementitious agent mechanically

After the layer of material has been prepared, the cementitious agent shall be spread uniformly over the full area of the layer by means of an approved type of mechanical bulk spreader at the prescribed rate of application in a continuous process.

When the mechanical application of the cementitious agent is clearly uneven in places it shall be evenly respread using squeegees where required so that it is uniformly spread over the entire surface to be stabilised before mixing may commence.

A recycler may be used to mechanically apply the cementitious agent through an on-board automatic dispensing system. Adjacent cuts of the recycler shall overlap by at least 150 mm. Over application of either moisture or cementitious agent in the overlap shall not exceed 10 % of the average requirement for the layer.

b) Applying the cementitious agent by hand

When spreading of the cementitious agent is done by hand, pockets or bags of cementitious agent shall be accurately packed out and spaced at equal intervals across the full area of the section to be stabilised so that the specified rate of application will be achieved. Spreading shall only commence once it has been confirmed by the Engineer that the correct quantity of cementitious agent has been placed on the layer by physically counting the number of pockets and checking the spacing of the pockets.

The even spreading of the hand spaced and packed cementitious agent may further be done by hand using squeegees, provided that the wind speed is less than 15 km/h (4 m/s). Irrespective of the spreading method used the cementitious agent shall be uniformly spread over the entire surface to be treated.

c) Mixing in the cementitious agent using conventional equipment

Immediately after the cementitious agent has been evenly spread, it shall be mixed with the layer material for the full depth of treatment. The completed layer underneath shall not be damaged, nor shall the cementitious agent be mixed below the required depth. Mixing shall be continued until a homogeneous mix of the material and the cementitious agent has been achieved over the full area and depth of the material being pretreated or stabilised.

Mixing shall be done using a combination of a grader, disc harrow and/or rotary mixer or by using a recycler, working over the full area and depth of the layer by means of successive passes of the construction equipment as applicable. When a recycler is used in isolation, cross-mixing is often inadequate and additional mixing plant shall then be utilised in conjunction with the recycler to ensure thorough cross-mixing. Mixing may also be done in a central batch-mixing plant if the Contractor so chooses.

After completion of the mixing process the mixed material shall be spread and shaped.

If the material is being pretreated, the shaped layer shall be given at least one pass with a flat wheel or steel tyre roller and left undisturbed for the time period as specified in Table A5.4.3-1. After the specified time period, the chemically modified layer may then be stabilised in accordance with Section A5.4 if the material is now compliant for stabilisation or processed and compacted as an unstabilised layer in accordance with Section A5.3.

d) Watering and mixing in of water for stabilisation using conventional equipment

Moisture content tests shall be done the day before the stabilising agent is to be added to the material in order to determine the amount of water that must be added to bring the moisture content up to the required compaction moisture content. If there is any rain after the moisture content test samples were collected additional tests shall be done.

Immediately after the cementitious agent for stabilisation has been properly mixed with the material, the required amount of compaction water shall be added incrementally. Each application of water shall be thoroughly mixed with the material before more water is added so as to avoid a concentration of water near the surface or the flow of water across the surface of the layer.

The Contractor shall ensure that a satisfactory and even moisture distribution is achieved over the full depth, width and length of the section being stabilised and shall ensure that no portion of the work gets excessively wet after the cementitious stabilising agent has been added. Any portion of the work that becomes too wet after the stabilising agent has been added and before the mixture has been compacted, due to poor construction control or disregard for the specified weather limitations or for any other specified requirement that has not been complied with, shall be rejected. Such portions shall be allowed to dry out to the required moisture content and shall then be scarified, re-stabilised using additional agent, compacted and finished off in accordance with the specification, all at no cost to the Employer.

The water supply and watering equipment shall be adequate and sufficient to ensure that all the water required shall be added and mixed with the material within a short enough period to enable compaction and finishing to be completed within the period specified in Table A5.4.3-1.

The moisture content of the material during compaction shall never exceed 80 % of the saturation moisture content of the natural material without a stabilising agent.

The moisture content at the specified saturation degree (S_r) shall be determined as follows:

$$W_v = S_r \{X_w/X_d - 1000/G_s\}$$

W_v = moisture content of the specified degree
of saturation (%)

X_w = density of water (kg/m^3)

X_d = dry field density of the material (kg/m^3)

G_s = apparent density of the material (kg/m^3)

S_r = specified degree of saturation (%).

e) Applying and mixing in the cementitious agent using a recycler

When the cementitious agent is applied by hand the requirements of Clause A5.4.7.2b) remain applicable.

The requirements of proper moisture control specified in Clause A5.4.7.2d) remain applicable.

The recycler shall be capable of applying the agent and mixing to the required depth in a single pass. The recycler shall be equipped with an onboard automatic spraying system that can accurately apply a specific metered quantity of water over the full width of the milling drum. Electronic sensors shall be fitted to maintain the milling/mixing depth within a tolerance of 5,0 mm.

The speed of rotation of the milling drum and the forward speed of the machine shall be adjustable to obtain a material that is evenly mixed with the cementitious agent. The outer edges of the recycler cut shall be vertical and the floor of the cut shall be clean and to the lines specified in the Contract Documentation. The width of application shall be the same as the cut-width of the recycler.

The recycler shall be required to simultaneously add the required amount of water and mix the cementitious agent to produce an approved uniform mix.

f) Compaction of a chemically stabilised layer

Section A5.3 shall apply to the compaction of chemically stabilised layers.

During the compaction process the Contractor shall ensure that no lamination layers or biscuit layers are formed within the compacted layer. Final rolling shall be done with equipment that will give a smooth surface finish which conforms to the surface tolerances specified. Low spots on the surface of a chemically stabilised layer may not be filled after compaction.

When a recycler has been used to mix the layer material Contractor shall ensure that the mixed material between the wheel paths of the recycler is compacted to at least the same density as the material in the wheel paths, before commencing with the cutting of levels.

The minimum compaction requirements shall be as specified for the particular layer. Sufficient compaction equipment shall be employed on each layer to ensure that, from the time when the stabilising agent is first mixed into the layer, the mixing process, watering, compacting, shaping and final finishing will be completed within the time periods specified in Table A5.4.3-1.

A5.4.7.4 Bituminous stabilisation

a) In-situ mixing for stabilisation

The material to be stabilised with bitumen shall be prepared and placed as specified in Section A5.3.

(i) Addition of the cementitious agent

If a cementitious agent is specified as part of the bituminous stabilisation process then it shall be evenly spread over the layer surface (Clause A5.4.7.2) before the bitumen stabilisation process commences.

When using standard construction equipment such as a grader along with a plough / rotovator, the Contractor shall pre-mix the cementitious agent into the layer as specified (Clause A5.4.7.2) before the compaction moisture and the bituminous stabilising agent is added and mixed in.

When using a recycler, the cementitious agent shall be mixed in at the same time as the compaction moisture and the bituminous stabilising agent is being added.

(ii) Heating and diluting the bituminous stabilising agent

The bituminous stabilising agent shall be heated to the required temperature as specified by the supplier.

If dilution of the bitumen emulsion stabilising agent with water is required, only potable water shall be used. The water shall be added gradually during constant stirring or circulation of the emulsion by means of pumps to prevent the emulsion from separating or breaking.

(iii) *Apply and mix in the bituminous stabilising agent*

The bituminous stabilising agent (foamed bitumen or bitumen emulsion) may be applied and mixed into the material using an

approved in-situ recycling machine as specified in Section A5.5.

When a bituminous emulsion stabilising agent is being used it can be applied using a calibrated spray tanker with a spray bar, followed immediately behind ahead of it being mixed into the material using a grader and a rotovator.

The quantity of material being stabilised with a bituminous stabilising agent must be restricted to the amount that can be properly mixed with the available equipment before the bitumen emulsion breaks.

b) Remote mixing for stabilisation

Where in-situ mixing and stabilisation is not possible due to a confined working area or inadequate turning space for the construction equipment, then remote off-site mixing may take place.

(i) *Remote site and material preparation*

An appropriate site shall be prepared in accord with Section A4.1 of Chapter 4 in the same way a stockpile site is specified to be prepared.

Place and spread the material on the prepared remote site to a thickness of approximately 300 mm. Place and spread the cementitious agent as specified in Clause A5.4.7.2 and proceed to mix using appropriate construction equipment such as a grader, or an articulated loader, or a rotovator.

(ii) *Adding the bituminous stabilising agent*

Apply the bituminous stabilising agent, heated and/or diluted as specified, using a hand sprayer and then mix the material further.

Once the material has been thoroughly mixed it shall be loaded, hauled, placed and then processed at its point of use, as specified in Sections A5.3 and A5.4.

A5.4.7.7 Protection and curing of chemically stabilised layers

All stabilised layers shall be protected against rapid drying-out for at least seven days following completion of the layer.

This can be achieved by the frequent application of water for 7 days or by water curing followed by covering with the next layer or by water curing followed by the application of an approved curing membrane. The use of single-axle trucks with a maximum axle load of 6t shall be used to apply the chosen curing compound.

The specific method of protection or curing used may be any one of the methods as specified hereunder or as stipulated in the Contract Documentation.

a) Water curing

The stabilised layer shall be kept continuously wet by watering at frequent intervals for an initial period of 48 hours after the compaction of the stabilised layer has been completed. The stabilised layer shall thereafter be kept continuously damp for at least a further five days.

Any stabilised layer which is not kept continuously wet or damp for at least seven (7) days, and is by default therefore subjected to consecutive wet-dry cycles, may be rejected if the layer exhibits shrinkage cracking or any carbonation.

b) Damp protective layer curing

The stabilised layer shall first be cured for 48 hours as specified in Clause A5.4.7.7a).

The stabilised layer shall then be covered with the material required for the next layer. The covering material shall be placed using only single-axle trucks with a maximum axle load of 6t and then immediately spreading the material. The layer material shall not be compacted. Water curing of the still exposed portions of the stabilised layer shall continue while the curing layer is dumped and spread.

The material forming the spread layer shall be watered at such intervals as may be required to keep the stabilised layer continuously damp until it has been cured for at least 7 days. In dry weather the spread layer shall be well watered at least once every 24 hours and even more often in hot or windy weather conditions.

c) Membrane curing

The chemically stabilised layer shall be covered with a curing membrane consisting of spray-grade bitumen emulsion or cutback bitumen applied at the rate specified in the Contract Documentation immediately after stabilisation.

d) Prime coat curing

Where a prime coat is specified on top of any stabilised layer, the prime coat may be utilized as a curing membrane and it shall be applied at the rate specified in the Contract Documentation. Use of the prime coat as a curing membrane may only be applied provided the surface moisture is only slightly damp and not wet.

If the prime coat is utilised as a curing membrane for a stabilised base layer, payment shall only be made once for the prime coat and no additional payment will be made for providing a curing membrane.

C5.4 STABILISATION
PART C: MEASUREMENT AND PAYMENT

(i) Preamble

The tendered rate for each item shall include full compensation for providing, maintaining and decommissioning upon completion, of all the constructional plant, equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the item, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the conditions of contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum item.

The requirements of Section C1.1 of Chapter 1 shall apply.

Where pay item descriptions include any wording in brackets it is an indication that contract specific information is to be inserted in the Pricing Schedule included in the Contract Documentation.

(ii) Items not measured in this Section

The following required activities will not be measured or paid for separately and the Contractor shall include the cost thereof in other items as deemed appropriate:

1. All surveying, setting out and level control required for the stabilisation of the pavement layers.
2. Protection of all existing or new kerbs, channels, sidewalks, lined drains, catch pits, kerb inlets, gratings, culverts, bridges, structures, buildings, road signs, guard rails, street lights, fencing, service pipes or cables and any other items adjacent to, over or under the road to prevent damage by any stabilising agent.
3. Repair of all damage to surfacing and any new or existing structures, buildings and road furniture caused by the stabilising agents.
4. All setting out work required for the accurate application of the stabilising agent specified in the Contract Documentation.

(iii) Items to be measured and paid for using items specified elsewhere in the specifications

For activities in Table C5.4-1 items specified in other Chapters or Sections of the specification, where they relate to work under this Section, will be listed in the Pricing Schedule.

Table C5.4-1: Payment items from other Chapters or Sections

Activity	Section 5.4 reference	Section item reference
Clearing and grubbing - remote mixing	A5.4.7.4b)	Section C1.6 of Chapter 1 – All applicable items
Construction of stockpile site - remote mixing	A5.4.7.4b)	Section C4.1 of Chapter 4 – All applicable items
Procurement of stabilising agents	A5.4.5	Section C4.4 of Chapter 4 – All applicable items
Procurement of commercial materials	A5.4.5.1	Section C4.4 of Chapter 4 – All applicable items
Reclaimed materials	A5.4.5.1	Section C5.5 – All applicable items

Processing and compaction of layer material	A5.4.7	Section C5.3 – All applicable items
Curing – membrane or prime	A5.4.7.6c) / A5.4.7.6d)	Section C6.1 of Chapter 6 and Chapter 10 – All applicable items

Item Description Unit

C5.4.5 Cementitious stabilisation agents for pavement layers

C5.4.5.1 Addition of cementitious stabilisation agents (specify agent separately) for pavement layers

- (a) Cement (for pavement layer) ton (t)
- (b) And so forth for other agents (for pavement layers) ton (t)

C5.4.5.2 Addition of cementitious stabilisation agents (specify agent separately) for pavement layers and spreading the agent using bags and labour enhancement methods.

- (a) Cement (for pavement layer) ton (t)
- (b) And so forth for other agents (for pavement layers) ton (t)

The unit of measurement shall be the ton of cementitious stabilising agent spread and mixed into the prepared layer material in-situ.

The tendered rates shall include full compensation for the supply and delivery of the agent to the point of use. The tendered rates shall also include for spreading the specified amount of cementitious stabilising agent, and all materials, supervision, labour, equipment, tools and incidentals necessary for completing the specified work. The layer thickness can be varied by up to 20 mm and the rate for this work shall remain applicable.

A distinction shall be made between spreading the cementitious soil stabilisation agents by mechanical bulk spreaders or using labour enhancement methods.

C5.4.6 Addition of cementitious stabilisation agents (specify agent separately) for a PMPL layer

C5.4.6.1 Cement ton (t)

C5.4.6.2 And so forth for other agents ton (t)

The unit of measurement shall be the ton of cementitious stabilising agent mixed into the material at a central mixing plant at the specified application rate.

The tendered rates shall include full compensation for delivery of the agent from storage to the mixing plant and introducing the specified amount of cementitious agent and water into the mixing plant for the PMPL layer and all materials, supervision, labour, equipment, tools and incidentals necessary for completing the specified work. No distinction shall be made in respect of the type of cementitious stabilisation agent used, the time for completion or the specific layer being produced whether that is a wet lean-mix concrete or a chemically stabilised crushed stone material.

Item	Description	Unit
C5.4.7	Bituminous stabilisation of pavement layers	cubic metres (m³)
C5.4.7.1	Bituminous stabilisation (layer thickness indicated) of pavement layers (layer to be indicated)	litres (ℓ)
C5.4.7.2	Bituminous stabilisation (layer thickness indicated) of pavement layers (layer to be indicated) using labour enhanced methods of construction	litres (ℓ)

The unit of measurement shall be the cubic metre of stabilised material, the quantity of which shall be determined in accordance with the authorised dimensions of the bituminous stabilised compacted layer.

The tendered rates for bituminous stabilisation shall include full compensation for watering and compacting the surface of the placed material prior to spreading the stabilising agent, for mixing the specified amount of stabilisation agent and material and shall include full compensation for all incidentals. No distinction shall be made with regard to the type of bituminous stabiliser used, the time for completion, and the particular layer to be stabilised with bitumen. The tendered rate shall apply to any combination thereof.

The layer thickness can be varied by up to 20 mm, and the rate for this cementitious stabilisation work shall remain applicable.

A distinction shall be made between spreading the cementitious soil stabilisation agents by mechanical bulk spreaders or using labour enhancement methods.

Item	Description	Unit
C5.4.8	Bituminous stabilisation agent (specify agents separately)	
C5.4.8.1	60 % anionic emulsion	litres (ℓ)
C5.4.8.2	60 % cationic emulsion	litres (ℓ)
C5.4.8.3	Foamed bitumen	litres (ℓ)
C5.4.8.4	Any other	litres (ℓ)

The unit of measurement shall be the litre of bituminous stabilising agent mixed into the road layer at the specified application rate. For bitumen emulsion this shall be the litre of 60 % emulsion mixed into the material. For foamed bitumen this shall be the litre of bitumen that is foamed.

For bitumen emulsion stabilisation the tendered rates shall include full compensation for diluting and introducing the specified amount of stabilisation agent at the point of use, and shall include full compensation for all incidentals. No distinction shall be made in regard to the type of bituminous stabiliser used, the method of application, the time for completion, and the particular layer to be stabilised with bitumen and the tendered rates shall apply to any combination thereof. The layer thickness can be varied by up to 20 mm, and the rate for this bituminous stabilisation work shall remain applicable.

For foamed bitumen, the rate shall also 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 into the material being processed

The tendered rates shall also include full compensation for heating and the transfer into tankers of the bitumen. It shall also include for coupling to the recycling train, for all transport on site, for any re-heating required, for all wastage and for strict adherence to all safety measures required when handling warm or hot bitumen.

Item	Description	Unit
C5.4.9	Filler for bituminous stabilisation	
C5.4.9.1	Filler for bituminous stabilisation (specify agents separately)	ton (t)
	Filler for bituminous stabilisation spreading the agent or filler using labour	ton
C5.4.9.2	enhanced methods of construction (specify agents separately)	(t)

The unit of measurement shall be the ton of cementitious agent mixed into the road layer at the specified application rate.

The tendered rates shall include full compensation for the supply and the blending of the specified amount of filler with the bituminous stabilisation process and all materials, supervision, labour, equipment, tools and incidentals necessary for completing the specified work. No distinction will be made in respect of the type of filler used, the time for completion or the specific layer being treated.

A distinction shall be made between spreading the filler by mechanical bulk spreaders and using labour enhancement methods.

C5.4.10 Provision and application of water for curing kilolitre (kℓ)

The unit of measurement shall be the kilolitre of water provided and applied for curing a chemically stabilised layer. The tendered rate shall include full compensation for furnishing, transporting and applying the water.

Item Description Unit

C5.4.11 Curing by covering with the subsequent layer square metre (m²)

The unit of measurement shall be the square metre of chemically stabilised pavement layer being cured by covering it with the subsequent layer. The quantity will be determined by the plan area of the authorised dimensions of the layer being cured

The tendered rate shall include full compensation for incidentals in respect of applying the subsequent layer for curing as specified, including the cost of regularly supplying and applying water.

Item	Description	Unit
C5.4.12	Curing with a membrane (type of material to be specified)	

C5.4.12.1	Cut back bitumen	litre (ℓ)
C5.4.12.2	Inverted bitumen emulsion	litre (ℓ)
C5.4.12.3	Spray grade emulsion	litre (ℓ)
C5.4.12.4	Curing compound for PMPL layers	litre (ℓ)

The unit of measurement shall be the litre of curing material measured at spraying temperature and sprayed as specified.

The tendered rates shall include full compensation for supplying the material, preparation of the surface before applying the curing membrane, applying the membrane material and maintaining the surface as specified.

Item Description Unit

C5.4.13 Trial section for a PMPL layer (specify width) square metre (m²)

The unit of measurement for the trial section of the plant-mixed paver-laid pavement layer shall be the square metre of trial section of the specified width as specified in the Contract Documentation measured along the centre line of the road. A total length of at least 250m of trial section and no more than 350 m will be measured for payment as a trial section.

The tendered rate shall include full compensation for supplying, introducing and mixing the cementitious stabilising agent at the specified rate at the mixing plant for the construction of the trial section.

Item Description Unit

C5.4.14 Trial section for a chemically stabilised layer cubic metre (m³)

The unit of measurement for the trial section of a chemically stabilised pavement layer shall be the cubic metre of trial section as per the authorised dimensions. A total length of at least 150 m of trial section and no more than 200 m will be measured for payment as a trial section.

The tendered rate shall include full compensation for placing spreading and mixing the stabilising agent at the specified application rate during the construction of the trial section.

Item Description Unit

C5.4.15 Trial section for a bituminously stabilised layer (specify width) square metre (m²)

The unit of measurement for the trial section of a bituminously stabilised pavement layer shall be the square metre of trial section of the specified width as specified in the Contract Documentation measured along the centre line of the road. A total length of at least 250 m of trial section and no more than 350 m will be measured for payment as a trial section.

The tendered rate shall include full compensation for placing spreading and mixing the bituminous stabilising agent and filler at the specified application rate during the construction of the trial section.

Item Description Unit

C5.4.16 Mechanical modification cubic metre (m³)

The unit of measurement shall be the cubic metre of material in the compacted layer which has been mechanically modified as per Clause A5.4.7.2a) calculated using the layer work dimensions given in the Contract Documentation.

The tendered rate shall include full compensation for mixing all the different materials together to form one homogeneous layer as per Clause A5.4.7.2.

Payment for the construction operations required to process and compact the modified layer shall be made under item C5.3.2.

Item	Description	Unit

C5.4.17	Addition of a soil binder	cubic metre (m ³)

The unit of measurement shall be the cubic metre of soil binder added to and mixed into the pavement layer as per Clause A5.4.7.2b). The volume of soil binder shall be calculated using the completed layer work dimensions given in the Contract Documentation multiplied by the percentage by volume of soil binder added as specified.

The tendered rate shall include full compensation for mixing the soil binder into the layer to form one homogeneous layer.

Payment for the construction operations required to process and compact the modified layer shall be made under item C5.3.2

A5.5 RECONSTRUCTION OF PAVEMENT LAYERS

PART A: SPECIFICATIONS

A5.5.1 SCOPE

This Section covers the work requirements for the reconstruction of existing road pavement layers. This comprises patching and in-situ reconstruction.

A5.5.1.1 Patching

Patching covers the work requirements for the patching of existing pavement layers, and in exceptional cases patching fills and the roadbed, with the purpose of repairing local failures. Patching involves excavating the existing failed sections to the specified depth and area, removing the excavated material and reconstructing the excavated fills and pavement layers with the specified material.

Patching specified in this Section A5.5 is applicable when the project scope of works is predominantly the reconstruction of Pavement Layers.

Patching specified in Section A8.8 is applicable when the project scope of works is predominantly the construction of Asphalt Layers.

This scope also covers the work requirements for the repair of edge breaks.

Resurfacing the repaired failed area does not form part of this scope and is provided for in Chapters 8 and 9.

A5.5.1.2 In-situ reconstruction

In-situ reconstruction covers the work requirements for the process using either conventional construction equipment exclusively or a custom designed recycling machine (recycler) along with some conventional construction equipment, to reconstruct pavement layers.

A5.5.2 DEFINITIONS

The relevant definitions in the standard specification are applicable. Additional definitions for this Section are included here.

Conventional equipment - this is equipment that is normally used for the construction of the Works. This equipment excludes equipment specifically designed and used for in-situ reconstruction works and/or for the recycling of materials.

Cross-mixing -this is the mixing of layer materials horizontally across a layer width when the material properties of the layer are not the same throughout the width and the depth of the layer. Cross-mixing cannot be carried out using a recycler.

Edge break -an edge break is a defect in which the outer edge of the wearing course and part of the underlying pavement layer (asphalt or crushed stone or gravel) is broken and/or worn away resulting in an irregular road edge line with an average defect width of 250 mm or less. Edge breaks wider than 250 mm are defined as patching.

In-situ -this means in the actual original or final location without moving the material elsewhere.

Patching -means the repair of failures in fill and/or pavement layers when the failed width is less than 1,0 m or the failed length is less than 25 m or the failed area is less than 100 m². Patching does not include the pretreatment of a surfacing, or the repair/patching of surfacing defects, or the rehabilitation of a concrete pavement which is covered in Chapters 8 (pretreatment), 8 (surface defects) or 7 (repair of concrete).

Reconstruction -this is the reconstruction of existing pavement layer material (in-situ or reclaimed material) with or without stabilisation. Reconstruction in several construction phases can be accomplished using conventional construction equipment to reclaim and reconstruct layer work material or in a single construction phase using a recycler along with some conventional construction equipment to achieve the reclaiming and reconstruction of layer work material.

Rehabilitation -this is the restoration of an existing deteriorated or failed road pavement either to the original constructed condition or to a better condition. The restoration of the road pavement can take place by patching, by layer reconstruction, by adding layers or a combination of the aforementioned as specified in the Contract Documentation.

Recording pass -this is the roller-pass when the roller's compactometer readings are recorded, cross-referenced to a location and compared with the specified layer density requirements. A recording pass is only made on the second roller-pass over the same area. A recording pass comprises two passes with the roller.

Slushing -the process of wetting the surface of a compacted layer accompanied by rolling with a smooth-drum roller and/or a pneumatic tyre roller to generate saturated fine material or slush, on the upper surface of the compacted layer.

Uniform pavement section -a uniform pavement section has pavement layers with similar layer materials, similar layer properties, similar layer thicknesses and similar deflection responses (when available) throughout the section. Uniform pavement sections shall be clearly identified in the Contract Documentation.

A5.5.3 GENERAL

A5.5.3.1 Traffic accommodation

The traffic accommodation arrangements required during the reconstruction of existing roadworks in urban and rural areas are specified in Chapter 1 of the specifications.

The works-specific details shall be specified in the Contract Documentation.

A5.5.3.2 Material selection

The reclaimed material specifications in this Section are supplementary to the material specifications of Chapter 4. Reclaimed material from existing pavements shall be utilised as specified in the Contract Documentation.

All reclaimed material from existing pavements, or reconstructed in-situ, shall be broken down and oversized material removed, to comply with the maximum size and grading requirements for the particular use of the reclaimed material as specified in the Contract Documentation.

The classes of excavation for reclaimed material shall be as specified in Section A4.3 of Chapter 4.

A5.5.3.3 Construction requirements

The processing, compaction, stabilisation, finishing and protection requirements of the in-situ material or reclaimed material as specified in Sections A5.1 to A5.5 shall apply to the construction of reclaimed material and to the reconstruction of in-situ pavement layers.

In addition, the processing and compaction of materials for patching shall also be carried out as specified in the relevant Sections of Chapter 5.

A5.5.3.4 Existing bituminous seal and/or asphalt layers

Thin bituminous seal surfacing layers are usually processed together with the underlying pavement layer or layers which are being reclaimed or reconstructed in-situ, unless the complete removal thereof is specified in the Contract Documentation.

Asphalt surfacing and/or asphalt base layers may be reclaimed by milling off to stockpile as specified in Clauses A4.3.7.4 to A4.3.7.6 or they may be reconstructed in-situ, together with the underlying pavement layer(s).

Bituminous seal surfacing or asphalt base and/or surfacing layers which are processed together with the underlying gravel or crushed stone pavement layer/s shall be properly broken down by the milling and reconstruction process and mixed thoroughly with the underlying material and to the depth as specified in the Contract Documentation. Any remaining fragments of the bituminous seal surfacing or asphalt material which exceed the specified maximum particle size of the pavement layer being reprocessed shall be broken down or removed as oversized material.

A5.5.3.5 Reconstructing existing pavement layer materials

Where the existing pavement material is to be reconstructed in-situ as base, the exposed surface shall be cleaned by removing all remaining fragments of asphalt material. No more than 15 % of the exposed surface area shall still be covered but with a reduced thickness of no more than 10 mm of asphalt material.

The existing pavement material shall be broken down to the full depth and then reconstructed in-situ, as specified in the Contract Documentation.

A5.5.3.6 In-situ reconstruction near existing road infrastructure

Care shall be exercised to avoid damage to any concrete elements, expansion joints, joint nosings, manholes, kerbing, catch pits and any other roadside furniture during reconstruction of the layers. Damage caused to any element forming part of the permanent works shall be repaired at no cost to the Employer.

A5.5.3.7 Exposed pavement layer

The exposed surface of the in-situ layer left after a pavement layer has been excavated, shall be inspected once the exposed surface has been cleaned of all loose material by sweeping, or blowing with compressed air or by vacuuming.

Irrespective of whether the exposed layer is an unstabilised layer or a stabilised layer the cleaned floor of the excavation shall be inspected for any failed areas and for cracks of any form by the Contractor along with the Engineer.

A5.5.3.8 Widening an existing pavement

Where existing roads need to be widened, the existing pavement layers shall be cut back to a firm, well compacted or cemented material ahead of the commencement of any widening activities. The cut back material may be used together with imported material in the widening process as specified in the Contract Documentation.

Where pavement layers are widened, then the different existing pavement layers shall be excavated in steps or benches as specified in Clause A5.3.3.7.

If there is a restricted working space caused by the widening of an existing pavement over a narrow width, the Contractor shall ensure that all material complies with the specified maximum aggregate sizes before the material is brought into the restricted working space. No further breaking down on the road shall be permitted within the restricted working space unless the Contractor can demonstrate that the oversize material can be broken down or removed successfully without compromising the safety of workers or members of the public using the adjacent road.

A5.5.5 MATERIALS

The Contractor shall ensure that reclaimed material complies with the specified requirements of Chapter 4 prior to use in the particular pavement layer.

Further specifications for patching of existing road pavement layers and for the processing and compaction of existing road pavement layer materials using a recycler, are contained in this Section A5.5.

A5.5.5.1 Existing crushed stone pavement materials

Where existing crushed stone material is to be reconstructed, the Contract Documentation shall specify whether the material shall be processed as a gravel layer or as a crushed stone layer.

The compaction requirements specified in Table A5.3.5-2 shall apply to crushed stone layers constructed from reclaimed or in-situ reconstructed material unless specified otherwise in the Contract Documentation.

A5.5.5.3 Imported materials for patching

The imported materials used for patching shall comply with the material specifications of Section A4.1 of Chapter 4 for the specific layer being reconstructed in the patch.

A5.5.5.4 Compaction density

The density of the reconstructed layer shall be measured in terms of the MDD of the layer.

The minimum compaction density for reconstructed pavement layers shall be as specified in Table A5.5.5-1.

Table A5.5.5-1: Minimum compaction density for reconstructed material

Reconstructed material type	Compaction as % of maximum dry density (MDD)	
	Cementitious stabilisation	Bituminous stabilisation
Natural gravel	as per Table A5.3.5-1	100
Graded crushed stone	as per Table A5.3.5-2	102

A5.5.5.5 Material shortfall and make-up material

Where there is a shortfall of material for the reconstruction of a layer or layers, this shortfall shall be imported from compliant material prepared in accord with the specification in Chapter 4 from stockpile or from commercial sources as specified in the Contract Documentation. The shortfall of material may be due to the poor shape of the road pavement or due to poor levels or to a deficient as-built layer thickness.

The grading and other properties of the in-situ material blended with the imported material shall be determined. Where the grading of this layer to be reconstructed is not compliant either in-situ, or after being milled, or after being ripped and broken down, then make-up material shall be imported and blended with the in-situ material so that the combined grading and other material properties of the in-situ reconstructed layer shall be as specified. Nowhere shall the thickness of imported material exceed two thirds of the depth of reconstruction.

A5.5.7.6 Reconstruction trial section

The Contractor shall construct an in-situ reconstruction trial section for each uniform section of pavement using the approved mix design determined in accordance with the specifications in Clause A4.4.7 of Chapter 4. The uniform sections shall be as specified in the Contract Documentation.

The Engineer may waive the need for a trial section for each uniform section, when the approved mix design and material types are similar for each uniform section.

The Contractor shall follow the in-situ reconstruction process specified in Clause A5.5.7.3.

Prior to constructing the reconstruction trial section the Contractor shall assemble all items of construction equipment proposed to be used for the trial section. Only the construction equipment items (conventional or recycler) that the Contractor intends using for production work shall be used to construct the trial section and under no circumstances shall any substitutes be permitted.

The objectives of the trial section are as follows:

- To demonstrate that the construction equipment and the proposed process will enable the construction of the reconstructed layer in accordance with the specified requirements in the Contract Documentation.
- To determine the effect on the grading of the reconstructed material by varying the advance speed of the recycler and the rate of rotation of the milling drum.
- To determine how many roller-passes are required to achieve the specified relative compaction density.
- To confirm the finishing process methodology and confirm the required surface finish standard.
- To check the surface regularity of the base layer for compliance with Clause A5.3.8.5a).
- To determine the bulking factor of the reconstructed material, the size of the working windrow and the amount of material to be removed after construction

A trial section shall be at least 150 m in length with a maximum of 200 m in length and shall cover the full lane width or partial road width in accordance with the geometry of the road and the accepted work plan.

If the Contractor makes any alterations in the methods, processes, equipment or materials used, or is unable to consistently comply with the specifications due to variations in the in-situ material or for any other reason, the construction of another trial section shall be required. If the first trial section proves to be non-compliant a second trial section shall be constructed. The non-compliant first trial section shall be at no cost to the Employer.

Reconstruction work may only commence once a trial section has been evaluated and certified compliant for a particular uniform pavement section. Thereafter, it is the responsibility of the Contractor to obtain the necessary approval for the relevant mix design and any alterations to the mix design that may be necessary for each uniform section ahead of the commencement of the reconstruction work.

To allow sufficient time to assess all aspects of the quality of the completed trial section and to ensure that the test results are compliant, the Contractor shall programme to start the in-situ reconstruction work no sooner than 7 calendar days after constructing the trial section. The Contractor shall have no claim for any programme delay caused by the construction of trial sections for whatever reason and the time required to construct, test and approve the trial sections shall be allowed for in the approved construction programme.

A5.5.7.7 Curing reconstructed layers

The curing of chemically stabilised layers shall take place as specified in Clause A5.4.7.

No curing treatment is required for a bitumen stabilised layer when the layer has been slushed with a diluted bitumen emulsion.

A5.5.8 WORKMANSHIP

A5.5.8.1 Inspection of the works

The Engineer shall do routine inspections and conduct routine tests to determine whether the quality of material and workmanship provided, complies with the requirements of the Contract Documentation.

Any reconstructed layer with lamination layers or biscuit layers, as identified by the hollow sound caused when a heavy chain is dragged over the compacted layer or when the layer is tapped with a geological hammer shall be rejected. The material in the rejected sections of the completed layer shall be reconstructed in accord with the

specifications or in accord with instruction from the Engineer. The layer shall be reconstructed prior to the construction of any subsequent layers at no cost to the Employer.

A5.5.8.2 Material quality and compaction requirements

The test results and measurements will be assessed in accordance with the provisions of Chapter 20: Quality Assurance.

A5.5.8.3 Construction tolerances for pavement layers

The individual reconstructed pavement layers shall comply with the construction tolerances for the appropriate layer as specified in Clause A5.3.8.4. The surface regularity of a reconstructed base layer shall comply with the requirements of Clause A5.3.8.5a).

When a pavement layer of material is processed directly on top of a milled excavation floor (Clause A5.5.3.6) without the requirement that the milled excavated floor first be trimmed to prescribed levels, the thickness tolerances shall not apply to the processed pavement layer on top provided the compacted thickness of the layer on top is not less than 130 mm thick.

The final surface on any particular point on patches or between the patch and existing surface shall not deviate more than 5,0 mm from the bottom of a 3,0 m long straight edge. The surface of the base layer of the patch shall match this tolerance taking into account that the maximum deviation shall be 5,0 mm plus the proposed surfacing thickness.

A5.5.8.4 Material testing for reconstructed layer

Sample preparation and testing for bitumen stabilisation sampling and testing shall be in accordance with the latest edition of TG2.

The stabilised material sampled from the layer for the compaction of MDD briquettes, shall be prepared according to SANS 3001-GR54 and compacted according to SANS 3001-GR31.

A5.5.8.5 Reconstructed layer process control

The Contractor shall establish a comprehensive process control system for the reconstruction work. This shall consist of a system of daily reports submitted to the Engineer.

a) Pre-reconstruction

report This report shall
comprise the following:

- The production and cut plans.
- The completed pre-start check list.
- Weather conditions and temperature measurements.

b) Post-reconstruction report

This report shall comprise the details of the reconstruction work completed during a single-operation with the following information for each reconstruction cut (for a recycler) or reconstruction width (for conventional construction equipment):

- Start and end km value.
 - Width and depth of cut including a schedule of dip measurements.
 - Width of application of each stabilising agent.
 - Nozzle settings and closures for each relevant spray bar.
 - Computer data input.
 - Number of primary compaction recording passes made.
 - Primary compaction process control density records.
 - Compaction data (including compactometer reading, vibration amplitude, advance speed of roller) in electronic format from the integrated compactometer device fitted to the primary roller when applicable, at 2,0 m intervals.
- ##### **c) Stabilising agent report**

This report shall comprise details of the actual usage of stabilisation agent.

- Chemical stabilising agent spreading check measurements.
- Bitumen emulsion consumption.

- Straight bitumen consumption.
 - Average temperature and pressure measured at the bitumen spray bar.
 - All other details shown in the sample report included in the appendices of the latest edition of TG2. **d**
- Site diary report**

This report shall comprise relevant information specifically concerning the reconstruction operation. These shall include but shall not be limited to:

- Stoppage time and cause.
- Sections where in-situ pavement conditions changed from the documented uniform pavement section together with a description of the change.
- Details of any non-routine tests undertaken.
- Any changes in the weather during the day.
- All site instructions received.
- The sampling location of the daily samples of pulverised or broken down material.

C5.5 RECONSTRUCTION OF PAVEMENT LAYERS

PART C: MEASUREMENT AND PAYMENT

(i) Preamble

The tendered rate for each item shall include full compensation for providing, maintaining and decommissioning upon completion, of all the constructional plant, equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the item, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the conditions of contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum pay item.

The requirements of Section C1.1 of Chapter 1 shall apply.

Where pay item descriptions include any wording in brackets it is an indication that contract specific information is to be inserted in the Pricing Schedule included in the Contract Documentation.

(ii) Items not measured in this Section

The following required activities will not be measured or paid for separately and the Contractor shall include the cost thereof in other items as deemed appropriate:

1. No additional payment shall be made for work in restricted areas.
2. Drainage and protection of the pavement layers from all damage that may occur for any reason until the Employer has taken over the works.
3. Protection of all existing or new kerbs, channels, sidewalks, lined drains, catch pits, kerb inlets, gratings, culverts, bridges, structures, buildings, road signs, guard rails, street lights, fencing, service pipes or cables and any other items adjacent to, over or under the road that could be damaged by the Contractor's vehicles, construction equipment, or by public traffic being accommodated on or alongside the pavement layers, during the construction of the pavement layers, until the Employer has taken over the works.
4. Repair of all damage to the existing pavement layers after access to the reconstruction site has been given to the Contractor and that may occur before, during or after the construction of the reconstructed or rehabilitated pavement layers up until the Employer has taken over the works.
5. Provision of additional material in excess of the compacted volume of the layers calculated using the layer dimensions given in the Contract Documentation for whatever reason including additional material required for the correct placing, mixing, levelling and compaction of the layers.
6. The removal of oversize material up to 5 % of the compacted layer volume.
7. Construction of tie in joints to new or existing road layers or surfacing.
8. The preparation and the inspection for cracks in an underlying layer after removal of a pavement layer.
9. Excavation of benches in pavement layers when widening an existing pavement

10. The provision and maintenance of covers for stockpiled reclaimed materials
11. The provision of method statements and of the programme of reconstruction work along with regular updates of the programme.
12. The brooming during the slushing process whether by hand or by mechanical means.

(iii) **Items to be measured and paid for using payment items specified elsewhere in the specifications**

For activities in Table C5.5-1 payment items specified in other Chapters or Sections of the specification, where they relate to work under this Section, will be listed in the Pricing Schedule.

Table C5.5-1: Payment items from other Chapters or Sections

Activity	Section 5.5 reference	Section item reference
Traffic accommodation	A5.5.3.1	Section C1.5 of Chapter 1 – All applicable items
Reclaiming / removing layer material or surfacing	A5.5.7.3c) and A5.5.7.4c)	C4.3 of Chapter 4 – All applicable items
Hauling materials such as: • Surplus material from the works • Import material from stockpile for specific layers • Import gravel material from Contractor quarry or borrowpit • Pre-milling material	Several references	Section C1.7 of Chapter 1 – All applicable items
Clearing and grubbing for reclaimed material stockpile sites	A5.5.5.2	Section C1.6 of Chapter 1 – All applicable items
Construction of stockpile site for materials designated for reconstruction including stabilisation	A5.5.5.2	Sections C4.1, C4.4 of Chapter 4 and C5.4 – All applicable items
Crack sealing	A5.5.3.6	Section C8.5 of Chapter 8 – All applicable items
Surfacing of a patch or of an edge break	A5.5.7.1 and A5.5.7.2	Section C8.8 of Chapter 8 – All applicable items
Saw cutting	A5.5.7.1b)	C4.3 of Chapter 4 and Section C8.8 of Chapter 8 – All applicable items
Stabilisation and agents	A5.5.7.4	Section C5.4 – All applicable items
Activity	Section 5.5 reference	Section item reference
Processing of pavement layers with conventional construction equipment	A5.5.7.4c)	Section C5.3 – All applicable items
Curing a stabilised layer	A5.5.7.6	Section C5.4 – All applicable items
Tack or prime a layer	A5.5.3.6	Section C8.1 of Chapter 8 – All applicable items
Surfacing a reconstructed layer	Several references	Chapter 8 and Chapter 9 – All applicable items
Providing a milling machine and milling	A5.5.7.4c) and e)	Section C4.3 of Chapter 4 – All applicable items
Material testing of exposed layer	A5.5.7.3b)	Item C4.3.1

(iv) **Payment items specifically for this Section of the specifications**

Item Description Unit

Item Description Unit

C5.5.7 Pre-milling existing wearing course material

- C5.5.7.1 Pre-milling an asphalt wearing course (depth of pre-milling varies between 10 mm and 40 mm maximum). square metre (m²)
- C5.5.7.2 Pre-milling a seal wearing course (depth of pre-milling varies between 10 mm and 25 mm) square metre (m²)

The unit of measurement shall be a square metre of road surface pre-milled in accordance with the specifications. The quantity shall be calculated based on the square metres of the actual pre-milling areas.

The tendered rates shall include full compensation for pre-milling ahead of reconstruction, for removing the isolated high spots with a minimum milling depth of 10 mm and maximum milling depth of 40 mm or 25 mm for the asphalt wearing course or the seal wearing course respectively.

The tendered rates shall also include for directly loading and removing the milled material, for all plant movement over the site between isolated high spots for providing all equipment, labour, supervision and incidentals for completing the work in accordance with the specifications.

The haul of the material shall be measured from the point of loading at the pre-milling section to the point of off loading as per Section A1.7 of Chapter 1.

Item	Description	Unit

C5.5.15 In-situ reconstruction of a pavement layer using a recycler to construct a stabilized subbase layer

C5.5.15.1 Chemically stabilised subbase layer compacted to 97 % of MDD:

- (a) Using non-cemented material compacted to _____ mm thick cubic metre (m³)
- (b) Using cemented material compacted to _____ mm thick cubic metre (m³)
- (c) Using a combination of non-cemented and cemented material compacted to _____ mm thick cubic metre (m³)

Item	Description	Unit

C5.5.16 In-situ reconstruction of a pavement layer using a recycler to construct a stabilised base layer

C5.5.16.1 Chemically stabilised base layer compacted to 100 % of MDD:

- (a) Using non-cemented material compacted to _____ mm thick cubic metre (m³)
- (b) Using cemented material compacted to _____ mm thick cubic metre (m³)

The unit of measurement for items C5.5.14; C5.5.15 and C5.5.16 above, shall be the cubic metre of in-situ reconstructed pavement layer, using a recycler, the quantity of which shall be calculated in accordance with the authorised dimensions of the compacted layer.

The tendered rates shall include full compensation for setting out the works, preparing and providing the production plan(s) as per Clause A5.5.8.5a), preparing the existing road surface where required and breaking up the existing layer to the specified depth.

The tendered rates shall include full compensation for breaking down the in-situ layer and preparing the material utilising a recycler, adding any extra water required and placing of the material followed by the primary compaction and secondary compaction of the material. The rate shall include full compensation for cutting final levels as well as the protection and maintenance of the layer, conducting process control and daily monitoring, measuring and demarcating the work where layers are only partly reprocessed and for protecting the adjacent pavement and for the repair thereof should it be damaged.

The tendered rates for items C5.5.14.1d), C5.5.14.2d) and C5.5.14.3d); items C5.5.15.1d), C5.5.15.2d) and C5.5.15.3d) and items C5.5.16.1d), C5.5.16.2d) and C5.5.16.3d) shall also include full compensation for shaping and compacting the pre-pulverised material to 93% MDD.

The tendered rates shall include full compensation for the application of the bituminous stabilising agents in accord with the specifications of Section A5.5.

The layer thickness to be stabilised can be varied by the Engineer by up to 20 mm, and the rate for this stabilisation work shall remain applicable. The tendered rates shall also include for all labour, equipment and incidentals required to reconstruct the pavement layer.

The procurement, storage, spreading and mixing in of the chemical and/or bituminous stabilising agent for the stabilisation of the layer shall be measured and paid for in accord with the relevant items of Section C4.4 of Chapter 4 and Section A5.4.

A8.1 PRIME COAT

PART A: SPECIFICATIONS

A8.1.1 SCOPE

This Section covers the work in connection with the application of a prime coat.

A8.1.2 DEFINITIONS

Prime coat - consists of a low viscosity bituminous binder, applied in a single application on a granular, cemented or treated base or subbase to facilitate a good bond between the base and the bituminous surfacing or subbase and bitumen treated base.

A8.1.3 GENERAL

A8.1.3.1 Weather limitations

No prime shall be applied under the following adverse conditions:

- During foggy or wet conditions;
- When rain is imminent;
- When wind is blowing sufficiently hard to cause uneven spraying;
- When the surface of the layer is visibly wet, i.e. more than damp;
- When the temperature of the surface immediately prior to commencing with the application of the prime is below, or in the opinion of the Engineer, likely to fall below 10°C;
- After sunset;
- When at any position within the layer the moisture content of a granular base layer is more than 50 % of the optimum moisture content determined according to SANS 3001 No GR30. In the event of rain after priming the base shall be allowed to dry out to meet the above moisture content requirements prior to surfacing. Limiting moisture contents for treated layers before priming shall be specified in the Contract Documentation.

A8.1.3.2 Nominal rate of prime coat application

The nominal rate of application, for tender purposes, shall be 0,8 l/m².

A8.1.5 MATERIALS

A8.1.5.1 Bituminous material

The priming material shall be one of the following as specified in Part C: Measurement and Payment:

Table A8.1.5-1: Bituminous binder for priming the excavated area

Bituminous binder for priming the excavated area	Specification
MC-10 cut-back bitumen	SANS 4001 – BT2
MC-30 cut-back bitumen	SANS 4001 – BT2
Inverted bitumen emulsion	SANS 4001 – BT5
Other appropriate product containing solvents	Certified by independent

	certification agency
Other appropriate product containing no solvents	Certified by independent certification agency

The type of prime and application rate best suited for the base shall be determined after construction of the base. The Contractor shall provide about 20 ℓ of at least three prime products and apply it at different application rates with a brush on the base. The Engineer shall evaluate the performance of the prime in accordance with the latest version of TRH1/SABITA Manual 26 and then instruct the type of prime and application rate to be applied. No payment shall be made for tests to determine the appropriate priming product.

A8.1.5.2 Aggregate for blinding primed layers

Where so instructed, blinding material shall consist of crusher sand or natural sand, with 100 % passing the 7,5 mm sieve and not more than 10 % passing the 2,0 mm sieve. The aggregate shall be clean, hard and free from excessive dust and shall contain no clay, loam or other deleterious matter.

Blinding of the primed surface with such aggregate at a nominal rate of 285 m²/m³ shall only be permitted to facilitate traffic accommodation or access arrangements.

A8.1.7 EXECUTION OF THE WORKS

A8.1.7.1 Preparation of the layer to be primed

Not longer than 24 hours before spraying, the layer to be primed shall be broomed and cleaned of all loose or deleterious material by means of a controlled rotary broom and/or hand brooms. Sweeping shall be done carefully so as not to cause any damage to the layer. A light spray of water, sufficient to dampen the surface, shall be uniformly applied to the layer immediately before the application of the prime. If the water is over applied, resulting in standing water, the layer shall be allowed to dry until a uniform damp surface is obtained.

Before any priming material is sprayed, the layer to be primed shall be checked for conformance with the surface and other requirements specified.

A8.1.7.2 Storage and application of the prime coat

The temperatures for storage and spraying shall be in accordance with the relevant SANS 4001 specifications or be in accordance with the manufacturer's specifications or as required by a product's certification documentation. All prime materials stored in a heated condition shall be stored in a tank with a properly functioning circulation system and having a securely fitting lid.

All layers where the application of a prime is specified or ordered shall be primed using a mechanical distributor complying with Clause A10.1.6.1 of Chapter 10. The edges of the previously constructed or existing surfacing shall be adequately protected by approved means to ensure that an overlap of prime not exceeding 50 mm is achieved.

A mat of reinforced paper or other suitable approved material shall be used at all joints at the beginning and end of all sprays to obtain a neat start and cut-off.

If the prime is applied in more than one strip, allowance shall be made for overlapping of strips by 200 mm, in accordance with the triple spray flair configuration, to ensure a full application of the prime over the joint.

Unless directed otherwise by the Engineer or indicated on the drawings, the edges of the primed surface shall be 200 mm wider than the edges of the surfacing. The edges of the primed surface shall be true to line with a maximum deviation of 25 mm from the specified edge line.

Wherever feasible, the prime shall be applied in one or more lanes evenly over the full width of the road and allowed to penetrate and cure until traffic can pass over the surface without any pickup. All traffic shall be kept off the surface until this condition is obtained.

Where it is not feasible for traffic to use diversions, the prime shall be applied and allowed to penetrate for as long as is practicable before a blinding layer of aggregate is applied at a nominal rate of 285 m²/m³. Care shall be exercised in this operation to avoid the aggregate being applied too soon after spraying the prime. Any "caking" of aggregate which may take place and cause problems during the surfacing process and all loose aggregate shall be removed before the final surfacing is applied.

Where it is not possible to construct such ancillary works after priming, care shall be taken to protect all kerbing, channeling and guard rails from the prime by covering them with suitable protective material when spraying. The Contractor shall, at his own cost, replace all soiled items. Painting of the soiled surfaces shall not be accepted as a suitable remedial measure.

A8.1.7.3 Areas inaccessible to mechanical equipment

The provisions of Clause A10.1.3.3 of Chapter 10 shall apply to the application of the prime in areas inaccessible to mechanical equipment. The prime shall be applied by means of a portable binder distributor that complies with the requirements of Clause A10.1.6.1 of Chapter 10. The quantity of prime applied shall be controlled so that the specified rate of application is achieved. Surplus prime shall be removed as specified in Clause A8.1.7.4.

A8.1.7.4 Removal of surplus prime

After the prime has penetrated sufficiently, surplus prime shall be covered with damp crusher sand, which shall be worked into it by means of hand brooms to absorb the surplus prime. As soon as it is saturated with prime, the crusher sand shall be swept off the primed surface and the area allowed to dry before surfacing. The process shall be repeated until no surplus prime or wet prime remains on the surface.

A8.1.7.5 Opening to traffic

Where a blinding layer is specified in the drawings or directed by the Engineer, and applied to the primed surface the Contractor shall maintain the blinding layer and the primed surface during the period when the surface is opened to traffic and shall repair all damage caused to the surface by such traffic, as directed by the Engineer, at no additional payment.

Traffic accommodation shall comply with the specifications in Section A1.5 of Chapter 1.

A8.1.8 WORKMANSHIP

A8.1.8.1 Tolerances

The actual spray rates measured at spraying temperature shall not deviate by more than 8,0 % from that ordered by the Engineer. The Engineer may conditionally accept application rates falling outside this tolerance at reduced payment in accordance with Table A8.1.8-1. Conditional acceptance shall not relieve the Contractor of his contractual obligations.

A8.1.8.2 Testing

The Contractor shall give the Engineer at least 24 hours' notice of his intention to spray prime material so that the actual spray rates can be verified and approved by the Engineer. Unless otherwise agreed in advance, the Contractor shall only spray when the Engineer's representative is present.

The Contractor shall provide, at his cost, representative samples of every batch of prime delivered onto site.

Table A8.1.8-1: Payment reduction factors for conditionally accepted prime coat

Deviation specified spray rate at spraying temperature (%)	Payment reduction factor of tendered rate
±8,0	1.00
±9,0	0.97
±10,0	0.95
±11,0	0.90
±12,0	0.85
±13,0	0.80

Any deviation outside these limits shall not be paid for however, the Engineer shall have the right to instruct the Contractor to make up any deficiency, or blind excessive prime without additional payment. If under-spraying occurs, and it is accepted by the Engineer, only the actual quantities applied shall be paid for.

C8.1 PRIME COAT

PART C: MEASUREMENT AND PAYMENT

(i) Preamble

The tendered rate for each item shall include full compensation for providing, maintaining and decommissioning upon completion, of all the plant, equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the item, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the conditions of contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum item.

The requirements of Section C1.1 of Chapter 1 shall apply.

Where pay item descriptions include any wording in brackets it is an indication that contract specific information is to be inserted in the Pricing Schedule included in the Contract Documentation.

(ii) Items that will not be measured separately

The following activities, whether required to complete the specified work or not, will not be measured and paid for separately and the Contractor shall include the cost thereof in other pay items as he deems appropriate:

1. No separate payment will be made for setting out the works.
2. No separate payment will be made for the protection or repair as required of any existing or new road furniture, structures, buildings, infrastructure or services damaged by the Contractor's activities.
3. No additional payment shall be made, nor shall any claim for additional payment be considered, for any specified work in confined or restricted areas. Any additional costs associated with working in confined or restricted areas shall be deemed to be included in the standard applicable pay items.
4. No separate payment will be made for the loading of any materials.
5. No separate payment will be made for the hauling of any materials where the material is moved over a distance of less than, and up to 1,0 km.
6. No separate payment will be made for transporting materials from commercial sources irrespective of the hauling distance.
7. No separate payment will be made for the removal or any surplus material imported to complete the works.
8. For all Works performed, precautionary measures required in terms of the Occupational Health and Safety Act (Act 85 of 1993) and the latest amendments thereof as well as the latest Construction Regulations shall be deemed included in the rates tendered for the relevant products.
9. Removal of surplus prime.

(iii) Items to be measured and paid for using items specified elsewhere in the specifications

Not applicable to this Section.

(iv) Items specifically for this Section of the specifications

Item	Description	Unit	C8.1.1	Prime coat:
C8.1.1.1	MC -10 cut-back bitumen	litre (ℓ)		
C8.1.1.2	MC -30 cut-back bitumen	litre (ℓ)		
C8.1.1.3	Inverted bitumen emulsion	litre (ℓ)		
C8.1.1.4	Certified product containing solvents (State name)	litre (ℓ)		
C8.1.1.5	Certified product containing no solvents (State name)	litre (ℓ)		

The unit of measurement shall be the litre of priming material measured at spraying temperature and sprayed as required.

The tendered rates shall include full compensation for supplying the priming material, cleaning and watering the layer to be primed, applying the priming material and maintaining the primed surface as specified.

Item	Description	Unit
C8.1.2	Aggregate for blinding:	
	C8.1.2.1 Natural sand	cubic metre (m ³)
	C8.1.2.2 Crusher sand	cubic metre (m ³)
The unit of measurement shall be the cubic metre of aggregate used for blinding on the instructions of the Engineer.		
The tendered rate shall include full compensation for procuring, furnishing and applying the aggregate for blinding where directed by the Engineer and for maintenance of the blinding layer, as specified.		

Item	Description	Unit
C8.1.3	Extra over item C8.1.1 for applying the prime coat accessible only to hand-held or light equipment	litre (ℓ)

The unit of measurement shall be the litre of priming material measured at spraying temperature and sprayed in accordance with the requirements for areas accessible only to hand-held or light equipment and shall include for all additional costs.

A8.2 COVER SPRAYS, FOG SPRAYS AND REJUVENATION SPRAYS

PART A: SPECIFICATIONS

A8.2.1 SCOPE

This Section covers the work in connection with the application of cover sprays, fog sprays and rejuvenation sprays.

A8.2.2 DEFINITIONS

Cover spray - refers to the application of a diluted emulsion as a final binder application on single or double seals or before application of the slurry, in case of Cape seals.

Fog spray or rejuvenation spray - is used for the application of diluted anionic emulsion or rejuvenator for purposes of adding additional binder to the seal or rejuvenating the seal at a later stage of the seal life.

The convention for describing diluted emulsion in this document is to state the type of emulsion with the proportion of emulsion and water in brackets e.g. 65 % cationic emulsion (60/40), which defines the mix as 60 % of the cationic emulsion and 40 % water.

A8.2.3 GENERAL

Fog sprays in the form of diluted anionic emulsion or inverted bitumen emulsion are applied during the service life of an existing bituminous surfacing to add additional binder or to rejuvenate the existing binder. Fog sprays using stable grade diluted anionic emulsions are applied as a pretreatment prior the application of a surfacing seal, if specified.

Diluted cationic spray grade emulsions are used as cover sprays during seal construction or shortly thereafter where the seal is sensitive to aggregate loss.

A8.2.3.1 Weather limitations

Weather limitations as specified in Clause A10.1.3.2 of Chapter 10 shall apply.

A8.2.3.2 Nominal rate of application for cover sprays, fog sprays and rejuvenation sprays

The nominal rate of application for tender purposes shall be:

- a) Diluted cationic emulsion cover spray at 1,0 l/m²
- b) Diluted anionic or cationic emulsion cover spray, in the case of Cape seals, at 0,8 l/m²
- c) Diluted anionic emulsion fog spray as enrichment treatment at 0,8 l/m²
- d) Rejuvenation spray with cut-back inverted emulsion or other Agrément certified products at 0,5 l/m²

A8.2.5 MATERIALS

A8.2.5.1 Bitumen

a) Cover spray

Diluted 65 % cationic spray grade emulsion, or 60 % anionic stable grade emulsion, with the dilutions as specified in Part C: Measurement and Payment.

b) Fog spray as enrichment treatment

A diluted 60 % anionic stable-grade emulsion (50/50) shall be used.

c) Rejuvenation spray

Agrément SA certified products or inverted bitumen emulsion complying with SANS 4001 – BT5, with the exception that the Viscosity at 60 °C on residue from distillation shall be between 10 and 20 Pas.

A8.2.7 EXECUTION OF THE WORKS

A8.2.7.1 Preparation and execution

The areas to be treated shall be cleaned of all dust, dirt, dung, oil or any other foreign matter.

The treatment shall consist of the application of a cover spray, fog spray or rejuvenation spray of the specified grade and dilution of bituminous emulsion to the existing surface, by means of a pressure distributor, at the rate of application as specified in the Contract Documentation or as directed by the Engineer, in widths that may vary from 0,5 m to 4,0 m.

A water tanker with a pressure distributor shall be available on standby for pre-wetting or post-wetting the areas scheduled for fog spray.

A8.2.7.2 Opening to traffic

Treated sections shall only be opened to traffic when the emulsion has properly cured and tackiness has reduced to the extent that no pickup occurs. Should pick-up occur after opening, immediate action is required by the Contractor to stabilise the situation through closure, water spraying or blinding with approved coarse sand.

Traffic accommodation shall comply with the specifications in Clause A1.5 of Chapter 1.

A8.2.8 WORKMANSHIP

The requirements of Clauses A10.1.3.9 and A10.1.3.4 of Chapter 10 regarding joints between sprayed strips and the protection of kerbs, channels, barriers, any structures, etc, shall apply.

The provisions of Part A shall apply.

C8.2 COVER SPRAYS, FOG SPRAYS AND REJUVENATION SPRAYS

PART C: MEASUREMENT AND PAYMENT

(i) Preamble

The tendered rate for each item shall include full compensation for providing, maintaining and decommissioning upon completion, of all the plant, equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the item, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the conditions of contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum item.

The requirements of Section C1.1 of Chapter 1 shall apply.

Where pay item descriptions include any wording in brackets it is an indication that contract specific information is to be inserted in the Pricing Schedule included in the Contract Documentation.

(ii) Items that will not be measured separately

The following activities, whether required to complete the specified work or not, will not be measured and paid for separately and the Contractor shall include the cost thereof in other pay items as he deems appropriate:

1. No separate payment will be made for setting out the works.
2. No separate payment will be made for the protection or repair as required of any existing or new road furniture, structures, buildings, infrastructure or services damaged by the Contractor's activities.
3. No additional payment shall be made, nor shall any claim for additional payment be considered, for any specified work in confined or restricted areas. Any additional costs associated with working in confined or restricted areas shall be deemed to be included in the standard applicable pay items.
4. No separate payment will be made for the loading of any materials.
5. No separate payment will be made for the hauling of any materials where the material is moved over a distance of less than, and up to 1,0 km.
6. No separate payment will be made for transporting materials from commercial sources irrespective of the hauling distance.
7. No separate payment will be made for the removal or any surplus material imported to complete the works.

8. For all Works performed, precautionary measures required in terms of the Occupational Health and Safety Act (Act 85 of 1993) and the latest amendments thereof as well as the latest Construction Regulations shall be deemed included in the rates tendered for the relevant products. **(iii) Items to be measured and paid for using items specified elsewhere in the specifications**

Not applicable to this Section.

(iv) Items specifically for this Section of the specifications

Item	Description	Unit
C8.2.1	Cover sprays, fog sprays and rejuvenation sprays	
C8.2.1.1	65 % Cationic spray grade emulsion	
(a)	Indicate dilution (Diluted ..% Emulsion/...% Water)	litre (ℓ)
C8.2.1.2	60 % Anionic stable grade emulsion	
(a)	Indicate dilution (Diluted ..% Emulsion/...% Water)	litre (ℓ)
C8.2.1.3	Cutback Inverted bitumen emulsion	litre (ℓ)
C8.2.1.4	Certified rejuvenator (State type and certification)	litre (ℓ)

The unit of measurement shall be the litre of binder measured at spraying temperature and sprayed in accordance with the requirements.

The tendered rates shall include full compensation for cleaning and preparing the existing surface, for furnishing the material and applying the binder and for all other incidentals necessary for completing the work as specified.

Item	Description	Unit
C8.2.2	Extra over item C8.2.1 for labour enhanced application	
C8.2.2.1	65 % Cationic spray grade emulsion	
(a)	Indicate dilution (Diluted ..% Emulsion/...% Water)	litre (ℓ)
C8.2.2.2	60 % Anionic stable grade emulsion	
(a)	Indicate dilution (Diluted ..% Emulsion/...% Water)	litre (ℓ)
C8.2.2.3	Cutback inverted bitumen emulsion	Litre(ℓ)
C8.2.2.4	Certified rejuvenator (State type and certification)	litre (ℓ)

A10.1 GENERAL REQUIREMENTS FOR SURFACE TREATMENTS PART A: SPECIFICATIONS

A10.1.1 SCOPE

This Chapter covers all the material requirements and work in connection with the construction of surface treatments incorporating single seals, multiple stone seals, sand seals, Cape seals, graded aggregate seals, slurry seals and microsurfacing.

A10.1.2 DEFINITIONS

Surface treatments - encompass thin bituminous surfacings applied as wearing courses for new construction or as reseals.

Bitumen -is a dark brown to black viscous liquid or solid, consisting essentially of hydrocarbons and their derivatives. It is soluble in trichloroethylene, is substantially non-volatile, and softens gradually when heated. Bitumen is obtained by refining petroleum crude oil.

Penetration grade bitumen -is manufactured by straight-run distillation of crude oil or by blending two or more base components (one hard, such as 40/50 pen, and the other soft, such as 150/200 pen). Penetration grade bitumen is used either as a primary binder (70/100 pen for surface seal work in South Africa) or as a base bitumen for the manufacture of cut back bitumen, modified binders or bitumen emulsions.

Bitumen emulsions -are two-phase systems consisting of a dispersion of bitumen droplets in water which contains an emulsifier. The emulsifiers are added to assist in the formation of the emulsion, to render it stable,

and to modify its properties. Different grades of emulsion are manufactured to allow slower and faster curing e.g. stable grade (Slow setting) is required for labour intensive work and manufacturing of conventional slurries. Spray grade (Rapid setting) emulsions are preferred for spray sealing. The terms cationic and anionic derive from the electrical charges on the bitumen globules. The positively charged cationic emulsions are preferred for construction of sprayed seals due to superior adhesive properties with the mostly negatively charged aggregate used for seal work in South Africa.

Cutback bitumens -are blends of penetration grade bitumen and slow, medium or rapid curing solvents. The choice of solvent determines the rate at which the bitumen will "set up" or cure when exposed to air. A rapid-curing (RC) solvent will evaporate more quickly than a medium-curing (MC) solvent, which in turn will cure more rapidly than a slow-curing (SC) solvent. The viscosity of the cutback bitumen is determined by the proportion of solvent added. MC-30 used for prime coats has a high percentage of medium curing solvent (45 %) with a very low viscosity. MC-3000 used for sprayed seal work has approximately 12 % solvent allowing application at low road surface temperature.

Modified binders -modification is achieved by the introduction of polymers, crumb rubber, aliphatic synthetic wax or naturally occurring hydrocarbons to a penetration grade bitumen. Modified binders for seal work are classified into:

- Hot homogeneous modified binder S-E1 and S-E2 for spray sealing and C-E1 for crack sealing (refer properties in TG1)
- Cold homogeneous modified binder SC-E1 and SC-E2 for spray sealing and CC-E1 for crack sealing
- Hot non-homogeneous modified binder S-R1 and S-R2 for spray sealing and C-R1 and C-R2 for crack sealing.

Aggregate for seal work consists mainly of crushed rock with specified hardness, durability, polishing resistance, adhesion to bitumen and falling within selected grading envelopes. Screened natural gravels and sand as well as crushed slag, separated from metals during the smelting or refining of ore, are also used with success for specific seal types.

Sprayed seals - are constructed by spraying bituminous binder, spreading of aggregate and rolling. For purpose of this document sprayed seals are divided into sand/ grit seals, single stone seals (including single stone and sand blinding layer), Multiple stone seals (Double or triple stone seals) and Graded aggregate seals e.g. Otta seals.

Combination seals -are defined as seal types consisting of at least two components of different character e.g. Cape seals (Single stone seal with one or two layers of slurry) and Slurry-bound Macadam seals.

Slurry -is a homogeneous mixture consisting of fine aggregate (normally crusher dust), or where required to satisfy grading requirements and permitted, a blend of crusher dust and a limited percentage approved natural sand, stable grade bitumen emulsion (anionic or cationic) or a polymer modified stable grade emulsion, active filler (usually cement or lime), water, additive to retard the setting rate of rapid setting slurry) and Polymer (in case of microsurfacing).

Tack coat - is defined as the first application of binder for a sprayed seal or a Cape seal

Penetration coat - is defined as the second application of binder on a multiple stone seal

The **term cover spray** - refers to the application of a diluted emulsion as a final binder application on single or double seals or before application of the slurry, in case of Cape seals.

The term **fog spray or rejuvenation spray** -is used for the application of anionic emulsion, diluted anionic emulsion or invert emulsion rejuvenator for purposes of adding additional binder to the seal or rejuvenating the seal at a later stage of the seal life. Specifications for this type of treatment are provided in Chapter 8.

A10.1.3 GENERAL

A10.1.3.1 Requirements pertaining to all surface treatments

Adequate advance notice shall be given to the Engineer before the Contractor proceeds with any seal work. This notice shall include the program containing exact dates and sections to be sealed as well as the stockpile/s which will be used for each section.

Seal work shall not commence until a design has been submitted for each section and approved by the Engineer.

The areas to be sealed shall be cleaned of all dust, dirt, dung, oil or any other foreign matter that may be deleterious to the seal. Sealing work shall not commence until the Engineer has approved all preparatory works ordered on that section of road.

Unless otherwise agreed by the Engineer and subject to the outcome of a trial section, the Contractor shall programme all spraying to cease each working day at 15:00.

The Contractor shall comply with the requirements of Chapter 1 regarding traffic over completed layers

Wherever reference is made to distance the measurements for length shall be taken as actual lengths measured along the road centreline.

All quantities of sprayed binder and variations shall be measured at spray temperature of the applied binder.

A10.1.3.2 Weather limitations

The following general limitations shall apply:

- Whenever the temperature of the road surface falls below the specified temperature for the binder to be applied or will probably fall below the required temperature before spraying the binder, no binder shall be sprayed;
- No bituminous work shall be done during foggy or rainy weather and, when a cold wind is blowing, the above temperatures as specified in the sub-sections below, shall be increased by 3°C to 6°C.
- When strong winds (more than 30 km/h) are blowing which are likely to interfere with the proper execution of the work, no sealing, especially spraying of binder, shall be done;
- No sealing shall be done when rain or cold temperature is imminent;
- No sealing shall be done when the surface of the layer is visibly wet, i.e. more than damp;
- No sealing shall be done after sunset

Only emulsion products, MC3000 and cutback S-E1 binder shall be permitted during the embargo period stated in the Contract Documentation. Special formulated winter grade binders shall only be allowed if provision is made in the Contract Documentation.

The minimum road-surface rising temperatures at which the spraying of the different types and grades of binder shall be allowed are specified in Table A10.1.3-1.

Table A10.1.3-1: Minimum road-surface rising temperature

Bituminous binder type	Minimum rising road surface temperature
70/100 penetration-grade	25°C
MC 3000	10°C
Cationic emulsion	10°C
Anionic emulsion	10°C
S-E1	25°C
S-E2	25°C
S-R1	25°C
S-R2	25°C
SC-E1	10°C
SC-E2	10°C
S-E1 cut back with 4.5% MC30	23°C
S-E1 cut back with 9.0% MC30	21°C

Any special formulated binder not defined above	As specified in the Documentation Contract

Conventional slurry shall not be applied at an air temperature of less than 7°C when temperatures are rising or less than 13°C when temperatures are dropping.

During hot weather slurry operations shall be suspended when aggregate is being displaced by the spreader boots or squeegees.

Rapid setting slurry or microsurfacing shall be sufficiently versatile to be laid in air temperatures of 4°C to 40°C as well as capable of being laid under damp conditions. When the breaking process accelerates to such an extent that it renders the product unworkable to attain the required end result, no further work shall be done until adjustments to the composition of the product have been proven through trial sections and approval by the Engineer.

A10.1.3.3 Areas inaccessible to mechanical equipment

a) Bituminous binder application

Each area that is to be sealed shall be screened off by means of fibre-reinforced paper, so that only the area to which the binder is to be applied will be exposed.

Bituminous binders shall be applied at the rate specified in the Contract Documentation by means of a binder distributor. Hand-spray or light appropriate equipment may be used only with the written approval of the Engineer and then only in accordance with approved methods under the strict supervision of experienced personnel and with equipment suitable for performing the work in accordance with specified requirements.

The application of binders shall be controlled to ensure that the specified application rates are obtained.

b) Aggregate

The aggregate shall be of the same size as the aggregate in the existing surrounding seal and shall be spread by hand.

c) Rolling and brooming

Each layer of the seal shall be rolled with the most effective rollers that can be used in the area in question and thereafter the excess aggregate shall be swept off the surface with hand brooms

d) Grit or slurry application

The Engineer may require Grit or a texture slurry to be applied to areas subjected to traffic turning actions. The slurry and application thereof shall comply with the requirements of Section A8.3 of Chapter 8. Grit shall conform to specifications in Clause A10.1.5.14. The Engineer may order precoat of the Grit and application of diluted cationic emulsion before spreading the Grit.

A10.1.3.4 Protection of kerbs, channels, etc.

Kerbs, channels, manholes, guard rails, bridge railings and any other structures, adjoining seals to be constructed shall be protected from soiling. The Contractor shall replace at his own cost any items that have been soiled.

A10.1.3.5 Moisture content

No seal shall be placed immediately after a rainy spell on an existing partly cracked and /or highly permeable surfacing resulting in the trapping of moisture in the pavement structure. A minimum delay of 24 hours shall apply. Seal work shall not be permitted on new granular base layers of type G1, G2 or G3 if the moisture content in the upper 50 mm exceeds 50 % of the optimum moisture content as determined in accordance with SANS 3001 NGR30.

Seal work shall not be permitted on new granular base layers of type G4 or G5, if the moisture content in the upper 50 mm exceeds 60 % of the optimum moisture content as determined in accordance with SANS 3001 NGR30.

These limitations shall apply even if the layer has been previously primed.

A10.1.3.6 Pretreatment

New base layers shall be pre-treated if the volumetric macro texture depth varies with more than 40 % or if the macro texture exceeds the guideline values for different seal types as published in SABITA Manual 40.

Existing roads that require resealing shall, if so specified in the Contract Documentation, be given a pretreatment in accordance with one or more of the methods described in Chapter 8.

The following curing periods shall apply to the various treatments listed, prior to applying to seal/reseal unless otherwise specified in Contract Documentation:

Texture treatment using fine slurries.....	6 weeks
Coarse slurry, rapid setting slurry or micro-surfacing applied as screed or rut filling	12 weeks
Crack sealing	2 weeks
Asphalt patches for pavement repair	6 weeks
Bitumen treated granular materials.....	4 weeks
Untreated granular and cement stabilized materials.....	2 weeks

The Engineer may reduce the specified curing period for slurry, micro-surfacing and asphalt application, based on a representative corrected ball penetration (SANS 3001-BT10), at the expected operating road surface temperature (Refer SABITA Manual 40) of less than 2,0 mm.

A10.1.3.7 Demarcation of working area

The Contractor shall demarcate the area to be sealed by means of setting out string lines along each edge of the specified seal area. The intervals for setting out horizontal curves shall be as agreed with the Engineer.

Before the tack coat and first application of aggregate may be applied, the centreline of the road shall be demarcated by means of a clearly visible fibre rope, pegged down with nails driven into the existing surface or primed base at intervals of 15 m on straight sections and 3,0 m apart on curves. The demarcating rope shall be removed prior to the application of the tack coat and aggregate on the adjacent lane.

A10.1.3.8 Dust control

Any temporary deviations and construction roads shall be kept watered and damp during all sealing operations and all dust shall be removed from surfaces before any binder, aggregate or slurry is applied.

The supply and application of water on temporary deviations will be paid for separately as specified in Clause A1.5.7.10 of Chapter 1 but payment for watering the haul and construction roads shall be included in the unit rates tendered for the various types of seals used.

A10.1.3.9 Spray joints

a) Transverse joints

In order to prevent overlapping at junctions of separate binder applications the previous work along the joint shall be covered with removable reinforced paper for a sufficient distance back from the joint to ensure that the sprayer is operating at the required speed before the untreated surface is reached and also to prevent additional binder application onto the previously treated section. The same method shall be used to ensure a neat joint at the end of the run.

b) Longitudinal joints

Longitudinal joints shall be constructed meeting the following requirements:

- Unless specified differently in the Contract Documentation, the spraying of adjacent strips shall overlap by 200 mm i.e. 100 mm of 2/3 application and 100 mm of 1/3 application
- The string line on the joint shall demarcate the area sprayed at full application and 2/3 application
- No turning of the end nozzles or use of fish plates shall be allowed at longitudinal joints
- Aggregate shall only be applied on the area with full triple overlap binder application
- No longitudinal joints are allowed in the wheel tracks
- All aggregate applied on the 2/3 and 1/3 binder application shall be broomed back or chipped off in a neat straight line before the adjoining spray
- All stone-loss shall be made good by the Contractor at no additional cost.

A10.1.3.10 Traffic limitations

Traffic shall not be allowed:

- On a single seal or double seal prior to application of the cover spray, if designed with a cover spray
- On the first layer of aggregate of a double seal, second layer of a triple seal (split application double seal) or Cape seal (single seal with slurry)
- On non-completed longitudinal joints

Stop/go positions shall not be allowed at steep grades.

Speed restriction of maximum 60 km/h shall be enforced for at least 24 hours after opening to traffic or for such time as determined by the Engineer. The Contractor shall not allow any construction equipment which is likely to cause damage, over the completed seal.

A10.1.3.11 Opening to traffic

The road shall not be opened to traffic until sufficient adhesion has developed between the binder and aggregate cover sprays, fog sprays and rejuvenation sprays have lost its tackiness or in the case of slurry seals, the slurry has cured completely.

When non-fluxed binders are applied and cold temperatures are expected, the road shall only be opened to traffic when the surface temperature increases above 20°C.

During the specified embargo period, and unless MC3000 has been used, the road shall only be opened to traffic when the road surface temperature increases above 20°C. Closures are required for the first three days after sealing when the road surface temperature falls below 20°C

When rain is imminent, the road shall only be opened to traffic once the surface is dry.

The Contractor shall erect and maintain the necessary temporary traffic-control signs in accordance with the requirements in the Contract Documentation and the latest version of the South African Road Traffic Signs Manual.

Where a double application of slurry has been specified in case of single seals with slurry, the Contractor shall open the road to traffic before the second layer of slurry is applied.

Where road widths allow, traffic shall be directed through placement of delineators to compact the full width of the applied seal.

A10.1.3.12 Trial sections

Before the Contractor commences with the construction of any seal work he shall demonstrate that the equipment and processes he proposes to use will enable him to construct the seal in accordance with the specified requirements.

At the commencement of the surfacing operation, a 200 m lane section shall be considered as a trial. After completion of each phase of the seal on this 200 m section, the Engineer will review and then approve/reject the work method. If approval is granted for a specific operation i.e. application of tack coat, aggregate, fog or slurry, the Contractor shall proceed with that approved operation and document the approved method statement, which shall include aggregate spread rates, the timing, type, sequence and number of roller passes, as well as the approved strategy for opening to traffic.

Trial sections for sand seals and Grit seals, using emulsion, shall specifically be designed to evaluate the appropriate timing of aggregate application to prevent wave forming as well as the sequence and timing of rollers to prevent pick up.

Should the Contractor at any stage fail to deliver an accepted product, as adjusted, he shall rectify the problems at his own cost, demonstrate with a further trial section that he can carry out the operation successfully and revise the method statement. No specific payment shall be made for conducting these additional trials.

A10.1.3.13 Maintenance

The Contractor shall maintain the bituminous surface until the work is finally accepted by the Employer, after the specified Defects Notification Period. Any damage related to design, materials and workmanship or any defects which may develop before the issue of the Performance Certificate, fair wear and tear and 3rd party mechanical damage excepted, shall be corrected by the Contractor at his own cost.

Treatment of defects shall be carried out in accordance with Chapter 8.

Penalties in accordance with Part D of this Chapter shall apply, when applicable.

A10.1.3.14 Nominal rates of application for tender purposes

The nominal rates of application provided in these specifications are for tendering purposes only and will not necessarily be used in construction. Application rates for all bituminous binders shall be specified at spraying temperature.

All binders, aggregates and slurry used in the various types of seals shall be applied at the rates of application as approved by the Engineer after:

- Measurement of the existing surface characteristics
- Testing of the materials proposed for use
- Aggregate spread rate determination on site
- Construction and evaluation of a trial section
- Documentation of the method statement and approval thereof

a) Single seals

The nominal rates of application given in Table A10.1.3-2 shall be used for tendering purposes only.

The actual application rate shall be as approved by the Engineer after assessing the Contractor's design proposals.

Table A10.1.3-2: Nominal binder application rates for single seals

Nominal size of aggregate mm	Nominal rates of binder application for tack coat (l/m ²)				Nominal aggregate spread rate (m ² per m ³)	
	Conventional bitumen and emulsion. (Residual cold bitumen)	Homogeneous modified emulsion. (Residual cold binder)	Hot applied homogeneous modified bitumen at spray temperature.	Hot applied non-homogeneous modified binders at spray temperature	Aggregate spread rate for conventional and homogeneous modified binders	Aggregate spread rate for non-homogeneous modified binders
20	1,6	1,6	1,9	2,7	70	65
14	1,4	1,4	1,7	2,1	100	90
10	1,0	1,0	1,2	1,6	140	130
7,1	0,75	0,75	0,9	1,1	200	
5	0,6	0,6	0,7		250	

b) Multiple stone seals

The nominal rates of application given in Tables A10.1.3-3 and A10.1.3-4 shall be for the purposes of tendering only and the actual rates of application shall be approved by the Engineer.

The use of cut-back bitumen in the tack coat will only be permitted under special circumstances and if so specified in the Contract Documentation.

Table A10.1.3-3: Nominal rates of first application of binder and aggregate for multiple stone seals

Nominal size of aggregate mm	Nominal rates of binder application for tack coat (l/m ²)				Nominal aggregate spread rate (m ² per m ³)	
	Conventional bitumen and emulsion. (Residual cold bitumen)	Homogeneous modified emulsion. (Residual cold binder)	Hot applied homogeneous modified bitumen at spray temperature	Hot applied non-homogeneous modified binders at spray temperature	Aggregate spread rate for conventional and homogeneous modified binders	Aggregate spread rate for non-homogeneous modified binders
20	1,2	1,2	1,3	2,0	75	65
14	0,9	0,9	1,0	1,8	110	90
10	0,7	0,7	0,8	NA	150	130

Table A10.1.3-4: Nominal rates of application for second binder and final aggregate

Nominal size of aggregate mm	Nominal rates of binder application for penetration coat (l/m ²)				Nominal aggregate spread rate (m ² per m ³)	
	Conventional bitumen and emulsion. (Residual cold bitumen)	Homogeneous modified emulsion. (Residual cold binder)	Hot applied homogeneous modified bitumen at spray temperature	Hot applied non-homogeneous modified binders at spray temperature	Aggregate spread rate for conventional and homogeneous modified binders	Aggregate spread rate for non-homogeneous modified binders
10	1,0	1,0	1,2	1,8	165	140
7,1	0,8	0,8		-	170	
7,1 (1st layer)*	n/a	n/a		-	250	
7,1 (2nd layer)*	1	1	1,1	-	150	
5	0,6	0,6	0,9	-	230	

*Split application 20/7 double seal

Residual cold binder is defined as the net binder (bitumen, polymers and additives) cold at a temperature of 20°C. The hot applied binder is calculated by multiplying the residual cold bitumen by the "Cold to hot" conversion factors published in TRH3.

c) Nominal binder application and aggregate spread rates for sand and grit seals

The nominal rates of application given in Table A10.1.3-5 shall be for the purposes of tendering only and the actual rates of application shall be as approved by the Engineer.

Table A10.1.3-5: Nominal binder and aggregate application rates for sand and Grit seals

Seal Type	Hot applied 70/100 Pen bitumen at spray temperature.	Hot applied MC3000 at spray temperature.	Hot applied Emulsion at spray temperature.	Aggregate spread rate (m ² per m ³)
Grit precoated		1,1	1,1	200
Grit unprecoated		1,2	1,3	200
Sand	1,0	1,2	1,3	180

d) Nominal binder application and aggregate spread rates for Cape seals (Single seal component)

The nominal rates of binder and aggregate application provided in Table A10.1.3-6 shall apply for tender purposes only.

Table A10.1.3-6: Nominal application for binder and single sized aggregate application in Cape seals

Nominal size of aggregate (mm)	Conventional bitumen and emulsion. (Residual cold bitumen)	Homogeneous modified emulsion. (Residual cold binder)	Hot applied homogeneous modified bitumen at spray temperature.	Aggregate spread rate for conventional and homogeneous modified binders

20	1,2	1,2	1,5	75
14	0,9	0,9	1,2	110
10	0,65	0,65	0,8	150

Residual cold binder is defined as the net binder (bitumen, polymers and additives) cold at a temperature of 20°C. The hot applied binder is calculated by multiplying the residual cold binder by the “Cold to hot” conversion factor published in TRH3.

e) Nominal binder application and aggregate spread rates for Cape seals (Slurry component)

The following proportions per cubic metre of slurry shall apply for tendering purposes only:

(i) First or only slurry application

Slurry aggregate (saturated volume)..... 1,0 m³
Stable-grade emulsion at mixing temperature..... 230 / Cement
..... 16,5kg³
Water..... 210 /

(ii) Second slurry application

Slurry aggregate (saturated volume) 1,0 m³
Stable-grade emulsion at mixing temperature..... 260 /
Cement
..... 16,5kg³
Water..... 200 /

The following spread rate of slurry (saturated aggregate volume) shall apply for tender purposes only: **Table A10.1.3-7: Nominal spread rate of slurry for Cape seals**

Nominal size of aggregate (mm)	First layer of slurry (m ² per m ³)	Second layer of slurry (m ² per m ³)
20	140	185
14	150	
1	180	

f) Nominal binder application spread rates for Slurry-bound Macadams

The nominal rates of aggregate and slurry application provided in Table A10.1.3-8 shall apply for tender purposes only.

Table A10.1.3-8: Nominal application rates of aggregate and Slurry for Slurry-bound Macadam

Layer Thickness (mm)	Nominal size of aggregate (mm)	Aggregate spread rate (m ² /m ³)	Slurry Spread rate (m ² /m ³)
25	14	40	16
30	14	33	13
30	20		
40	20	25	10
50	20		
50	28	20	10

The following proportions per cubic metre of slurry shall apply for tendering purposes only:

Slurry aggregate (saturated volume)	1,0 m
Stable-grade emulsion at mixing temperature	230 l
Cement.....	0,01m
Water.....	200 l

g) Cover sprays

The nominal hot application rate of a diluted emulsion cover spray (50/50) as specified, shall for tender purposes be 0,8 l/m². **h) Slurry**

The nominal rate for a void filling coat of diluted 60 % anionic stable-grade emulsion (50/50), before application of the slurry, for tender purposes, shall be 0,8 l/m².

The nominal binder content of the slurry (60 % anionic stable-grade emulsion), for tender purposes shall be taken as 235 l/m³. The nominal active filler content of the slurry, for tender purposes shall be taken as 16,5 kg/m³.

The nominal rate of slurry application is dependent on the thickness and shall be specified in the Contract Documentation. **i) Micro-surfacing**

The nominal binder content (emulsion) for tender purposes shall be taken as 180 l/m³.

The nominal rate of micro-surfacing application is dependent on the thickness and shall be as specified in the Contract Documentation.

A10.1.3.16 Pre-coating fluid

For tender purposes the nominal quantity of pre-coating fluid for the relevant nominal aggregate sizes is specified in Table A10.1.3-9.

The nominal application rates as provided in Table A10.1.3-9 are for tender purposes only and must be verified in the site laboratory, with upward adjustment in case of pre-coating on stockpile by hand or front-end loader. **Table A10.1.3-9: Nominal rates for pre-coating fluid**

Nominal aggregate size (mm)	Nominal pre-coating application on stockpile or by hand rate (l/m ³)	Nominal pre-coating application plant pre-coating rate (l/m ³)
20	12	10
14	14	12
10	16	14
7,1	18	16
5 or Grit	20	18

If required, an adhesion agent approved by the Engineer shall be added to the pre-coating fluid at a rate of 0,5 % of the volume of pre-coating fluid.

A10.1.6 CONSTRUCTION EQUIPMENT

The following equipment shall be available and in good working order:

A10.1.6.1 Binder distributor

The binder distributor used for distributing the bituminous binders shall-

- Comply with SANS 3001-BT20 and shall be covered by a valid certificate of compliance with SANS 3001-BT20, *not older than 12 months*, issued by an accredited testing organisation
- Not have any fuel, oil or binder leaks;
- Have a straight and clean spraybar, all the spray heads of which shall be of the same type which operate simultaneously and shall not leak when closed;

- Have its spray heads all spraying at the same angle to the spraybar and the height adjusted to the correct level so as to obtain the required overlapping. The uneven application of binder shall be unacceptable.
- Have its sieve undamaged and clean;
- Be under the direct control of an operator approved by the Engineer on the grounds of a CV with experience and list of contracts completed with references, in writing or a certificate of competence signed by a representative of a road authority;
- Be fitted with a suitable cut-off spray-head (end nozzles) or fishplates to prevent over spraying onto gravel shoulders or staining of concrete elements on the edge of the surfacing of the road.
- Be capable of spraying the binder at the specified applications rates. The pump of the distributor shall be capable of delivering the binder at the spray bar nozzles at the correct pressure to obtain the specified application rates, irrespective of the viscosity properties of the prescribed binder and the number of nozzles open.
- Fitted with a suitable valve or other access gate for taking of samples of the binder for testing purposes.

The binder distributor, pumps and nozzles, used for non-homogeneous modified binder shall be adapted to spray the rubber modified binder satisfactorily. The Contractor shall provide proof by way of a test on the site that the binder distributor has sufficient reserve power to maintain the required constant speed up the steepest incline to which spray has to be applied and to obtain a uniform distribution of the binder.

The transverse distribution of the spray bar shall be field-verified by means of SANS 3001-BT24. Measurements of transverse distribution ('Bucket test') for a binder distributor. The maximum permissible tolerance permitted between the troughs (excluding the outer 300 mm) is dependent on the viscosity of the binder type being applied and shall be as follows:

- All emulsions, cutback and penetration grade bitumens – 5 %
- Hot homogeneous modified bitumens – 7 %
- Non-homogeneous binders (bitumen rubber) – 10 %

The spray bar shall be of such design as to allow for any adjustments to be made in order to meet the above tolerances. This procedure shall be carried out each time the distributor is first established on site and once a week thereafter or when a problem with transverse distribution is suspected. The distributor shall thus have a set of troughs available in order to allow the execution of the test. For limited quantities of spray-work, the Engineer may accept the results of a recently completed distribution test that has been recorded and approved by an independent supervisor on the distributor's test log book.

The transverse distribution of spray flairs shall be field verified according to SANS 3001-BT24 and Clause A20.1.5.9 of Chapter 20. The maximum permissible tolerance permitted for each trough from the average of the nine troughs is 10 %.

A10.1.6.2 Chip spreaders

The chip spreaders shall be capable of spreading stone of the specified size uniformly and shall be capable of adjustment to permit variation of the rate of application within the specified tolerances and uniform spreading in both the transverse and longitudinal directions.

The chip spreader shall be capable of delivering a proper and uniform transverse distribution of chips across the width of application. The chip distribution shall be tested by means of canvas patches, each 1,0 m by 1,0 m and placed side by side over the full width of application. The mass of chips spread onto each individual canvas patch shall not deviate by more than 10 % from the spread rate determined as part of the trial section and recorded in the approved method statement.

At least two chip spreaders shall be provided on site, one of which shall be self-propelled.

In cases where the sprayed width exceeds the maximum spread width of the chip spreader, an additional chip spreader shall be provided to apply aggregate on the remaining strip within twenty seconds of the first chip spreader.

Spreaders which are not self-propelled shall be of a type that can be attached quickly to the rear of trucks and operated while backed over the aggregate being spread.

A non-self-propelled chip spreader may only be used in the event:

- of a breakdown of the self-propelled chip spreader during a pull, and shall be limited to the completion of that pull. No further application of binder shall be permitted until such time as the self-propelled chip spreader is repaired or replaced.
- of spreading Class 3 aggregate, Graded aggregate, Sand- or Grit seals and Slurry-bound Macadam seals.

A10.1.6.3 Rollers

a) General

Sufficient operational rollers of each of the following types shall be available on the works to maintain the required tempo of work.

- Pneumatic tyred rollers (minimum two)
- Rubber-soled steel wheel rollers (as and when specified in the Contract Documentation)
- Light steel wheeled rollers of 2 – 4 tons (minimum two)
- Heavy steel wheel rollers of 5 – 12 tons (as and when specified in the Contract Documentation)

The timing, sequence of rolling and number of passes for each seal type shall be in accordance with the approved method statements following completion of the trial sections.

No seal work shall continue if the required rollers are not on site or

not in an operational condition. **b) Pneumatic-tyred rollers**

Pneumatic-tyred rollers shall be of a self-propelled type equipped with smooth flat profile pneumatic tyres of uniform size and diameter. The mass of the roller shall not be less than 2 ton per wheel.

The rollers shall be equipped with suitable devices for keeping the wheels wet and clean with water or non petroleum-based products during operation.

The wheels of the roller shall be so spaced that one pass of the roller will provide one complete coverage equal to the rolling width of the machine. The total operating mass and tyre pressure shall be in accordance with the manufacturer's recommendations. Individual tyre pressures shall not differ by more than 35 kPa from one another.

In case of sealing more than 12 000 m² per day, using hot binder, at least three

pneumatic-tyred rollers are required. **c) Rubber-soled steel-wheeled rollers**

Rubber-soled steel-wheeled rollers shall be self-propelled and have a mass of between 6 and 8 tons. It shall be equipped with suitable devices for cleaning and moistening the wheels using water or non-petroleum-based products. The wheels of the roller shall be so arranged as to give one or two complete coverage by one passage of the roller, over a width equal to the rolling width of the roller. **d) Steel-wheeled rollers**

Steel-wheeled rollers shall be self-propelled tandem rollers of between 2 and 4 tons mass and shall be equipped with suitable devices for cleaning and moistening the wheels using water or non-petroleum-based products. Heavier rollers shall only be permitted when specified in the Contract Documentation and tested for excessive crushing during construction of the trial section. No steel-wheeled rollers shall be used on the final aggregate layer without the consent of the Engineer, unless a cover spray will be applied after brooming the surface.

A10.1.6.4 Water sprinkler

The water sprinkler shall have efficient spray equipment, capable of spraying a uniform film of water over the whole area to be primed.

A10.1.6.5 Rotary broom

The rotary broom shall be height adjustable self-propelled or a towed type supplied together with a suitable pneumatic-tyred towing vehicle. The minimum bristle length allowed shall be 70 % of the initial length.

A10.1.6.6 Drag broom

A triangular or "Z-shaped" drag broom shall be provided together with a suitable pneumatic-tyred towing vehicle and capable of being ballasted to distribute the specified seal aggregate size.

A10.1.6.7 Miscellaneous equipment

Sufficient equipment for handling and hauling aggregate, binder and slurry, and blending units for non-homogeneous modified binders, shall be provided to ensure prompt and continuous placing and application of bituminous materials as specified. The Contractor shall have available all the necessary ancillary equipment, which shall include hand brooms, mat or reinforced paper for joints, string, nails and hand tools to carry out the work efficiently.

Suitable protective clothing shall be worn at all times.

Suitable fire-fighting equipment for dealing with fires shall be available on site, together with suitable first aid equipment for dealing with injuries and evacuation transport in case of bitumen burns. (Refer to Sabita Manual 8 Bitumen Safety Handbook.)

The Engineer shall be entitled to request reserve plant should there be any doubt as to the efficiency or capability of the equipment provided.

A10.1.6.8 Batch mixer for slurry

A mixer shall be provided in a good working order capable of producing a uniform slurry of the constituent materials. All the constituents of the slurry shall be accurately proportioned and due care and attention shall be given to the sequence in which the ingredients are introduced into the mixer and to the period of mixing. Volume batching will only be permitted with the written approval of the Engineer. Mixing shall be continued until the materials in each batch are thoroughly blended.

A10.1.6.9 Mass-measuring device for large batch mixers

Where payment per ton is specified, the Contractor shall provide and install suitable gauged mass-measuring device on the site. The device shall be provided with a printer for printing the mass, the time and date. The printed data shall be submitted to the Engineer on a daily basis.

A10.1.6.10 Loader for aggregate

A loader, or equivalent capacity labour force where so required in the Contract Documentation, compatible with the needs and capacity of the trucks or mixer, in the case of slurry, unit shall be available at the stockpiling site.

A10.1.6.11 Continuous slurry machine

Aggregate and filler contained in separate bins shall be fed through metering devices at controlled rates to the mixer. Water and bitumen emulsion contained in separate tanks shall similarly be pumped to the mixer at controlled rates through precise metering devices to enable the various constituents to be combined continuously to the selected or prescribed formulation. The mixing of the slurry shall be at a suitable rate adjusted to ensure complete blending of the ingredients and uniformity of mix before depositing into the spreader box.

The spreader box shall be so constructed as to distribute the weight onto metal skids in such a way that no damage shall be done to the surface when the box is in operation.

Soft rubber belting shall be attached to the framework in such a manner as to prevent slurry from being spilt past the sides of the spreader box when the box is in operation.

The spreader box shall be capable of spreading a uniform application of the slurry in adjustable widths from 1,5 m to 4,0 m, at specified rates, and it shall have efficient mechanical means of adjusting the rates and widths of application specified.

The mixing and application of microsurfacing shall be done by a mixer designed to provide a rapid mixing time and sufficient agitation within the spreading system to prevent segregation or premature hardening. The appropriate workability measured by the flow (Consistency test: ASTM 3910) shall be verified during the first application and recorded as part of a method statement.

A10.1.6.12 Spreader box for slurry

If the use of a spreader box has been permitted in the Contract Documentation, the type of spreader box used for spreading the slurry shall be submitted to the Engineer, in advance, for approval. The spreader box for rapid setting slurry shall be of a proven and approved type, fitted with a proven and approved device to ensure sufficient agitation within the spreader system.

A10.1.7 EXECUTION OF THE WORKS

A10.1.7.2 Multiple stone seals

a) Preparation

All specifications as stated in Clause A10.1.3 shall be met.

b) Application of tack coat and first layer of aggregate

The binder of the type and grade and the aggregate of the size and grade specified in the schedule of quantities and according to the design approved by the Engineer, shall be applied as specified in Clause A10.1.7.1b).

c) Application in case of geosynthetic membrane

Following compliance with all relevant specifications in Clause A10.1.3, a tack coat of cationic 65 % bitumen emulsion (without solvents) or SC-E1(t) shall be applied at a spray rate of 0,8//m² by means of a hand applicator or distributor. The geosynthetic shall then be applied to the wet tack coat by hand or a suitable mechanical applicator and rolled with a suitable roller to ensure satisfactory bonding between the geosynthetic and the road surface. All wrinkles shall be smoothed out.

The nominal rate of the binder for the seal shall be as specified in the Contract Documentation.

d) Initial rolling

Initial rolling shall be carried out as specified in Clause A10.1.7.1d).

e) Broom drag and final rolling of aggregate

Dragging and final rolling of aggregate shall be carried out as specified in Clause A10.1.7.1e).

f) Second application of bituminous binder and aggregate

The second bituminous binder shall be applied and followed by the second layer of aggregate of the size specified, in accordance with the approved method statement.

Where hot binders are used, all the aggregate shall be applied immediately but not more than 2 minutes after the application of the tack coat.

The second application of binder shall preferably take place within 48 hours of the application of the tack coat.

Where a 20 mm + double 7,1 mm split application seal is to be constructed, the application of the 7,1 mm aggregate shall be carried out in two separate operations. The first application of the 7,1 mm aggregate shall be placed before application of the second binder application, at the application rate determined during construction of the trial section and then slowly dragged with a drag broom to ensure an even distribution. **g) Initial rolling of second and final layer**

Initial rolling of the second layer of aggregate, or final layer in case of the 20 mm and double 7,1 mm split application seal, shall be carried out as specified in Clause A10.1.7.1d) or as per approved method statement

h) Broom drag and final rolling of second layer

Dragging and final rolling of the second layer of aggregate shall be carried out as specified in Clause

A10.1.7.1e) or as per approved method statement. i) Cover spray

When required by the Contract Documentation or if so directed by the Engineer in writing, a cover spray of diluted SC-E1 or diluted cationic spray grade emulsion shall be applied to the surface of the aggregate by means of a pressure distributor at the rate and dilution specified in the Contract Documentation or as directed by the Engineer.

A10.1.7.5 Slurry Seals

a) Application of slurry

Material which is not properly mixed or in which the emulsion shows signs of having broken during mixing shall not be applied to the road.

In order to achieve the required workability, the slurry consistency when measured in accordance with ASTM D3910 section 6.1 shall be within the ranges of the target flow stated in Table A10.1.7-1 or the adjusted ranges, approved by the Engineer, after construction of the trial section. **Table A10.1.7-1: Slurry consistency requirements**

Application	Target Flow
Slurry bound macadam	60 mm
Hand application of slurry for texture treatment or Cape seals	30 - 40 mm
Slurry overlay	20 - 30 mm
Micro surfacing	10 - 20 mm

C10.1 GENERAL REQUIREMENTS FOR SURFACE TREATMENTS PART C: MEASUREMENT AND PAYMENT

(i) Preamble

The tendered rate for each item shall include full compensation for providing, maintaining and decommissioning upon completion, of all the plant, equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the item, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the conditions of contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum item.

The requirements of Section C1.1 of Chapter 1 shall apply.

Where pay item descriptions include any wording in brackets it is an indication that contract specific information is to be inserted in the Pricing Schedule included in the Contract Documentation.

(ii) Items that will not be measured separately

The following activities, whether required to complete the specified work or not, will not be measured and paid for separately and the Contractor shall include the cost thereof in other pay items as he deems appropriate:

1. No separate payment will be made for setting out the works.
2. No separate payment will be made for the protection or repair as required of any existing or new road furniture, structures, buildings, infrastructure or services damaged by the Contractor's activities.
3. No additional payment shall be made, nor shall any claim for additional payment be considered, for any specified work in confined or restricted areas. Any additional costs associated with working in confined or restricted areas shall be deemed to be included in the standard applicable pay items.
4. No separate payment will be made for the loading of any materials.
5. No separate payment will be made for the hauling of any materials where the material is moved over a distance of less than, and up to, 1,0 km.
6. No separate payment will be made for transporting materials from commercial sources irrespective of the haul distance.
7. No separate payment will be made for the removal of any surplus material imported to complete the works.
8. For all Works performed, precautionary measures required in terms of the Occupational Health and Safety Act (Act 85 of 1993) and the latest amendments thereof as well as the latest Construction Regulations shall be deemed included in the rates tendered for the relevant products.

9. (iii) **Items to be measured and paid for using items specified elsewhere in the specifications**

Not applicable to this Section.

Item	Description	Unit
C10.1.3	Multiple stone seals including a cover spray, if specified using:	
C10.1.3.1	20 mm and 10 mm aggregate (state grade of aggregate and type of binder to be used for each layer)	square metre (m ²)
C10.1.3.2	20 mm and 7,1 mm aggregate (state grade of aggregate and type of binder to be used for each layer)	square metre (m ²)
C10.1.3.3	14 mm and 7,1 mm aggregate (state grade of aggregate and type of binder to be used for each layer)	square metre (m ²)
C10.1.3.4	14 mm and 5,0 mm aggregate (state grade of aggregate and type of binder to be used for each layer)	square metre (m ²)
C10.1.3.5	20 mm with a split application of 7,1 mm aggregate (state grade of aggregate and type of binder to be used for each layer)	square metre (m ²)

The unit of measurement shall be the square metre of completed and accepted seal in accordance with the approved method statement and additional instructions.

The nominal rates for multiple stone seals indicated in Tables A10.1.3-4 and A10.1.3-5 shall apply. The tendered rate shall include full compensation inter alia, for furnishing all materials, marking the centreline, spraying of binder spreading of aggregate, rolling, removing of dust or deleterious material, supplying of water and spraying of haul roads and construction roads, trimming the edges of the completed surface, and all other incidentals necessary for completing the work as specified, including the application of a fog spray, except the precoating of aggregate, which shall be paid for separately.

Item	Description	Unit
C10.1.9	Bituminous binder variations:	
C10.1.9.1	70/100 Penetration grade bitumen	litre (ℓ)
C10.1.9.2	60 % Stable-grade emulsion	litre (ℓ)
C10.1.9.3	Cationic Stable grade emulsion ((indicate bitumen content)	litre (ℓ)
C10.1.9.4	Cationic Spray-grade emulsion (indicate bitumen content)	litre (ℓ)
C10.1.9.5	Homogeneous modified binder (indicate type and bitumen content) cold applied	litre (ℓ)
C10.1.9.6	Non-homogeneous modified binder (indicate class S-R1 or S-R2)	litre (ℓ)
C10.1.9.7	Homogeneous modified binder (indicate type) hot applied	litre (ℓ)
C10.1.9.8	Homogeneous modified binder S-E1 with 4,5% MC30	litre (ℓ)
C10.1.9.9	Homogeneous modified binder S-E1 with 9% MC30	litre (ℓ)
C10.1.9.10	MC-3000 cut-back bitumen	litre (ℓ)
C10.1.9.11	Precoating fluid (state type)	litre (ℓ)

The unit of measurement for bituminous binder in respect of an increase or a decrease in the specified rates of application shall be the litre measured at spraying temperature (except for diluted emulsions, where the variation is calculated in terms of the emulsion before dilution)

Where MC30 is used to cut back the penetration-grade bitumen, the rate for MC-30 variation shall include full compensation for providing the MC-30 and mixing it with the bituminous binder.

Item	Description	Unit
C10.1.10	Aggregate variation (state grade):	
C10.1.10.15	0 mm aggregate	cubic metre (m ³)
C10.1.10.27	1 mm aggregate	cubic metre (m ³)
C10.1.10.3	10 mm aggregate	cubic metre (m ³)
C10.1.10.4	14 mm aggregate	cubic metre (m ³)
C10.1.10.5	20 mm aggregate	cubic metre (m ³)
C10.1.10.6	Sand	cubic metre (m ³)
C10.1.10.7	Grit	cubic metre (m ³)

The unit of measurement for aggregate in respect of an increase or a decrease in the rates of application determined during the trial sections and contained in the approved method statement, shall be the cubic metre of aggregate.

Item	Description	Unit
C10.1.11	Application of cover spray:	
C10.1.11.1	60 % Anionic Stable-grade emulsion	litre (ℓ)
C10.1.11.2	60 % Diluted Anionic stable-grade emulsion (indicate dilution in % emulsion/%water)	litre (ℓ)
C10.1.11.3	Diluted Cationic spray-grade emulsion (indicate % bitumen and dilution in % emulsion/%water)	litre (ℓ)
C10.1.11.4	Diluted SC-E1 (indicate % bitumen and dilution in % emulsion/%water)	litre (ℓ)

This pay item shall only apply when an additional cover spray is ordered by the Engineer. Cover sprays included as part of the seal design shall be deemed to be included in the total rate for the pay item of the specific seal.

The nominal rates for cover sprays seals indicated in Clause A10.1.3.15 shall apply.

The unit of measurement shall be the litre of undiluted/diluted emulsion as specified, measured at spraying temperature.

The tendered rate shall include full compensation for furnishing the material and applying the cover spray as instructed.

Item	Description	Unit
C10.1.12	Application of cover spray by hand:	
C10.1.12.1	60% Anionic Stable-grade emulsion	litre (ℓ)
C10.1.12.2	60% Diluted Anionic Stable-grade emulsion (indicate dilution in % emulsion/%water)	litre (ℓ)
C10.1.12.3	Diluted Cationic Spray-grade emulsion (indicate % bitumen and dilution in % emulsion/%water)	litre (ℓ)
C10.1.12.4	Diluted SC-E1 (indicate % bitumen and dilution in % emulsion/%water)	litre (ℓ)

This pay item shall only apply when an additional cover spray is ordered by the Engineer. Cover sprays specified as part of the seal are included in the pay item of the specific seal.

The nominal rates for cover sprays seals indicated in Clause A10.1.3.15 shall apply.

The unit of measurement shall be the litre of diluted/undiluted emulsion as specified, measured at spraying temperature.
The tendered rate shall include full compensation for furnishing the material and applying the cover spray as instructed.

Item	Description	Unit
C10.1.13	Precoating of aggregate using a dedicated plant	

C10.1.13.1	Product containing low flashpoint solvent (indicate precoating fluid)	litre (ℓ)
C10.1.13.2	Product containing no low flashpoint solvent (indicate precoating fluid)	litre (ℓ)

Item	Description	Unit
C10.1.14	Precoating of aggregate using a frontend loader	

C10.1.14.1	Product containing low flashpoint solvent (indicate precoating fluid)	litre (ℓ)
C10.1.14.2	Product containing no low flashpoint solvent (indicate precoating fluid)	litre (ℓ)

Item	Description	Unit
C10.1.15	Precoating of aggregate by hand	

C10.1.15.1	Product containing low flashpoint solvent (indicate precoating fluid)	litre (ℓ)
C10.1.15.2	Product containing no low flashpoint solvent (indicate precoating fluid)	litre (ℓ)

The unit of measurement for the precoating of aggregate shall be the litres of precoating fluid for treatment of the specified aggregate in accordance with the specified precoating method.

The nominal rates for precoating fluid as indicated Table A10.1.3-9 (non-plant) shall apply.
The tendered rate shall include full compensation for furnishing the equipment and materials and precoating the aggregate as specified, including the handling, stockpiling and protecting of the stockpiles against inclement weather.

Item	Description	Unit
C10.1.25	Variation in active filler content (specify active filler)	ton (t)

The unit of measurement in respect of increases or decreases in the active filler content from that specified in the nominal mix for tender purposes shall be the ton. No payment shall be made for inert filler added by the Contractor.

Payment for variations shall be made as specified in C1.1.4 of Chapter 1.

Item	Description	Unit
C10.1.26	Trial sections for all seal types specified (specify seal type)	Lump sum

The tendered rates shall include full compensation, for furnishing all materials, demarcating the working area constructing the seal, and all other incidentals necessary for completing the work as specified.

Item	Description	Unit
C10.1.27	Provision of Performance Guarantee in respect of the Surfacing	Lump sum

The tendered rate shall include the provision of a bank guarantee in respect of the Surfacing, for an amount equal to 10 % of the contract value, valid for a period of two (2) years from Completion. The terms and conditions

applicable to the release of the guarantee shall be as described under Clause D10.1.7. The guarantee shall be valid for two years, after the issuing of the Completion Certificate.

The performance guarantee as required shall be delivered to the Employer by the successful Contractor before signing of the contract with the applicable date of commencement of validity of the guarantee stated to be from the Completion Certificate and its estimated date.

The guarantee shall be prepared to the format provided in the Contract Documentation. The terms of the conditions applicable to the release of the performance guarantee shall be as described under Clause D10.1.3.

The tendered lump sum shall not be subject to Contract Price Adjustment and shall become payable once the Contractor has submitted and the Employer has accepted the guarantee.

Item	Description	Unit
metre (m²) C10.1.28	Surfacing (state type and binders)	square

The unit of measurement shall be the square metre of surfacing constructed within specifications.

The tendered rate shall include full compensation for materials and construction as well as for process-control testing, and for protecting and maintaining the work, all as specified.

A1.9 FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS

PART A: SPECIFICATIONS

A11.9.1 SCOPE

This Section covers the final finishing and cleaning up of the road and road reserve and all associated works on the site at the completion of construction, including scarifying and treating old roads, temporary deviations and other temporary works.

Construction may be as new construction, as renewal construction or as a combination of both. When construction includes elements under Section A1.6 of Chapter 1: Clearing and Grubbing, Chapter 4: Borrow Materials, and Mass Earthworks; and Section A11.8 of Chapter 11: Landscaping and planting plants, then this Section does not cover the required finishing under those Chapters and Sections.

A11.9.7 EXECUTION OF THE WORKS

A11.9.7.1 *Finishing the road and road reserve*

For new construction, after completing the seal, surfacing or gravel surfacing on gravel roads; or other final activities where surfacing is not included, the road and road reserve shall be cleared of all excess earth, stones boulders, debris, litter, garbage, unwanted vegetation and other waste or excess material resulting from the construction of the works or the use of the road. All finishing and cleaning not previously done or required as specified in the sections of the specifications set out in Clause A11.9.1 above, shall be undertaken and completed. This specification, however, does not intend the finishing, cleaning and maintenance, which must be undertaken as provided for in other Sections of these specifications, to be postponed until the final finishing operations provided for in this section.

For renewal construction after completing construction work within the site, the Contractor shall ensure that all construction generated or related material that may have been swept, windrowed, stockpiled, stored or spread beyond the road surface is removed. This shall be done before any other rehabilitation work is undertaken including shaping, topsoiling and grassing. Should, during the removal of construction generated or related material, existing vegetation or topsoil be disturbed or destroyed, the Contractor shall, at his own cost, re-instate the road reserve to its original state. This shall include ripping, should the construction material and processes have compacted the original surfaces.

Culvert inlets and outlets, culvert barrels, and open drains shall be cleared of debris, soil, silt undesirable vegetation and other material generated from the construction activities.

The surfacing shall be cleared of all dirt, mud and foreign objects. Brooming or other non-damaging actions shall be used on finished surfacing and dragging, pushing or scraping material across surfacing shall not be permitted. All junctions, intersections, islands, kerbing and other elements making up the completed works shall be neatly finished off.

The Contractor shall ensure that all noxious weeds have been removed from the road reserve and borrow pit areas.

All materials resulting from the finishing operations shall be disposed of at approved locations, such as approved waste disposal sites or approved disused borrow pits. Excess stone in particular from resurfacing operations shall be collected and removed from the site to ensure that future grass cutting maintenance work will not be hindered by remaining surfacing stone. The Contractor shall make his own arrangements with the owners of properties or

which such materials are to be deposited. Disposal shall be carried out in a neat and uniform manner. Disused materials such as pipe culverts, not further required and left with approval on adjoining properties, shall be disposed of out of sight from the road to ensure the road appearance reflects a fully complete and finished project. All materials resulting from the finishing operations shall be disposed of at approved spoil sites.

A11.9.7.2 Treating old roads

All old roads, temporary deviations, haul roads and construction roads shall, in so far as is practicable, be levelled with the original ground. Surfaces shall be scarified and broken up to a depth of 150 mm for promoting plan growth.

Where specified by the Engineer, in order to prevent soil erosion, banks, dykes or ditches shall be constructed over the old road to dimensions specified by the Engineer.

All roads and temporary deviations treated as above shall be left in a neat and tidy state.

A11.9.8 WORKMANSHIP

No specific testing of materials is required.

B11.9.1 SCOPE

C11.9 FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS PART C: MEASUREMENT AND PAYMENT

(i) Preamble

The tendered rate for each item shall include full compensation for providing, maintaining and decommissioning upon completion, of all the plant, equipment, labour, tools, incidentals and supervision to carry out the activity or construct the works in the item, unless otherwise stated.

Any prime cost or provisional sums shall be paid in accordance with the provisions of the conditions of contract. The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost or provisional sum. This percentage shall cover all the Contractor's handling, supervision, profit and liability costs to provide the services in the prime cost or provisional sum item.

The requirements of Section C1.1 of Chapter 1 shall apply.

Where pay item descriptions include any wording in brackets it is an indication that contract specific information is to be inserted in the Pricing Schedule included in the Contract Documentation. **(ii) Notes on measurement and pay items**

None.

(iii) Items that will not be measured separately

The following activities, whether required to complete the specified work or not, will not be measured and paid for separately and the Contractor shall include the cost thereof in other pay items as he deems appropriate:

1. No separate payment will be made for backfilling excess excavations/trimming and disposing of surplus material not removed previously, etc. or any other contingent work, unless the work is specifically specified or ordered.
2. No separate payment will be made for setting out the works.
3. No separate payment will be made for the protection or repair as required of any existing or new road furniture, infrastructure or services damaged by the Contractor's activities.
4. No additional payment shall be made, nor shall any claim for additional payment be considered, for any specified work in confined or restricted areas. Any additional costs associated with working in confined or restricted areas shall be deemed to be included in the standard applicable pay items.
5. No separate payment will be made for the hauling of any materials where the material is moved over a distance of less than, and up to 1,0 km.
6. No separate payment will be made for transporting materials from commercial sources irrespective of the haul distance.
7. No separate payment will be made for the removal or any surplus material imported to complete the works.
8. For all Works performed, precautionary measures required in terms of the Occupational Health and Safety Act (Act 85 of 1993) and the latest amendments thereof as well as the latest Construction Regulations shall be deemed included in the rates tendered for the relevant products.

(iv) **Items to be measured and paid for using items specified elsewhere in the specifications**

The following items of work, when specified, shall be carried out, measured and paid for in accordance with the appropriate Sections of the specifications.

Table C11.9-1: Payment items from other Chapters or Sections

Activity	Section 11.9 reference	Section item reference
Loading and hauling	C11.9	Section C1.7 of Chapter 1 – All applicable items
Scarifying for loosening topsoil	C11.9	C11.8.3.2
Construction of banks, dykes or open drains	C11.9.2	C3.1.6 of Chapter 3

(v) **Items specifically for this Section of the specification**

Item	Description	Unit

C11.9.1 Finishing the road and road reserve:

C11.9.1.1 Dual carriageway road	kilometre (km)

C11.9.1.2 Single carriageway road	kilometre (km)

The unit of measurement shall be the kilometre of road measured along the centerline. No separate measurement will be made of ramps at interchanges or at crossroads where intersections have been constructed.

No distinction shall be made between new works and renewal construction.

The tendered rates shall include full compensation for cleaning, trimming, disposing of material, tidying and all other work to be done for finishing off the road and road reserve as specified.

Item	Description	Unit

C11.9.2 Treatment of old roads and temporary deviations

C11.9.2.1 Conventional construction methods	kilometre (km)

C11.9.2.2 By hand only	kilometre (km)

The unit of measurement shall be the kilometre of old road or temporary deviation treated.

The construction of banks, dykes or open drains shall be measured and paid for under Section C3.1 of Chapter 3.

The tendered rate shall include full compensation for levelling and scarifying any surfaces and tidying old roads and temporary deviations as specified.

No payment will be made in regard to treating Contractor constructed haul roads and construction roads not intended for public road users, for which the Contractor shall make allowance in his rates for constructing the relevant Items of work for which such roads are necessary.

SECTION C: ENVIRONMENTAL MANAGEMENT PLAN

TABLE OF CONTENTS	PAGE
C1001 SCOPE	C3.121
C1002 DEFINITIONS	C3.121
C1003 LEGAL REQUIREMENTS.....	C3.122
C1004 ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS	C3.124
C1005 TRAINING.....	C3.126
C1006 ACTIVITIES/ASPECTS CAUSING IMPACTS	C3.127
C1007 ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES	C3.130
C1008 AREAS OF SPECIFIC IMPORTANCE	C3.138
C1009 REHABILITATION.....	C3.139
C1010 RECORD KEEPING	C3.140
C1011 COMPLIANCE AND PENALTIES.....	C3.140

C1001 SCOPE

The Employer recognises environmental management as a key component of road infrastructure development and as part of its environmental policy has developed this Environmental Management Plan (EMPI) as a tool for continual improvement in environmental performance.

This EMPI prescribes the methods by which proper environmental controls are to be implemented by the contractor. The duration over which the contractor's controls shall be in place cover the construction period of the project as well as the limited time after contract completion defined by the General Conditions of Contract, 2010 as the Defects Notification Period (maintenance period).

The provisions of this EMPI are binding on the contractor during the life of the contract. They are to be read in conjunction with all the documents that comprise the suite of documents for this contract, particularly the conditions of any environmental authorisation and associated Environmental Management Programme (EMPr). In the event that any conflict occurs between the terms of the EMPI and the rest of the project specifications or environmental authorisation, the terms herein shall be subordinate.

The EMPI is a dynamic document subject to similar influences and changes as are brought by variations to the provisions of the project specification. Any changes to the EMPI and/or environmental authorisation cannot occur without being submitted to the Employer who will manage the process of seeking approval of the change from the relevant authority.

The EMPI identifies the following:

- Relevant parties and their responsibilities;
- Construction activities that will impact on the environment;
- Specifications with which the contractor shall comply in order to protect the environment from the identified impacts; and
- Actions that shall be taken in the event of non-compliance.

C1002 DEFINITIONS

Alien Vegetation: undesirable plant growth which includes, but is not limited to all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA), 1983 regulations. Other vegetation deemed to be alien are those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable.

Construction Activity: any action taken by the contractor, his sub-contractors, suppliers or personnel during the construction process as defined in the contract documents.

Environment: the surroundings within which the contract exists and comprises land, water, atmosphere, micro-organisms, plant and animal life (including humans) in any part or combination thereof as well as any physical, chemical, aesthetic or cultural inter-relationship among and between them..

Environmental Aspect: any component of a contractor's construction activity that is likely to interact with the environment.

Environmental authorisation: a written statement from the National Department of Environmental Affairs, (DEA), with the general and specific conditions and the EMPr recording its approval of an application for a planned undertaking that triggers listed

activities in the Environmental Impact Assessment (EIA) regulations of the National Environmental Management Act (NEMA).

Environmental Impact: any change to the environment, whether desirable or undesirable, that will result from the effect of a construction activity. An impact may be the direct or indirect consequence of a construction activity.

Environmental Impact Assessment (EIA): a systematic process of identifying, assessing and reporting environmental impacts associated with an activity and includes basic assessment and scoping and environmental impact reporting.

Environmental Management Programme (EMPr): the embodiment of this EMPI to ensure that undue or reasonably avoidable adverse impacts of a development are prevented, and to ensure that positive impacts are enhanced. It thus addresses the how, when, who, where and what of integrating environmental mitigation and monitoring measures through identified projects.

Road Reserve: a corridor of land, defined by co-ordinates and/or proclamation, within which the road, including access intersections or interchanges, is situated. A road reserve may, or may not, be bounded by a fence.

Site; the site is defined in the General Conditions of Contract and in the scope of works. It is bound by the limits of construction as shown in the drawings or the title of the project and extends to also include the following:

- Areas outside the construction zones where accommodation of traffic is placed;
- All borrowpits defined in the applications approved by the relevant Department of Mineral Resources (DMR);
- All haul roads constructed by the contractor for purposes of access;
- Any non-adjacent sites specified in the contract documentation;
- The contractor's and his subcontractors' camp sites; and

for the purposes of this EMPI includes areas outside of, but adjacent to, the road reserve that may be affected by construction activities.

C1003 LEGAL REQUIREMENTS

(a) General

Construction shall be according to the best industry practices, as identified in the project documents. This EMPI, which forms an integral part of the contract documents, informs the contractor as to his duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. The contractor should note that obligations imposed by the EMPI are legally binding in terms of this contract. In the event that any rights and obligations contained in this EMPI contradict those specified in the standard or project specifications then the latter shall prevail.

(b) Statutory and other applicable legislation

The contractor is deemed to have made himself conversant with all legislation pertaining to the environment, including provincial and local government ordinances, which may be applicable to the contract.

Major environmental legislation, as amended from time to time, includes but is not limited to the following:

(i) Conservation of Agricultural Resources Act (Act No. 43 of 1983)

This act provides for control over the utilisation of the natural agricultural resources of South Africa in order to promote the conservation of soil, water sources and vegetation, as well as combating weeds and invader plants.

(ii) The Constitution (Act 6 of 1996)

The Constitution states that everyone has the right to an environment that is not harmful to their health or well-being, and to have the environment protected through reasonable legislative and other measures to prevent pollution and ecological degradation; promote conservation and ensure ecologically sustainable development and use of natural resources.

(iii) Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)

This act makes provision for equitable access to, and sustainable development of, minerals and petroleum resources.

(iv) National Environmental Management Act (NEMA), (Act No. 107 of 1998)

This act supports the Bill of Rights within the Constitution and highlights principles of sustainable development including preservation of ecosystems and biological diversity and avoidance, minimisation and remediation of pollution and environmental degradation. It also sets the stage for the EIA Regulations.

(v) National Environmental Management: Air Quality Act (Act No. 39 of 2004)

This act provides reasonable measures for the prevention of pollution and ecological degradation; and provides for specific air quality measures; for national norms and standards regulating air quality monitoring, management and control by all spheres of government.

(vi) National Environmental Management: Biodiversity Act (Act No. 10 of 2004)

This act makes provisions to accomplish the objectives of the United Nations' Convention on Biological Diversity. The Employer may be required to apply for permits to conduct certain listed activities which, together with the listed threatened or protected species, may be identified by the Minister.

Section 73 (3) of this act empowers a competent authority to direct a person to take steps to remedy any harm to biodiversity resulting from the actions of that person or as a result of occurrence of listed invasive species occurring on land on which that person is the owner. Thus the Employer may be directed to remedy harm caused by listed invasive species.

(vii) National Environmental Management: Protected Areas Act (Act No. 57 of 2003)

This act provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity, natural landscapes and seascapes.

(viii) National Environmental Management: Waste Act (Act No. 59 of 2008)

This act aims to regulate waste management practices through provision of national norms and standards, specific waste measures, licensing and control of waste activities, remediation of contaminated land as well as providing for compliance and law enforcement.

(ix) National Forests Act (Act No. 84 of 1998)

This act makes provision for promoting the sustainable management and development of forests, and for the protection of certain forests and trees for environmental, economic, educational, recreational, cultural, health and spiritual purposes.

(x) National Heritage Resources Act (Act No. 25 of 1999)

This act provides for an integrated and interactive system for identification, assessment and management of South Africa's heritage resources, and empowers civil society to nurture and conserve their heritage resources.

(xi) National Water Act (Act No. 36 of 1998)

This act makes provision for the protection of surface water and groundwater and their sustainable management for the prevention and remediation of the effects of pollution, as well as for the management of emergency situations.

C1004 ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS

Copies of this EMPI shall be kept at the site office and must be distributed to all senior contract personnel who shall familiarise themselves with its contents.

Implementation of this EMPI requires the involvement of several stakeholders, each fulfilling a different but vital role as outlined herein, to ensure sound environmental management during the construction phase of a project.

(a) The Employer

The Employer is the holder of authorisations issued by the relevant environmental regulating authorities responsible for authorising and enforcing environmental compliance. The Employer and anyone acting on the Employer's behalf is accountable for the potential impacts of the activities that are undertaken and is responsible for managing these impacts.

(b) The Engineer

The engineer has been appointed by, and acts for, the Employer as its on-site implementing agent and carries the responsibility to ensure that the contractor

undertakes its construction activities in such a way that the Employer's environmental responsibilities are not compromised.

The engineer will, within seven days of receiving a contractor's request for approval of a nominated Designated Environmental Officer (DEO), approve, reject or call for more information on the nomination. The engineer will be responsible for issuing instructions to the DEO where environmental considerations call for action to be taken.

If in the opinion of the engineer the DEO is not fulfilling his/her duties in terms of this EMPI, the engineer may, in writing and clearly setting out reasons, exercise his powers under NEC3 and instruct replacement of the DEO.

(c) The Contractor

The contractor is responsible for project delivery in accordance with the prescribed specifications, among which this EMPI shall be included.

The contractor shall receive and implement any instruction issued by the engineer relating to compliance with the EMPI including the removal of personnel or equipment.

Compliance with the provisions contained herein or any condition imposed by the environmental approvals shall become the responsibility of the contractor through an approved Designated Environmental Officer (DEO). The contractor shall nominate a person from among his site personnel to fulfil this function and submit to the engineer for his approval the *curriculum vitae* of the proposed DEO. This request for approval shall be given, in writing, at least fourteen days before the commencement of any construction activity clearly setting out reasons for the nomination, and with sufficient detail to enable the engineer to make a decision.

(d) The Designated/Dedicated Environmental Officer (DEO)

Once a nominated representative of the contractor has been approved he/she shall become the DEO and shall be the responsible person for ensuring that the provisions of this EMPI are complied with during the life of the contract. The DEO shall submit regular written reports to the engineer, but not less frequently than once a month.

The DEO may undertake other construction duties unless the Appendix to Tender prescribes this position as 'dedicated' as opposed to the standard position being 'designated'. However, the DEO's environmental duties shall hold primacy over other contractual duties and the engineer has the authority to instruct the contractor to reduce the DEO's other duties or to replace the DEO if, in the engineer's opinion, he/she is not fulfilling his/her duties in terms of the requirements of this EMPI. Such instruction will be in writing clearly setting out the reasons why a replacement is required.

As a minimum the DEO shall have an accredited diploma qualification in environmental or natural sciences or equivalent. Alternatively, the DEO shall have a minimum of 2 years' experience in a similar role in construction or other environmental regulatory field.

In addition to the compliance duties relating to EMPI the DEO shall also provide full cooperation whenever the contractor is subjected to regular environmental audits.

(e) Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is an independent environmental specialist appointed by the engineer to objectively and regularly monitor the contractor's implementation of this EMPI and the EMPr as may be determined by the sensitivity of the project or by conditions of authorisations. These are 'internal' audits and the regularity determined by the environmental approvals, usually once a month. Other ad hoc or 'external' audits ordered by the Employer will be conducted by other environmental specialists.

C1005 TRAINING

(a) Qualifications

The (DEO) shall have the minimum qualifications as prescribed above, and must be conversant with all legislation pertaining to the environment applicable to the contract. He/she must be appropriately trained in environmental management and possess the skills necessary to impart environmental management skills to all personnel involved in the contract.

The contractor shall ensure that adequate environmental training takes place. All employees shall have been given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees.

(b) Content

Apart from induction environmental training should, as a minimum, include the course content below and no induction or course should be given until the engineer has been afforded the opportunity to appraise it and provide comment.

- (i) The importance of conformance with all environmental policies and the consequences of departure from standard operating procedures;
- (ii) Environmental impacts, actual or potential, caused by work activities, prevention measures to avoid them and mitigation measures when they occur;
- (iii) Work force roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the Employer's environmental management systems, including emergency preparedness and response requirements; and
- (iv) The environmental benefits of improved personal performance.

(c) Induction

In the case of permanent staff the contractor shall provide evidence that such induction courses have been presented. In the case of new staff (including contract labour) the contractor shall inform the engineer when and how he intends concluding his environmental training obligations.

Typical environmental aspects and impacts associated with road construction are listed in Table 1: Aspects and Impacts Associated with Road Construction. Actual impacts will differ from project to project and, therefore, so may the mitigation measures employed. The commonest aspects and impacts are addressed separately and typical avoidance and/or mitigation measures described. The list and descriptions are not by any means exhaustive and they shall be used for guideline purposes only.

TABLE 1: ASPECTS AND IMPACTS ASSOCIATED WITH ROAD CONSTRUCTION

Aspect	Impact
Waste generation/storage	Water pollution; nuisance; visual impact
Water use and stormwater discharge	Change in flow regime and/or reduction in downstream availability; soil erosion; water pollution
Vehicle use and maintenance	Air pollution; noise
Chemical/fuel storage	Water/air/soil pollution; health impacts; accidents e.g. slips, fire
Site clearing; earthworks; layer-works; seal works	Change in landform; impact on heritage resources; noise; soil erosion; air pollution
River bridges; installing drainage structures	Water pollution; impact on river flows; noise
Land acquisition	Loss of land &/or livelihood; change in land use;
Acquisition of building material from borrow pits	Change in landform and use

(a) General approach

The role of the DEO cannot be underestimated and once approved he/she shall be on the site at all times, and before the contractor begins each construction activity he/she shall give to the engineer a written statement setting out the following:

- (i) The type of construction activity about to be started.
- (ii) Locality where the activity will take place.
- (iii) Identification of the environmental aspects and impacts that might result from the activity.
- (iv) The methodology of impact prevention for each activity or aspect.
- (v) The methodology of impact containment for each activity or aspect.
- (vi) Identification of the emergency/disaster potential for each activity (if any) and the reaction procedures necessary to mitigate impact severity.
- (vii) Treatment and continued maintenance of impacted environment.

The contractor shall programme his work in such a way that each cause and effect of a construction activity is also identified and the activity planned so as to prevent any impact from happening and shall demonstrate that he is capable of carrying out any repair and reinstatement of the damaged environment. These requirements shall be concurrent with the time constraints to produce method statements for each construction activity in compliance with the provisions of the project specifications.

The contractor shall provide such information in advance of any or all construction activities provided that new submissions shall be given to the engineer whenever there is a change or variation to the original.

The engineer may provide comment on the methodology and procedures proposed by the DEO, but he shall not be responsible for the contractor's chosen measures of impact mitigation and emergency/disaster management systems. However, the contractor shall demonstrate at inception and at least once during the contract that the approved measures and procedures function properly.

(b) Spillages

Streams, rivers and dams shall be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and bituminous products. In the event of a spillage, the contractor shall be liable to arrange for professional service providers to clear the affected area.

Responsibility for spill containment and treatment (whether hazardous or not) lies with the contractor. The individual causing a spill, or who discovers a spill, must report the incident to his/her DEO or to the engineer. The DEO will assess the situation in consultation with the engineer and act as required. In all cases, the immediate response shall be to contain the spill. The exact treatment of polluted soil / water shall be determined by the contractor in consultation with the DEO and the engineer. Areas cleared of hazardous waste shall be re-vegetated according to the engineer's instructions.

Should water downstream of the spill be polluted, and fauna and flora show signs of deterioration or death, specialist hydrological or ecological advice will be sought for appropriate treatment and remedial procedures to be followed. The requirement for such input shall be agreed with the engineer. The costs of containment and rehabilitation shall be for the contractor's account, including the costs of specialist input.

(c) Water use and control

The contractor's use of water shall take into consideration that it is a scarce commodity, and shall be optimised. Where applicable, authorisation shall be obtained from the Department of Water Affairs (DWA) before water is drawn from streams or new boreholes developed.

The contractor shall also ensure that any stream deviations or diversions are undertaken in such a manner that the impact on the environment is minimised. Method statements shall be submitted to the engineer for comment, detailing how the work will be undertaken, what risks are foreseen and what measures will be employed to minimise such risks. Notwithstanding any comments by the engineer,

no work on stream deviations or diversions can commence without written approval from DWA.

The quality, quantity and flow direction of any surface water runoff shall be established prior to disturbing any area for construction purposes. Cognisance shall be taken of these aspects and incorporated into the planning of all construction activities. Before a site is developed or expanded, it shall be established how this development or expansion will affect the drainage pattern. Recognised water users / receivers shall not be adversely affected by the expansion or re-development. No water source shall be polluted in any way due to proposed changes.

Streams, rivers, pans, wetlands, dams, and their catchments shall be protected from erosion and from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and bituminous products.

The contractor shall submit to the engineer his proposals for prevention, containment and rehabilitation measures against environmental damage of the identified water and drainage systems that occur on the site. Consideration shall be given to the placement of sedimentation ponds or barriers where the soils are of a dispersive nature or where toxic fluids are used in the construction process. The sedimentation ponds must be large enough to contain runoff so that they function properly under heavy rain conditions.

(d) Alien vegetation

The contractor shall be responsible for the removal of alien vegetation disturbed by road construction activities within and outside the road reserve. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for or from road construction has been stored temporarily. This responsibility shall continue for the duration of the defects notification period.

(e) Dust control

Dust caused by strong winds shall be controlled by means such as water spray vehicles and applied at sufficient frequency so as not to cause nuisance to adjacent habitation or affect farming activities or natural vegetation. Vegetation cover should also be kept for as long as possible to reduce the area of exposed surfaces. Dust emissions from batching and screening plants shall be subject to the relevant legislation and shall be the subject of inspection by the relevant authorities.

(f) Noise control

The contractor shall endeavour to keep noise generating activities to a minimum. Noises that could cause a major disturbance, for instance blasting and crushing activities, should only be carried out during daylight hours. Should noise generating activities have to occur at night the people in the vicinity of the noise-generating activity shall be warned about the noise well in advance and the activities kept to a minimum. Relevant legislation shall also be taken into consideration, and any practical mitigation measures adopted.

(g) Energy consumption

The contractor shall take into consideration the impacts of high energy consumption, both from a cost and emissions point of view. Energy use shall be minimised, and where possible, alternative energy sources such as solar utilised.

Furthermore, the contractor shall undertake a study of the consumption of carbon units his chosen method of construction produces in the execution of his programme. In conjunction with the engineer who will provide complete cooperation in this study, a month by month output shall be compiled and efforts made to see how these outputs can be curtailed and reduced.

C1007 ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES

The contractor shall undertake “good housekeeping” practices during construction as stated in the COLTO Standard Specifications for Roads and Bridges and the NEC3. This will help avoid disputes on responsibility and allow for the smooth running of the contract as a whole. Good housekeeping extends beyond the wise practice of construction methods that leaves production in a safe state from the ravages of weather to include the care for and preservation of the environment within which the site is situated.

The construction activities addressed below shall become part of the contractor's obligations regarding his programme of work and incorporated into the required method statements for workmanship and quality control.

a) Site establishment

i) Site Plan

The site refers to an area with defined limits on which the project is located. The contractor shall establish his construction camps, offices, workshops, staff accommodation and testing facilities on the site in a manner that does not adversely affect the environment. However, before any site establishment can begin, the contractor shall submit to the engineer for his approval, plans of the exact location, extent and construction details of these facilities and the impact mitigation measures the contractor proposes to put in place.

The plans shall detail the locality as well as the layout of the waste management facilities for litter, kitchen refuse, sewage and workshop-derived effluents. The site offices should not be sited in close proximity to steep areas, as this will increase soil erosion. Preferred locations would be flat areas along the route. If the route traverses water courses, streams and rivers, it is recommended that the offices, and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles are located as far away as possible from any water course. Regardless of the chosen site, the contractor's intended mitigation measures shall be indicated on the plan. The site plan shall have been submitted and approved before establishment commences. Detailed, electronic colour photographs shall be taken of the proposed site before any clearing may commence. These records are to be kept by the engineer for consultation during rehabilitation of the site in order that rehabilitation is, as a minimum, done to a standard similar to pre-construction activities.

ii) Vegetation

The contractor has a responsibility to inform his staff of the need to be vigilant against any practice that will have a harmful effect on vegetation.

The natural vegetation encountered on the site is to be conserved and left as intact as possible. Vegetation planted at the site shall be indigenous and in accordance with instructions issued by the engineer. Only trees and shrubs directly affected by the works, and such others as may be indicated by the engineer in writing, may be felled or cleared. In wooded areas where natural vegetation has been cleared out of necessity, the same species of indigenous trees as were occurring shall be re-established. Protected trees may not be removed without a permit from the Department of Agriculture, Forestry and Fisheries.

Contravention of a notice of listed protected tree species under the National Forests Act, 1998 is regarded as a first category offence that may result in a fine or imprisonment for a period up to three years, or to both a fine and imprisonment. (No trees has been specified)

Rehabilitation shall be undertaken using indigenous tree, shrub and grass species. Any proclaimed weed or alien species that propagates during the contract period shall be cleared by hand before seeding.

Fires shall only be allowed in facilities or equipment specially constructed for this purpose. The need for a firebreak shall be determined in consultation with the engineer and the relevant authorities, and if required a firebreak shall be cleared and maintained around the perimeter of the camp and office sites. The contractor's staff shall at no time make fires for purposes of keeping out the cold unless they are contained in purpose-built containers capable of preventing runaway fires if knocked over and the ashes collected and safely and environmentally disposed of on a daily basis.

iii) Water management

Water for human consumption shall be available at the site offices and at other convenient locations on site.

All effluent water from the camp/office sites shall be disposed of in a properly designed and constructed system, situated so as not to adversely affect water sources (streams, rivers, pans, dams etc.). Only domestic type wastewater shall be allowed to enter this system.

iv) Heating and cooking fuel

The contractor shall provide adequate facilities for his staff so that they are not encouraged to supplement their comforts on site by accessing what can be taken from the natural surroundings. The contractor shall ensure that energy sources are available at all times for construction and supervision personnel for heating and cooking purposes.

b) Sewage management

Particular reference in the site establishment plan shall be given to the treatment of sewage generated at the site offices, site laboratory and staff accommodation and at all localities on the site where there will be a concentration of labour. Sanitary

arrangements should be to the satisfaction of the engineer, the local authorities and legal requirements.

Safe and effective sewage treatment will require one of the following sewage handling methods: septic tanks and soak-away, dry-composting toilets such as “enviro loos”, or the use of chemical toilets which are supplied and maintained by a specialist service provider. The type of sewage management will depend on the geology of the area selected, the duration of the contract and proximity (availability) of providers of chemical toilets. Should a soak-away system be used, it shall not be closer than 800 metres from any natural water course or water retention system. The waste material generated from these facilities shall be serviced on a regular basis. The positioning of the chemical toilets shall be done in consultation with the engineer.

Toilets and latrines shall be easily accessible and shall be positioned within walking distance from wherever employees are employed on the works. Use of the veld for this purpose shall not, under any circumstances, be allowed.

Outside toilets shall be provided with locks and doors and shall be secured to prevent them from blowing over. The toilets shall also be placed outside areas susceptible to flooding. The contractor shall arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintaining such latrines in a clean, orderly and sanitary condition to the satisfaction of the engineer.

c) Waste management

The contractor’s intended methods for waste management shall be outlined and implemented at the outset of the contract, and shall be to the satisfaction of the engineer. Opportunities for avoiding, reducing, reusing and recycling of materials should be identified upfront, as should constraints for their implementation. All personnel shall be instructed to dispose of all waste in the proper manner.

i) Solid waste

Solid waste shall be stored in an appointed area in covered, tip-proof metal drums or similar container for collection and disposal. Disposal of solid waste shall be at a licensed landfill site or at a site approved by the relevant authority in the event that an existing operating landfill site is not within reasonable distance from the project area. No waste shall be burned or buried at or near the project area.

ii) Litter

No littering by construction workers shall be allowed and any locality where motorists are encouraged or forced to stop shall be effectively controlled for litter collection. During the construction period, the various contractor’s facilities shall be maintained in a neat and tidy condition and the site shall be kept free of litter. Measures shall be taken to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse. At all places of work the contractor shall provide litter collection facilities for later safe disposal at approved sites.

Particular emphasis on litter control measures shall apply at stop/go facilities.

iii) Hazardous waste C3-112

Hazardous waste such as oils shall be disposed of at an approved landfill site. Special care shall be taken to avoid spillage of bitumen products such as binders or pre-coating fluid to avoid water-soluble phenols from entering the ground or contaminating surface water.

Under no circumstances shall the spoiling of bituminous products on the site, over embankments, in borrow pits or any burying, be allowed. Unused or rejected bituminous products shall be returned to the supplier's production plant. Any spillage of bituminous products shall be attended to immediately and affected areas shall be promptly reinstated to the satisfaction of the engineer.

iv) Construction and demolition waste

The opportunity for recycling and reuse of construction and demolition waste as fill for road embankments, land reclamation and drainage control must first be explored and take priority before the option of declaring these materials a 'waste'.

The contractor is encouraged to actively engage with authorities and landowners adjacent to the site and identify where such 'waste' materials can be usefully deployed to repair existing environmentally damaged areas such as erosion dongas.

d) **Control at the workshop**

The contractor's management and maintenance of his plant and machinery will be strictly monitored according to the criteria given below, regardless of whether it is serviced on the site (i.e. at the place of construction activity or at a formalised workshop).

i) Hazardous Material Storage

Petrochemicals, oils and identified hazardous substances shall only be stored under controlled conditions. All hazardous materials such as bitumen binders shall be stored in a secured, appointed area that is suitably fenced, bunded and has restricted entry. Storage of bituminous products shall only take place using suitable containers to the approval of the engineer.

The contractor shall provide proof to the engineer that relevant authorisation to store such substances has been obtained from the relevant authority. In addition, hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure. Before containment or storage facilities can be erected the contractor shall furnish the engineer with details of the preventative measures he proposes to install in order to mitigate pollution of the surrounding environment from leaks or spillage. The preferred method shall be a concrete floor that is bunded. Any deviation from the method will require proof from the relevant authority that the alternative method proposed is acceptable to that authority. The proposals shall also indicate the emergency procedures in the event of misuse or spillage that will negatively affect an individual or the environment.

ii) Fuel and gas storage

The contractor shall take cognisance of the limits set by legislation for the storage of fuels and acquire the necessary authorisation for storage capacity beyond these. All fuel shall be stored in a secure area in steel tanks supplied and maintained by the fuel suppliers. An adequate bund wall, 110% of volume, shall be provided for fuel and diesel areas to accommodate any leakage spillage or overflow of these substances. The area inside the bund wall shall be lined with an impervious lining to prevent infiltration of the fuel into the soil. Any leakage, spillage or overflow of fuel shall be attended to without delay.

Gas welding cylinders and LPG cylinders shall be stored chained in a secure, well-ventilated area exterior to any building wall.

iv) Oil and lubricant waste

Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery shall be collected in a holding tank and sent back to the supplier. Water and oil should be separated in an oil trap. Oils collected in this manner, shall be retained in a safe holding tank and removed from site by a specialist oil recycling company for disposal at approved waste disposal sites for toxic/hazardous materials. Oil collected by a mobile servicing unit shall be stored in the service unit's sludge tank and discharged into the safe holding tank for collection by the specialist oil recycling company.

All used filter materials shall be stored in a secure bin for disposal off site. Any contaminated soil shall be removed and replaced. Soils contaminated by oils and lubricants shall be collected and disposed of at a facility designated by the local authority to accept contaminated materials.

e) **Clearing the site**

In all areas where the contractor intends to, or is required to clear the natural vegetation and soil, either within the road reserve, or at designated or instructed areas outside the road reserve, a plan of action shall first be submitted to the engineer for his approval. Working areas shall be clearly defined and demarcated on site to minimise the construction footprint. 'No-go- areas' and other sensitive areas shall also be clearly demarcated on site, and staff must be made aware of them.

The plan of action shall contain a photographic record and chainage/land reference of the areas to be disturbed. This shall be submitted to the engineer for his records before any disturbance/stockpiling may occur. The record shall be comprehensive and clear, allowing for easy identification during inspections.

f) **Soil management**

i) Topsoil

Topsoil shall be removed from all areas where physical disturbance of the surface will occur and shall be stored and adequately protected. The contract will provide for the stripping and stockpiling of topsoil from the site for later re-use. Topsoil is considered to be the natural soil covering, including all the vegetation and organic matter. Depth may vary at each site. The areas to be cleared of topsoil shall include all storage areas. All topsoil stockpiles

windrows shall be maintained throughout the contract period in a weed-free condition. Weeds appearing on the stockpiled or windrowed topsoil shall be removed by hand. Soils contaminated by hazardous substances shall be disposed of at an approved waste disposal site. The topsoil stockpiles shall be stored, shaped and sited in such a way that they do not interfere with the flow of water to cause damming or erosion, or itself be eroded by the action of water. Stockpiles of topsoil if they are to be left for longer than 6 months, shall be analysed, and if necessary, upgraded before replacement. Stockpiles shall be protected against infestation by weeds.

The contractor shall ensure that no topsoil is lost due to erosion – either by wind or water. Areas to be top-soiled and grassed shall be done so systematically to allow for quick cover and reduction in the chance of heavy topsoil losses due to unusual weather patterns. The contractor's programme shall clearly show the proposed rate of progress of the application of topsoil and grassing. The contractor shall be held responsible for the replacement, at his own cost, for any unnecessary loss of topsoil due to his failure to work according to the progress plan approved by the engineer. The contractor's responsibility shall also extend to the clearing of drainage or water systems within and beyond the boundaries of the road reserve that may have been affected by such negligence.

ii) Subsoil

The subsoil is the layer of soil immediately beneath the topsoil. It shall be removed, to a depth instructed by the engineer, and if not used for road building it shall be stored and maintained separately from the topsoil so that neither stockpile is contaminated by the other. This soil shall be used for rehabilitation purposes by first spreading it over the excavated slopes without interfering with or contaminating the stockpiled topsoil.

Whilst in stockpile it shall be maintained free from erosion and weed infestation in the same way as for topsoil stockpile maintenance.

g) Earthworks and layer works

This section includes all construction activities that involve the mining of all materials, and their subsequent placement, stockpile, spoil, treatment or batching, for use in the permanent works, or temporary works in the case of deviations. Before any stripping prior to the commencement of construction, the contractor shall have complied with the requirements of this EMPI. In addition, the contractor shall take cognisance of the requirements set out below.

i) Quarries and borrow pits

The contractor's attention is drawn to the requirement of the Department of Mineral Resources, that before entry into any quarry or borrow pit, an EMPr for the establishment, operation and closure of the quarry or borrow pit shall have been approved by the Department. It is the responsibility of the contractor to ensure that he is in possession of the approved EMPr or a copy thereof, prior to entry into the quarry or borrow pit. The conditions imposed by the relevant EMPr are legally binding on the contractor and may be more extensive and explicit than the requirements of this specification. In the event

of any conflict occurring between the requirements of the specific EMPr and these specifications the former shall apply. The cost of complying with the requirements shall be deemed to be included in existing rates in the Pricing Schedule.

ii) Excavation, hauling and placement

The contractor shall provide the engineer with detailed plans of his intended construction processes prior to starting any cut or fill or layer. The plans shall detail the number of personnel and plant to be used and the measures by which the impacts of pollution (noise, dust, litter, fuel, oil and sewage), erosion, vegetation destruction and deformation of landscape will be prevented, contained and rehabilitated. Particular attention shall also be given to the impact that such activities will have on the adjacent built environment. The contractor shall demonstrate his "good housekeeping", particularly with respect to closure at the end of every day so that the site is left in a safe condition from rainfall overnight or over periods when there is no construction activity.

iii) Spoil sites

The contractor shall be responsible for the safe siting, operation, maintenance and closure of any spoil site he uses during the contract period, including the defects notification period. This shall include existing spoil sites that are being re-entered. Before spoil sites may be used proposals for their locality, intended method of operation, maintenance and rehabilitation shall be given to the engineer for his approval. The location of these spoil sites shall have signed approval from the affected landowner before submission to the engineer. No spoil site shall be located within 500m of any watercourse. A photographic record shall be kept of all spoil sites for monitoring purposes. This includes before the site is used and after re-vegetation.

The use of approved spoil sites for the disposal of hazardous or toxic wastes shall be prohibited unless special measures are taken to prevent leaching of the toxins into the surrounding environment. Such special measures shall require the approval of the relevant provincial or national authority. The same shall apply for the disposal of solid waste generated from the various camp establishments. The engineer will assist the contractor in obtaining the necessary approval if requested by the contractor.

Spoil sites will be shaped to fit the natural topography. These sites shall receive a minimum of 75mm topsoil and be grassed with the recommended seed mixture. Appropriate grassing measures to minimise soil erosion shall be undertaken by the contractor. This may include both strip and full sodding. The contractor may motivate to the engineer for other acceptable stabilising methods. The engineer may only approve a completed spoil site at the end of the defects notification period upon receipt from the contractor of a landowner's clearance notice and an engineer's certificate certifying slope stability.

iv) Stockpiles

The contractor shall plan his activities so that materials excavated from borrow pits and cuttings, in so far as possible, can be transported direct to and placed

at the point where it is to be used. However, should temporary stockpiling become necessary, the areas for the stockpiling of excavated and imported material shall be indicated and demarcated on the site plan submitted in writing to the engineer for his approval, together with the contractor's proposed measures for prevention of environmental damage, containment and subsequent rehabilitation.

The areas chosen shall have no naturally occurring indigenous trees and shrubs present that may be damaged during operations. Care shall be taken to preserve all vegetation in the immediate area of these temporary stockpiles. During the life of the stockpiles the contractor shall at all times ensure that they are positioned and sloped to create the least visual impact, constructed and maintained so as to avoid erosion of the material and contamination of surrounding environment and kept free from all alien/undesirable vegetation.

After the stockpiled material has been removed, the site shall be re-instated to its original condition. No foreign material generated / deposited during construction shall remain on site. Areas affected by stockpiling shall be landscaped, top soiled, grassed and maintained at the contractor's cost until clearance from the engineer and the relevant national authority is received.

Material milled from the existing road surface that is temporarily stockpiled in areas approved by the engineer within the road reserve, shall be subject to the same condition as other stockpiled materials. Excess materials from windrows, in situ milling or any detritus of material from road construction activities may not be swept off the road and left unless specifically instructed to do so in the contract documentation or under instruction from the engineer.

In all cases, the engineer shall approve the areas for stockpiling and disposal of construction rubble before any operation commences and shall approve their closure only when they have been satisfactorily rehabilitated.

v) Blasting activities

Wherever blasting activity is required on the site (including quarries and/or borrow pits) the contractor shall rigorously adhere to the relevant statutes and regulations that control the use of explosives. In addition, the contractor shall, prior to any drilling of holes in preparation for blasting, supply the engineer with a risk assessment and locality plan of the blast site on which shall be shown the zones of influence of the ground and air shock-waves and expected limits of fly-rock. The plan shall show each dwelling, structure and service within the zones of influence and record the existing positions and conditions of the dwellings/structures/services including, lengths and widths of cracks, as well as the condition of doors, windows, roofing, wells, boreholes etc. The contractor, alone, shall be responsible for any costs that can be attributed to blasting activities, including the collection of fly-rock from adjacent lands and fields. The submission of such a plan shall not in any way absolve the contractor from his responsibilities in this regard. The contractor shall also indicate to the engineer the manner in which he intends to notify the adjacent communities and/or road users the times and delays to be expected for each individual blast.

h) On site plant

i) Crusher, screening plants and concrete batching plants

Crushing plants and concrete batching plants, whether sited inside or outside of defined quarry or borrow pit areas, shall be subject to the requirements of the applicable industrial legislation that governs gas and dust emissions into the atmosphere. Such sites will be the subject of regular inspections by the relevant authorities during the life of the project. In addition, the selection, entry onto, operation, maintenance, closure and rehabilitation of such sites shall be the same as for those under section C1007(g)(i) of this EMPI, with the exception that the contractor shall provide additional measures to prevent, contain and rehabilitate against environmental damage from toxic/hazardous substances. In this regard the contractor shall provide plans that take into account such additional measures as concrete floors, bunded storage facilities, linings to drainage channels and settlement dams. Ultimate approval of these measures shall be from the relevant national authority, as shall approval of closure. The engineer will assist the contractor in his submissions to the relevant authority.

Screening activities shall be undertaken so that dust and noise is minimised. This can be done by carefully choosing the site for the activity, and by using slightly damp material.

Effluent from concrete batch plants and crusher plants shall be reused where possible or treated in a suitable designated sedimentation dam to the legally required standards to prevent surface and groundwater pollution. The designs of such a facility should be submitted to the engineer for approval.

The contractor shall invite the relevant department to inspect the site within 2 months after any plant is commissioned and at regular intervals thereafter, not exceeding 12 months apart.

ii) Asphalt Plant

Asphalt plants are considered to be one of the scheduled processes listed in the Environmental Impact Assessment Regulations of 2010. The activity triggered by the asphalt for road construction purposes is activity 26 of GN. R. 545, which states: "*Commencing of an activity, which requires an atmospheric emission license in terms of Section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No 39 of 2004) except where Activity 28 in Notice No R544 of 2010 applies.*" Commencing with activity 26 of GN R. 545 requires Scoping and Environmental Impact Reporting (S&EIR) in order to obtain an environmental authorisation. In the event the use of an on-site asphalt plant is considered the contractor shall be responsible to obtain the necessary permit from the Department of Environmental Affairs, regardless of where the site is situated. **(No Asphalt plant is envisaged for this project)**

Operation of the plant shall conform to the same requirements as for a crushing plant or concrete batching plant under C1007(h)(i) above.

Any area, as determined and identified within the project documents as sensitive or of special interest within the site shall be treated according to the express instructions contained in these specifications or the specific, approved EMPr. The contractor may offer

alternative solutions to the engineer in writing should he consider that construction will be affected in any way by the hindrance of the designated sensitive area or feature. However, the overriding principle is that such defined areas requiring protection should not be changed. Every effort to identify such areas within the site will have been made prior to the project going out to tender. The discovery of other sites with archaeological or historical interest that have not been identified shall receive ad hoc treatment.

a) Archaeological sites

If an artefact on site is uncovered, work in the immediate vicinity shall be stopped immediately. The contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery thereof inform the engineer of such discovery. The South African Heritage Resource Agency (SAHRA) is to be contacted, and a SAHRA-registered archaeological consultant may undertake the necessary work involved in confirming the find and advising on how it should be preserved or removed. Work may only resume once clearance is given in writing by the archaeologist.

If a grave or midden is uncovered on site, or discovered before the commencement of work, then all work in the immediate vicinity of the graves/middens shall be stopped and the engineer informed of the discovery. The South African Heritage Resource Agency and the South African Police Services (SAPS) should be contacted and in the case of graves, arrangements made for an undertaker to carry out exhumation and reburial. The undertaker will, together with SAHRA, be responsible for attempts to contact family of the deceased and for the place where the exhumed remains can be re-interred.

C1009 REHABILITATION

The contractor shall be responsible for the re-establishment of grass within the road reserve boundaries for all areas disturbed during construction. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for, or from, construction has to be stored temporarily, and designated or instructed areas outside the road reserve. It also includes the area where site offices were erected which may require rehabilitation at the end of the contract. All construction material, including concrete slabs and barbecue (braai) areas shall be removed from the site on completion of the contract unless written approval from the relevant landowner demonstrates it is to be left in place.

Responsibility for re-establishment of vegetation shall extend until expiry of the defects notification period. However, the employer reserves the right to continue holding retention monies (or not releasing guarantees in lieu of retention) depending upon the state of cover at the end of the defects notification period. Such extension may continue until closure of the relevant quarry or borrow pit has been secured,

Rehabilitation of affected areas should be undertaken as early as possible when the relevant activities are done in order to reduce further environmental damage. All re-vegetation should be undertaken using indigenous vegetation. The standard of rehabilitation should be to the satisfaction of the engineer and the relevant authorities. The Department of Minerals Resources will only issue closure certificates for borrow pits and quarries when they are satisfied with the rehabilitation undertaken. It should also be noted that in some cases there is a requirement for a final environmental audit covering the extent of the project.

C1010 **RECORD KEEPING**

The engineer and the DEO will continuously monitor the contractor's adherence to the approved impact prevention procedures and the DEO shall submit regular written reports to the ECO and to the engineer, at least once a month. The engineer shall issue to the contractor a notice of non-compliance whenever transgressions are observed. The DEO shall document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance shall be documented and reported to the engineer in the monthly report.

Copies of any authorisations or EMPs (including those for specific borrow pits or quarries used on the project) shall be kept on site and made available for inspection by visiting officials from the employer, relevant environmental departments or internal/external auditors.

C1011 **COMPLIANCE AND PENALTIES**

The contractor shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. This record shall be submitted with the monthly reports and an oral report given at the monthly site meetings.

Any non-compliance with the agreed procedures of the EMP and this EMPI is a transgression of the various statutes and laws that define the manner by which the environment is managed and, therefore, any avoidable non-compliance, dependant on severity, may be considered sufficient grounds for contact to be made with relevant provincial or national authorities to invite their sanction.

The engineer's decision with regard to what is considered a violation, its seriousness and the action to be taken against the contractor shall be final. Failure to redress the cause shall be reported to the relevant authority. The responsible provincial or national authority may ensure compliance and impose penalties relevant to the transgression as allowed within statutory powers.

Table 7/1: Mechanisms that Cause Environmental Impacts during Construction Activities

Section	Contents	Environmental Impacts				
		Pollution Type	Deformation of Landscape	Soil erosion	Alien Vegetation	Sensitive Areas
1300	Camp Establishment	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	None identified
1400	Housing, Offices and laboratories	Waste treatment Hazardous waste Water supply Spillage Storage Noise/lights	Selection of site Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	None identified
1500	Accommodation of Traffic	Waste treatment Hazardous waste Water supply Spillage Storage Noise/lights Dust control	Selection of site Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas Maintenance of windrows	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	None identified
1600	Overhaul	Spillage Storage Noise/lights Dust control Exhaust fumes Washing waste	Turning circles Parking areas	Restrict access to sensitive areas	Protection of indigenous vegetation Preserve topsoil	None identified
1700	Clearing and grubbing	Waste treatment Hazardous waste Water supply Noise /lights Dust control	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Protection of indigenous vegetation Preserve topsoil	None identified

2100 - 2400	Drainage	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	None identified
3100	Borrow pits	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	None identified
3200	Stockpiling	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	None identified
3300	Mass Earthworks	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	None identified
3400 - 3900	Pavement layers	Waste treatment Hazardous waste Water supply Spillage Storage Noise / lights Dust control	Selection of site Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas Maintenance of windrows	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	None identified
4100	Asphalt works / sealing operations	Waste treatment Hazardous waste Water supply Spillage Storage Noise / lights Dust control Smoke control Storage of materials	Selection of site Preserve indigenous vegetation Preserve topsoil Turning circles Parking areas	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil	None identified

5000	Ancillary roadworks	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	None identified
6000	Structures	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	None identified
7000	Concrete pavements etc	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	None identified

**SECTION D: REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY
ACT AND REGULATIONS****Note to tenderer:**

Wherever reference is made in this section of the Scope of Works to contractor this is the equivalent of the *principal contractor* in the Occupational Health and Safety Act and Regulations. Similarly, reference to subcontractors is equivalent to *other contractors*.

TABLE OF CONTENTS**PAGE**

D1001	SCOPE	C3.146
D1002	GENERAL OCCUPATIONAL HEALTH AND SAFETY PROVISIONS	C3.146
D1003	OPERATIONAL CONTROL	C3.152
D1004	PROJECT/SITE SPECIFIC REQUIREMENTS.....	C3.153

D1001 **SCOPE**

This part of the specification has the objective to assist the contractor entering into contracts with the Employer that they comply with the Occupational Health and Safety (OH&S) Act, No. 85 of 1993, propagated on 7 February 2014, as well as all applicable Regulations. Compliance with this document does not absolve the contractor from complying with minimum legal requirements and the contractor remains responsible for the health and safety of his employees and those of his Mandataries. The contractor shall therefore include this part of the specification to any contract that he may have with subcontractors and/or suppliers.

This section covers the development of a health and safety specification that addresses all aspects of occupational health and safety as affected by this contract. It provides the requirements that the contractor shall comply with in order to reduce the risks associated with this contract, which may lead to incidents causing injury and/or ill health. In this matter the spirit and intention of Regulation 4 (2) of the Construction Regulations, regarding negotiations between the parties, related to the contents and approval of the Health and Safety Plan, must be complied with.

D1002 **GENERAL OCCUPATIONAL HEALTH AND SAFETY PROVISIONS****(a) Hazard Identification and Risk Assessment (Construction Regulation 9)****(i) Risk Assessments**

Clause E1004 contains a generic list of risk assessment headings that have been identified by the Employer as possibly applicable to this contract. It is, by no means, exhaustive and is offered as assistance to the contractor.

(ii) Development of Risk Assessments

The contractor shall, before the commencement of any construction work or work associated with the aforesaid construction work and during such work, conduct a risk assessment by a competent person and the risk assessment so produced shall form part of the OH&S plan and be implemented and maintained as contemplated in Construction Regulation 7(1) (a). Competence is a factor of training, knowledge, experience and/or appropriate qualifications. Where proof of competence is required by the Regulation, a concise CV must be attached to the appointment letter.

The risk assessment shall include, as far as is reasonably practicable, at least:

- the identification of the risks and hazards to which persons may be exposed
- the analysis and evaluation of the risks and hazards identified, inclusive of a residual risk rating methodology. The method to be used is not prescribed.
- a documented plan of safe work procedures, to mitigate, reduce or control those residual risks that have been identified as unacceptably high, by means of the rating system.
- a monitoring plan and
- a review plan, inclusive of dates to be adhered to.

Based on the risk assessments, the contractor shall develop a set of site-specific OH&S rules that shall be applied to regulate the OH&S aspects of the construction. The risk assessments, together with the site-specific OH&S rules shall be submitted to the Employer before construction on site commences.

Despite the more advanced (or site specific) risk assessments listed below in clause E1004: PROJECT/SITE SPECIFIC REQUIREMENTS, the contractor shall

conduct a baseline risk assessment, before work commences. The baseline risk assessment shall further include the standard working procedures and the applicable method statements, where applicable. This does not mean that all possible Risk Assessments must be attended to before work commences, but that all relevant Risk Assessments receive the necessary attention as the contract progresses.

All variations to the scope of work shall similarly be subjected to a risk assessment process.

(iii) Review of Risk Assessment

The contractor shall review the hazard identification, risk assessments and standard working procedures at each production planning and progress report meeting as the contract work develops and progresses and each time changes are made to the designs, plans and construction methods and processes. The contractor shall provide the Employer, subcontractors and all other concerned parties with copies of any changes, alterations or amendments as contemplated above.

(b) Legal Requirements

The contractor shall, as a minimum, comply with:

- The Occupational Health and Safety Act and Regulations (Act 85 of 1993), an up-to-date copy of which shall be available on site at all times.
- The Compensation for Occupational Injuries and Diseases Act (Act 130 of 1993), an up-to-date copy of which shall be available on site at all times.
- Where work is being carried out on a “mine”, the contractor shall comply with the Mines Health and Safety Act and Regulations (Act 29 of 1960) and any other OH&S requirements that the mine may specify. An up-to-date copy of the Mines Health and Safety Act and Regulations shall be available on site at all times.

(c) Structure and Responsibilities

(i) Overall Supervision and Responsibility for OH&S

It is a requirement that the contractor, when he appoints subcontractors in terms of Construction Regulations 7(1)(c) (i), (ii), (iii), (iv), (v) (vi), (vii), (viii), (ix), and (x) includes in his agreement with such subcontractors the following:

- OH&S Act (85 of 1993), Section 37(2) agreement: “Agreement with Mandatory”
- OH&S Act (85 of 1993), Section 16(2) appointee/s as detailed in his/her/their respective appointment forms. (Where applicable)

(ii) Further (Specific) Supervision Responsibilities for OH&S

The contractor shall appoint designated competent employees and/or other competent persons as required by the Act and Regulations. Below is a generic list of identified appointments and may be used to select the appropriate appointments for this contract. The contractor shall note that it is a generic list only and is intended for use as a guideline.

Appointment	Regulation
Construction Supervisor & Assistant Supervisor	(Construction Regulation 8(1) & 8(2))
Construction Vehicles and Mobile Plant/Machinery Supervisor	(Construction Regulation 23)
Demolition Supervisor	(Construction Regulation 14)
Drivers and Operators of Construction Vehicles or Plant	(Construction Regulation 23)
Electrical Installation and Appliances Inspector	(Construction Regulation 24)
Emergency/Security/Fire Coordinator	(Construction Regulation 29)
Excavation Supervisor	(Construction Regulation 13)
Explosive Actuated Fastening Device	(Construction Regulation 21)
Fall Protection	(Construction Regulation 10)
First Aider	(General Safety Regulation 3)
Fire Equipment Inspector	(Construction Regulation 29)
Temporary Works	(Construction Regulation 12)
Hazardous Chemical Substances Supervisor	(HCS Regulations)
Incident Investigator	(General Admin Regulation 29)
Ladder Inspector	(General Safety Regulation 13A)
Cranes	(Construction Regulation 22)
Materials Hoist Inspector	(Construction Regulation 19)
OH&S Committee	(OH&S Act Section 19)
OH&S Officer	(Construction Regulation 8(5))
OH&S Representatives	(OH&S Act Section 17)
Person Responsible for Machinery	(General Machinery Regulation 2)
Scaffolding Supervisor	(Construction Regulation 16)
Stacking & Storage Supervisor	(Construction Regulation 28)
Structures Supervisor	(Construction Regulation 11)
Suspended Platform Supervisor	(Construction Regulation 17)
Tunnelling Supervisor	(Construction Regulation 15)
Bulk Mixing Plant	(Construction Regulation 20)
Working on/next to Water Supervisor	(Construction Regulation 26)
Welding Supervisor	(General Safety Regulation 9)

In addition the Employer requires that a Traffic Safety Officer be appointed. The above appointments shall be in writing and the responsibilities clearly stated together with the period for which the appointment is made. This information shall be communicated and agreed with the appointees. Notice of appointments shall be submitted to the Employer. All changes shall also be communicated to the Employer.

The contractor shall, furthermore, provide the Employer with an organogram of all subcontractors that he/she has appointed or intends to appoint and keep this list updated and prominently displayed on site.

(iii) Designation of OH&S Representatives (Section 17 of the OH&S Act)

Where the contractor employs more than 20 persons (including the employees of subcontractors) he has to appoint one OH&S representative for every 50 employees or part thereof. This is a minimum (legal) requirement. The contractor may at his own discretion appoint more OH&S Representatives according to site specific requirements. General Administrative Regulation 6 requires that the appointment or election and subsequent designation of the OH&S representatives be conducted in consultation with employee representatives or employees. (Section 17 of the Act and General Administrative Regulation 6 & 7). OH&S representatives shall be designated in writing and the designation shall include the area of responsibility of the person and term of the designation. OH&S representatives must be experienced, permanently employed by the contractor or his subcontractors, trained and able to move freely within their designated area of responsibility.

(iv) Duties and Functions of the OH&S Representatives (Section 18 of the OH&S Act)

The contractor shall ensure that the designated OH&S representatives conduct continuous monitoring and regular inspections of their respective areas of responsibility, focusing on unsafe acts and unsafe conditions and report thereon to the contractor. OH&S representatives shall participate in accident or incident investigations. OH&S representatives shall attend all OH&S committee meetings.

(v) Appointment of OH&S Committee (Sections 19 and 20 of the OH&S Act)

The contractor shall establish an OH&S committee, which shall meet at least once a month.

(d) Administrative Controls and the Occupational Health & Safety File(i) The OH&S File (Construction Regulation 7(1) (b))

As required by Construction Regulation 7(1) (b), the contractor and subcontractors shall each keep an OH&S file on site. The following index is neither exhaustive nor prescriptive but recommended as a guide for the contents of the OH&S file:

- Notification of construction work (Construction Regulation 4) where applicable
- Latest copy of OH&S Act (General Administrative Regulation 4)
- Proof of registration and good standing with COID Insurer (Construction Regulation 5 (1) (j))
- OH&S plan agreed with the Employer including the underpinning risk assessment/s and method statements (Construction regulation 7(1) (a))
- Copies of OH&S committee and other relevant minutes
- Designs/drawings (Construction Regulation 6)
- A list of subcontractors including copies of the agreements between the parties and the type of work being done by each subcontractor (Construction Regulation 7)
- Appointment/designation forms as per sub-sub-clause E1002(a)(i) and (ii).
- Registers as follows:
 - Accident/Incident register (Annexure 1 of the General Administrative Regulations)
 - OH&S representatives' inspection register
 - Asbestos demolition and stripping register

- Batch plant inspections
- Construction vehicles and mobile plant inspections by controller

- Daily inspection of vehicles, plant and other equipment by the operator/driver/user
- Demolition inspection register
- Designer's inspection of structures record
- Electrical installations, -equipment and -appliances (including portable electrical tools)
- Excavations inspection
- Explosive powered tool inspection, maintenance, issue and returns register (incl. cartridges and nails)
- Fall protection inspection register
- First aid box contents
- Fire equipment inspection and maintenance
- Formwork and support work inspections
- Hazardous chemical substances record
- Ladder inspections
- Lifting equipment register
- Materials hoist inspection register
- Machinery safety inspection register (incl. machine guards, lock-outs etc.)
- Workers Medical Certificates
- Scaffolding inspections
- Stacking and storage inspection
- Inspection of structures
- Inspection of suspended platforms
- Inspection of tunnelling operations
- Inspection of vessels under pressure
- Welding equipment inspections
- Inspection of work conducted on or near water
- Welfare facilities as provided

(e) Notification of Construction Work (Construction Regulation 4)

The contractor shall, where the contract meets the requirements laid down in Construction Regulation 4, prior to commencement notify the Department of Labour of the intention to carry out construction work and use the form (Annexure A in the Construction Regulations) for the purpose. A copy shall be kept on the OH&S file and a copy shall be forwarded to the Employer for record keeping purposes.

(f) Training and Competence

The training required by the Act and Regulations shall be included in the contractor's OH&S plan. The contractor shall be responsible for ensuring that all relevant training is undertaken. Only accredited training providers shall be used for the regulatory OH&S training. The contractor shall ensure that his and his subcontractors' personnel appointed are competent and that all training required for doing the work safely and without risk to health, has been completed before work commences. The contractor shall ensure that follow-up and refresher training is conducted as the contract work progresses and the work situation changes. This does not absolve any subcontractors from their responsibilities as Employers. Records of all training must be kept on the OH&S file for auditing purposes.

(g) Consultations, Communication and Liaison

OH&S liaison between the Employer, the contractor, the subcontractors, the designer and other concerned parties will be through the OH&S committee as contemplated in

sub-sub-clause E1002(c)(v). In addition to the above, communication may be directly to the Employer or his appointed agent, verbally or in writing, as and when the need arises.

Consultation with the workforce on OH&S matters will be through their supervisors, OH&S representatives and the OH&S committee. The contractor shall be responsible for the dissemination of all relevant OH&S information to the subcontractors e.g. design changes agreed with the Employer and the designer, instructions by the Employer and/or his/her agent, exchange of information between subcontractors, the reporting of hazardous/dangerous conditions/situations etc. The contractors' most senior manager on site shall be required to attend all OH&S meetings.

(h) Checking, Reporting and Corrective Actions

(i) Monthly Audit by Employer (Construction Regulation 4(1)(d))

The Employer will conduct monthly audits to comply with Construction Regulation 5(1) (o) in order to ensure that the contractor has implemented and is maintaining the agreed and approved OH&S plan.

(ii) Other Audits and Inspections by the Employer

The Employer reserves the right to conduct other ad hoc audits and inspections as deemed necessary. This will include site safety walks.

(iii) Contractor's Audits and Inspections

The contractor must conduct his own regular internal audits to verify compliance with his own OH&S management system, as well as with this specification. The contractor shall furthermore ensure that each subcontractor's health & safety plan is being implemented by conducting periodic audits at intervals mutually agreed between the contractor and subcontractors, but at least once per month.

(iv) Inspections by OH&S Representative's and other Appointees

OH&S representatives shall conduct weekly inspections of their areas of responsibility and report thereon to their foreman or supervisor whilst other appointees shall conduct inspections and report thereon as specified in their appointments e.g. vehicle, plant and machinery drivers, operators and users must conduct daily inspections before start-up.

(v) Recording and Review of Inspection Results

All the results of the abovementioned inspections shall be in writing, reviewed at OH&S committee meetings, endorsed by the chairman of the meeting and placed on the OH&S File.

(i) Accidents and Incident Investigation (General Administrative Regulation 9)

The contractor and his subcontractors shall coordinate their investigation of all accidents/incidents where employees and non-employees were injured to the extent that he/she/they had to be referred for medical treatment by a doctor, hospital or clinic. The results of the investigation shall be entered into an accident/incident register listed in sub-sub-clause E1002 (d) (i).

The affected subcontractor shall be responsible for the investigation of all minor and non-injury incidents as described in Section 24(1) (b) & (c) of the Act and keeping a record of the results of such investigations including the steps taken to prevent similar accidents in future.

(j) Reporting

The contractor shall provide the Employer with copies of all statutory reports required in terms of the Act within 7 days of the incident occurring.

D1003 OPERATIONAL CONTROL

(a) Operational Procedures

Each construction activity shall be assessed by the contractor so as to identify operational procedures that will mitigate against the occurrence of an incident during the execution of each activity. This specification requires the contractor:

- to be conversant with all relevant Regulations;
- to comply with their provisions;
- to include them in his OH&S plan where relevant.

(b) Emergency Procedures

Simultaneous with the identification of operational procedures (per sub-clause E1003 (a) above), the contractor shall similarly identify and formulate emergency procedures in the event an incident does occur. The emergency procedures thus identified shall also be included in the contractor's OH&S plan, and communicated as part of induction training. It is the responsibility of the first aid worker, together with the construction supervisor, to make an assessment regarding the severity of injuries and which actions are appropriate. For example: transfer to a medical facility by ambulance or helicopter.

(c) Personal & Other Protective Equipment (Sections 8/15/23 of the OH&S Act)

The contractor shall identify the hazards in the workplace and deal with them. He must either remove them or, where impracticable, take steps to protect workers and make it possible for them to work safely and without risk to health under the hazardous conditions.

Personal protective equipment (PPE) should, however, be the last resort and there should always first be an attempt to apply engineering and other solutions to mitigating hazardous situations before the issuing of PPE is considered.

Where it is not possible to create an absolutely safe and healthy workplace the contractor shall inform employees regarding this and issue, free of charge, suitable equipment to protect them from any hazards being present and that allows them to work safely and without risk to health in the hazardous environment.

It is a further requirement that the contractor maintain the said equipment, that he instructs and trains the employees in the use of the equipment and ensures that the prescribed equipment is used by the employee/s.

Employees do not have the right to refuse to use/wear the equipment prescribed by the Employer and, if it is impossible for an employee to use or wear prescribed protective

equipment through health or any other reason, the employee cannot be allowed to continue working under the hazardous condition/s for which the equipment was

prescribed but an alternative solution has to be found that may include relocating or discharging the employee.

The contractor shall include in his OH&S plan the PPE he intends issuing to his employees for use during construction and the sanctions he intends to apply in cases of non-conformance by his employees. Conformance to the wearing of PPE shall be discussed at the weekly inspection meetings.

(d) Other Regulations

Wherever in the Construction Regulations or this specification there is reference to other regulations (e.g. Construction Regulation 24: Electrical Installations and Machinery on Construction Sites) the contractor shall be conversant with and shall comply with these regulations.

(e) Public Health & Safety (Section 9 of the OH&S Act)

The contractor shall, as far as is reasonably practicable, be responsible for ensuring that non-employees affected by the construction work are made aware of the dangers likely to arise from said construction work as well as the precautionary measures to be observed to avoid or minimise those dangers.

This includes:

- Non- employees entering the site for whatever reason
- The surrounding community
- Passers-by to the site

D1004 PROJECT/SITE SPECIFIC REQUIREMENTS

The following is a generic list of Risk Assessments taken from the Employer's audit template:

- Clearing and Grubbing of the area/site
- Site establishment including:
 - Office/s
 - Secure/safe storage for materials, plant and equipment
 - Ablutions
 - Sheltered eating area
 - Maintenance workshop
 - Vehicle access to the site
- Dealing with existing structures
- Location of existing services
- Installation and maintenance of temporary construction electrical supply, lighting and equipment
- Adjacent land uses/surrounding property exposures
- Boundary and access control/public liability exposures (NB: the Employer is also responsible for the OH&S of non-employees affected by his/her work activities.)
- Health risks arising from neighbouring as well as own activities and from the environment e.g. threats by dogs, bees, snakes, lightning etc.
- Exposure to noise
- Exposure to vibration
- Protection against dehydration and heat exhaustion
- Protection from wet and cold conditions
- Dealing with HIV/Aids and other diseases
- Use of portable electrical equipment including
 - Angle grinder

- Electrical drilling machine
- Circular saw

- Excavations including
 - Ground/soil conditions
 - Trenching
 - Shoring
 - Drainage of trench
- Welding including
 - Arc welding
 - Gas welding
 - Flame cutting
 - Use of LP gas torches and appliances
- Loading and offloading of trucks
- Aggregate/sand and other materials delivery
- Manual and mechanical handling
- Lifting and lowering operations
- Driving and operation of construction vehicles and mobile plant including
 - Trenching machine
 - Excavator
 - Bomag roller
 - Plate compactor
 - Front end loader
 - Mobile cranes and the ancillary lifting tackle
 - Parking of vehicles and mobile plant
 - Towing of vehicles and mobile plant
- Use and storage of flammable liquids and other hazardous substances e.g. petrol, diesel, cement, asphalt, bituminous materials and similar
- Layering and bedding
- Installation of pipes in trenches
- Pressure testing of pipelines
- Backfilling of trenches
- Protection against flooding
- Gabion work
- Use of explosives
- Protection from overhead power lines
- As discovered by the contractor's hazard identification exercise
- As discovered from any inspections and audits conducted by the Employer or by the contractor or any subcontractor on site
- As discovered from any accident/incident investigation.

SECTION E: EPWP CONDITIONS OF CONTRACT**Note:****Payment for the labour-intensive component of the works**

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

Applicable labour laws

The Ministerial Determination, Special Public Works Programmes, issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of Labour in Government Notice N° R63 of 25 January 2002, as reproduced below, shall apply to works described in the scope of work as being labour intensive and which are undertaken by unskilled or semi-skilled workers.

1 Introduction

- 1.1 This document contains the standard terms and conditions for workers employed in elementary occupations on a Special Public Works Programme (SPWP). These terms and conditions do NOT apply to persons employed in the supervision and management of a SPWP.
- 1.2 In this document –
- (a) "department" means any department of the State, implementing agent or contractor;
 - (b) "employer" means any department, implementing agency or contractor that hires workers to work in elementary occupations on a SPWP;
 - (c) "worker" means any person working in an elementary occupation on a SPWP;
 - (d) "elementary occupation" means any occupation involving unskilled or semi-skilled work;
 - (e) "management" means any person employed by a department or implementing agency to administer or execute an SPWP;
 - (f) "task" means a fixed quantity of work;
 - (g) "task-based work" means work in which a worker is paid a fixed rate for performing a task;
 - (h) "task-rated worker" means a worker paid on the basis of the number of tasks completed;
 - (i) "time-rated worker" means a worker paid on the basis of the length of time worked.

2 Terms of Work

- 2.1 Workers on a SPWP are employed on a temporary basis.
- 2.2 A worker may NOT be employed for longer than 24 months in any five-year cycle on a SPWP.
- 2.3 Employment on a SPWP does not qualify as employment as a contributor for the purposes of the Unemployment Insurance Act 30 of 1966.

3 Normal Hours of Work

- 3.1 An employer may not set tasks or hours of work that require a worker to work–

- (a) more than forty hours in any week
- (b) on more than five days in any week; and

(c) for more than eight hours on any day.

3.2 An employer and worker may agree that a worker will work four days per week. The worker may then work up to ten hours per day.

3.3 A task-rated worker may not work more than a total of 55 hours in any week to complete the tasks allocated (based on a 40-hour week) to that worker.

4 Meal Breaks

4.1 A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.

4.2 An employer and worker may agree on longer meal breaks.

4.3 A worker may not work during a meal break. However, an employer may require a worker to perform duties during a meal break if those duties cannot be left unattended and cannot be performed by another worker. An employer must take reasonable steps to ensure that a worker is relieved of his or her duties during the meal break.

4.4 A worker is not entitled to payment for the period of a meal break. However, a worker who is paid on the basis of time worked must be paid if the worker is required to work or to be available for work during the meal break.

5 Special Conditions for Security Guards

5.1 A security guard may work up to 55 hours per week and up to eleven hours per day.

5.2 A security guard who works more than ten hours per day must have a meal break of at least one hour or two breaks of at least 30 minutes each.

6 Daily Rest Period

Every worker is entitled to a daily rest period of at least eight consecutive hours. The daily rest period is measured from the time the worker ends work on one day until the time the worker starts work on the next day.

7 Weekly Rest Period

Every worker must have two days off every week. A worker may only work on their day off to perform work which must be done without delay and cannot be performed by workers during their ordinary hours of work ("emergency work").

8 Work on Sundays and Public Holidays

8.1 A worker may only work on a Sunday or public holiday to perform emergency or security work.

8.2 Work on Sundays is paid at the ordinary rate of pay.

8.3 A task-rated worker who works on a public holiday must be paid –

- (a) the worker's daily task rate, if the worker works for less than four hours;
- (b) double the worker's daily task rate, if the worker works for more than four hours.

8.4 A time-rated worker who works on a public holiday must be paid –

- (a) the worker's daily rate of pay, if the worker works for less than four hours on the public holiday;
- (b) double the worker's daily rate of pay, if the worker works for more than four hours on the public holiday.

9 Sick Leave

9.1 Only workers who work four or more days per week have the right to claim sick-pay in terms of this clause.

9.2 A worker who is unable to work on account of illness or injury is entitled to claim one day's paid sick leave for every full month that the worker has worked in terms of a contract.

9.3 A worker may accumulate a maximum of twelve days' sick leave in a year.

9.4 Accumulated sick-leave may not be transferred from one contract to another contract.

9.5 An employer must pay a task-rated worker the worker's daily task rate for a day's sick leave.

9.6 An employer must pay a time-rated worker the worker's daily rate of pay for a day's sick leave.

9.7 An employer must pay a worker sick pay on the worker's usual payday.

9.8 Before paying sick-pay, an employer may require a worker to produce a certificate stating that the worker was unable to work on account of sickness or injury if the worker is –

- (a) absent from work for more than two consecutive days; or
- (b) absent from work on more than two occasions in any eight-week period.

9.9 A medical certificate must be issued and signed by a medical practitioner, a qualified nurse or a clinic staff member authorised to issue medical certificates indicating the duration and reason for incapacity.

9.10 A worker is not entitled to paid sick-leave for a work-related injury or occupational disease for which the worker can claim compensation under the Compensation for Occupational Injuries and Diseases Act.

10 Maternity Leave

10.1 A worker may take up to four consecutive months' unpaid maternity leave.

10.2 A worker is not entitled to any payment or employment-related benefits during maternity leave.

10.3 A worker must give her employer reasonable notice of when she will start maternity leave and when she will return to work.

10.4 A worker is not required to take the full period of maternity leave. However, a worker may not work for four weeks before the expected date of birth of her child or for six weeks after the birth of her child, unless a medical practitioner, midwife or qualified nurse certifies that she is fit to do so.

10.5 A worker may begin maternity leave –

- (a) four weeks before the expected date of birth; or
- (b) on an earlier date –
 - (i) if a medical practitioner, midwife or certified nurse certifies that it is necessary for the health of the worker or that of her unborn child; or
 - (ii) if agreed to between employer and worker; or (c) on a later date, if a medical practitioner, midwife or certified nurse has certified that the worker is able to continue to work without endangering her health.

10.6 A worker who has a miscarriage during the third trimester of pregnancy or bears a stillborn child may take maternity leave for up to six weeks after the miscarriage or stillbirth.

10.7 A worker who returns to work after maternity leave, has the right to start a new cycle of twenty-four months employment, unless the SPWP on which she was employed has ended.

11 Family responsibility leave

11.1 Workers, who work for at least four days per week, are entitled to three days paid family responsibility leave each year in the following circumstances -

- (a) when the employee's child is born;
- (b) when the employee's child is sick;
- (c) in the event of a death of –
 - (i) the employee's spouse or life partner;
 - (ii) the employee's parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling.

12 Statement of Conditions

12.1 An employer must give a worker a statement containing the following details at the start of employment –

- (a) the employer's name and address and the name of the SPWP;
- (b) the tasks or job that the worker is to perform; and
- (c) the period for which the worker is hired or, if this is not certain, the expected duration of the contract;
- (d) the worker's rate of pay and how this is to be calculated;
- (e) the training that the worker will receive during the SPWP.

12.2 An employer must ensure that these terms are explained in a suitable language to any employee who is unable to read the statement.

12.3 An employer must supply each worker with a copy of these conditions of employment.

13 Keeping Records

13.1 Every employer must keep a written record of at least the following –

- (a) the worker's name and position;
- (b) in the case of a task-rated worker, the number of tasks completed by the worker;
- (c) in the case of a time-rated worker, the time worked by the worker;
- (d) payments made to each worker.

13.2 The employer must keep this record for a period of at least three years after the completion of the SPWP.

14 Payment

- 14.1 An employer must pay all wages at least monthly in cash or by cheque or into a bank account.
- 14.2 A task-rated worker will only be paid for tasks that have been completed.
- 14.3 An employer must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the contractor having submitted an invoice to the employer.
- 14.4 A time-rated worker will be paid at the end of each month.
- 14.5 Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.
- 14.6 Payment in cash or by cheque must take place –
- (a) at the workplace or at a place agreed to by the worker;
 - (b) during the worker's working hours or within fifteen minutes of the start or finish of work;
 - (c) in a sealed envelope which becomes the property of the worker.
- 14.7 An employer must give a worker the following information in writing –
- (a) the period for which payment is made;
 - (b) the numbers of tasks completed or hours worked;
 - (c) the worker's earnings;
 - (d) any money deducted from the payment;
 - (e) the actual amount paid to the worker.
- 14.8 If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it
- 14.9 If a worker's employment is terminated, the employer must pay all monies owing to that worker within one month of the termination of employment.
- 14.10 Payment of labour as per government gazette.

15 Deductions

- 15.1 An employer may not deduct money from a worker's payment unless the deduction is required in terms of a law.
- 15.2 An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.
- 15.3 An employer who deducts money from a worker's pay for payment to another person must pay the money to that person within the time period and other requirements specified in the agreement law, court order or arbitration award concerned.
- 15.4 An employer may not require or allow a worker to –
- (a) repay any payment except an overpayment previously made by the employer by mistake;

- (b) state that the worker received a greater amount of money than the employer actually paid to the worker; or
- (c) pay the employer or any other person for having been employed.

16 Health and Safety

16.1 Employers must take all reasonable steps to ensure that the working environment is healthy and safe.

16.2 A worker must –

- (a) work in a way that does not endanger his/her health and safety or that of any other person;
- (b) obey any health and safety instruction;
- (c) obey all health and safety rules of the SPWP;
- (d) use any personal protective equipment or clothing issued by the employer;
- (e) report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

17 Compensation for Injuries and Diseases

17.1 It is the responsibility of the employers (other than a contractor) to arrange for all persons employed on a SPWP to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993.

17.2 A worker must report any work-related injury or occupational disease to their employer or manager.

17.3 The employer must report the accident or disease to the Compensation Commissioner.

17.4 An employer must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months. The employer will be refunded this amount by the Compensation Commissioner. This does NOT apply to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

18 Termination

18.1 The employer may terminate the employment of a worker for good cause after following a fair procedure.

18.2 A worker will not receive severance pay on termination.

18.3 A worker is not required to give notice to terminate employment. However, a worker who wishes to resign should advise the employer in advance to allow the employer to find a replacement.

18.4 A worker who is absent for more than three consecutive days without informing the employer of an intention to return to work will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.

18.5 A worker who does not attend required training events, without good reason, will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.

19 Certificate of Service

19.1 On termination of employment, a worker is entitled to a certificate stating –

- (a) the worker's full name;
- (b) the name and address of the employer;

- (c) the SPWP on which the worker worked;
- (d) the work performed by the worker;
- (e) any training received by the worker as part of the SPWP;
- (f) the period for which the worker worked on the SPWP;
- (g) any other information agreed on by the employer and worker.

20 Job Creation

It is required that for every R1 million rand spent on this project, a minimum of 7 jobs per million must be created for a minimum period of 4 months.

21 Training

It is required that a minimum of 2 students be employed every year for in-service training for a minimum period of 12 months until the project lapses.

22 Subcontracting

Items that must be subcontracted to Departmentally approved subcontracting are traffic accommodation, detours, drainage, road signs, fencing, finishing of borrow pits and transporting of labours. **Failure of the principal contractor to adhere to the 30% approved subcontracting allocation will lead to termination of this contract.**

23 Contractor's Work Period

The contractors must be prepared to work during the holidays including the contractors year end break in December/January.

COVID 19 MANAGEMENT PLAN

PURPOSE OF THE BASIC WORK PLAN

To ensure compliance with the regulations by the employees, contractors and persons entering the facility and to ensure the measures the Contractors are taking to minimise the spread of COVID 19 are consistent with National Strategies of Government and within the confines of the appropriate legislation, rules and regulations. In addition, the purpose is also to provide and maintain an environment that is safe and without risk and to eliminate/mitigate potential hazards and to review and update the risk assessment in terms of the OHSA with specific focus on COVID 19 and to apply the updated risk assessment to the measures the

LEGISLATIVE COMPLIANCE

The Company is required to maintain this COVID-19 BASIC WORK PLAN within the following legislative framework. The legislation directing this document is:

- The Disaster Management Act, Act 57 of 2002
- Cooperative Governance and Traditional Affairs (Cogta) – Regulation 1 Dated 29 April 2020
- Cooperative Governance and Traditional Affairs (Cogta) – Regulation 2 Dated 30 April 2020
- Draft Framework for Sectors 25 April 2020 • Labour Department Regulations 29 April 2020

RESOURCES AND PPE**The following PPE is to be made available to the following people:**

- a. People who are spraying sanitizer at the entrance:
 - Full eye protection glasses/ Face Shield x2
 - Cloth masks X3
 - Disposable medical gloves
- b. Employees:
 - Washable Face Masks X3
 - Face Shields x2
- c. Management
 - Re-washable Face Mask

The following resources must be made available on each site:

- a. 2 people per entrance area to do the temperature checks with the thermometers(This should be the security personnel), executed on a daily basis
 - 1 person to do the temperature check
 - 1 person to do the sanitizing spray
- b. Each site to be supplied with at least 210L of sanitizer
- c. Each site to be supplied with at least 210L of disinfectant
- d. Each site to be supplied with at least 10x1L spray bottles
- e. Each site to be supplied with paper towels daily.
- f. Wash Station – Clean Water & Soap
- g. Each site to be supplied with at least 1 back pack sprayers for transport and eating area spraying

- h. Each site to be supplied with one heat thermometer for the testing of body temperature

Additional precautions to be used during aerosol-generating procedures include:

- performing procedures in an adequately ventilated room
- minimizing respirator face-seal leakage to fully protect the worker from exposure to aerosolized infectious droplets when using particulate respirators e.g. N95 mask
- eye protection (goggles or face shield) to protect the eyes from respiratory splash or spray

TRANSPORT

- Employees will use their own vehicles, company supplied transport or public transport as normal
- Selected company supplied transportation will be aligned with the Government Gazette regarding transportation quantities and reduce the amount of transported personnel as required
- In case of public transport, it is the employee's responsibility to ensure the use of only vehicles that adhere to the loading capacity as outlined in the Government Gazette
- Each driver will be responsible to have available a hand sanitizer spray bottle with a content of at least 70% alcohol. This must be used to spray on the hands of the commuters prior to them entering the transport
- Natural ventilation is key to ensure that the transport vehicle has a constant flow of natural air whilst in travel, where possible
- When transport vehicles are not in use they are to be parked in the sun with all windows open as this will assist in eliminating the virus
- Site Construction Manager will delegate a person to visually inspect these transport vehicles and see that the driver of the said vehicle cleans the transportation after each use and frequently with selected hygiene products
- After cleaning the transportation, the used rags, wipes, material etc., will be discarded into a waste bin allocated for this purpose that must be sealed. This container shall be discarded at an appropriate waste removal facility and not next to the road..
- When employees use their own vehicles, door handles, steering wheels and controls should be wiped down and sanitized with a disinfectant or a solution of 1:10 Jik – Water solution
- Face masks will be provided to employees using own and company supplied transport

ACCOMODATION

When company supplied accommodation is being used the following is to be executed:

- All employees entering the accommodation for the first time after the shutdown must ensure that they have been tested by means of the thermal scanning thermometer and that they do not have any symptoms of flu or the COVID-19 virus
- Social distancing is to be upheld within the accommodation
- Masks are to be used at all times when moving around the accommodation
- Sanitizer is to be made available for the accommodation unit and to be used continuously

SITE***Entrance to the site:***

- The rows for people to wait to enter must apply the principle of social gathering and must be at least 1.5m apart from each other in the rows.
- All personnel intending to enter the work place must be screened on a regular basis to ensure that those with Covid 19 Virus symptoms get the necessary assistance.
- Employees to be encouraged not to hide their fever-like symptoms when being screened
- Masks must be supplied to each person at the entrance to the site
- Sanitizer must be applied to each person's hands by the designated person
- A temperature reading must be taken by use of a thermal scanning thermometer of each person entering the site, by a designated person
- An isolation area is to be created outside the entrance to the site. This could be a taxi or bus or designated area. This area is to be at a distance from all people entering the gate and must be cordoned off.
- THE ISOLATION AREA WILL BE SANITISED BY SPRAYING 1:10 JIK – WATER SOLUTION (OR SIMILAR DISINFECTANT SOLUTION) AT LEAST ONCE PER DAY AND AFTER ANY PERSON WAS KEPT IN THE ISOLATION AREA.
- If a person has a temperature of 38 degrees c or higher must be moved to an isolation area
- Any person found with cold/flu like symptoms must be moved to the isolation area
- Posters and information pieces regarding the COVID 19 virus must be displayed so that all who enter the site can view the relevant information

Security Guard room:

- Maximum of 2 Security guards will be allowed to occupy the guard room and only if they are both wearing face masks.
- Security guards should each be provided with a full face shield and must wear it when interacting with employees, contractors, clients or visitors.
- The Security Guards will check the essential service permit for all visitors and clients (until such time as not deemed necessary by government) and NO ad hoc visitors, suppliers, contractors or clients will be allowed on site unless arranged and authorized by the manager and in accordance with government regulations.
- All employees shall be screened by means of a laser thermometer / temperature gauge by the security guard on duty before being allowed to clock in and access work area. **Normal body temperature is between 36,5 °C and 37,5 °C.**
- All employees will complete the COVID-19 Return to Work Health Questionnaire.
- If **ABNORMAL BODY TEMPERATURE 38 °C OR HIGHER** is observed through screening, access to the work area will be denied.

Working on the site:

- On entering the site all people are to go through a thorough induction process whereby all relevant information regarding the COVID 19 virus and the prevention thereof should be discussed.
- Social distancing is to be applied where possible
- All employees are to wear their cloth masks whenever they are in close contact with other people
- Toilets are to be provided with soap and or hand sanitizer as well as paper towels to dry hands with.
- Toilets to be cleaned more regularly
- Posters and information pieces regarding the COVID 19 virus must be displayed so that all who are on the site can view the relevant information
- Toolbox Talks are to be conducted regularly whereby information regarding the virus is discussed
- Eating areas should be disinfected on a daily basis
- All workers on site are to bring their own eating utensils, water bottles and drinking cups with to work. No sharing of these items are to take place.

OFFICE AREAS

- All office areas are to be disinfected on a daily basis
- Social distancing is to be executed in the seating arrangements within office areas
- No sharing of stationary is to take place amongst all staff working within the office areas
- Windows are to be kept open as far as possible within the offices
- Sanitizer must be available in the office areas for all office workers within the office areas.

MEETINGS

- Meetings are to be kept to an absolute minimum within the site area
- Electronic meetings over platforms like Skype or Zoom are preferred, even on sites
- If meetings are a must then preferable outside in an open area or an appropriate electronic medium is to be used
- If meetings must take place in an office area then social distancing must be applied as well as windows are to be kept open as far as possible
- All attendees must wear masks during the meeting and sanitizer must be applied to the hands prior to entering and after the meeting

TOOLS, PLANT AND MACHINERY

- All tools, plant and machinery shall be cleaned and disinfected when arriving on site.
- All tools, plant and machinery shall be sanitised after use, availing it ready to be used again.

DISPOSAL OF COVID 19 WASTE

- All gloves, masks, disposable suits and any other items used for prevention of the virus must be disposed of in black plastic bags.
- These bags, when full are to be stored in a designated area as determined by the Construction Manager and HSE officer
- Once a considerable amount of waste is generated then the waste is to be disposed of at a general waste site.

COMMUNICATION

- This plan and all relevant information, pamphlets, posters must be communicated to the local CLO, sub-contractors working in close proximity on site as well as to any visitors or other parties visiting the site.
- Subcontractors shall either compile their own Plan, which shall as a minimum be as stringent as this Plan, or they shall follow this Plan.
- Induction training to take place on entry to the site
- Toolbox talks to take place in small groups with social distancing applied
- Notice boards to carry relevant information regarding the COVID 19 virus
- Notice boards at the entrance to the site to carry relevant information regarding the COVID 19 virus

CONTINUOUS MEASURES

- When the daily register is being completed only one person is to tick off the names of the workers present. No signing of the register is to take place.
- Training of staff and employees
- Continually re-enforcing of universal hygiene precautions
- Enforce physical distancing in the workplace
- Continued use of facemasks and gloves where applicable.
- Promotion of good hygiene practices.

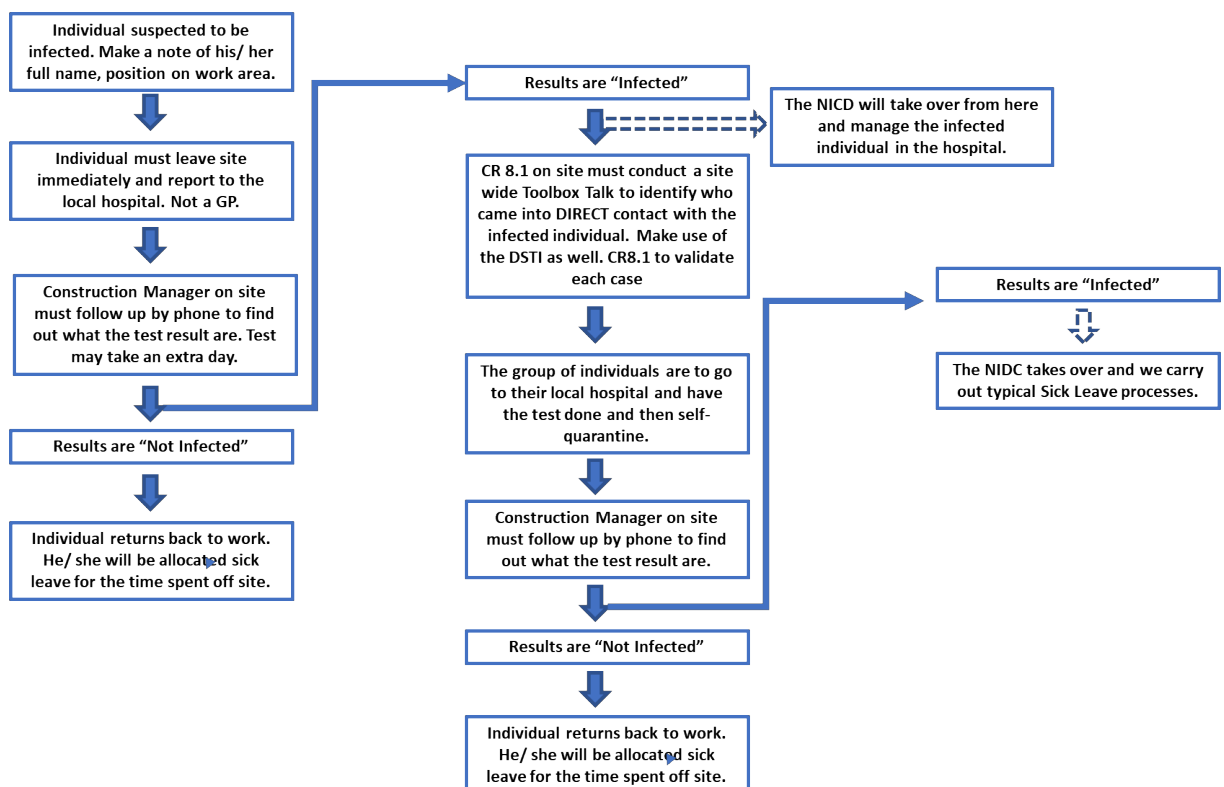
REPORTING

The non-contact, infrared thermal testing

Each employee will be screened at the gate, before entering the site. The daily screening is a non-contact, infrared thermometer that is held just off the forehead. This device produces a sample result in a matter of seconds, in degrees centigrade, which is then compared to the guidelines:

- Green: Less than 37.7. Unlikely to be infected.
- Amber: Between 37.7 and 39.4. Retest.
- Red: Higher than 39.4. Likely infected. Retest

4.2.2.. In the case there is a Red reading (likely infected person):



Create or identify a space for any suspected individuals to be kept aside until the process is run. This space should be:

- Private
- Well ventilated
- Comfortable

The site must identify the closest Public Hospital and have those details available at the entrance gates.

Criteria for person under investigation (PUI)

Persons with acute respiratory illness with sudden onset of at least one of the following: cough, sore throat, shortness of breath or fever [$\geq 38^{\circ}\text{C}$ (measured) or history of fever (subjective)] irrespective of admission status

In the 14 days prior to onset of symptoms, met at least one of the following epidemiological criteria:

- Were in close contact with a confirmed or probable case of SARS-CoV-2 infection;
- Had a history of travel to areas with presumed ongoing community transmission of SARS-CoV-2; i.e., China, South Korea, Japan, Iran, Hong Kong, Italy, and Taiwan (NB Affected countries will change with time, consult the NICD website for current updates);
- Worked in, or attended a health care facility where patients with SARS-CoV-2 infections were being treated;
- Admitted with severe pneumonia
- Close contact: A person having had face-to-face contact or was in a closed environment with a COVID-19 case; this includes, amongst others, all persons living in the same household as a COVID-19 case and, people working closely in the same environment as a case. A healthcare worker or other person providing direct care for a COVID-19 case, while not wearing recommended personal protective equipment or PPE (e.g., gowns, gloves, NIOSH-certified disposable N95 respirator, eye protection). A contact in an aircraft sitting within two seats (in any direction) of the case, travel companions or persons providing care, and crew members serving in the section of the aircraft where the case was seated.
- Confirmed case: A person with laboratory confirmation of SARS-CoV-2 infection, irrespective of clinical signs and symptoms.
- Probable case: A PUI for whom testing for SARS-CoV-2 is inconclusive (the result of the test reported by the laboratory) or who tested positive on a pan-coronavirus assay. Clinicians should also be vigilant for the possibility of atypical clinical presentations among immunocompromised patients. Consider the possibility of influenza (Northern Hemisphere season ends in April or May) and bacterial pneumonia and manage accordingly.

Reporting of any person showing symptoms of illness

Once it has been determined that a person has any symptoms as indicated above then the following people need to be notified:

- Site HSE Officer
- Construction Manager
- Client Representative
- FEM, NICD and DOL

Reporting of any person not being at work.

Once it has been determined that a person is not at work, through the daily register check, for any unknown reason then the following people need to be notified:

- Site HSE Officer
- Construction Manager

A follow up to his given contact details is to be made to determine the cause of his absence.

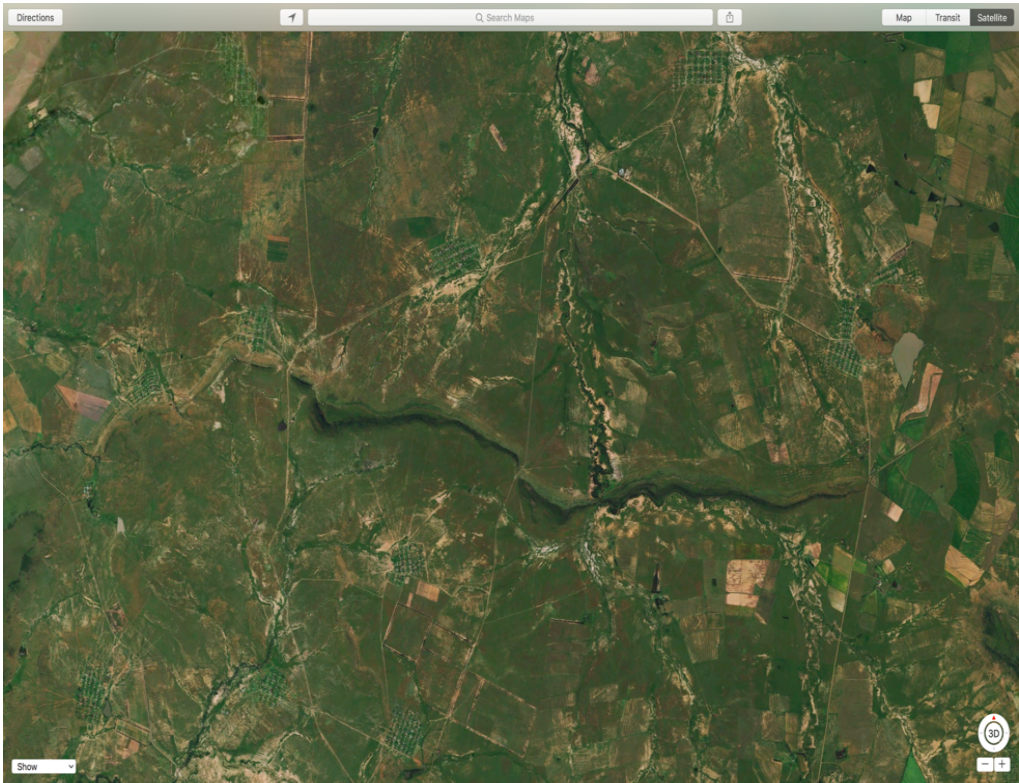
Reporting of any person having the COVID 19 Virus

- The Contractor or Covid Coordinator or HSE Officer will in turn report it to the COVID-19 Hotline or NICD hotline for further guidance **0800 029 999. (Department of Health (South Africa) WhatsApp Support Line: 060 012 3456)** This person **should not come into contact with any other person on site.**
- Transport of this employee will be dealt with by **NICD or Emergency Services** as indicated by them.
- Once test results for this person is confirmed positive through testing at a medical centre, contact tracing must be done through questioning the person who he / she has had contact with.
- The NDoH must be notified of the positive result for the employee.

GENERAL

- Do not remove any essential and required specific PPE at any time unless it is required to obtain fresh and new PPE. Do this in a well ventilated and controlled area. Do not share any PPE. Do not touch your mask or face.
- Follow the guideline of the Government Gazette and keep + - 1.5 meter between each other as a general guideline, increasing the space between personnel will be the primary goal.
- Minimize group activities on site.
- Perform general activities such as talks, discussions outside when practical.
- Keep supervision up to standard towards Government Gazette requirements and enforce strict compliance.
- Display topics of COVID 19 and Gazette on boards, outside notification boards.
- Communicate health and hygiene topics daily and keep proof of discussion and signatures.
- Keep head count daily and monitor the health of employees by visual checks and communication structures.
- Natural ventilation is key.
- Each person to have their own stationary to perform daily required documents or checks.
- Do not lick your fingers to page.
- Wipe all radios, tags, keys off with approved cleaning solution which will not cause damage to equipment or material.
- Each operator will clean his or her cab, equipment with approved solutions prior any use, as well to do so frequently.
- Manager to supply approved cleaning solutions and make them available.
- Supervisors to be strict and visible in the field when this process is running.
- Non-compliant personnel will be removed from site and the normal disciplinary rules will apply.

C4 SITE INFORMATION



DEPARTMENT OF POLICE, ROADS AND TRANSPORT
THE UPGRADING OF THABA NCHU PUBLIC TRANSPORT ROUTE FOR 10 KM'S

Information Only

All data and descriptions contained in this section of the contract documents are given for information purposes only and cannot be interpreted as prescriptive despite the fact that the text may give the opposite perspective. If any conflict arises between the content of this section and other sections of the contract documents, the latter take precedence.

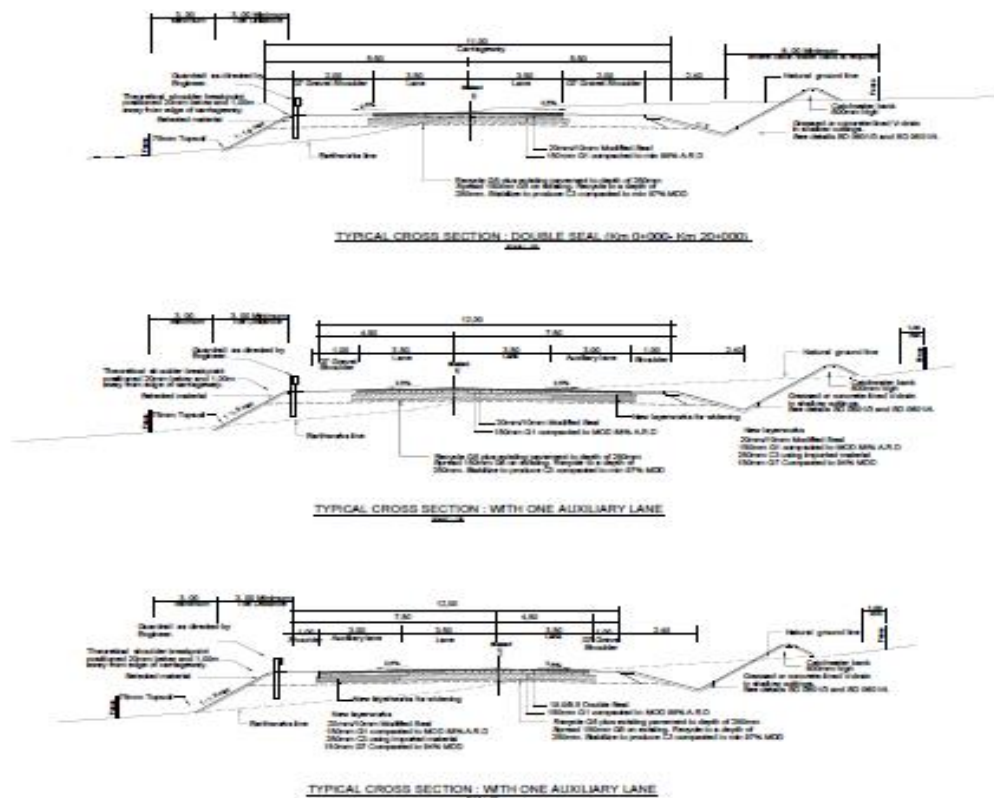
C4.1 DESCRIPTION OF THE WORKS

The description of the works shall inter alia contain the following particulars regarding the work to be constructed and maintained under the contract.

C4.1.1 ROADWORKS

This project is for the the upgrading of Thaba Nchu Public Transport Route for 10 km's. In general, the existing alignment will be lifted to allow for a new G1 Base with only minor adjustments to the vertical and horizontal alignment.

The subbase will be constructed by spreading 100 mm of G5A quality material onto the existing road followed by recycling to a depth of 250 mm. The layer will be stabilized using cement to produce 250 mm subbase of C3 quality. The base will consist of commercially imported G1 crushed stone material which will be sealed with a modified 20 mm/10 mm Double seal.



C4.1.2 PAVEMENT DESIGN FOR ALL PARTS OF THE VARIOUS ROADS

The pavement design is as follows:

- 20 mm/10 mm Double Seal with SE1 modified bitumen
- 150 mm Base Course – Import G1 crushed rock and compact to 88% AD.
- 150 mm Subbase of a C3 quality compacted to a 97% MOD AASHTO
- Upper selected layer of G5 quality material compacted to 93% MOD AASHTO

C4.1.3 STRUCTURAL WORKS

No structural work to be carried out.

C4.1.4 MAINTENANCE WORKS

The Free State Department of Police, Roads & Transport has currently no maintenance contracts on this section of road.

C4.2 DRAWINGS

The reduced drawings that form part of the tender document are issued for tender purposes only. It should be noted that due to limited time for design, the final approved design drawings will only be made available to the successful tenderer.

The contractor will be supplied with one set of paper A1 drawings plus a CD containing all the tender documentation.

Only figured dimensions may be used and drawings may not be scaled unless so instructed by the engineer. The engineer will supply all figured dimensions omitted from the drawings.

It is the contractor's responsibility to check all clearances given on the drawings and to inform the engineer of any discrepancies.

C4.3 **CAMP ESTABLISHMENT, POWER SUPPLY AND OTHER SERVICES**

The contractor is to make his own arrangements concerning the supply of electrical power and all other services. No direct payment will be made for the provision of electrical and other services. The cost thereof is deemed to be included in the rates and amounts tendered for the various items of work for which these services are required.

The contractor himself shall provide a suitable site for his camp and for accommodating his labourers.

C4.4 **CONSTRUCTION IN CONFINED AREAS**

It will be necessary for the contractor to work within confined areas. In certain places the width of the fill material and pavement layers may decrease to zero and the working space may be confined. The method of construction in these confined areas largely depends on the contractor's constructional plant.

Regardless, measurement and payment will be in accordance with the specified cross-sections and dimensions only, irrespective of the method used for achieving these cross-sections and

dimensions. It is deemed that the rates tendered in the Pricing Schedule include full compensation for all special equipment and construction methods and for all difficulties encountered when working in confined areas and narrow widths, and at or around obstructions. No extra payment will be made nor will any claim for additional payment be considered in such cases. (Refer to project specification sub-clause B1209 (g)).

C4.5 **MANAGEMENT OF THE ENVIRONMENT**

The contractor will be responsible for construction according to an environmental management plan in terms of Section C1000 Scope of Works.

The contractor must take the utmost care to minimise the impact of his establishment and other construction activities on the environment and must adhere to the requirements as set out in Section C of the Scope of Works. Where the contractor fails to adhere to these requirements the specifications in Section C of the Scope of Works provide the methodology and cost liability of remedy.

C4.7 SMME DEVELOPMENT TARGETS FOR THIS CONTRACT

The successful tenderer will be required to allocate a minimum of 30% of the contract amount as specified on Schedule F. Failure to achieve this target will lead to a breach of contract and could possibly be terminated.

C4.9 CLIMATE

TBC

C4.10 REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS

Refer to Section D of the Scope of Works for general requirements in terms of the OH&S requirements.

C4.11 OTHER INFORMATION**C4.11.1 MATERIALS**

Refer to Volume 6 for information on materials investigations. All materials that cannot be sourced within the road reserve and allocated borrow pit must be sourced by the contractor or commercially.

(a) Disclaimer

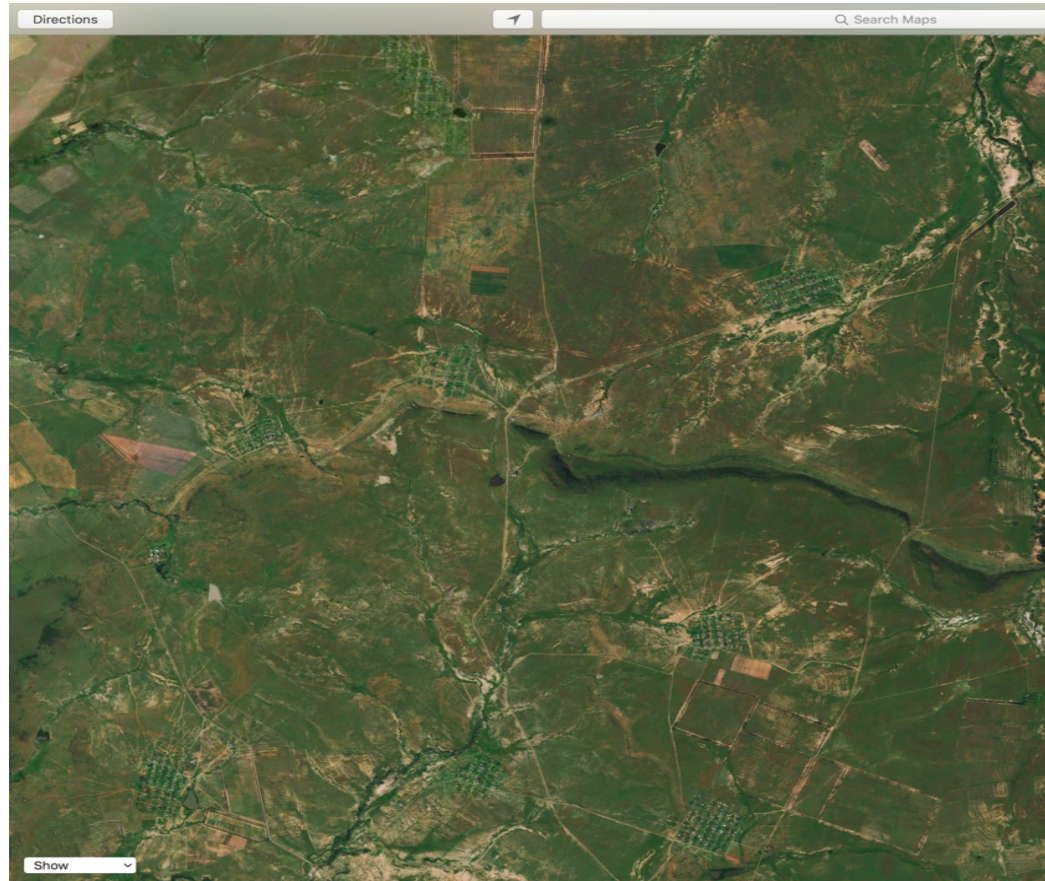
The information contained in Volume 6 records the results and findings of the various investigations undertaken along the route and is merely intended as an indication of conditions likely to be encountered. The results are given in good faith, but no warranty is given that the information is representative of the whole area and no responsibility will be accepted for any consequence arising from actual conditions being different from those indicated in this part.

The Employer accepts no responsibility for the correctness or sufficiency of this information or for any losses that might arise out of the information later proving to be incorrect or unrepresentative. Should the Contractor rely on the opinions, interpretations and proposed construction methods, he must be aware that this is done at his own risk.

The Contractor shall take cognizance of the fact that the provision of any ground or subsoil information will not relieve him of his responsibility in terms of the General Conditions of Contract to ascertain and satisfy himself concerning the site conditions.

This Volume will only be distributed to the successful tenderer.

PART C4: LOCALITY PLAN



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