



THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE

CONTRACT NO: G495/2023

THE APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE TO THE EXISTING RING ROAD, REPAIR OF GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE

PROCUREMENT DOCUMENT

DECEMBER 2023

Issued by:

South African National Biodiversity Institute
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Silverton
0184

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Name of tenderer:

Contact Details:

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T1.1: TENDER NOTICE AND INVITATION TO TENDER

SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE INVITES TENDERERS FOR THE PROVISION OF:

PROJECT TITLE:	THE APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE TO THE EXISTING RING ROAD, REPAIR OF GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE
CONTRACT NO:	G495/2023

Advertising date:	12 December 2023	Closing date:	6 February 2024
Closing time:	11:00	Validity period:	90 days

THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE INVITES TENDERERS FOR THE PROVISION OF: The appointing a contractor for the upgrade to the existing ring road, repair of the gravel service road and stormwater management for SANBI at the Karoo Desert National Botanical Garden in Worcester, Western Cape.

It is estimated that tenderers should have a CIDB contractor grading of **6 CE** or higher

- **Tender documents will be available** as from **12 December 2023** and will be available **ONLINE ONLY** on:
- SANBI website www.sanbi.org (click on "Opportunities")
 - CIDB Website
 - National e-Tender Publication Portal

A **compulsory** site briefing session will take place on site on **17 January 2024** at **13:00** in the Education Centre at the Karoo Desert National Botanical Garden, Worcester.

Bidders are encouraged to direct all technical and bidding procedure enquiries to the email address below.

Department: Supply Chain Management
Email: sanbi.tenders@sanbi.org.za
Cc: A.Hendricks@sanbi.org.za
Cut-off date for **enquiries**: 26 January 2024 at 12:00

Any queries regarding the tender document or any related matter prior to submission of tenders must be directed to:

SANBI Representative (Technical Queries Only)	Mr Johan Kruger Ukhukhula Holdings (Pty) Ltd Tel: 082 335 0535 E-mail: johan@ukhukhula.com
SANBI SCM Representative	sanbi.tenders@sanbi.org.za

The closing time and date for the receipt of tenders is **11:00** on **6 February 2024**.

The tenders will **NOT** be opened in public (please note that the two-envelope system is being followed). Requirements for sealing, addressing, delivery, opening and assessment of tenders are stated in the Tender Data.

T1.2 Tender Data

The conditions of tender are the Standard Conditions of Tender as contained in Annex F of the CIDB Standard for Uniformity in Construction Procurement (28 May 2010) as published in Government Gazette No 33239, Board Notice 86 of 2010 of 28 May 2010. (See www.cidb.org.za).

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	Tender Data
F.1.1	The employer is: The South African National Biodiversity Institute (SANBI) Private Bag X101 Silverton 0184
F.1.2	The Tender Documents issued by the Employer comprise the following documents: THE TENDER Part T1: Tendering procedures T1.1 - Tender notice and invitation to tender T1.2 - Tender data Part T2: Returnable documents T2.1 - List of returnable documents THE CONTRACT Part C1: Agreements and Contract data C1.1 - Form of offer and acceptance C1.2 - Contract data C1.3 - Construction guarantee Part C2: Pricing Data C2.1- Pricing Instructions C2.2 – Bill of Quantities Part C3: Scope of Works C3.1- Description of the works C3.2 – Construction C3.3 - Annexures Part C4: Site Information C4.1 – Geotechnical information C4.2 – Health and Safety Specification
F.1.4	The employer's agent is : Ukhukhula Holdings (Pty) Ltd 117 Strand Street Cape Town, 8000 Tel: 082 335 0535 Fax: 086 552 3309 E-mail: johan@ukhukhula.com

F 2.1.1	Only those tenderers who score the minimum score in respect of the quality criteria stated in F.3.11.9 of this Tender Data shall be considered responsive and have their tenders evaluated further.
F.2.1.2	<p>Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a 6 CE class of construction work, are eligible to have their tenders evaluated.</p> <p>Joint ventures are eligible to submit tenders provided that:</p> <ol style="list-style-type: none"> 1. every member of the joint venture is registered with the CIDB; 2. the lead partner has a contractor grading designation in the 6 CE class of construction work; and 3. the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a 6 CE class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.
F.2.7	<p>The arrangements for a compulsory clarification meeting are as stated in the Tender Notice and Invitation to Tender.</p> <p>Tenderers must sign the attendance list in the name of the tendering entity. Addenda will be issued to and tenders will be received only from those tendering entities appearing on the attendance list.</p>
F.2.12	Main tender offers are required to be submitted together with alternative tenders.
F.2.12	<p>If 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.</p> <p>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.</p> <p>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.</p> <p>The modified Pricing Data must include an amount equal to 5% of the amount tendered for the alternative offer to cover the Employer's costs in confirming the acceptability of the detailed design.</p>
F.2.13.3	<p>Tenderers shall note the specific requirements for packaging of their tender documents and include only the following:</p> <ul style="list-style-type: none"> • Original: one (1) original document marked "Original" including Form of Offer and Acceptance, Estimated monthly expenditure and Priced Bills of Quantity; and • Memory Stick: one (1) document pack <u>without any pricing</u> on a memory stick <p>Financial or pricing details should ONLY be included in the printed document pack marked 'ORIGINAL', and not in the PDF file(s) of the document(s) on the memory stick.</p>

	<p>NB: Failure to submit one printed document pack with pricing in the envelope, and a document pack without pricing on a memory stick will lead to your bid being disqualified. (Please put them in one envelope)</p> <p>INCLUSION OF ANY PRICING INFORMATION ANYWHERE ON THE MEMORY STICK WILL LEAD TO THE BID BEING DISQUALIFIED.</p> <p>The original document and the memory stick will be placed in one envelope and on the envelope sealed bearing the following:</p> <ul style="list-style-type: none"> • The address as stated in C.2.15.1 below • The identification details as stated in C.2.15.1 below • Name of the Tenderer • The words "Not be opened before the Tender opening"
F.2.13.5	<p>The Employer's address for delivery of tender offers and identification details to be shown on each tender offer package are:</p> <p>Location of Tender box: Biodiversity Centre, Pretoria National Botanical Garden, 2 Cussonia Avenue, Brummeria, Pretoria, Gauteng Province</p>
F.2.15.1	<p>Identification details: Tender number: G495/2023 Title of Tender: The appointment of a contractor for the upgrade to the existing ring road, repair of the gravel service road and stormwater management for SANBI at the Karoo Desert National Botanical Garden in Worcester, Western Cape.</p>
F.2.13.6	<p>A two-envelope procedure will be followed as described in clause F.2.13.3.</p>
F.2.13.9	<p>Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted.</p>
F.2.15	<p>The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender.</p>
F.2.16	<p>The tender offer validity period is 90 days.</p>
F.2.18	<p>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 together with satisfactory evidence that such staff members satisfy the eligibility requirements.</p>
F.2.23	<p>The tenderer is required to submit with his tender the following documents. Failure to include the following documents <u>WILL</u> result in the bid being disqualified:</p> <ol style="list-style-type: none"> 1) A copy of the Central Suppliers Database (CSD) registration report or registration number. 2) A printed copy of the Active Contractor's Listing off the CIDB website (www.cidb.org.za) 3) Letter of Good Standing from the Office of the Compensation Commissioner as required by the Compensation for Occupational Injuries and Diseases Act (COIDA). The letter should be issued by the Department of Labour. 4) In the case of a Joint Venture/Consortium the tax Compliance status Pin or Compliant tax status on CSD report must be submitted for each member of the Joint Venture/Consortium." 5) The signed compulsory Site Briefing Certificate.

F.3.4	The tenders will be opened in public if required (please note that the two-envelope system is being followed).																																									
F.3.11.1	The tender evaluation method for the evaluation of all responsive tender offers will be Method 4: Financial offer, quality and preferences in accordance with F.3.11.5.																																									
F.3.11.7	<p>Scoring financial offers</p> <p>The financial offer will be scored using Formula 1 (Option 1) where the value of W1 is 80 points.</p>																																									
F.3.11.9	<p>Scoring Quality</p> <p>The functionality (quality) evaluation criteria are listed below. Maximum points for each criterion are in bold while points for each sub-criterion are indicated in brackets.</p> <table><tr><th colspan="3">FUNCTIONALITY CRITERIA</th></tr><tr><th>ID</th><th>CRITERIA</th><th>POINTS</th></tr><tr><td rowspan="10">1</td><td>1. Implementation method and project plan or programme</td><td>25</td></tr><tr><td>(a) Project methodology</td><td></td></tr><tr><td><ul style="list-style-type: none">Method to be followed in delivering this project, the methodology and approach must be specific to the project and location of works.It should include team Organogram of the people who will be working on the project tendered.Time and quality management of the projectA list of subcontractors (if any) to be utilized for various disciplines and how the work will be dispatched to subcontractors considering the reasonable response times.</td><td></td></tr><tr><td><table><tr><th>Sub-Criteria</th><th>Points</th></tr><tr><td>No Methodology</td><td>0</td></tr><tr><td>Poor Methodology</td><td>3</td></tr><tr><td>Average Methodology</td><td>6</td></tr><tr><td>Above Average Methodology</td><td>9</td></tr><tr><td>Good Methodology</td><td>12</td></tr><tr><td>Comprehensive (Exceptional) Methodology</td><td>15</td></tr></table></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td>(15)</td></tr></table>	FUNCTIONALITY CRITERIA			ID	CRITERIA	POINTS	1	1. Implementation method and project plan or programme	25	(a) Project methodology		<ul style="list-style-type: none">Method to be followed in delivering this project, the methodology and approach must be specific to the project and location of works.It should include team Organogram of the people who will be working on the project tendered.Time and quality management of the projectA list of subcontractors (if any) to be utilized for various disciplines and how the work will be dispatched to subcontractors considering the reasonable response times.		<table><tr><th>Sub-Criteria</th><th>Points</th></tr><tr><td>No Methodology</td><td>0</td></tr><tr><td>Poor Methodology</td><td>3</td></tr><tr><td>Average Methodology</td><td>6</td></tr><tr><td>Above Average Methodology</td><td>9</td></tr><tr><td>Good Methodology</td><td>12</td></tr><tr><td>Comprehensive (Exceptional) Methodology</td><td>15</td></tr></table>	Sub-Criteria	Points	No Methodology	0	Poor Methodology	3	Average Methodology	6	Above Average Methodology	9	Good Methodology	12	Comprehensive (Exceptional) Methodology	15													(15)
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3	3. Contractor's Resources – Personnel and Plant	35
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Score	Prompt for judgement
0	Failed to address the question / issue
1	Very poor response: - response / answer / solution lacks convincing evidence of skill / experience sought or medium risk that relevant skills will not be available.
2	Poor response – some elements of the response / answer / solution are present but documentary evidence is mostly lacking in respect of the required information
3	Acceptable response / answer / solution to the particular aspect of the requirements and evidence given of skill / experience sought
4	Above acceptable - response / answer / solution demonstrating real understanding of requirements and evidence of ability to meet it.
5	Excellent - response / answer / solution provides confidence that the tenderer will add real value to the project.

The minimum number of evaluation points for functionality proposal is **70 points** in order to progress to stage 3 of the evaluation

3 Stage 3: Tender Price and Preference

The tenderers who complied with the functionality criteria in stage 2 are considered for further evaluation in terms of their Tender Price and Preference points.

3.1 Correction of arithmetical errors

Pursuant to clause C.3.9 of the standard conditions of tender as amended in the Tender Data, correction of arithmetical errors shall be undertaken.

3.2 Calculation of score for Tender Price

The score for Tender Price shall be calculated using the following formula:

$$N_F = W_f \times \left[1 - \left(\frac{P_t - P_{min}}{P_{min}} \right) \right]$$

Where:

N_F = the score for Tender Price awarded for the tender under consideration

W_f = the weighting given to financial offer, determined as follows:

- 90 where the Tender Price, inclusive of VAT, of all responsive tender offers received has a value in excess of R50 000 000,00; or
- 80 where the Tender Price, inclusive of VAT, of one or more responsive tender offers has a value that equals or is less than R50 000 000,00.

P_t = Tender Price of the tender under consideration

P_{min} = Tender Price of the lowest responsive tender

In the event that the calculated value of N_F is negative, the allocated score shall be 0

	<p>3.3 Financial and Preference</p> <p>After calculation of the scores for Tender Price and for Preference, a combined score will be calculated as follows:</p> $NT = NF + NP$ <p>Where:</p> <p>NT = Total score for tender under consideration</p> <p>NF = Score for Tender Price</p> <p>NP = Score for Preference</p> <p>The tender with the highest score should be recommended for appointment</p>
F.3.13	<p>In addition to the requirements of the Condition of Tender, offers will only be accepted if:</p> <ol style="list-style-type: none"> the tenderer submits a copy of the CSD registration report or registration number (refer to T2.1.13); the tenderer is registered with the Construction Industry Development Board in an appropriate contractor grading designation (refer to T2.1.12); the tenderer or any of its directors/shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector; the tenderer has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process and persons in the employ of the state are permitted to submit tenders or participate in the contract (refer to T2.1.16); the tenderer has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process and persons in the employ of the state are permitted to submit tenders or participate in the contract (refer to T2.1.16); the tenderer is registered and in good standing with the compensation fund or with a licensed compensation insurer (Letter of good standing with COIDA); the employer is reasonably satisfied that the tenderer has in terms of the Construction Regulations, 2014, issued in terms of the Occupational Health and Safety Act, 1993, the necessary competencies and resources to carry out the work safely; A copy of Tax Compliance Status Pin or CSD report.

Annex F

(normative)

Standard Conditions of Tender

F.1 General

F.1.1 Actions

F.1.1.1 The employer and each tenderer submitting a tender offer shall comply with these conditions of tender. In their dealings with each other, they shall discharge their duties and obligations as set out in F.2 and F.3, timeously and with integrity, and behave equitably, honestly and transparently, comply with all legal obligations and not engage in anticompetitive practices.

F.1.1.2 The employer and the tenderer and all their agents and employees involved in the tender process shall avoid conflicts of interest and where a conflict of interest is perceived or known, declare any such conflict of interest, indicating the nature of such conflict. Tenderers shall declare any potential conflict of interest in their tender submissions. Employees, agents and advisors of the employer shall declare any conflict of interest to whoever is responsible for overseeing the procurement process at the start of any deliberations relating to the procurement process or as soon as they become aware of such conflict, and abstain from any decisions where such conflict exists or recuse themselves from the procurement process, as appropriate.

Note: (1) A conflict of interest may arise due to a conflict of roles which might provide an incentive for improper acts in some circumstances. A conflict of interest can create an appearance of impropriety that can undermine confidence in the ability of that person to act properly in his or her position even if no improper acts result.

(2) Conflicts of interest in respect of those engaged in the procurement process include direct, indirect or family interests in the tender or outcome of the procurement process and any personal bias, inclination, obligation, allegiance or loyalty which would in any way affect any decisions taken.

F.1.1.3 The employer shall not seek and a tenderer shall not submit a tender without having a firm intention and the capacity to proceed with the contract.

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 of tender, the following definitions apply:

- (a) **conflict of interest** means any situation in which:
 - (i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfil his or her duties impartially;
 - (ii) an individual or organisation is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or
 - (iii) incompatibility or contradictory interests exist between an employee and the organisation which employs that employee.
- (b) **comparative offer** means the tenderer's financial offer after all tendered parameters that will affect the value of the financial offer have been taken into consideration in order to enable comparisons to be made between offers on a comparative basis
- (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

- (e) **organization** means a company, firm, enterprise, association or other legal entity, whether incorporated or not, or a public body
- (f) **quality (functionality)** means the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs

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 readily read, copied and recorded. Communications shall be in the English language. The employer shall not take any responsibility for non-receipt of communications from or by a tenderer. The name and contact details of the employer's agent are stated in the tender data.

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 written 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 responsive 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.1.6 Procurement procedures

F.1.6.1 General

Unless otherwise stated in the tender data, a contract will, subject to F.3.13, be concluded with the tenderer who in terms of F.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submissions that are received at the closing time for tenders.

F.1.6.2 Competitive negotiation procedure

F.1.6.2.1 Where the tender data require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of F.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of F.3.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

F.1.6.2.2 All responsive tenderers, or not less than three responsive tenderers that are highest ranked in terms of the evaluation method and evaluation criteria stated in the tender data, shall be invited in each round to enter into competitive negotiations, based on the principle of equal treatment and keeping confidential the proposed solutions and associated information. Notwithstanding the provisions of F.2.17, the employer may request that tenders be clarified, specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

F.1.6.2.3 At the conclusion of each round of negotiations, tenderers shall be invited by the employer to make a fresh tender offer, based on the same evaluation criteria, with or without adjusted weightings. Tenderers shall be advised when they are to submit their best and final offer.

F.1.6.2.4 The contract shall be awarded in accordance with the provisions of F.3.11 and F.3.13 after tenderers have been requested to submit their best and final offer.

F.1.6.3 Proposal procedure using the two stage-system

F.1.6.3.1 Option 1

Tenderers shall in the first stage submit technical proposals and, if required, cost parameters around which a contract may be negotiated. The employer shall evaluate each responsive submission in terms of the method of evaluation stated in the tender data, and in the second stage negotiate a contract with the tenderer scoring the highest number of evaluation points and award the contract in terms of these conditions of tender.

F.1.6.3.2 Option 2

F.1.6.3.2.1 Tenderers shall submit in the first stage only technical proposals. The employer shall invite all responsive tenderers to submit tender offers in the second stage, following the issuing of procurement documents.

F.1.6.3.2.2 The employer shall evaluate tenders received during the second stage in terms of the method of evaluation stated in the tender data, and award the contract in terms of these conditions of tender.

F.2 Tenderer's obligations

F.2.1 Eligibility

F.2.1.1 Submit a tender offer only if the tenderer satisfies the criteria stated in the tender data and the tenderer, or any of his principals, is not under any restriction to do business with employer.

F.2.1.2 Notify the employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the employer as the basis in a prior process to invite the tenderer to submit a tender offer and obtain the employer's written approval to do so prior to the closing time for tenders.

F.2.2 Cost of tendering

Accept that, unless otherwise stated in the tender data, the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer complies with requirements.

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 Clarification meeting

Attend, where required, a clarification meeting at which tenderers may familiarize themselves with aspects of the proposed work, services or supply and raise questions. Details of the meeting(s) are stated in the tender data.

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) might not be for the full cover required in terms of the conditions of contract identified in the contract data. The tenderer is advised to seek qualified advice regarding insurance.

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.2.10.3 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

Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations. Erasures and the use of masking fluid are prohibited.

F.2.11 Alternative tender offers

F.2.11.1 Unless otherwise stated in the tender data, submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted as well as a schedule that compares the requirements of the tender documents with the alternative requirements that are proposed.

F.2.11.2 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.2.12 Submitting a tender offer

F.2.12.1 Submit one tender offer only, either as a single tendering entity or as a member in a joint venture to provide the whole of the works, services or supply identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.

F.2.12.2 Return all returnable documents to the employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.

F.2.12.3 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.2.12.4 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.2.12.5 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.2.12.6 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.2.12.7 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.2.12.8 Accept that the employer will not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.

F.2.12.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the tender data.

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.2.14 Closing time

F.2.14.1 Ensure that the employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Accept that proof of posting shall not be accepted as proof of delivery.

F.2.14.2 Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.

F.2.15 Tender offer validity

F.2.15.1 Hold the tender offer(s) valid for acceptance by the employer at any time during the validity period stated in the tender data after the closing time stated in the tender data.

F.2.15.2 If requested by the employer, consider extending the validity period stated in the tender data for an agreed additional period with or without any conditions attached to such extension.

F.2.15.3 Accept that a tender submission that has been submitted to the employer may only be withdrawn or substituted by giving the employer's agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted.

F.2.15.4 Where a tender submission is to be substituted, submit a substitute tender in accordance with the requirements of F.2.13 with the packages clearly marked as "SUBSTITUTE".

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 competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.

Note: Sub-clause F.2.17 does not preclude the negotiation of the final terms of the contract with a preferred tenderer following a competitive selection process, should the Employer elect to do so.

F.2.17 Provide other material

F.2.17.1 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.2.17.2 Dispose of samples of materials provided for evaluation by the employer, where required.

F.2.18 Inspections, tests and analysis

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

F.2.19 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.2.20 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.2.21 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.2.22 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 requests from the tenderer

F.3.1.1 Unless otherwise stated in the tender Data, respond to a request for clarification received up to five working days before the tender closing time stated in the Tender Data and notify all tenderers who drew procurement documents.

F.3.1.2 Consider any request to make a material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used to prequalify a tenderer to submit a tender offer in terms of a previous procurement process and deny any such request if as a consequence:

- (a) an individual firm, or a joint venture as a whole, or any individual member of the joint venture fails to meet any of the collective or individual qualifying requirements;
- (a) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or
- (b) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

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 that tender documents are available until three days before the tender closing time stated in the Tender Data. If, as a result a tenderer applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, shall then notify all tenderers who drew documents.

F.3.3 Return late tender offers

Return tender offers received after the closing 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 meeting 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 and, where applicable, the total of his prices, specific goals and time for completion 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 more than 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 points claimed on Specific Goals. 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, after opening and before detailed evaluation, whether each tender offer properly received:

- (a) complies with the requirements of these Conditions of Tender,
- (a) has been properly and fully completed and signed, and
- (b) 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) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,
- (a) significantly change the Employer's or the tenderer's risks and responsibilities under the contract, or
- (b) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

Reject a non-responsive tender offer, and not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.

F.3.9 Arithmetical errors, omissions and discrepancies

F.3.9.1 Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern.

F.3.9.2 Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with F.3.11 for:

- (a) the gross misplacement of the decimal point in any unit rate;

- (a) omissions made in completing the pricing schedule or bills of quantities; or
- (b) arithmetic errors in:
 - (i) line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or
 - (ii) the summation of the prices.

F.3.9.3 Notify the tenderer of all errors or omissions that are identified in the tender offer and either confirm the tender offer as tendered or accept the corrected total of prices.

F.3.9.4 Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:

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

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.3.10 Evaluation of tender offers

F.3.10.1 General

Appoint an evaluation panel of not less than three persons. Reduce each responsive tender offer to a comparative offer and evaluate them using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the tender data.

F.3.10.2 Method 1: Financial Offer

In the case of a financial offer:

- (a) Rank tender offers from the most favourable to the least favourable comparative offer.
- (a) Recommend the highest ranked tenderer for the award of the contract, unless there are compelling and justifiable reasons not to do so.
- (b) Re-rank all tenderers should there be compelling and justifiable reasons not to recommend the highest ranked tenderer and recommend the highest ranked tenderer, unless there are compelling and justifiable reasons not to do so and the process set out in this subclause is repeated.

F.3.10.3 Method 2: Financial offer and preference

In the case of a financial offer and preferences:

- (a) Score each tender in respect of the financial offer made and preferences claimed, if any, in accordance with the provisions of F.3.11.7 and F.3.11.8.
- (a) Calculate the total number of tender evaluation points (T_{EV}) in accordance with the following formula:

$$T_{EV} = N_{FO} + N_P$$

where: N_{FO} is the number of tender evaluation points awarded for the financial offer made in accordance with F.3.11.7;

N_P is the number of tender evaluation points awarded for specific goals in accordance with F.3.11.8.

- (b) Rank tender offers from the highest number of tender evaluation points to the lowest.
- (c) Recommend the 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.

- (d) Rescore and re-rank all tenderers should there be compelling and justifiable reasons not to recommend the tenderer with the highest number of tender evaluation points, and recommend the tenderer with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so and the process set out in this sub-clause is repeated.

F.3.10.4 Method 3: Financial offer and quality

In the case of a financial offer and quality:

- (a) Score each tender in respect of the financial offer made and the quality offered in accordance with the provisions of F.3.11.7 and F.3.11.9, rejecting all tender offers that fail to score the minimum number of points for quality stated in the tender data, if any.
- (a) Calculate the total number of tender evaluation points (T_{EV}) in accordance with the following formula:

$$T_{EV} = N_{FO} + N_Q$$

where: N_{FO} is the number of tender evaluation points awarded for the financial offer made in accordance with F.3.11.7;

N_Q is the number of tender evaluation points awarded for quality offered in accordance with F.3.11.9.

- (b) Rank tender offers from the highest number of tender evaluation points to the lowest.
- (c) 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.
- (d) Rescore and re-rank all tenderers should there be compelling and justifiable reasons not to recommend the tenderer with the highest number of tender evaluation points and recommend the tenderer with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so and the process set out in this sub-clause is repeated.

F.3.10.5 Method 4: Financial offer, quality and preferences

In the case of a financial offer, quality and preferences:

- (a) Score each tender in respect of the financial offer made, specific goals claimed, if any, and the quality offered in accordance with the provisions of F.3.11.7 to F.3.11.9, rejecting all tender offers that fail to score the minimum number of points for quality stated in the tender data, if any.
- (a) Calculate the total number of tender evaluation points (T_{EV}) in accordance with the following formula, unless otherwise stated in the Tender Data:

$$T_{EV} = N_{FO} + N_P + N_Q$$

where: N_{FO} is the number of tender evaluation points awarded for the financial offer made in accordance with F.3.11.7;

N_P is the number of tender evaluation points awarded for specific goals claimed in accordance with F.3.11.8.

N_Q is the number of tender evaluation points awarded for quality offered in accordance with F.3.11.9.

- (b) Rank tender offers from the highest number of tender evaluation points to the lowest.
- (c) Recommend the 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.
- (d) Rescore and re-rank all tenderers should there be compelling and justifiable reasons not to recommend the tenderer with the highest number of tender evaluation points and recommend the tenderer with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so and the process set out in this sub-clause is repeated.

F.3.10.6 Decimal places

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

F.3.10.7 Scoring Financial Offers

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

$$NFO = W_1 \times A$$

where: N_{FO} is the number of tender evaluation points awarded for the financial offer.

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

A is a number calculated using the formula and option described in Table F.1 as stated in the Tender Data.

Table F.1: Formulae for calculating the value of A

(c) Formula	(d) Comparison aimed at achieving	(e) Option 1 ^a	(f) Option 2 ^a
(g) 1	(h) Highest price or discount	(i) $A = (1 + (\frac{P-P_m}{P_m}))$ (j) P_m	(k) $A = P / P_m$
(l) 2	(m) Lowest price or percentage (n) commission / fee	(o) $A = (1 - (\frac{P-P_m}{P_m}))$ (p) P_m	(q) $A = P_m / P$
(r) a (s)	P_m is the comparative offer of the most favourable comparative offer. P is the comparative offer of the tender offer under consideration.		

F.3.10.8 Scoring preferences

Confirm that tenderers are eligible for the preferences claimed in accordance with the provisions of the tender data and reject all claims for preferences where tenderers are not eligible for such preferences. Calculate the total number of tender evaluation points for preferences claimed in accordance with the provisions of the tender data.

F.3.10.9 Scoring quality

Score each of the criteria and sub-criteria for quality in accordance with the provisions of the Tender Data.

Calculate the total number of tender evaluation points for quality using the following formula:

$$N_Q = W_2 \times S_O / M_S$$

where: S_O is the score for quality allocated to the submission under consideration;

M_S is the maximum possible score for quality in respect of a submission; and

W_2 is the maximum possible number of tender evaluation points awarded for the quality as stated in the tender data

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.3.12 Acceptance of tender offer

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

- (a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement,
- (a) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract,
- (b) has the legal capacity to enter into the contract,

- (c) is not insolvent, in receivership, bankrupt or being wound up, has his affairs administered by a court or a judicial officer, has suspended his business activities, or is subject to legal proceedings in respect of any of the foregoing,
- (d) complies with the legal requirements, if any, stated in the tender data, and
- (e) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

F.3.13 Prepare contract documents

F.3.13.1 If necessary, revise documents that shall form part of the contract and that were issued by the employer as part of the tender documents to take account of:

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

F.3.13.2 Complete the schedule of deviations attached to the form of offer and acceptance, if any.

F.3.15 Complete adjudicator's contract

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

F.3.15 Notice to unsuccessful tenderers

F.3.15.1 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.

F.3.15.2 After the successful tenderer has been notified of the employer's acceptance of the tender, notify other tenderers that their tender offers have not been accepted.

F.3.17 Provide copies of the contracts

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

F.3.17 Provide written reasons for actions taken

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

T2.1: LIST OF RETURNABLE DOCUMENTS

PROJECT TITLE:	THE APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE TO THE EXISTING RING ROAD, REPAIR OF GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE
CONTRACT NO:	G495/2023

1. RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES

Tender document name	Number of pages issued	Returnable document
Resolution of Board of Directors (T2.1.01)	1 Page	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Resolution of Board of Directors to enter into consortia or JV's (T2.1.02) (If Applicable)	2 Pages	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Special Resolution of Consortia or JV's (T2.1.03) (If Applicable)	3 Pages	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Schedule of proposed sub-contractors (T2.1.04)	1 Page	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Capacity of Tenderer (T2.1.05)	3 Pages	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Preference points claim form in terms of the Preferential Procurement Regulations 2022 (T2.1.06)	6 Pages	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Resources to be employed in terms of organization and staffing (T2.1.07)	2 Pages	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Estimated Monthly Expenditure (T2.1.08)	1 Page	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Unemployment Insurance Fund (UIF) (Clause F2.23)		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Compensation of Occupational Injuries and Disease Act (COIDA) (Clause F.2.23)		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

2. OTHER DOCUMENTS REQUIRED FOR TENDER EVALUATION PURPOSES

Tender document name	Number of pages issued	Returnable document
Bidders Disclosure (T2.1.10)	1 Page	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Medical Certificate for the confirmation of permanent disabled status (T2.1.11)	1 Page	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Proof of registration with Construction Industry Development Board (T2.1.12)	1 Page	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
A copy of the Central Suppliers Database Registration Report or registration number (T2.1.13)	3 Pages	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Financial reference (T2.1.14)	1 Page	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Proof of Liability Insurance (T2.1.22)	1 Page	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Equipment Datasheets (T2.1.20)	1 Page	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

3. RETURNABLE SCHEDULES THAT WILL BE INCORPORATED INTO THE CONTRACT

Tender document name	Number of pages issued	Returnable document
Record of Addenda to tender documents (T2.1.15)	1 Page	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Compulsory Enterprise Questionnaire (T2.1.16)	3 Pages	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

4. OTHER DOCUMENTS THAT WILL BE INCORPORATED INTO THE CONTRACT

Tender document name	Number of pages issued	Returnable document
Applicable Form of Guarantee	3 Pages	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Priced Bill of Quantities	Pages	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

C1.1 Offer portion of Form of Offer and Acceptance
C1.2 Contract Data (Part 2)
C1.3 Form of Guarantee

RETURNABLE DOCUMENT CHECKLIST

This form has been created as an aid to ensure a tenderer's compliance with the completion of the returnable schedules and subsequent placement in the correct **Technical** and **Financial** envelopes.

A TECHNICAL ENVELOPE (1 COPY)

Reference No	Document Description	Tick if completed
T2.1.01	Resolution of Board of Directors	
T2.1.02	Resolution of Board of Directors to enter into consortia or JV's (If Applicable)	
T2.1.03	Special Resolution of Consortia or JV's (If Applicable)	
T2.1.04	Schedule of proposed sub-contractors	
T2.1.05	Capacity of Tenderer	
T2.1.06	Preference points claim form in terms of the Preferential Procurement Regulations 2022	
T2.1.07	Resources to be employed in terms of organization and staffing	
T2.1.09	Site Inspection Certificate	
T2.1.10	Bidders Disclosure	
T2.1.11	Medical Certificate for the confirmation of permanent disabled status	
T2.1.12	Proof of registration with Construction Industry Development Board (T2.1.12)	
T2.1.13	Original Valid Tax Clearance Certificate	
T2.1.14	CSD Registration Certificate	
T2.1.15	Financial Reference	
T2.1.16	Record of Addenda to Tender Documents	
T2.1.17	Compulsory Enterprise Questionnaire	
T2.1.18	Compensation of Occupational Injuries and Disease Act (COIDA)	
T2.1.22	Proof of Liability Insurance	
SBD 9	Certificate of Independent Quotation Determination	

B FINANCIAL ENVELOPE (ORIGINAL DOCUMENT)

The entire original tender document must be submitted in this envelope including the forms as listed below:

Reference No	Document Description	Tick if completed
Form C1.1	Form of Offer and Acceptance	
Form C1.2	Contract Data – Part 1	
Form C2.2	Priced Bill of Quantities	
Form T2.1.08	Estimated Monthly Expenditure	

PART T: THE TENDER

Part T2: Returnable Documents

PROJECT TITLE:	THE APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE TO THE EXISTING RING ROAD, REPAIR OF GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE
CONTRACT NO:	G495/2023

T2.2 Returnable documents/Schedules

T2.1.01: RESOLUTION OF BOARD OF DIRECTORS

RESOLUTION of a meeting of the Board of *Directors / Members / Partners of:

.....
.....
(Legally correct full name and registration number, if applicable, of the Enterprise)

Held at (place)

On (date)

RESOLVED that:

1. The Enterprise submits a Bid / Tender to the South African National Biodiversity Institute in respect of the following project:

.....
.....
(Project description as per Bid / Tender Document)

Bid / Tender Number: (Bid / Tender Number as per Bid / Tender Document)

2. *Mr/Mrs/Ms:

in *his/her Capacity as: (Position in the Enterprise)

and who will sign as follows:

be, and is hereby, authorised to sign the Bid / Tender, and any and all other documents and/or correspondence in connection with and relating to the Bid / Tender, as well as to sign any Contract, and any and all documentation, resulting from the award of the Bid / Tender to the Enterprise mentioned above.

	Name	Capacity	Signature
1			
2			
3			
4			

Note:

1. * Delete which is not applicable
2. **NB.** This resolution must be signed by all the Directors / Members / Partners of the Bidding Enterprise.
3. Should the number of Directors / Members/Partners exceed the space available above, additional names and signatures must be supplied on a separate page.

ENTERPRISE STAMP

T2.1.02: RESOLUTION OF BOARD OF DIRECTORS TO ENTER INTO CONSORTIA OR JOINT VENTURES

RESOLUTION of a meeting of the Board of *Directors / Members / Partners of:

.....
.....
(Legally correct full name and registration number, if applicable, of the Enterprise)

Held at (place)

On (date)

RESOLVED that:

1. The Enterprise submits a Bid /Tender, in consortium/Joint Venture with the following Enterprises:

.....
.....
(List all the legally correct full names and registration numbers, if applicable, of the Enterprises forming the Consortium/Joint Venture)

to the South African National Biodiversity Institute in respect of the following project:

.....
.....
(Project description as per Bid /Tender Document)

Bid / Tender Number: (Bid / Tender Number as per Bid / Tender Document)

2. *Mr/Mrs/Ms:

in *his/her Capacity as: (Position in the Enterprise)

and who will sign as follows:

be, and is hereby, authorised to sign a consortium/joint venture agreement with the parties listed under item 1 above, and any and all other documents and/or correspondence in connection with and relating to the consortium/joint venture, in respect of the project described under item 1 above.

3. The Joint Venture formation/arrangement will be in the following proportions:

Name of Contractor	Proportion (%)

4. The Enterprise accepts joint and several liability with the parties listed under item 1 above for the due fulfilment of the obligations of the joint venture deriving from, and in any way connected with, the Contract to be entered into with the Employer in respect of the project described under item 1 above.
5. The Enterprise chooses as its *domicilium citandi et executandi* for all purposes arising from this joint venture agreement and the Contract with the Employer in respect of the project under item 1 above:

Physical address:.....

.....

.....(code)

Postal address:.....

.....

.....(code)

Telephone number:(code)

Fax number:(code)

	Name	Capacity	Signature
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Note:

1. * Delete which is not applicable.
2. **NB.** This resolution must be signed by all the Directors / Members / Partners of the Bidding Enterprise.
3. Should the number of Directors / Members / Partners exceed the space available above, additional names and signatures must be supplied on a separate page.

ENTERPRISE STAMP

T2.1.03: SPECIAL RESOLUTION OF CONSORTIA OR JOINT VENTURES

RESOLUTION of a meeting of the duly authorised representatives of the following legal entities who have entered into a consortium/joint venture to jointly bid for the project mentioned below: *(legally correct full names and registration numbers, if applicable, of the Enterprises forming a Consortium/Joint Venture)*

1.
.....
2.
.....
3.
.....
4.
.....
5.
.....
6.
.....
7.
.....
8.
.....

Held at (place)

On (date)

RESOLVED that:

- A. The above-mentioned Enterprises submit a Bid in Consortium/Joint Venture to the South African National Biodiversity Institute in respect of the following project:

.....
.....
(Project description as per Bid /Tender Document)

Bid / Tender Number: *(Bid / Tender Number as per Bid / Tender Document)*

*Mr/Mrs/Ms:

in *his/her Capacity as: *(Position in the Enterprise)*

and who will sign as follows:

be, and is hereby, authorised to sign the Bid, and any and all other documents and/or correspondence in connection with and relating to the Bid, as well as to sign any Contract, and any and all documentation, resulting from the award of the Bid to the Enterprises in Consortium/Joint Venture mentioned above.

- B. The Enterprises constituting the Consortium/Joint Venture, notwithstanding its composition, shall conduct all business under the name and style of:
- C. The Enterprises to the Consortium/Joint Venture accept joint and several liabilities for the due fulfilment of the obligations of the Consortium/Joint Venture deriving from, and in any way connected with, the Contract entered into with the Employer in respect of the project described under item A above.
- D. Any of the Enterprises to the Consortium/Joint Venture intending to terminate the consortium/joint venture agreement, for whatever reason, shall give the Employer 30 day's written notice of such intention. Notwithstanding such decision to terminate, the Enterprises shall remain jointly and severally liable to the Employer for the due fulfilment of the obligations of the Consortium/Joint Venture as mentioned under item D above.
- E. No Enterprise to the Consortium/Joint Venture shall, without the prior written consent of the other Enterprises to the Consortium/Joint Venture and of the Employer, cede any of its rights or assign any of its obligations under the consortium/joint venture agreement in relation to the Contract with the Employer referred to herein.
- F. The Enterprises choose as the *domicilium citandi et executandi* of the Consortium/Joint Venture for all purposes arising from the consortium/joint venture agreement and the Contract with the Employer in respect of the project under item A above:

Physical address:

.....

.....(code)

Postal address:

.....

.....(code)

Telephone number:(code)

Fax number:(code)

South African National Biodiversity Institute

THE APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE TO THE EXISTING RING ROAD, REPAIR OF GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE - Contract: G495/2023

	Name	Capacity	Signature
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Note:

1. * Delete which is not applicable.
2. **NB.** This resolution must be signed by all the Duly Authorised Representatives of the Legal Entities to the Consortium Joint Venture submitting this Bid.
3. Should the number of Duly Authorised Representatives of the Legal Entities joining forces in this Bid exceed the space available above, additional names and signatures must be supplied on a separate page.
4. Resolutions, duly completed and signed, from the separate Enterprises who participate in this Consortium/Joint Venture must be attached to the Special Resolution.

T2.1.04: SCHEDULE OF PROPOSED SUBCONTRACTORS

PROJECT TITLE:	THE APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE TO THE EXISTING RING ROAD, REPAIR OF GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE
CONTRACT NO:	G495/2023

We notify you that it is our intention to employ the following Subcontractors for work in this contract.

If we are awarded a contract, we agree that this notification does not change the requirement for us to submit the names of proposed Subcontractors in accordance with requirements in 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.

	Name and address of proposed Subcontractor	Nature and extent of work	Previous experience with Subcontractor
1			
2			
3			
4			

Name of representative	Signature	Capacity	Date

Name of organisation:	
------------------------------	--

T2.1.05: CAPACITY OF TENDERER

PROJECT TITLE:	THE APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE TO THE EXISTING RING ROAD, REPAIR OF GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE
CONTRACT NO:	G495/2023

1. WORK CAPACITY: *(The Tenderer is requested to furnish the following particulars, attach additional pages if more space is required. Failure to furnish the particulars may result in the Tender being disregarded.)*

Skilled artisans employed		Unskilled employees employed	
Categories of artisans	Number	Categories of employees	Number

1.1. Provide full particulars of:

Machinery	Plant	Workshops

2. PARTICULARS OF COMMITMENTS WHICH THE TENDERER HAS PREVIOUSLY COMPLETED AND PRESENTLY ENGAGED WITH:

2.1. Current projects:

Project		Place (town)	Reference / Contact person	Contact Tel. No.	Contract amount	Contract period	Date of commencem ent	Scheduled date of completion
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

2.2. Previous projects:

Project	Place (town)	Reference / Contact person	Contact Tel. No.	Contract amount	Contract period	Date of commencement	Scheduled date of completion	Actual date of completion
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
Name of Tenderer		Signature			Date			

Any reference to words "Bid" or Bidder" herein and/or in any other documentation shall be construed to have the same meaning as the words "Tender" or "Tenderer".

T2.1.06: PREFERENCE POINT SYSTEM

SBD 6.1

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022

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

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

1. GENERAL CONDITIONS

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

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

1.2 To be completed by the organ of state

(delete whichever is not applicable for this tender).

- a) The applicable preference point system for this tender is the 90/10 preference point system.
- b) The applicable preference point system for this tender is the 80/20 preference point system.
- c) Either the 90/10 or 80/20 preference point system will be applicable in this tender. The lowest/ highest acceptable tender will be used to determine the accurate system once tenders are received.

1.3 Points for this tender (even in the case of a tender for income-generating contracts) shall be awarded for:

- (a) Price; and
- (b) Specific Goals.

1.4 To be completed by the organ of state:

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	80
SPECIFIC GOALS	20
Total points for Price and SPECIFIC GOALS	100

1.5 Failure on the part of a tenderer to submit proof or documentation required in terms of this tender to claim points for specific goals with the tender, will be interpreted to mean that preference points for specific goals are not claimed.

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

2. DEFINITIONS

- (a) **“tender”** means a written offer in the form determined by an organ of state in response to an invitation to provide goods or services through price quotations, competitive tendering process or any other method envisaged in legislation;
- (b) **“price”** means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts;
- (c) **“rand value”** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;
- (d) **“tender for income-generating contracts”** means a written offer in the form determined by an organ of state in response to an invitation for the origination of income-generating contracts through any method envisaged in legislation that will result in a legal agreement between the organ of state and a third party that produces revenue for the organ of state, and includes, but is not limited to, leasing and disposal of assets and concession contracts, excluding direct sales and disposal of assets through public auctions; and
- (e) **“The Act”** means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

3.1.1 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
$P_s = 80 \left(1 - \frac{P_t - P_{min}}{P_{min}} \right)$	or	$P_s = 90 \left(1 - \frac{P_t - P_{min}}{P_{min}} \right)$

Where

P_s = Points scored for price of tender under consideration

P_t = Price of tender under consideration

P_{min} = Price of lowest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

- 4.1. In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goals stated in table 1 below as may be supported by proof/documentation stated in the conditions of this tender:
- 4.2. In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that, if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of state must, in the tender documents, stipulate in the case of—

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

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

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

Table 1: Specific goals for the tender and points claimed are indicated per the table below.

(Note to organs of state: Where either the 90/10 or 80/20 preference point system is applicable, corresponding points must also be indicated as such.

Note to tenderers: The tenderer must indicate how they claim points for each preference point system.)

The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system) (To be completed by the organ of state)	Number of points allocated (80/20 system) (To be completed by the organ of state)	Number of points claimed (90/10 system) (To be completed by the tenderer)	Number of points claimed (80/20 system) (To be completed by the tenderer)
Categories of persons historically disadvantaged by unfair discrimination on the basis of race. Information will be verified on the CSD report. Points will be allocated based on the percentage of ownership per goal Black Ownership = 10 Points		(10)		
Categories of persons historically disadvantaged by unfair discrimination on the basis of gender. Information will be verified on the CSD report. Points will be allocated based on the percentage of ownership per goal Female Ownership = 10 Points		(10)		
Total		20		

DECLARATION WITH REGARD TO COMPANY/FIRM

4.3. Name of company/firm.....

4.4. Company registration number:

4.5. TYPE OF COMPANY/ FIRM [TICK APPLICABLE BOX]

- ☐ Partnership/Joint Venture / Consortium
- ☐ One-person business/sole propriety
- ☐ Close corporation
- ☐ Public Company
- ☐ Personal Liability Company
- ☐ (Pty) Limited
- ☐ Non-Profit Company
- ☐ State Owned Company

4.6. I, the undersigned, who is duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the specific goals as advised in the tender, qualifies the company/ firm for the preference(s) shown and I 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 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct;
- iv) If the specific goals have been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have –
 - (a) disqualify the person from the tendering process;
 - (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
 - (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
 - (d) recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
 - (e) forward the matter for criminal prosecution, if deemed necessary.

.....
SIGNATURE(S) OF TENDERER(S)

SURNAME AND NAME:

DATE:

ADDRESS:

.....

.....

.....

The Tenderer shall list below the key personnel (including first nominee and the second choice alternate), whom he proposes to employ on the Contract should his tender be accepted, both at his headquarters and on the Site, to direct and for the execution of the work, together with their qualifications, experience, positions held and their nationalities.

[illegible]

THE APPOINTMENT OF A CONTRACTOR FOR UPGRADE TO THE EXISTING RING ROAD, REPAIR OF THE GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE - Contract: G495/2023

[illegible]

T2.1.08: ESTIMATED MONTHLY EXPENDITURE

The Tenderer shall state below the estimated value of work to be completed every month, based on his preliminary programme and his tendered unit rates.

The amounts for contingencies and Contract Price Adjustment must not be included ***OR** The amount for contingencies must not be included.

MONTH	VALUE
1	R
2	R
3	R
4	R
5	R
6	R
7	R
8	R
9	R
10	R
11	R
12	R
	COMPLETION OF CONTRACT
TOTAL	R

T2.1.10: Bidders Disclosure

PROJECT TITLE:	THE APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE TO THE EXISTING RING ROAD, REPAIR OF GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE
CONTRACT NO:	SANBI G495/2023

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**

- 2.1.1 If so, furnish particulars of the names, individual identity numbers, and, if applicable, state employee numbers of sole proprietor/ 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

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.

Any reference to words "Bid" or Bidder" herein and/or in any other documentation shall be construed to have the same meaning as the words: "Tender" or "Tenderer".

T2.1.11: MEDICAL CERTIFICATE FOR THE CONFIRMATION OF PERMANENT DISABLED STATUS

PROJECT TITLE:	THE APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE TO THE EXISTING RING ROAD, REPAIR OF GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE
CONTRACT NO:	G495/2023

I, _____ (*surname and name*), Identity number, _____
do hereby declare that I am a registered medical practitioner, with my
practice number being _____, practicing at _____
_____ (Physical and postal addresses) declare that I have examined

Mr/Mrs _____, identity number of _____
_____ and have found the said person to be permanently disabled
or having a recurring disability.

“Disability” means, in respect of a person, a permanent impairment of a physical, intellectual, or sensory function, which results in restricted, or lack of, ability to perform an activity in the manner, or within the range, considered normal for a human being.” – As per Preferential Procurement Policy Framework Act: No 5 of 2000 (PPPFA)

The nature of the disability is as follows:

Thus signed at _____ on this day of _____ of _____.

Signature Date

OFFICIAL STAMP OF
MEDICAL PRACTITIONER

T2.1.12: PROOF OF REGISTRATION WITH CONSTRUCTION INDUSTRY DEVELOPMENT BOARD

The Tenderer shall provide a printed copy of the Active Contractor's Listing off the CIDB website. (www.cidb.org.za). In the case of a joint venture, a printed copy of the Active Contractor's listing must be provided for each member of the joint venture.

Name of Contractor:

Contractor Grading Designation:

CIDB Contractor Registration Number:

T2.1.13: COPY OF CENTRAL SUPPLIERS DATABASE (CSD) REGISTRATION REPORT OR REGISTRATION NUMBER

**A copy of CSD registration report or registration number
must be included for evaluation purposes.**

T2.1.14: FINANCIAL REFERENCES

PROJECT TITLE:	THE APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE TO THE EXISTING RING ROAD, REPAIR OF GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE
CONTRACT NO:	G495/2023

Notes to tenderer:

1. The tenderer shall attach to this form a letter from the bank in which it is declared how he conducts his account. The contents of the bank's letter must state the credit rating that the bank, in addition to the information required below, accords to the tenderer for the business envisaged by this tender. Failure to provide the required letter with the tender submission may render the tenderer's offer unresponsive in terms of tender condition F3.8.
2. The tenderer's banking details as they appear below shall be completed.
3. In the event that the tenderer is a joint venture enterprise, details of all the members of the joint venture shall be similarly provided and attached to this form.

Details of Company's Bank

DESCRIPTION OF BANK DETAIL	BANK DETAILS APPLICABLE TO TENDERER'S HEAD OFFICE
Name of bank	
Branch name	
Branch code	
Street address	
Postal address	
Name of manager	
Telephone number	
Fax number	
Account number	

T2.1.15: RECORD OF ADDENDA TO TENDER DOCUMENTS

PROJECT TITLE:	THE APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE TO THE EXISTING RING ROAD, REPAIR OF GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE
CONTRACT NO:	G495/2023

I / We confirm that the following communications received from the South African National Biodiversity Institute before the submission of this tender offer, amending the tender documents, have been taken into account in this tender offer: *(Attach additional pages if more space is required)*

	Date	Title or Details
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

Name of Tenderer	Signature	Date

I / We confirm that no communications were received from the South African National Biodiversity Institute before the submission of this tender offer, amending the tender documents.

Name of Tenderer	Signature	Date

T2.1.16: 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, if any:

Section 3: CIDB registration number, if any:

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 in the service of the state

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

<input type="checkbox"/> a member of any municipal council <input type="checkbox"/> a member of any provincial legislature <input type="checkbox"/> a member of the National Assembly or the National Council of Province <input type="checkbox"/> a member of the board of directors of any municipal entity <input type="checkbox"/> an official of any municipality or municipal entity	<input type="checkbox"/> an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No 1 of 1999) <input type="checkbox"/> a member of an accounting authority of any national or provincial public entity <input type="checkbox"/> 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

*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 or a sole proprietor, partner in a partnership or director, manager, principal shareholder or stakeholder in a company or close corporation is currently, or has been within the last 12 months, in the service of any of the following:

<input type="checkbox"/> a member of any municipal council <input type="checkbox"/> a member of any provincial legislature <input type="checkbox"/> a member of the National Assembly or the National Council of Province <input type="checkbox"/> a member of the board of directors of any municipal entity <input type="checkbox"/> an official of any municipality or municipal entity	<input type="checkbox"/> an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No 1 of 1999) <input type="checkbox"/> a member of an accounting authority of any national or provincial public entity <input type="checkbox"/> an employee of Parliament or a provincial legislature
--	--

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

*Insert separate page if necessary.

South African National Biodiversity Institute

THE APPOINTMENT OF A CONTRACTOR FOR UPGRADE TO THE EXISTING RING ROAD, REPAIR OF THE GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE - Contract: G495/2023

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

- (i) authorises the Employer to obtain a tax clearance certificate from the South African Revenue Services that my/our tax matters are in order;
- (ii) confirms that neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly 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, 2004;
- (iii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise, has within the last five years been convicted of fraud or corruption;
- (iv) confirms that I/we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the Tenderers or those responsible for compiling the Scope of Work that could cause or be interpreted as a conflict of interest; and
- (v) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

Signed: Date:

Name: Position:

Enterprise name:

T2.1.18: COMPENSATION OF OCCUPATIONAL INJURIES AND DISEASE ACT (COIDA)

PROJECT TITLE:	THE APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE TO THE EXISTING RING ROAD, REPAIR OF GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE
CONTRACT NO:	SANBI G495/2023

Letter of Good Standing from the office of the Compensation Commissioner as required by the Compensation for Occupational Injuries and Diseases Act (COIDA) must be included for evaluation purposes. The letter should be issued by the Department of Labour.

T2.1.22: PROOF OF LIABILITY INSURANCE

PROJECT TITLE:	THE APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE TO THE EXISTING RING ROAD, REPAIR OF GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE
CONTRACT NO:	SANBI G495/2023

The tender shall append their Proof of Liability Insurance behind this page.

SBD 9

CERTIFICATE OF INDEPENDENT QUOTATION DETERMINATION

1. This Standard Bidding Document (SBD) must form part of all quotations¹ invited.
2. Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive Bidding (or Bid rigging) ² Collusive Bidding is a *per se* prohibition meaning that it cannot be justified under any grounds.
3. Treasury Regulation 16A9 prescribes that accounting officers and accounting authorities must take all reasonable steps to prevent abuse of the supply chain management system and authorizes accounting officers and accounting authorities to:
 - a. Disregard the Bid of any Bidder if that Bidder, or any of its directors have abused the institution's supply chain management system and or committed fraud or any other improper conduct in relation to such system.
 - b. Cancel a contract awarded to a supplier of goods and services if the supplier committed any corrupt or fraudulent act during the Bidding process or the execution of that contract.
4. This SBD serves as a certificate of declaration that would be used by institutions to ensure that, when Bids are considered, reasonable steps are taken to prevent any form of Bid-rigging.
5. In order to give effect to the above, the attached Certificate of Bid Determination (SBD 9) must be completed and submitted with the Bid:

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

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

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying Bid:

THE APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE TO THE EXISTING RING ROAD, REPAIR OF THE GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE (BID G495/2023)

In response to the invitation for the quote made by:

SOUTH AFRICAN NATIONAL BIODIVERSITY CONSERVATION CENTRE (SANBI)

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

I certify, on behalf of: _____ that:

(Name of Bidder)

1. I have read and I understand the contents of this Certificate.
2. I understand that the accompanying Bid will be disqualified if this Certificate is found not to be true and complete in every respect.
3. I am authorized by the Bidder to sign this Certificate, and to submit the accompanying Bid, on behalf of the Bidder.
4. Each person whose signature appears on the accompanying Bid has been authorized by the Bidder to determine the terms of, and to sign the Bid, on behalf of the Bidder.
5. For the purposes of this Certificate and the accompanying Bid, I understand that the word "competitor" shall include any individual or organization, other than the Bidder, whether or not affiliated with the Bidder, who:
 - (a) Has been requested to submit a Bid in response to this Bid invitation.
 - (b) Could potentially submit a Bid in response to this Bid invitation, based on their qualifications, abilities or experience; and
 - (c) Provides the same goods and services as the Bidder and/or is in the same line of business as the Bidder
6. The Bidder has arrived at the accompanying Bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium³ will not be construed as collusive Bidding.
7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
 - (a) Prices.
 - (b) Geographical area where product or service will be rendered (market allocation).
 - (c) Methods, factors or formulas used to calculate prices.
 - (d) The intention or decision to submit or not to submit, a Bid.
 - (e) The submission of a Bid which does not meet the specifications and conditions of the Bid; or
 - (f) Bidding with the intention not to win the Bid.
8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this Bid invitation relates.

³ **Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.**
9. The terms of the accompanying Bid have not been, and will not be, disclosed by the Bidder, directly or indirectly, to any competitor, prior to the date and time of the official Bid opening or of the awarding of the contract.
10. I am aware that, in addition to 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.

.....
Signature

.....
Date

.....
Position

.....
Name of Bidder

C1.1: FORM OF OFFER AND ACCEPTANCE

PROJECT TITLE:	THE APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE TO THE EXISTING RING ROAD, REPAIR OF GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE
CONTRACT NO:	G495/2023

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the

THE APPOINTMENT OF A CONTRACTOR FOR THE BOREHOLE WATER SUPPLY, WATER PURIFICATION, RESERVOIR REPAIRS, POTABLE WATER STORAGE AND AUTOMATED IRRIGATION SYSTEM FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE

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

The tenderer, identified in the Offer signature block, has examined the draft contract as listed in the Acceptance section and agreed to provide this Offer.

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

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VAT IS:

(in words)

.....Rand;

R..... (in figures)

THE OFFERED PRICES ARE AS STATED IN THE PRICING SCHEDULE

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 including the Schedule of Deviations (if any) to the tenderer before the end of the period of validity stated in the Tender Data, or other period as agreed, whereupon the tenderer becomes the party named as the **Contractor** in the conditions of contract identified in the Contract Data.

Signature(s)

Name(s)

Capacity

For the tenderer:

.....
(Insert name and address of organisation)

Name &
signature of
witness

Date

Acceptance

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

The terms of the Contract are contained in

Part C1	Agreements and Contract Data <i>[which includes this Agreement]</i>
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 Tender Data and any Addenda thereto listed in the Tender Schedules, as well as any changes to the terms of the Offer agreed by the Tenderer and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Agreement. No amendments to or deviations from the said documents are valid unless contained in this Schedule, which must be duly signed by the authorised representative(s) of both parties.

The Tenderer shall within the time required to submit documentation in accordance with clause 5.3.2 of the Contract Data (C1.2) after receiving a completed copy of this Agreement, including the Schedule of Deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the Conditions of Contract identified in the Contract Data at, or just after, the date this Agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this Agreement.

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

Signature(s)

Name(s)

Capacity

**For the
Employer:**

.....

.....
(Insert name and address of organisation)

Name &
signature of
witness

.....

.....

Date

Schedule of Deviations

1 Subject	
Details	
.....	
.....	
.....	
2 Subject	
Details	
.....	
.....	
.....	
3 Subject	
Details	
.....	
.....	
.....	
4 Subject	
Details	
.....	
.....	
.....	
5 Subject	
Details	
.....	
.....	
.....	

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

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

South African National Biodiversity Institute

THE APPOINTMENT OF A CONTRACTOR FOR UPGRADE TO THE EXISTING RING ROAD, REPAIR OF THE GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE - Contract: G495/2023

FOR THE TENDERER:

Signature(s) _____

Name(s) _____

Capacity _____

[Name and address of organisation]

Name and
signature of
witness _____ Date _____

FOR THE EMPLOYER:

Signature(s) _____

Name(s) _____

Capacity _____

[Name and address of organisation]

Name and
signature of
witness _____ Date _____

CONFIRMATION OF RECEIPT

The Tenderer (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 the Schedule of Deviations (if any) today:

The[day] of [month] 2024

at[place]

For the Contractor:

.....
Signature

.....
Name

.....
Capacity

Signature and name of witness:

.....
Signature

.....
Name

C.1.2 Contract Data

PROJECT TITLE:	THE APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE TO THE EXISTING RING ROAD, REPAIR OF GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE
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C.1.2 Contract Data

The Conditions of Contract are the *General Conditions of Contract for Construction Works (Second Edition, 2010)* published by the South African Institution of Civil Engineering. Copies of these conditions of contract may be obtained from the South African Institution of Civil Engineering (Tel: 011-805 5947).

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

Part 1: Data provided by the Employer

Clause	Data
1.1.1.13	Clause 1.1.1.13: Defects Liability Period The Defects Liability Period is 12 months , measured from the date of the Certificate of Completion
1.1.1.14	Clause 1.1.1.14: Due Completion Date The time for achieving Practical Completion is TWELVE (12) Months after the Commencement Date
1.1.1.15	The name of the Employer is The South African National Biodiversity Institute , represented by Mr C. Willis and/or such persons or person duly authorised thereto be the Employer in writing.
1.2.1.2	The Employer's address for receipt of communications is: Delivery Address: Attention: Deputy Director: Supply Chain Management Biodiversity Centre Pretoria National Botanical Garden 2 Cussonia Avenue, Brummeria, Pretoria Postal Address: Attention: Deputy Director: Supply Chain Management The South African National Biodiversity Institute Private Bag X101 Silverton, 0184
1.1.1.16	The name of the Engineer is Ukhukhula Holdings (Pty) Ltd
1.2.1.2	The address of the Engineer is: Ukhukhula Holdings (Pty) Ltd 117 Strand Street Cape Town, 8000 Tel: 082 335 0535 Email: johan@ukhukhula.com

1.1.1.26	<p>Clause 1.3.: Pricing Strategy</p> <p>The Pricing Strategy is a re-measurement contract</p>
3.1.3	<p>Clause 3.1.3: Specific Approval of the Employer Required</p> <p>The Engineer is required to obtain the specific approval of the Employer before executing any of the following functions or duties:</p> <ol style="list-style-type: none"> 1 Clause 6.3: Variations 2 Clause 5.11.1: Suspension of the Works 3 Clause 5.12: Extension of Time for Practical Completion
5.3.1	<p>Clause 5.3.1: Commencement of the Works</p> <p>The documentation required before commencement with Works execution are:</p> <p style="padding-left: 40px;">Health and Safety Plan (Refer to Clause 4.3) Initial programme (Refer to Clause 5.6) Security (Refer to Clause 6.2) Insurance (Refer to Clause 8.6) Cash flow projection</p>
5.3.2	<p>Clause 5.3.2: Timeframe to deliver documentation</p> <p>The time to submit the documentation required before commencement with Works execution is twenty-eight (28) days.</p>
5.4.2	<p>The access and possession of Site shall not be exclusive to the Contractor but as set out in the Site Information.</p>
5.8.1	<p>Clause 5.8.1: Non-Working Times</p> <p>The non-working days are Saturdays and Sundays.</p> <p>The special non-working days are:</p> <ol style="list-style-type: none"> 1. All gazetted public holidays falling outside the year end break. 1. The year-end break commencing on 14 December 2023 and ending on 14 January 2024 (Provisional).
5.12.2.	<p>Clause 5.12.2.: Some reasons for extension of time</p> <p>Clause 5.12.2.2: Abnormal climatic conditions.</p> <p><i>Add the following:</i></p> <p>Regardless of the cause of any delay an extension of time will only be considered if it can be shown that the activity delayed is on the critical path indicated on the Programme of Works (Clause 5.6.1).</p> <p>No extension of time will be granted in respect of any delays attributed to normal climatic conditions. Normal Climatic Conditions shall be deemed to include normal rainfall and associated wet conditions and materials, strong winds and extremes of temperature. However, in the event that delays to critical activities exceed the number of working days listed below for each month, then abnormal climatic conditions shall be deemed to exist, and an extension of time shall be granted in accordance with the provisions of that Clause.</p> <p>The number of days quoted below shall be regarded as a fair estimate of the delays to be anticipated and allowed for under normal climatic conditions where inclement weather prevents or disrupts work on the critical path.</p>

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	<p>January 2 days May 2 days September 4 days</p> <p>February 2 days June 4 days October 2 days</p> <p>March 2 days July 4 days November 2 days</p> <p>April 2 days August 4 days December 2 days</p> <p>Claims for delays for abnormal climatic conditions shall be accompanied by substantiating facts and evidence, which shall be submitted timeously as each day or half-day delay is experienced. Should an extension of time be granted by the Engineer such extension of time will be added to the Time for Completion.</p> <p>It shall be further noted that where the critical path is not affected, no extension of time for <u>abnormal</u> climatic conditions or for any other reason will be entertained. Rainfall of 10mm or less per day shall be deemed to be normal climatic conditions.</p>
5.13.1	<p>Clause 5.13.1: Penalty for Delay</p> <p>The penalty for failing to complete the Works is R 2500.00 per day.</p>
5.16.3	<p>Clause 5.16.3: Latent defect liability</p> <p>The latent defect period is ten (10) years for civil engineering works.</p>
6.2	<p>Clause 6.2: Security</p> <p>The Form of Guarantee is to contain the wording of the pro-forma document as per the contract document.</p> <p>The liability of the guarantee shall be for 10% of the Approved Contract Sum.</p>
6.8.2	<p>Clause 6.8.2: Contract Price Adjustment</p> <p>Contract Price Adjustment: Is not applicable</p>
6.8.3	<p>Clause 6.8.3: Variation in Cost of Special Materials</p> <p>Price adjustments for variations in the costs of special materials are not allowed</p>
6.10.1.5	<p>Clause 6.10.1.5: Interim Payments - Materials on Site</p> <p>No percentage advance on materials on site, but not yet built into the Permanent Works, is allowed for, or will be paid.</p>
6.10.3	<p>Clause 6.10.3: Retention Money</p> <p>The percentage retention on the amounts due to the Contractor is 10% (ten percent). The limit of retention is 5% of the Contract Sum, including allowances for contingencies. This reduces to 2.5% upon the issue of the Certificate of Completion. The remaining 2.5% retention will be released upon the issue of the Final -Approval Certificate upon lapse of the defects liability period.</p> <p>Security plus Retention amount will not exceed 15% of the Contract Sum</p>
6.10.4	<p>Clause 6.10.4: Delivery, dissatisfaction with and payment of payment certificate</p> <p><i>Replace "28 days" in the second last sentence with "30 days"</i></p>
6.10.6	<p>Clause 6.10.6: Set-Off and Delayed Payments</p> <p>A guarantee <i>in lieu</i> of retention is not permitted.</p>
6.10.6.2	<p>Clause 6.10.6.2: Set-Off and Delayed Payments</p> <p><i>Replace the words "prime overdraft rate certified by the Contractor's banker" with the words "interest rate as determined by the Minister of Finance, from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No. 1 of 1999), will apply"</i></p>

Any reference to words "Bid" or Bidder" herein and/or in any other documentation shall be construed to have the same meaning as the

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6.10.8	Clause 6.10.8: Contractor's completion statement <i>Replace "28 days" in the last sentence with "30 days"</i>
6.10.9	Clause 6.10.9: Final payment certificate <i>Replace "28 days" in the last sentence with "30 days"</i>
6.12	Clause 6.12: Additional <i>Add Clause 6.12 as follows:</i> In respect of any amount owed by the Contractor to the Employer, the Contractor shall pay the Employer interest at the rate as determined by the Minister of Finance, from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No. 1 of 1999), will apply
8.6.1	Clause 8.6.1: Insurance <i>Add the following:</i> Damage to the Works (a) Without in any way limiting the Contractor's obligations in terms of the Contract, the Contractor shall bear the full risk of damage to and/or destruction of the Works by whatever cause during construction of the Works and hereby indemnifies and holds harmless the Employer against any such damage. The Contractor shall take such precautions and security measures and other steps for the protection and security of the Works, as he may deem necessary. (a) The Contractor shall at all times proceed immediately to remove or dispose of any debris arising from damage to or destruction of the Works and to rebuild, restore, replace and/or repair the Works. (b) The Employer shall carry the risk of damage to or destruction of the Works and material paid for by the Employer that is the result, whether direct or indirect or proximate or remote, of the excepted risks as set out in Clause 8.6.2. (d) Where the Employer bears the risk in terms of this Contract, the Contractor shall, if requested to do so, reinstate any damage or destroyed portions of the Works and the costs of such reinstatement shall be measured and valued in terms of Clause 6.7 hereof. .
8.6.1.1.2	Clause 8.6.1.1.2: Insurance The value of the materials supplied by the Employer to be included in the insurance sum is -Nil.
8.6.1.1.3	Clause 8.6.1.1.3: Insurance The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is -Nil.
8.6.1.3	Clause 8.6.1.3: Insurance The limit of indemnity for liability insurance is R5 000 000.00 for any single claim – the number of claims to be unlimited during the construction.

8.6.1.5	<p>Clause 8.6.1.5: Additional Insurance</p> <p>Additional Insurance is required for the following:</p> <p>a) Where the contract involves manufacturing and/or fabrication of the works or part thereof at premises other than the Site, the Contractor shall satisfy the Employer that all materials and equipment for incorporation in the works are adequately insured during manufacture and/or fabrication. In the event of the Employer having an insurable interest in such works during manufacture or fabrication then such interest shall be noted by endorsement to the Contractor's Policies of Insurance.</p> <p>a) The insurance policy held by the Contractor shall cover "wet risks" because a portion of the works will be in the confines of an existing river.</p>
10.5, 10.6, 10.7	<p>Clause 10.5, 10.6, 10.7: Dispute Resolution</p> <p>Dispute resolution shall be by Arbitration.</p>
11	<p>Clause 12: Confidentiality</p> <p>The Contractor shall treat the details of the Works comprised in this Contract as private and confidential (save in so far as may be necessary for the purposes hereof) and shall not publish or disclose the same or any particulars thereof in any trade or technical paper elsewhere without prior written consent of the Engineer.</p>
12	<p>Clause 13: Amendments in writing</p> <p>No amendments of this Contract or of any provisions or terms hereof and no waiver or relaxation or suspension of any of the provisions or terms of this Contract shall be of any force or effect unless reduced to writing and signed by both the parties hereto.</p>

PART 2: DATA PROVIDED BY THE CONTRACTOR

Clause

1.1.1.9 The Contractor is

1.2.1.2 The Contractor's address for receipt of communications is:

Physical address:

Postal address:

.....

.....

.....

.....

.....

.....

.....

.....

Telephone:

Fax:

Email:

C1.3 FORM OF GUARANTEE

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means:

Physical address:

"Employer" means:

"Contractor" means:

"Engineer" means:

"Works" means:

"Site" means:

"Contract" means: The Agreement made in terms of the Form of Offer and Acceptance and such amendments or additions to the Contract as may be agreed in writing between the parties.

"Contract Sum" means: The accepted amount inclusive of tax of R

Amount in words:

"Guaranteed Sum" means: The maximum aggregate amount of R

Amount in words:

"Expire Date" means:

CONTRACT DETAILS

Engineer issues: Interim Payment Certificates, Final Payment Certificate and the Certificate Completion of the Works as defined in the Contract.

PERFORMANCE GUARANTEE

- 1 The Guarantor's liability shall be limited to the amount of the Guaranteed Sum.
- 2 The Guarantor's period of liability shall be from and including the date of issue of this Performance Guarantee and up to and including the Expiry Date or the date of issue by the Engineer of the Certificate of Completion of the Works or the date of payment in full of the Guaranteed Sum, whichever occurs first. The Engineer and/or the Employer shall advise the Guarantor in writing of the date on which the Certificate of Completion of the Works has been issued.
- 3 The Guarantor hereby acknowledge that:
 - 3.1 any reference in this Performance Guarantee to the Contract is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship;
 - 3.2 its obligation under this Performance Guarantee is restricted to the payment of money.

- 4 Subject to the Guarantor's maximum liability referred to in 1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 4.1 to 4.3:
- 4.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Engineer in an Interim or Final Payment Certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 4.2;
- 4.2 A first written demand issued by the Employer to the guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) days has elapsed since the first written demand in terms of 4.1 and the sum certified has still not been paid;
- 4.3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum certified in 4.
- 5 Subject to the Guarantor's maximum liability referred to in 1, the Guarantor undertakes to pay to the Employer the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand from the Employer to the Guarantor at the Guarantor's physical address calling up this Performance Guarantee, such demand stating that:
- 5.1 the Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 5; or
- 5.2 a provisional or final sequestration or liquidation court order has been granted against the Contractor and that the Performance Guarantee is called up in terms of 5; and
- 5.3 the aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provisional liquidation court order.
- 6 It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4 and 5 shall not exceed the Guarantor's maximum liability in terms of 1.
- 7 Where the Guarantor has made payment in terms of 5, the Employer shall upon the date of issue of the Final Payment Certificate submit an expense account to the Guarantor showing how all monies received in terms of this Performance Guarantee have been expended and shall refund to the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Performance Guarantee shall bear interest at the prime overdraft rate of the Employer's bank compounded monthly and calculated from the date payment was made by the Guarantor to the Employer until the date of refund.
- 8 Payment by the Guarantor in terms of 4 or 5 shall be made within seven (7) calendar days upon receipt of the first written demand to the Guarantor.
- 9 Payment by the Guarantor in terms of 5 will only be made against the return of the original Performance Guarantee by the Employer.
- 10 The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.
- 11 The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.
- 12 This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.
- 13 This Performance Guarantee, with the required demand notices in terms of 4 or 5, shall be regarded as a liquid document for the purposes of obtaining a court order.

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- 14 Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate's Courts Act No 32 of 1944, as amended, to the jurisdiction of the Magistrate's Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's Court.

Signed at

Date

Guarantor's signatory: (1)

Capacity

Guarantor's signatory: (2)

Part C2: Pricing Data and Bill of Quantities

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C2.2 Bill Of Quantities	77

C2.1 Pricing Instructions

1. Measurement and payment clauses of the COTO (2020)/SABS 1200 Standardised Specifications, as well as the Particular Specifications, shall be deemed to form part of and included in the pricing instructions.

1. The units of measurement described in the Bill of Quantities are metric units. Abbreviations used in the Bill of Quantities are as follows:

%	=	percent	m ² .pass	=	square metre-pass
h	=	hour	m ³	=	cubic metre
ha	=	hectare	m ³ .km	=	cubic metre-kilometre
kg	=	kilogram	MN	=	meganewton
kl	=	kilolitre	MN.m	=	meganewton-metre
km	=	kilometre	MPa	=	megapascal
km-pass	=	kilometre-pass	No.	=	number
kPa	=	kilopascal	Prov sum	=	Provisional sum
kW	=	kilowatt	P C sum	=	Prime Cost sum
l	=	litre	sum	=	lump sum
m	=	metre	t	=	ton (1 000 kg)
mm	=	millimetre	W/day	=	Work day
m ²	=	square metre			

2. Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance is made for waste.
3. 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 items. Such prices and rates shall cover all costs and expenses that may be required in accordance with the provisions of the Scope of Work, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the Contract Data, as well as overhead charges and profit. These prices shall be used as a basis for assessment of payment for additional work that may have to be carried out.
4. It will be assumed that prices included in the Bill of Quantities are based on Acts, Ordinances, Regulations, By-laws, International Standards and National Standards that were published 28 days before the closing date for tenders. (Refer to www.sabs.co.za or www.iso.org for information on standards).
5. Where the Scope of Work requires detailed drawings and designs or other information to be provided, all costs associated therewith are deemed to have been provided for and included in the unit rates and sum amount tendered for such items.
6. An item against which no price is entered will be considered to be covered by the other price s or rates in the Bill of Quantities. A single lump sum will apply should a number of items be grouped together for pricing purposes.
7. The quantities set out in the Bill of Quantities are approximate and do not necessarily represent the actual amount of work to be done. The quantities of work accepted and certified for payment will be used for determining payments due and not the quantities given in the Bills of Quantities.
8. Reasonable compensation will be received where no pay item appears in respect of work required in the Bills of Quantities in terms of the Contract and which is not covered in any other pay item.
9. 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 entailed under each item appear in the Scope of Work.
10. The Bill of Quantities has been drawn up in accordance with the latest issue of the COLTO (1998)/SABS1200 Standardised Specifications. Descriptions in the Bill of Quantities are abbreviated and must be read in conjunction with the measurement and payment clauses of the applicable specifications.

C2.2 Bill of Quantities

General Conditions of Contract for Works of Civil Engineering Construction (GCC 2015: 3rd Edition)

NB TENDERERS MUST COMPLETE THE SCHEDULE OF QUANTITIES IN BLACK INK

SCHEDULE NO 1: GENERAL

PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
SANS 1200 A	100.00	<u>GENERAL</u>				
	101.00	Scheduled fixed-charge and value-related items:				
PSA 8.3.1		.01 Fixed and Value-related preliminary and general charges	-	-	sum	
	102.00	Scheduled time-related items:				
PSA 8.4.1		.01 Time-related preliminary and general charges	months	12		
PSA 8.8		<u>TEMPORARY WORKS</u>				
PSA 8.8.4	103.00	Location and protection of existing services:				
		.01 Water and sewer pipes	-	-	sum	
		.02 Electric and other cables	-	-	sum	
		.03 Supply and erecting of Sectional Fence	m	50		
	104.00	Accommodating traffic and maintaining temporary deviations	km	1.20		
	105.00	Temporary traffic-control facilities				
		.01 Flagman	man-days	350		
		.02 Portable STOP and GO signs	number	4		
		.03 Road signs, R- and TR-series	number	4		
		.04 Delineators	number	40		
		.05 Traffic cones	number	40		
		.06 Safety jackets for use by SANBI officials and engineers	number	10		
	Carried forward					

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PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
		Brought forward				
PSA 8.6	106.00	Prime cost sums:				
		.01 Housing for Engineer's representative	-	PC	sum	45,000.00
		.02 Charge required by Contractor on subitem .01 above	%	45,000.00	_____ %	
		.03 Housing for Engineer inspections	-	PC	sum	36,000.00
		.04 Charge required by Contractor on subitem .03 above	%	36,000.00	_____ %	
		OCCUPATIONAL HEALTH AND SAFETY				
	107.00	Full time attendance on site of a SACPCMP-registered construction health and safety officer or manager from the start of construction until the end of project handover.	months	12		
		.01 General				
		.01 First aiders and first aid kits.	-	-	sum	
		.02 Medical certificates of fitness Medical examination of all employees and certification of fitness by an occupational medicine practitioner. Pre-employment, annual and exit medical examination is required.	-	-	sum	
		.03 Emergency Equipment based on the risk exposure and emergency rescue. stretchers, neck brace, spill kits, lifting and lowering hosting equipment of the injured.	-	-	sum	
		.04 Competent inspectors for equipment such as examples scaffolding inspectors and lifting machine inspector.	-	-	sum	
		.05 Mandatory training such as risk assessments, legal liability/OHS Act, incident investigation.	-	-	sum	
		Carried forward				

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PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
		Brought forward				
		.06 Provide, supply and maintenance for each worker the following SANS approved personal protective equipment & clothing as per the site-specific risk assessments: • Hard Hats • Overall/work suit (100% Cotton) • Safety boots/shoes (Steel-Toe) • Safety gumboots (Steel-Toe) • Ear Plugs/Muffs • Dust Mask(at least FF2 type) • Respirators • Safety goggles • Hand gloves •Reflector vests • Other	-	-	sum	
		.07 Barricading and hoarding for fall arrest, SANS approved safety netting (orange color with minimum of 1,2 meters high).	-	-	sum	
		.08 Waste bins on site and regular removal.	-	-	sum	
		.09 Construction signage, including the sign for the construction work permit number.	-	-	sum	
		.10 Safe lifting equipment for lifting and lowering pipes.	-	-	sum	
		.11 Dust control measure for the prevention of dust nuisance.	-	-	sum	
	108.00	TEMPORARY FENCING TO CORDEN OFF WORKS BETWEEN THE VARIOUS SECTIONS				
		.01 Bonnox fencing with shade cloth:				
		.01 1,83m High 'Bonnox Close Mesh 1472/12' fence fixed to and including 150mm diameter gumpole posts at 5,0m centres cast in suitable sized concrete bases and the fence covered with shadecloth, including excavations, formwork, backfilling, cart away etc., installed complete.	m	50		
		.02 Carefully take down and re-erect 1,83m High 'Bonnox Close Mesh 1472/12' fence fixed to and including 150mm diameter gumpole posts at 5,0m centres cast in suitable sized concrete bases and the fence covered with shadecloth including excavations, formwork, backfilling, cart away etc., installed complete.	m	50		
		Carried forward				

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PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Brought forward					
		.03 Take down and remove 1,83m High 'Bonnox Close Mesh 1472/12' fence fixed to and including 150mm diameter gumpole posts at 5,0m centres cast in suitable sized concrete bases and the fence covered with shade cloth, gates etc., including making good.	m	50		
		.04 4500mm x 1830mm High Vehicle gate covered with shade cloth including gate posts, 3500mm x 1200mm High vehicle gate including gate posts, including excavations, formwork, backfilling, cart away etc., installed complete.	No	2		
		.05 Carefully take down and re-erect 4500mm x 1830mm High Vehicle gate covered with shade cloth including gate posts, 3500mm x 1200mm High vehicle gate including gate posts, including excavations, formwork, backfilling, cart away etc., installed complete.	No	2		
	109.00	Contingency Allowance				
		.01 Provide the sum of R 300 000.00 (Three Hundred Thousand Rand) for contingencies, to be used as instructed for by the Engineer.	-	PC	sum	300,000.00
		.02 Charge required by Contractor on sub item .01 above	%	300,000.00	_____ %	
		.03 Provide the sum of R 100 000.00 (One Hundred Thousand Rand) for surveyor, to be used as instructed for by the Engineer.	-	PC	sum	100,000.00
		.04 Charge required by Contractor on sub item .03 above	%	100,000.00	_____ %	
		.05 Provide the sum of R 30 000.00 (Thirty Thousand Rand) for detail drawings from surveyor measurements, to be used as instructed for by the Engineer.	-	PC	sum	30,000.00
		.06 Charge required by Contractor on sub item .05 above	%	30,000.00	_____ %	
	TOTAL SCHEDULE NO 1 CARRIED TO SUMMARY					

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SCHEDULE NO 2: ROADS AND STORMWATER DRAINAGE

PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
SANS 1200	201.00	<u>DEMOLITIONS</u>				
		Breaking up excavating and removing				
		.01 Remove 25mm Asphalt layer on existing roads and spoil to identified spoil site	m ²	9,169		
		.02 Remove existing base layer to a depth of 200mm and remove to spoil site	m ²	9,610		
		.03 Remove existing sub-base layer to a depth of 150mm and remove to spoil site	m ²	10,743		
		.04 Extra over excavation for excavation in Intermediate material	m ³	161		
		.05 Extra over excavation for excavation in hard rock material	m ³	161		
		.06 Remove existing kerbing and spoil to identified spoil site	m	2,806		
		.07 Saw-cut into top of existing asphalt to facilitate part removal thereof.	m	58		
CA.04.01	202.00	.08 Remove existing 450mm half-round concrete channel next to asphalt ring road and spoil to spoil site	m	1,080		
		<u>Surface Preparation</u>				
SANS 1200	203.00	.01 Trim and level off surface of ground (excavated or filled under this contract) to receive concrete surface beds,paving etc. including excavating or filling, ripping and scarifying as necessary and compacting the whole area for a depth of 150mm to a density of at least 93% Mod. AASHTO maximum density, part to falls.	m ²	9,473		
		<u>EARTH FILLING</u>				
		Earth filling supplied by the contractor under paving				
		.01 Import G7 subbase course material in accordance with SABS 1200 DM compacted to 93% Mod AASHTO density.	m ³	301		
	Carried forward					

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PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Brought forward					
CA.03.06	204.00	.02 Import G5 subbase course material in accordance with SABS 1200 DM compacted to 95% Mod AASHTO density.	m ³	1,611		
		.03 Import C4 cemented natural gravel material (G5) from commercial sources and construct 125mm thick base compacted in accordance with SABS 1200 DM compacted to 98% Mod AASHTO density.	m ³	1,184		
		Extra over for stabilising C4 layer as in point .03 above with 3% cement				
	205.00	.01 Cement <u>BOND AND INTERLOCKING CONCRETE BLOCK PAVERS</u> 80mm Thick Type S-A approved precast concrete coloured interlocking paving blocks (colour to Engineer specification) in accordance with SANS 1058, laid to falls on and including 25mm thick sand layer with joints filled in with sand, compacted with a vibration compactor. Type: "Kirstenbosch paver"	t	78		
CB.03.04	206.00	.01 Paving to roads, parking areas etc. to falls	m ²	9,473		
		.02 Extra over for straight edge blocks	m	947		
		.03 Fair circular cutting and waste to paving.	m	1,895		
		<u>CONCRETE KERBING</u>				
		Install new concrete kerbing:				
		.01 Cast in situ kerbing or edge restraint of maximum depth 200 mm and maximum width 300 mm:				
		.01 Radius up to 4 m	m	40		
		.02 Radius over 4 m up to 20 m	m	270		
		.03 Radius over 20 m and straight sections	m	900		
		.02 Cast in situ kerbing of maximum depth 300 mm and maximum width 200 mm:				
		.01 Radius up to 4 m	m	5		
		.02 Radius over 4 m up to 20 m	m	35		
		.03 Radius over 20 m and straight sections	m	168		
	Carried forward					

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PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Brought forward					
CB.03.04		.03 Precast kerbing - SABS 927 figure 3:				
		.01 Radius up to 4 m	m	44		
		.02 Radius over 4 m up to 20 m	m	170		
		.03 Radius over 20 m and straight sections	m	480		
CB.03.04		.04 Precast kerbing - SABS 927 figure 7:				
		.01 Radius up to 4 m	m	50		
		.02 Radius over 4 m up to 20 m	m	110		
		.03 Radius over 20 m and straight sections	m	500		
CB.03.04		.05 Precast kerbing - C900:				
		.01 Radius up to 4 m	m	94		
		.02 Radius over 4 m up to 20 m	m	280		
		.03 Radius over 20 m and straight sections	m	980		
CA.05		<u>ERECTION AND REPAIR OF PERMANENT ROAD TRAFFIC SIGNS</u>				
	207.00	Type R3 - Series 'R' 900mm no entry sign constructed of 1.4mm thick sheet steel in sign faces with galvanised background and symbols, characters, legends and borders in engineering grade retro-reflective material complete with reinforcement fitted on and including 125-150 mm diameter bitumen impregnated creosote pole bedded in and including unreinforced concrete base, including any necessary excavation, paint finish, stainless steel strapping, etc.	No	2		
	208.00	Type R1 - Series 'R' 900mm stop sign constructed of 1.4mm thick sheet steel in sign faces with galvanised background and symbols, characters, legends and borders in engineering grade retro-reflective material complete with reinforcement fitted on and including 125-150 mm diameter bitumen impregnated creosote pole bedded in and including unreinforced concrete base, including any necessary excavation, paint finish, stainless steel strapping, etc.	No	2		
	Carried forward					

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PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Brought forward					
CA.05.02	209.00	Road sign supports (overhead road sign structures excluded):				
		.01 Steel tubing (dia 76 mm and 3 mm wall thickness)	m	8		
CA.05.03	210.00	Excavation and backfilling for road sign supports (not applicable to kilometre posts)	m³	2		
CA.05.04	211.00	Extra over item CA 07.03 for cement-treated soil backfill	m³	2		
CA.05.05	212.00	Extra over item CA 07.03 for rock excavation	m³	1		
CA.05.07	213.00	Hazard plates (600 mm x 150 mm)	number	6		
CA.06		<u>ROAD MARKINGS</u>				
CA.06.01	214.00	Prepare and apply one coat white reflective road marking paint on bituminous road surfacing, precast concrete paving blocks, concrete road surfacing, etc.:				
		.01 100 mm wide broken or unbroken lines, white, yellow or red	m	65		
		.02 150 mm wide broken or unbroken lines, white, yellow or red	m	65		
		.03 Straight directional arrow 300 x 3500mm overall.	number	6		
		.04 Right/Left turn directional arrow 300 x 3500mm overall.	number	4		
		.05 Straight directional arrow 500 x 3500mm overall with right/left turn side arrow 955 x 600mm overall.	number	12		
		.06 Painted "STOP" sign with 2000mm high letters.	number	4		
CA.06.02	215.00	Setting out and premarking of lines (excluding traffic-island markings, lettering and symbols)	km	2		
SANS1200MJ	216.00	<u>SEGMENTED PAVING</u>				
		.01 Precast concrete paving blocks of thickness 50 mm up to 75 mm:				
		.01 450 mm x 450 mm	m²	150		
	Carried forward					

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PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Brought forward					
CA.01		<u>REPAIR OF GRAVEL WEARING COARSE</u>				
CA.01.01	217.00	Reshaping the wearing course by:				
		.01 Grading only	m ²	4,217		
		.02 Ripping, redistributing and compacting	m ²	4,217		
		.03 Importing, placing and compacting material from commercial sources (G5) in two 150mm layers	m ³	1,515		
CA.01.01	218.00	Construction of new earth side drains:				
		.01 Top width not exceeding 1,0 m and depth not exceeding 0,6 m	m	390		
		.02 Top width not exceeding 2,0 m and depth not exceeding 0,6 m	m	810		
CA.01.02	219.00	Overhaul on surplus material	m ³ -km	1,206		
		<u>TEST BLOCKS</u>				
	220.00	Test blocks:				
		.01 Making and testing set of three 150 x 150 x 150mm concrete strength test cubes.	Sets	52		
	221.00	Finishing top surfaces of concrete with a power float to pan floated finish:				
		.01 Paving to parking areas, roads, etc to falls.	m ²	30		
		.02 Paving to parking areas, roads, etc.	m ²	40		
		.03 Paving to ramps, etc to falls.	m ²	20		
		<u>REINFORCEMENT</u>				
CB.03.05	222.00	Steel reinforcement	t	0.4		
	223.00	Fabric reinforcement:				
		.01 Mesh Ref 193 fabric reinforcement in concrete surface beds etc.	m ²	120		
		.02 Mesh Ref 243 fabric reinforcement in concrete surface beds etc.	m ²	90		
		.03 Mesh Ref 395 fabric reinforcement in concrete surface beds etc.	m ²	1,350		
	Carried forward					

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PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Brought forward					
CB.01		<u>PREFABRICATED CULVERT INSTALLATION AND REPAIR OF EXISTING CULVERTS AND STRUCTURES</u>				
CB.01.01	224.00	Excavation: .01 Excavation of soft material within the following depth ranges below the surface level: .01 0 m up to and including 1,5 m	m³	27		
CB.01.03	225.00	Prefabricated culverts: .01 On Class B bedding Class 100D pipe: .01 600 mm diameter	m	40		
CB.01.04	226.00	Cast in situ concrete and formwork in stormwater structures: .01 Concrete .01 Class 20 MPa concrete .02 Class 25 MPa concrete	m³ m³	5 5		
		<u>STORMWATER CHANNELS</u>				
	227.00	Precast or in-situ reinforced concrete (30Mpa) with mesh Ref 395, V- shaped stormwater channels, finished smooth on all exposed surfaces and with angles rounded, cast in suitable lengths (not exceeding 2 000mm), with bitumen applied to one edge at joints, and reinforced as necessary for handling if precast, including all formwork, reinforcing, moulds, shallow excavation, filling and ramming, laying to falls, bedding and pointing in (3:1) cement mortar:				
CB.03.08		.01 1500mm wide x 300mm V-Drain (125mm thick).	m	700		
CB.03.08		.02 900mm wide x 300mm V-Drain (125mm thick).	m	650		
		.03 D12 type open ended concrete channel	m	1,073		
		.04 Extra for angles, intersections, ends, dressing into sides of catchpits, etc.	No	12		
	Carried forward					

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PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Brought forward					
CB.01.03	228.00	.05 12mm Bitumen impregnated softboard, size 450mm wide x 150mm high with a V cut in the top to match the shape of the end of the channel, expansion joint between concrete stormwater channels.	m	675		
		.06 10 x 10mm 'Sikaflex Pro 3' Silicone sealing compound including backing cord, bond breaker, primer, etc, in isolation joint in channels including raking out expansion joint filler as necessary.	m	675		
		<u>STORMWATER DRAINAGE</u>				
		Class 100D concrete pipes with interlocking joint pipes, including wrapping joints with 200mm wide strip of geotextile filter blanket with wrapping to overlap at least 200mm:				
		.01 600mm Pipes laid in and including trenches not exceeding 1m deep.	m	40		
		.02 450mm Pipes laid in and including trenches not exceeding 1m deep.	m	40		
		CB.01.01(a) 229.00 Extra over excavation in earth for pipe trenches, chambers, etc for excavation in soft rock.	m³	32		
		CB.01.01(b) 230.00 Extra over excavation in earth for pipe trenches, chambers, etc for excavation in hard rock.	m³	16		
CB.01.02	231.00	Extra over backfilling to pipe trenches, chambers, etc. for backfilling with soilcrete (10% cement) supplied by the Contractor	m³	16		
CB.01.02	232.00	Extra over backfilling to pipe trenches, chambers, etc. for backfilling with G7 material supplied by the Contractor to bedding and cradle in accordance with SABS 1200M compacted to 98 % Mod AASHTO density.	m³	32		
CB.01.01(b)	233.00	Extra over excavation for pipe trenches, chambers, etc for carting away surplus material to a dumping site to be located by the Contractor.	m³	32		
	Carried forward					

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THE APPOINTMENT OF A CONTRACTOR FOR UPGRADE TO THE EXISTING RING ROAD, REPAIR OF THE GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE - Contract: G495/2023

PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Brought forward					
	234.00	Excavate for and build stormwater catch pit size 300 x 300 x exceeding 0,5m and not exceeding 1,0m deep internally, formed of 150mm thick cement concrete (25MPa) bottom projecting 75mm all round, mass concrete (15Mpa) benching, hard burnt one brick sides with galvanised brickforce between each course, rendered internally in 1:3 cement plaster, 760 x 760 x 200mm thick (25Mpa) reinforced concrete cover slab including reinforcing, rebating for and fitted with mild steel angle frame and grating (frame and grating elsewhere) in accordance with SABS 558, bedded in 1:3 cement mortar and sealed in tallow, including all necessary fittings, excavations, formwork, holes through sides for pipes.	number	3		
	235.00	Excavate for and build stormwater catch pit Type B size 600 x 600 x exceeding 0,5m and not exceeding 1,0m deep internally, formed of 150mm thick cement concrete (25MPa) bottom projecting 75mm all round, mass concrete (15Mpa) benching, hard burnt one brick sides with galvanised brickforce between each course, rendered internally in 1:3 cement plaster, 1800 x 1800 x 200mm thick (25Mpa) reinforced concrete cover slab including reinforcing, rebating for and fitted with mild steel angle frame and grating (frame and grating elsewhere) in accordance with SABS 558, bedded in 1:3 cement mortar and sealed in tallow, including all necessary fittings, excavations, formwork, holes through sides for pipes etc.	number	3		
	236.00	Excavate for and build stormwater catch pit Type A size 650 x 900 x exceeding 1,5m and not exceeding 2,0m deep internally, formed of 150mm thick cement concrete (25MPa) bottom projecting 75mm all round, mass concrete (15Mpa) benching, hard burnt one brick sides with galvanised brickforce between each course, rendered internally in 1:3 cement plaster, 2400 x 880mm overall x 200mm thick (25Mpa) reinforced concrete cover slab including reinforcing, rebating for and fitted with mild steel angle frame and grating (frame and grating elsewhere) in accordance with SABS 558, bedded in 1:3 cement mortar and sealed in tallow, including all necessary fittings, excavations, formwork, holes through sides for pipes etc.	number	1		
	Carried forward					

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PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Brought forward					
CB.02	237.00	<u>PITCHING, STONEWORK AND PROTECTION AGAINST EROSION</u>				
		.01 Stone Pitching				
		.01 Grouted stone pitching	m²	150		
		.02 Grouted stone pitching on a concrete bed max 150mm thick	m²	55		
		<u>GRATINGS, COVERS, ETC:</u>				
	238.00	600 x 600mm Hot dipped galvanised angle section frame and grating, comprising of 70 x 70 x 8mm angle iron frame size 630 x 630mm cast into concrete and grating size 600 x 600mm comprising of 60 x 8mm flat iron support frame filled in with 50mm diameter high tensile steel bars at 100mm centres installed complete as detailed on Stormwater Cachpit.	number	3		
	239.00	900 x 650mm Hot dipped galvanised angle section frame and grating, comprising of 50 x 50 x 6mm angle iron frame size 930 x 680mm cast into concrete and grating size 900 x 650mm comprising of 40 x 6mm flat iron support frame filled in with 25mm diameter high tensile steel bars at 65mm centres installed complete as detailed on Stormwater Cachpit	number	3		
		<u>CLEANING OF PREFABRICATED CULVERTS</u>				
	240.00	Cleaning of prefabricated culverts and inlet structures				
		.01 Prefabricated concrete pipes and portal culverts				
CB.04.01		.01 Up to and including 500 mm	m	48		
		.02 Over 500 mm up to 750 mm	m	24		
CB.02.02		.02 Clean grid inlets	number	8		
	TOTAL SCHEDULE NO 2 CARRIED TO SUMMARY					

Any reference to words "Bid" or Bidder" herein and/or in any other documentation shall be construed to have the same meaning as the

words: "Tender" or "Tenderer".

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THE APPOINTMENT OF A CONTRACTOR FOR UPGRADE TO THE EXISTING RING ROAD, REPAIR OF THE GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE - Contract: G495/2023

CALCULATION OF TENDER SUM

TOTAL OF SCHEDULE NO 1: GENERAL R

TOTAL OF SCHEDULE NO 2: ROADS AND STORMWATER DRAINAGE R

SUBTOTAL R

VALUE-ADDED TAX (VAT)

The tenderer shall add 15% of the subtotal for value-added tax R

TENDER SUM CARRIED TO FORM OF TENDER R

SIGNED ON BEHALF OF TENDERER :

Part C3: Scope of Work

		<u>Page</u>
C3.1	DESCRIPTION OF THE WORKS	89
C3.2	CONSTRUCTION	90
C3.3	ANNEXURES	158

Status

Should any requirement or provision in the parts of the Scope of Work conflict with any requirement of any Standardised Specification, Particular Specification or any drawings, the order of precedence, unless otherwise specified, is:

Drawings
Scope of Work
Standardised Specifications

C3.1 Description of the Works

C3.1.1 Employer's Objectives

The Employer's objective is the upgrade to the existing ring road, repair of the gravel service road and stormwater management for SANBI at the Karoo Desert National Botanical Garden in Worcester, Western Cape.

C3.1.2 Overview of the Works

This project entails the upgrading and paving of the existing asphalt ring road, repair of the gravel service road, and stormwater management at the Karoo Desert National Botanical Garden, Worcester, Western Cape.

C3.1.3 Extent of the Works

The scope of works includes but is not limited to the following:

- Surface repair and layer works
- Paving of 80 mm interlocking paving of ring road
- Paving of 80 mm interlocking paving of parking areas
- Repair of gravel wearing course
- Earth drains and concrete side drains
- Stormwater structures and drains
- Stormwater pipes and inlet/outlet structures

The Contractor will be required to construct the works in conformity with design criteria specified in the Project Specification and/or shown on the drawings.

C3.1.4 Location of the Works

The works is located at the following site:

The Karoo Desert National Botanical Garden (NBG) is located in Worcester in the Western Cape. GPS Co-ordinates: 33°37'00.2"S; 19°27'01.7"E.

C3.1.5 Description of Site and Access

The garden is easily accessible via public roads.

C3.1.6 Temporary Works

All design and the construction of any temporary works must be approved by the Engineer.

C 3.2 Construction

G : VARIATIONS AND ADDITIONS TO THE STANDARDISED SPECIFICATIONS FOR THIS CONTRACT, AS WELL AS TECHNICAL SPECIFICATIONS

The following variations and additions to the SANS 1200 Standardised Specifications referred to in the last clause of Portion 1 apply to this Contract. The prefix PS indicates an amendment to SANS 1200. The letters and numbers following these prefixes respectively indicate the relevant Standardised Specification and clause numbers in SANS 1200.

G GENERAL

G 1 SCOPE

REPLACE SUBCLAUSE 1.1 WITH THE FOLLOWING:

"1.1 This specification covers requirements, principles and responsibilities of a general nature that are normally applicable to all Civil Engineering Contracts, as well as the requirements for the Contractor's establishment on the Site."

G 2 INTERPRETATIONS

G 2.3 DEFINITIONS

(a) General

ADD THE FOLLOWING DEFINITIONS:

"General conditions: The General Conditions of Contract specified for use with this Contract, and the Special Conditions of Contract.

Specified: As specified in the standardised specifications, the Drawings or the Project Specifications.

Permanent Works: as defined in Subclause 1(1)(p) of the General Conditions of Contract shall for the purpose of this Contract, be regarded as the repair work.

(c) Measurement and payment

REPLACE THE DEFINITIONS FOR "fixed charge", WITH THE FOLLOWING:

"Fixed charge: A charge that is not subject to adjustment on account of variation in the value of the Contract amount or the Contract Time of Completion.

G 2.4 ABBREVIATIONS

- (a) Abbreviations relating to standard documents

ADD THE FOLLOWING ABBREVIATION:

"CKS: SABS Co-ordinating Specification."

G 3 MATERIALS

G 3.1 QUALITY

ADD THE FOLLOWING:

"All manufactured materials supplied shall be new materials unless the contrary is specified. All materials specified in accordance with SABS Specifications shall bear the SABS mark, whether so specified or not."

ADD THE FOLLOWING SUBCLAUSE:

G 3.3 ORDERING OF MATERIALS

The quantities set out in the Schedule of Quantities have been carefully determined from calculations based on data available at the time and should therefore be *considered to be approximate quantities only*. Before ordering materials of any kind the Contractor shall check with the Engineer whether or not the scope of the work for which the materials are required is likely to change substantially. No liability or responsibility whatsoever shall be attached to the Employer for materials ordered by the Contractor except when ordered in accordance with written confirmation issued by the Engineer."

G 4 PLANT

G 4.2 CONTRACTOR'S OFFICES, STORES AND SERVICES

ADD THE FOLLOWING PARAGRAPH BEFORE THE FIRST PARAGRAPH:

"The Contractor's construction camp shall be fenced off and shall contain all offices, stores, workshops, testing laboratories, toilet facilities, etc. The camp shall always be kept in a neat and orderly condition.

No personnel may reside on the Site. Only one night-watchman may be on the Site after hours."

ADD THE FOLLOWING TO THE SECOND PARAGRAPH:

"One chemical toilet per 10 workmen shall be provided and must be screened from public view and its use shall be enforced.

The Contractor shall, where applicable, make the necessary arrangements for the removal of night soil."

G 5 CONSTRUCTION

G 5.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES

REPLACE THE HEADING AND THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

"G 5.4 LOCATION AND PROTECTION OF EXISTING SERVICES

G 5.4.1 Location of existing services

Before underground or excavation work is carried out, the Contractor shall ascertain the presence and position of all services likely to be damaged or interfered with by his activities. He shall obtain up-to-date plans from the Engineer for this purpose, showing the position of services in the area where he intends to work. As services can often not be reliably located from such plans, the Contractor shall determine the exact position of such services by means of suitable detecting equipment and afterwards by careful hand excavation where necessary in order to expose the services at the positions of possible interference by his activities. This procedure shall also be followed in respect of services not shown on the plans but believed to be present.

All such services, the positions of which have been located at the critical points, shall be designated as 'known' services and their positions shall be indicated on a separate set of drawings, a copy of which shall be furnished to the Engineer.

While he is occupying the site, the Contractor shall be liable for all damage caused by him to known services as well as for consequential damage, whether caused directly by his operations or by the lack of proper protection.

G 5.4.2 **Protection during repair work**

The Contractor shall exercise all the necessary care to prevent damage to known services during repair work. Where applicable, major excavating equipment and other Plant shall not be operated dangerously close to these services. Where necessary, excavation in close proximity to these services shall be carefully carried out with suitable hand tools, excluding picks wherever their use could damage the services. No additional payment will apply to such more difficult work.

Services left exposed shall be suitably protected from damage.

G 5.4.3 **Alterations and repairs to existing services**

Unless the contrary is clearly specified or ordered, the Contractor shall not carry out alterations to existing services. When this is necessary, the Contractor shall inform the Engineer, who will either make arrangements for such work to be executed by the owner of the service, or instruct the Contractor to make such arrangements himself.

When existing services are damaged by the Contractor, he shall immediately inform the Engineer, or when this is not possible, the relevant authority, and obtain instructions as to who should carry out repairs. In urgent cases the Contractor shall take the necessary steps to minimise damage to and interruption of the service. No repairs of telecommunication cables or electric power lines and cables shall be attempted.

The Employer will accept no liability for damages due to a delay in having such alterations or repairs effected. The Contractor shall provide all reasonable opportunity, access and assistance to persons carrying out alterations or repairs of existing services."

ADD THE FOLLOWING SUBCLAUSE:

"G 5.9 **SITE MEETINGS**

The Contractor will be required to attend regular site meetings, normally held once a month to discuss general progress, quality of work, problems, claims, payments, etc, but not matters concerning the day-to-day running of the Contract."

G 6 TOLERANCES

ADD THE FOLLOWING SUBCLAUSE:

"G 6.4 GENERAL

No guarantee is given 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 of the tolerances may deprive him of the full or any use of tolerances relating to other aspects of the work.

Except where the contrary is specified or when clearly not applicable, all quantities for measurement and payment shall be determined from the 'authorised' dimensions. These are specified dimensions or those shown on the drawings or, if changed, as finally prescribed by the Engineer, without any allowance for the specified tolerances. Except if otherwise specified, all measurements for determining quantities for payment will be based on the 'authorised' dimensions.

If the work is therefore constructed in accordance with the 'authorised' dimensions plus or minus the tolerances allowed, quantities will be based on the 'authorised' dimensions regardless of the actual dimensions to which the work has been constructed.

When the work is not constructed in accordance with the 'authorised' dimensions plus or minus the tolerances allowed, the Engineer may nevertheless, at his sole discretion, accept the work for payment. In such cases no payment shall be made for quantities of work or material in excess of those calculated for the 'authorised' dimensions, and where the actual dimensions are less than the 'authorised' dimensions minus the tolerance allowed, quantities for payment shall be based on the actual dimensions as constructed."

G 8 MEASUREMENT AND PAYMENT

G 8.1 MEASUREMENT

G 8.1.2 Preliminary and general items or section

G 8.1.2.2 Tendered sums

REPLACE THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

"The Contractor's tendered sums under item G 8.3 shall cover all charges for

- risks, costs and obligations in terms of the General Conditions of Contract and of this standardised specification, except where provision is made in these Project Specifications to cover compensation for any of these items;
- head-office and site overheads and supervision;
- profit and financing costs;
- expenses of a general nature not specifically related to any item or items of permanent or temporary work;
- providing facilities on site for the contractor's personnel

G 8.2 PAYMENT

G 8.2.1 Fixed-charge and value-related items

REPLACE THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

"Payment of fixed charges in respect of item 8.3.1 will be made as follows:

Eighty per cent (80%) of the sum tendered will be paid when the facilities have been provided and approved. The remaining 20% will be paid when the works have been completed, the facilities have been removed and the camp site has been cleared and cleaned.

8.3 SCHEDULED FIXED-CHARGE ITEMS

REPLACE THE ITEMS WITH THE FOLLOWING:

"G 8.3.1 Fixed preliminary and general charges..... Unit : Sum

8.8 TEMPORARY WORKS

REPLACE ITEM 8.8.4 WITH THE FOLLOWING:

"G 8.8.4 Location and protection of existing services:

G 8.8.4.1 Provision of detecting devices for:

(a) Water and sewer pipes Unit : Sum

(b) Electrical and other cables Unit : Sum

The tendered sums shall cover the cost of providing and operating suitable equipment for as long as it is needed to locate all the existing services likely to be affected by the construction activities. Alternatively, an approved specialist firm may be employed to carry out the work.

G 8.8.4.2 Hand excavation necessary for locating and exposing existing services in all material:

(a) In roadways Unit: m³

(b) In all other areas..... Unit: m³

The rates shall cover the cost of excavating by means of hand tools within authorised dimensions, for all precautionary measures to protect the services from damage during excavation and backfilling, and for subsequent backfilling and compacting. Compaction of material in all areas except in roadways shall be to 90% of the modified AASHTO density.

The rate for hand excavation in roadways shall include compensation for compacting excavated or selected backfill material to 93% of modified AASHTO density.

The tendered rates shall also include for keeping excavations safe, for dealing with surface and subsurface water, for removing surplus excavated material from the Site, for transporting all material, and for supplying adequate supervision during both excavation and backfilling operations."

ADD THE FOLLOWING ITEMS:

"G 8.9 ADDITIONAL TESTS:

(a) Additional tests required by the Engineer Unit : PC Sum

(b) Attendance and profitUnit : %

An amount has been allowed in the Schedule of Quantities under subitem (a) to cover the cost of additional tests required by the Engineer. The Engineer will have the sole authority to spend the amount or part thereof.

The tendered percentage under subitem (b) will be paid to the Contractor on the value of each payment made to the testing authority.

Note in connection with subitem (a):

The Contractor is responsible for both the cost of normal testing and for the cost of any additional test that indicates that the Specifications have not been complied with.

G 8.13 COMPLIANCE WITH OHS ACT AND CONSTRUCTION REGULATIONS

Unit: sum

The tendered sum shall include full compensation to the Contractor for compliance with all the requirements of the OHS Act and the Construction Regulations 2003 at all times during construction, as described in the Project Specifications. The successful tenderer shall provide the Engineer with a complete breakdown of this tendered sum.

This sum will be paid to the Contractor in equal monthly amounts for the entire duration of the contract period.

CA ROADS

CONTENTS

CA 01	SCOPE
CA 02	STANDARD SPECIFICATIONS
CA 03	OPERATING AND MAINTENANCE MANUALS
CA 04	EXECUTION OF REPAIR WORK
CA 05	MAINTENANCE
CA 06	MEASUREMENT AND PAYMENT

CA 01 SCOPE

This specification covers the materials, equipment, methods, testing and work required for the repair and refurbishment of existing roadways, parking areas, miscellaneous areas subjected to vehicular traffic and other miscellaneous paved areas. It covers both surfaced and unsurfaced roadways and includes appurtenant works such as kerbing, road markings and road signs.

This specification shall form an integral part of the repair and maintenance contract document and shall be read in conjunction with portion 3: Additional Specifications included in this document.

Where a particular specification has been included in the documents to supplement Technical Specification CA: Roads, this technical specification shall act as a guideline to the Particular Specification and, in the event of any discrepancies between the Technical Specification and the Particular Specification, the latter shall take precedence. The Contractor shall at all times adhere to this technical specification, unless otherwise specified in the applicable Particular Specification.

CA 02 STANDARD SPECIFICATIONS

CA 02.01 GENERAL STANDARD SPECIFICATIONS, REGULATIONS AND CODES

The latest edition, including all amendments up to date of tender, of the following specifications, publications and codes of practice shall be read in conjunction with this specification and shall be deemed to form part thereof:

PW 371	-	Specification of Materials and Methods to be used, fourth edition, October 1993
SANS 1200 D	-	Earthworks
SANS 1200 DM	-	Earthworks (roads, sub grade)
SANS 1200 M	-	Roads (general)
SANS 1200 ME	-	Sub base
SANS 1200 MF	-	Base
SANS 1200 MG	-	Bituminous surface treatment
SANS 1200 MH	-	Asphalt base and surfacing
SANS 1200 MJ	-	Segmented paving
SANS 1200 MK	-	Kerbing and channelling
SANS 1200 MM	-	Ancillary roadwork
COTO Standard specifications for road and bridge works for state road authorities.		

CA 02.02 OCCUPATIONAL HEALTH AND SAFETY ACT 85 OF 1993

The Contractor shall be required to comply with the Occupational Health and Safety Act 85 of 1993, Construction Regulations 2014 and related regulations.

CA 02.03 MANUFACTURERS' SPECIFICATIONS, CODES OF PRACTICE AND INSTALLATION INSTRUCTIONS

All equipment and materials shall be installed, applied, serviced and repaired strictly in accordance with the manufacturers' specifications, instructions and codes of practice.

CA 02.04 MUNICIPAL REGULATIONS, LAWS AND BY-LAWS

All municipal regulations, laws, by-laws and special requirements of the Local Authority shall be adhered to unless otherwise specified.

CA 03 OPERATING AND MAINTENANCE MANUALS

No operating and maintenance manuals will be required for Roads.

CA 04 EXECUTION OF REPAIR WORK

CA 04.01 GENERAL

The Contractor shall investigate and inspect all areas of the installation to confirm the extent of the repair work required and shall report to the Engineer. The Engineer will thereafter demarcate any areas to be repaired and shall instruct the Contractor with regard to the repair work to be done.

At the start of the repair and refurbishment contract all the systems, installations and equipment shall be repaired as specified in the Particular Specification. This repair work shall include but not be limited to the details specified in the Particular Specification.

All repair work shall be executed using approved materials and equipment suitable to the systems and/or installations they serve.

All materials and equipment shall comply fully with the requirements as specified for each installation.

The said repair work shall be executed in accordance with the relevant codes of practice, standards, regulations, municipal laws and by-laws, manufacturer's specifications and codes of practice and all additional and particular specifications included in this document.

All new equipment, materials and systems shall be furnished with a written guarantee with a defects liability period of twelve (12) months from date of completion of repair work. These guarantees shall be furnished in favour of the Department of Public Works.

On completion of the required and specified repair work the systems, installations and equipment shall be commissioned and handed over to the satisfaction of the Engineer.

Repair and refurbishment work items for the existing roadways, parking areas, miscellaneous areas subject to vehicular traffic and other paved areas shall be categorised under the following headings:

- (a) Repair of gravel wearing course
- (b) Surface repairs of concrete pavements
- (c) Pavement layers and surface repairs
- (d) Surface patching of surfaced roads
- (e) Crack sealing
- (f) Surface treatment of surfaced roads
- (g) Erection and repair of permanent road traffic signs
- (h) Road markings
- (i) Chemical control of vegetation and eradication of undesirable vegetation.

CA 04.02 REPAIR OF GRAVEL WEARING COURSE

This section covers the reprocessing or replacement of an existing gravel wearing course over part of or over the full road width.

CA 04.02.01 Construction

The Engineer will demarcate any areas to be repaired, and shall instruct the Contractor with regard to the repair work to be done.

The reshaped wearing course shall be constructed true to line, level and cross-section as shown on the drawings or as directed by the Engineer.

The reshaping process shall in general be carried out using the existing wearing course. This material shall be graded to form the correct road profile. If necessary, the Engineer shall instruct the Contractor to rip, redistribute and recompact the wearing course in order to achieve the correct road profile.

Unsuitable or excess material from the road prism shall be removed from the site or to spoil. Any shortfall in material shall be made up by importing suitable material.

Material which is ripped or imported shall be placed, watered, mixed and compacted to a minimum of 93% of modified AASHTO density.

The Contractor's attention is specifically drawn to the requirement that only material approved by the Engineer may be imported.

During the reshaping process, the roadside drains and cut and fill slopes shall be trimmed and finished true to line, level and cross-section. No additional payment will be made for trimming and finishing of cut and fill slopes.

CA 04.02.02 Quality standard

The gravel wearing course shall be constructed true to line, level and cross-section as shown on the drawings or as directed by the Engineer.

CA 04.02.03 Materials

The materials shall comply with SANS 1200 ME and the additional requirements detailed below:

Additional material requirements for wearing course - natural gravel.

Maximum size	37,5 mm
Oversize index (I_o) ^a	≤ 5 per cent
Shrinkage product (S_p) ^b	100 - 365 (maximum of 240 preferable)
Grading coefficient (G_c) ^c	16 - 34
CBR: ≥ at ≥ 95 per cent modified AASHTO compaction and OMC ^d	

- a) I_o = Oversize index (per cent retained on 37,5 mm sieve)
- b) S_p = Linear shrinkage x per cent passing 0,425 mm sieve
- c) G_c = (Per cent passing 26,5 mm - per cent passing 2,0 mm) x per cent passing 4,75 mm/100
- d) Tested immediately after compaction

CA 04.03 SURFACE REPAIRS OF CONCRETE PAVEMENTS

This section covers the repair of spalled concrete at joints, the forming and sealing of new joints and the sealing or resealing of existing joints and random cracks in existing concrete pavements, and the patching of existing concrete.

Repairs to concrete are regarded as specialist work and shall be undertaken by approved subcontractors with relevant experience.

CA 04.03.01 Construction

Patching, resealing of joints and sealing of cracks in concrete pavements shall be done at the positions indicated by the Engineer.

(a) Resealing of joints and cracks

(i) Preparation of joints for resealing

The old deteriorated sealant in the top of the joint to be resealed shall be cut or scraped loose from each joint face with equipment that will not damage joint edges or the concrete surface. Care shall be taken not to damage, spall or bevel the joint edges.

The joints shall be initially cleaned to the full depth of the old sealant plus its backing material, as well as of all foreign material in the joints. A vacuum process, and not compressed air, shall be used to remove all loosened material from the joints. The Contractor shall continuously remove debris from the road surface and keep the surface clean. After the removal of the old material has been completed, re-facing of the joint planes shall be done with an abrasive wheel or a power-driven concrete

saw to widen each face of the sealant reservoir portion of the joint by a minimum of 2,0 mm and a maximum of 5,0 mm. No sealant may be applied to other than freshly cut concrete faces. The freshly cut concrete faces shall be degreased to such extent that adhesion of the sealant to the concrete in every respect satisfies the sealant manufacturer's guarantee. Immediately after the sawing operation, the joint grooves shall be thoroughly vacuumed and washed out with a jet of clean water to remove all remaining loose material resulting from the sawing operation. Any slurry resulting from the wet sawing shall be removed from the road surface.

Sweeping up old joint material and other debris with hand brooms shall be a continuous process during joint preparation. The joints shall be finally cleaned again prior to resealing, but in no case shall the cleaning precede the sealant by more than 30 m of joint length.

(ii) Preparation of cracks for sealing

Sealing shall be considered only for cracks that are open wide enough to permit entry of joint sealant or mechanical routing tools. The decision of whether a crack is to be sealed or not shall rest with the Engineer. Sealant in previously sealed cracks shall be removed as described in sub clause CA 04.03.01(a)(i) above.

A groove of at least 12 mm wide by 18 mm deep shall be made along the crack with a machine capable of closely following the path of the crack without causing excessive spalling or other damage to the adjacent concrete. Cleaning of the cracks after the grooving operation shall be done as described in subclause CA 04.03.01(a)(i) above.

(b) Patching of concrete

Patching of concrete shall be done where indicated by the Engineer.

Unless otherwise instructed by the Engineer, the patching shall have a neat rectangular shape with sides parallel to existing joints. The concrete within the area to be patched shall be broken up and removed to its full depth. The vertical face of the existing concrete adjacent to the patch shall be planed with an abrasive wheel or power-driven concrete saw, if necessary, to provide a smooth face.

Immediately prior to the placing of new concrete, the surface of the underlying pavement layer shall be compacted with either hand or mechanical equipment, depending on the space available, to ensure a firm foundation surface.

An isolation joint shall be constructed between all interfaces of existing and new concrete. The isolation joint shall consist of a joint filler, a bond breaking strip and a polysulphide sealant. The isolation joint shall only be sealed between 21 and 28 days after the casting of the concrete, at which time the uppermost portion of the joint filler shall be raked out, the bond breaking strip inserted and the polysulphide sealant applied.

As the patching of concrete will generally occur in trafficked areas, the Contractor shall allow fully in the relevant rates for accommodation of traffic to enable safe construction conditions. No additional payment will be made over and above the tendered rates for the work.

No traffic shall be allowed over concrete patches for a period of seven (7) days after casting.

CA 04.03.02 Materials

(a) Polysulphide sealant

The polysulphide sealant shall be a two-component material that complies with the requirements of SANS 110.

(b) Additional materials for polysulphide sealant

The sealant shall be supported by a bond breaker backing strip, and, unless otherwise recommended by the manufacturer and approved by the Engineer, the faces of the joint groove shall first be treated with a primer.

Supporting and priming materials shall be compatible with adjacent materials or surfaces in contact with the materials and shall be in accordance with the manufacturer's recommendations and subject to approval by the Engineer.

Primers, bond breakers and back-up material shall comply with instructions and recommendations issued by the manufacturer of the approved liquid sealant used.

CA 04.03.03 Quality standard

Surface repairs shall be executed and finished strictly in accordance with the prescribed requirements.

Repair work shall be carried out in such a manner as to blend in colour, texture and finish with adjacent concrete surfaces as far as possible.

CA 04.04 PAVEMENT LAYERS AND SURFACE REPAIRS

CA 04.04.01 General

This section covers the work in connection with the repair of localised failures of the pavement layers.

The work comprises excavating the deformed areas and reconstructing the pavement and surfacing layers, including treatment of the floor of the excavation prior to backfilling.

CA 04.04.02 Execution of work

(a) Removal of distressed pavement layers

The Engineer will demarcate any failed areas to be repaired, and shall instruct the Contractor with regard to the repair work to be done. The Contractor shall provide assistance and temporary traffic control facilities for marking out failed sections of the road.

Unless otherwise instructed by the Engineer, the patching shall have a neat rectangular shape, at right angles to the direction of traffic. The existing material shall be excavated and removed to the specified depth. Asphalt layers and surfacing shall be cut with approved cutting equipment.

Excavation for patching shall be cut with side slopes of approximately 60° to the horizontal.

Excavated material from each pavement layer shall be placed in separate stockpiles adjacent to the patch. The stockpiled material shall be reused or removed from the site in accordance with the Engineer's instructions.

After completion of the excavation to the specified depth, the Engineer shall be afforded the opportunity to examine the excavation. Where required, the floor of the excavation shall be compacted to the specified density for the layer concerned. These densities as percentages of modified AASHTO density are as follows:

Sub-base	(150 - 300 mm below final base course level)	95%
Selected	(300 - 600 mm below final base course level)	93%
Fill	(Lower than 600 mm below final base course level)	90%

Materials excavated from the various pavement layers shall not be contaminated if the reuse of excavated material for backfilling is instructed by the Engineer.

Excavated material shall be removed from the site, unless reuse of material is instructed by the Engineer. Under no circumstances shall excess material be dumped inside drains or side banks.

(b) Backfilling

Prior to backfilling, the base and sides of the excavation shall be cleaned of all loose material. The top 150 mm of all excavations shall be regarded as base and all other backfill up to 500 mm below the final road level shall be regarded as sub-base. Deeper excavations shall be backfilled with approved gravel to a density of 90% modified AASHTO density.

Backfilling of the excavation shall be done as follows:

- (i) The Engineer may instruct the Contractor to use stabilised material excavated from the existing pavement as backfilling, either for sub-base layers only or for both sub-base and base course layers.

Material shall be broken down and 60 kg/m³ of ordinary Portland cement shall be added. Water shall be uniformly mixed into the material. The material shall then be returned to the road and compacted to 95% of modified AASHTO density for the sub-base layers and to 97% of modified AASHTO density for the base layers.

- (ii) Where required by the Engineer, backfilling for the base course layer shall be done with imported material of G3 or better quality, treated with bitumen emulsion. Ordinary Portland cement or Portland blast furnace cement shall be added at a rate of 25 kg/m³ and mixed off the road by means of a concrete mixer or hand labour if approved by the Engineer. All mixing shall result in a homogenous mixture of additives and parent material which is to the satisfaction of the Engineer.

Thereafter the material shall be treated with a 60% anionic stable-grade bitumen emulsion diluted with five parts water to one part emulsion and added at a rate of 70 litres/m³ of crushed stone. All mixing shall result in a homogeneous mixture of additives and parent material which is to the satisfaction of the Engineer.

The mixed material shall then be transported to the excavated area, placed and compacted, all within five hours of the commencement of the mixing process. Thereafter 0,6 litres/m² of the diluted 60% bitumen emulsion shall be applied to the base or layer to ensure a sealed surface.

The density of the backfilling of the base layer shall be at least 100% of modified AASHTO density.

- (iii) Where required by the Engineer the backfilling of the base layer shall be done with continuously graded asphalt base compacted to 95% of Marshall density.

The excavated areas shall be tacked at a spray rate of 0,40 litre/m² using 60% cationic emulsion. The asphalt base material shall be spread and compacted so that the final surface is neat and uniform.

- (iv) All the backfilling shall be completed in geometric patterns of squares or rectangles and in each case it shall be finished off neatly to $40 \text{ mm} \pm 10 \text{ mm}$ below the levels of the surrounding sound road surface.

(c) Surfacing

A tack coat of 60% cationic emulsion shall be applied to the floor at top of base layer level at a rate of $0,4 \text{ litre/m}^2$ before backfilling is commenced or as otherwise instructed by the Engineer.

A layer of hot continuously graded medium asphalt shall be applied, compacted to 94% of Marshall density to bring the level of the patch up to final road level.

(d) Alternative for application of surfacing layer for limited localised repair work

- (i) Where instructed by the Engineer, a cold premixed bituminous mixture may be used for application of the surfacing layer for minor repair works. The mixture shall either be an approved cold mix from commercial sources, or can be prepared and mixed in a suitable concrete or other type of mixer, and shall have the following mix proportions:

- (i) 9,5 mm nominal sized aggregate: 1 part
- (ii) 6,7 mm nominal sized aggregate: 1 part
- (iii) Crusher sand (fine grade): 1 part
- (iv) 60% stable mix-grade emulsion
(prepared from 80/100 penetration grade: between 75 and 90 litre/m³ aggregate mix bitumen)

Before spreading the mixture, the surface shall be prepared by painting it with one layer of bituminous emulsion at a rate of $0,6 \text{ litre/m}^2$, which must be allowed to dry. The mixture shall then be placed on the areas to be sealed and screeded off in a layer of uniform thickness. After the emulsion has broken and the layer has attained sufficient stability, it shall be rolled with a small steel wheeled roller to obtain compaction. The thickness of the layer shall be the same as that of the adjacent seal.

- (ii) Where instructed by the engineer, a commercially available pre-fabricated stone seal with a bitumen rubber binder may be used as final surfacing on minor repair works. The material shall consist of pre-coated stone chippings of the nominal size as directed by the engineer, held together by a layer of bitumen rubber binder on a workable surface, e.g. treated paper. Backfilling of the underlying layer works shall be as described in CA 04.05.02 and the top of the base shall be repaired to such a level that the road surface shall be flush with the surrounding surface after repairs have been completed. The top of the base shall be prepared by painting it with one layer of bituminous emulsion at a rate of $0,6 \text{ litre/m}^2$, which must be allowed to dry (or alternatively according to the supplier's prescriptions). The surfacing material shall be handled and placed according to the supplier's prescriptions.

(e) Production limitations

As far as it is practically possible the size of the area to be repaired shall be limited to that which can be excavated, backfilled and opened to traffic within a single working day. Where this is impractical the Contractor shall consult with the Engineer regarding the signs requirements for controlling the traffic during night time. No area that is to be prepared, shall be left exposed if rain is imminent.

The asphalt base material shall be placed in layers not exceeding 80 mm and crushed stone material be placed in layers not exceeding 100 mm measured in the loose. The surfacing material shall be placed in one layer at a thickness of 40 mm \pm 10 mm.

(f) Testing

Modified AASHTO densities shall be determined using TMHI Method A16T (Preparation of Material) and Method A7 (Compaction of Material).

CA 04.04.03 Quality standard

The repaired area shall be rectangular in shape.

The edges of the completed surfacing shall not be more than 3 mm above the existing surface. Nowhere shall the edges be below the surrounding road surface.

The thickness of the asphalt surfacing at any point shall be 40 mm \pm 10 mm.

The cross-fall of the completed area shall be equal to that of the adjacent surface to within a tolerance of \pm 0,5% cross-fall.

When tested with a 3 metre straight edge laid parallel to or at right angles to the road centre line the surface of the area shall not deviate from the bottom of the straight edge by more than 7 mm.

The reconstruction of the pavement layers shall require a standard of workmanship to produce a patch that will not deteriorate within the contract period.

CA 04.04.04 Plant and equipment

All equipment shall be suitable for the specified use and size of working areas and shall be capable of obtaining the specified results.

Only approved cutting or sawing equipment may be used for cutting or sawing asphalt layers. The equipment must be capable of cutting asphalt layers to depths of 200 mm in one operation without fragmenting the material, and in straight lines within the required tolerances.

The following items of plant and equipment shall also be available and in good working order:

- (a) A vibratory roller having a mass approximately equal to that of a Bomag 90 or similar vibratory roller, with an adjustable amplitude and frequency of vibration;
- (b) A mobile compressor capable of producing at least 3 m³/minute compressed air at 750 kPa;
- (c) Appropriate paving breakers;
- (d) Manually-operated pneumatic compactors as required, and
- (e) Appropriate concrete mixers.

CA 04.04.05 Materials

(a) Crushed stone

Crushed stone for use as backfill in patches shall be of G3 or better quality, from an approved commercial source, and shall comply with SANS 1083 in general and the following in particular:

- (i) Plasticity index (maximum) = 6
- (ii) Maximum flakiness index of the -26,5 mm, + 13,2 mm material = 35
- (iii) Maximum aggregate crushing value = 29
- (iv) The grading shall comply with the following grading envelope:

<u>Sieve size</u>	<u>Percentage passing (mass)</u>
37,50	100
26,50	100
19,00	85 - 95
13,20	71 - 84
4,750	42 - 60
2,000	27 - 45
0,425	13 - 27
0,075	5 - 12

(b) Stabilising agent

The stabilising agent shall be ordinary Portland cement or Portland blast furnace cement (PBFC complying with SANS 626) and shall comply with requirements of category ENV 197-1.

(c) Hot-mix asphalt base and surfacing mix requirements

The mix shall be a continuously graded asphalt and shall have the properties specified in table CA 04.04.05/1 below:

TABLE CA 04.04.05/1: PROPERTIES FOR CONTINUOUSLY GRADED ASPHALT BASE AND SURFACING	
PROPERTY	RANGE
Marshall stability (kN)	8 - 16
Marshall flow (mm)	2 - 4
Stability/Flow (kN/mm)	3 minimum
Static creep modulus (MPa)	60 minimum
Indirect tensile strength @ 25 °C (kPa)	1 000 minimum
Dynamic creep modulus (MPa)	16 minimum
% Air voids	3 - 6
Immersion index %	75 minimum

A 60/70 penetration grade bitumen shall be used and the binder type shall comply with the requirements of SANS 307.

Grading limits and mix proportions are given in table CA 04.04.05/2.

TABLE CA 04.04.05/2: GRADING LIMITS AND MIX PROPORTIONS FOR
CONTINUOUSLY

GRADED ASPHALT BASE AND SURFACINGS					
PERCENTAGE PASSING THROUGH SIEVE BY MASS					
SIEVE SIZE (mm)	ASPHALT BASE		ASPHALT SURFACING		
	37,5 mm maximum	26,5 mm maximum	COARSE	MEDIUM	FINE
53,000	-	-	-	-	-
37,500	100	-	-	-	-
26,500	84 - 94	100	100	-	-
19,000	71 - 84	85 - 95	85 - 100	-	-
13,200		71 - 86	71 - 84	100	
9,500	50 - 67	62 - 78	62 - 76	82 - 100	100
6,700			-	-	-
4,750	36 - 53	42 - 60	42 - 60	54 - 75	64 - 88
2,360	25 - 42	30 - 48	30 - 48	-	-
1,180	17 - 34	22 - 38	22 - 38	27 - 42	35 - 54
0,600		16 - 28	16 - 28	18 - 32	24 - 40
0,300	10 - 22	12 - 20	12 - 20	11 - 23	16 - 28
0,150		8 - 15	8 - 15	7 - 16	10 - 20
0,075	5 - 12	5 - 10	4 - 10	4 - 10	4 - 12
NOMINAL MIX PROPORTIONS (BY MASS)					
Aggregate	94,5%		93,5%	93,0%	93,0%
Bitumen	5%		5,5%	6,0%	6,0%
Active filler	0,5%		1,0%	1,0%	1,0%

(d) Tack coat

The tack coat shall be 60% cationic emulsion complying with SANS 548.

CA 04.04.06 Variation from specified nominal rates of applications or nominal mix proportions

The various sections of these specifications specify nominal rates of applications or nominal mix proportions for materials such as bituminous materials, aggregates, fillers, stabilizing agents, paint and other relevant materials. Tenderers shall base their tenders on these nominal rates of applications and mix proportions.

Where such nominal rates of applications or mix proportions are specified, provision is made for deviations in the quantities of material in consequence of the rates of application or mix proportions prescribed by the Engineer in each particular case in consideration of the available materials and the site.

Where the actual rates of applications or mix proportions used in the works vary from the specified nominal rates and mix proportions, adjustment to compensation will be made as:

- (a) payment to the Contractor in respect of any authorised increase in quantities which exceed those specified and where such increase has been ordered in writing by the Engineer;
- or
- (b) a refund to the Employer in respect of the decrease in quantities that are less than those specified, irrespective of whether such decrease results from an authorised decrease in the rates of applications or mix proportions, or from unauthorised reductions on the part of the Contractor.

Payment for a prescribed rate of application or mix proportion shall be based on the actual rate of application or mix proportion used, provided that this does not exceed the prescribed rate of application or mix proportion, plus any tolerance in the rate of application or mix proportion allowed. If the actual rate of application or mix proportion exceeds the prescribed rate or proportion, payment shall be based on the prescribed rate of application or mix proportion plus any tolerance allowed. If the actual rate of application or mix proportion is below the prescribed rate of application or mix proportion specified or instructed by the Engineer, payment shall be based on the actual rate of application or mix proportion regardless of any tolerance allowed. Notwithstanding the above, the Engineer shall be entitled to reject work which has not been constructed in accordance with the specifications or the rates of applications or mix proportions prescribed by him.

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

CA 04.05 ERECTION AND REPAIR OF PERMANENT ROAD TRAFFIC SIGNS

CA 04.05.01 General

This section covers the erection of permanent road traffic signs. It includes the repair and replacement of faded, damaged or not clearly visible existing signboards and reference marker boards.

Specifications relating to manufacturing of road signs are not included in this document, as relevant specifications regarding manufacturing will be issued to a nominated subcontractor who shall be a recognised manufacturer of road signs.

The signs shall be the standard regulatory, guidance, warning and information signs and fabricated in accordance with the South African Road Traffic Signs Manual (July 1993) except where otherwise specified, indicated on drawings or directed by the Engineer.

The erection and placement of any signs, whether temporary or permanent, shall be in accordance with the South African Road Traffic Signs Manual (June 1999).

CA 04.05.02 Storage and handling

All road signs or parts of road signs shall be transported, handled and stored in a weather-proof storeroom in such a manner as to prevent any damage and deformation.

Sign boards shall be stored on blocks in the vertical position so that the signs are not in contact with the ground. There shall be sufficient space between the finished road sign boards to permit free air circulation and moisture evaporation. Contact of road sign boards with treated timber and diesel, or storage where road sign boards come into contact with dirt or water will not be permitted.

When required, existing or newly erected road signs shall be fully or partially covered with burlap or other approved adequately ventilated material to obscure destinations that are temporarily inapplicable or irrelevant. The covers shall be neatly and firmly fixed in position so that they will be able to withstand strong gusts of wind or eddies caused by passing traffic. The fixing shall be done in a way that will not cause any damage to the road sign face.

CA 04.05.03 Execution of the work

(a) Position

Road signs shall be erected in the positions shown on the drawings or indicated by the Engineer.

(b) Excavation and backfilling

Excavations for the erection of road signs shall be made according to the dimensions shown on the drawings. Where the excavations are to be backfilled with soil, a 1:12 cement/soil mixture (soilcrete) shall be prepared if instructed by the Engineer. The soil or soil-cement mixture shall then be placed at optimum moisture content in 100 mm thick layers in the excavation and shall be compacted to a minimum of 90% of modified AASHTO density.

Where posts or structures are to be fixed in concrete, or where concrete footings are to be cast, the concrete, formwork and reinforcement shall comply with the relevant requirements. The holes shall be completely filled with concrete up to the level shown on the drawings or indicated by the Engineer. The upper surface of the concrete shall be neatly finished with sufficient fall to ensure proper drainage.

This subclause shall apply to ground-mounted signs only. Excavating and backfilling for the foundations of overhead steel structures are specified and regarded as specialised structural work.

Excavation in rock shall be paid for under item CA.07.05.

Where material from the excavations is not suitable for backfilling or for the preparation of soilcrete, suitable material shall be obtained as instructed by the Engineer.

(c) Erection

Road sign boards must be inspected by the Engineer and approved in writing before the boards are taken from the camp site to the erection site. The Contractor shall notify the Engineer at least one (1) week before the said inspections are required.

Road signs shall be erected strictly in accordance with the details and instructions on the drawings and as directed by the Engineer.

During erection the structural steelwork shall be firmly bolted and protected to prevent buckling or damage being caused during erection, or by the equipment used for erection.

Posts to which road signs are to be fixed shall be vertical and the undersides of road signs shall be horizontal after having been erected.

Where timber posts are used for erecting the signs, all holes that are drilled in the timber shall be retreated with the approved preservative. A road sign identification number (as indicated on the layout drawings) shall be painted with white enamel paint on the reverse side of the road sign board, above the month and year of manufacture, in 50 mm high letters and numbers on the side closest to the road shoulder as directed by the Engineer.

Any sign damaged during transit to the erection site or during the erection process shall be replaced or repaired to the satisfaction of the Engineer at no extra cost to the Employer.

(d) Field welding

All welding done during erection shall comply with the requirements for welding during manufacture.

(e) On-site painting

All painting done after the road signs have been erected shall comply with the requirements for painting during manufacture.

All places where the paintwork has been damaged during erection shall be repaired by the Contractor at his own cost to the satisfaction of the Engineer.

(f) Time of erection

Road signs shall be erected immediately prior to the road being opened to public traffic, unless otherwise decided by the Engineer.

(g) Attachment of overlays

The type of overlay to be used will be specified by the Engineer and will consist either of 1 mm thick Chromadek plate, pop-riveted onto the existing sign plate, or System 5 overlay or similar approved.

Before the application of the overlay to any structure, the existing sign board shall be thoroughly cleaned.

(h) Repair of signs

The Engineer may require that certain existing signs be dismantled for repair work or storage and later re-erected. The signs shall be repainted or repaired by replacing the 200 mm profiles or straightening the sheet metal as specified during the manufacturing process. New materials shall be used for part or all of the supporting structure. This work shall be done with as little damage as possible to the signs.

CA 04.05.04 Materials

(a) Timber posts for road sign supports

Timber posts for road sign supports shall conform to the requirements of SANS 754, shall be equal to or better than strength group B timber posts and shall be stamped with the SANS mark. The exposed surface of the cut shall be given two coats of creosote. Any holes drilled in the timber posts after treatment with creosote shall be retreated.

(b) Corrosion-protection tape

Corrosion-protection tape used between aluminium and steel shall be black PVC tape not less than 0,25 mm in thickness, shall be resistant to ultra-violet rays, and shall have an adhesive backing. The breaking strength of the material shall be not less than 3,5 kN/m.

CA 04.05.05 Protection and maintenance

The Contractor shall protect the completed road signs against damage until they have been finally accepted by the Employer, and he shall maintain the road signs until the maintenance certificate have been issued. Damage or defects caused by negligence or faulty workmanship shall be rectified by the Contractor at his own cost to the satisfaction of the Engineer.

CA 04.05.06 Dismantling, storing and re-erecting existing road signs

Where instructed by the Engineer, the Contractor shall dismantle existing road signs, store them, and re-erect them at new positions indicated. This work shall be done taking care to cause as little damage as possible to the signs.

The method applied for dismantling the existing signs and transporting and storing the signs shall be subject to the Engineer's approval. No additional payment shall be made for any equipment or handling methods necessary to prevent damage to existing signs which are suitable for re-use, as instructed by the Engineer.

Where required by the Engineer, the signs shall be repainted or repaired and new materials shall be used for part or all of the supporting structure.

CA 04.06 ROAD MARKINGS

CA 04.06.01 General

This section covers the permanent marking and maintenance of white, yellow or red painted lines or symbols on the road surface by specialist contractors.

CA 04.06.02 Materials

(a) Plant

(i) Road-marking paint

Road-marking paint shall comply with the requirements of SANS 731-1 for type 1, type 2 or type 4 paint.

The paint shall be delivered at the site in sealed containers bearing the name of the manufacturer and the type of paint. Marking shall be in accordance with SANS 731-1.

The viscosity of the paint shall be such that it can be applied without being thinned down.

(ii) Retro-reflective road-marking paint

Retro-reflective road-marking paint shall comply with the requirements of CKS 192 and SANS 731-1.

(iii) Colour

The colours to be used shall be bright white, yellow or red.

The colour of the yellow and red paint shall be as specified in SANS 731-1.

(iv) Retro-reflective beads

The retro-reflective beads shall be glass beads that comply with the requirements for glass beads specified in CKS 192.

The beads shall be delivered at the site in sealed bags, marked with the name of the manufacturer, the batch number and an inspection seal of the South African Bureau of Standards (SANS), confirming that the beads form part of a lot that has been tested by the SANS and complies with the requirements of CKS 192. If not, the Contractor shall at all times have a SANS certificate on the site, with details of the batches that make up a lot that has been tested by the SANS, complies with CKS 192 and to which the inspection seal applies.

CA 04.06.03 Weather limitations

Road-marking paint shall not be applied to a damp surface or at temperatures lower than 10 °C, or when, in the opinion of the Engineer, the wind strength is such that it may adversely affect the painting operations.

No road-marking paint may be applied when visibility is dangerously impeded by mist, smoke or smog.

CA 04.06.04 Mechanical equipment for painting

The equipment shall consist of an apparatus for cleaning the surfaces, a mechanical road-painting machine and all additional hand-operated equipment necessary for completing the work. The mechanical road-marking machine shall be capable of painting at least two lines simultaneously and shall apply the paint to a uniform film thickness at the rates of application specified hereinafter. The machine shall be so designed that it will be capable of painting the road markings everywhere to a uniform width with sides within the tolerances specified hereinafter, without the paint running or splashing. The machine shall further be capable of painting lines of different widths by adjusting the spray jets on the machine or by means of additional equipment attached to the machine.

The machine shall be provided with clearly visible amber warning flashing lights which shall always be in operation when the machine is on the road.

CA 04.06.05 Surface preparation

Road markings shall be applied to bituminous surfaces only after sufficient time has elapsed to ensure that damage will not be caused to the painted surface by volatiles evaporating from the seal. After completion of the seal no less than two weeks or such longer period as may be directed by the Engineer shall elapse before any road markings shall be applied. However, the Engineer may, in certain cases, require road markings

to be painted without waiting for the seal to harden, in which case it shall be done as soon as possible after the instruction has been given.

Before the paint is applied, the surface shall be clean and dry and completely free from any soil, grease, oil, acid or any other material that will be detrimental to the bond between the paint and the surface. The surface where the paint is to be applied shall be properly cleaned by means of watering, sweeping or compressed air if required.

Particular care shall be taken to ensure that the surface shall be clean, where roadstuds are to be fixed.

The Contractor shall take note of conditions which he is unable to rectify by himself and may affect the durability of the paint, and he shall point out these conditions to the Engineer in writing. Disputes arising from such conditions shall be referred to the relevant Regional Engineer for arbitration before road marking commences.

The Contractor shall protect the retro-reflective surfaces of roadstuds when paint is applied and remove the protection immediately after the paint has been applied.

On concrete and bituminous surfaces where polished aggregate is exposed, a tack coat shall be used. On new concrete surfaces any laitance and/or curing compound shall be removed before the markings are applied.

The material shall not be laid over loose debris, mud or similar extraneous matter or over old flaking markings of paint or thermoplastic material. If the road surface is at a temperature of less than 5 °C, or if it is wet, it shall be warmed carefully by a road heater so that, when the material is laid, the surface temperature is above 5 °C and the surface dry.

CA 04.06.06 Setting out the road markings

The lines, symbols, figures or marks shall be premarked by means of paint spots of the same colour as that of the final lines and marks. These paint spots shall be at such intervals as will ensure that the traffic-markings can be accurately applied, and in no case shall they be more than 1,5 m apart. Normally spots of approximately 10 mm in diameter should be sufficient.

The dimensions and positions of road-markings shall be as indicated by the Engineer, specified in the appropriate statutory provisions and the South African Road Traffic Signs Manual.

The repainting of a roadway after the application of a fogspray shall only be done once it is possible to determine the beginning and positions of individual broken line segments. Premarking of such a roadway shall entail the searching for and marking of such broken line segments. Painting shall thereafter be done to the same tolerances as prescribed in CA 04.09.10.

After spotting, the positions of the proposed road markings such as broken lines and the starting and finishing points of barrier lines shall be indicated on the road. These premarkings shall be approved by the Engineer prior to commencement of any painting operations.

The position and outlines of special markings shall be produced on the finished road in

chalk and shall be approved by the Engineer before the markings are painted. Approved templates may be used on condition that the positioning of the marking is approved by the Engineer before painting is commenced.

The positions for the beginning and end of all barrier-line road-markings must be suitably indicated by the Engineer before the marking of the road commences.

CA 04.06.07 Applying the paint

The figures, letters, signs, symbols, broken or unbroken lines or other marks shall be painted as shown on the drawings or as directed by the Engineer.

Where the paint is applied by machine, it shall be applied in one layer. Before the road-marking machine is used on the permanent works, the satisfactory operation of the machine shall be demonstrated on a suitable site which is not part of the permanent works. Adjustments to the machine shall be followed by further testing. Only when the machine has been correctly adjusted and its use has been approved by the Engineer after testing, may the machine be used on the permanent work. The operator shall be experienced in the use of the machine.

After the machine has been satisfactorily adjusted, the rate of application shall be checked and adjusted if necessary before application on a large scale is commenced.

Where two or three lines are required next to each other, the lines shall be applied simultaneously by the same machine. The paint shall be stirred before application in accordance with the manufacturer's instructions. Paint shall be applied without the addition of thinners.

Where, under special circumstances, painting is done by hand, it shall be applied in two layers, and the second layer shall not be applied before the first layer has dried out sufficiently. As most road-marking paint reacts with the bitumen surface of the road, the paint shall be applied with one stroke only of the brush or roller.

Ordinary road-marking paint shall be applied at a rate not less than 0,42 litre/m².

Unless otherwise instructed by the Engineer, the road-marking shall be completed before a particular section of the road is opened to traffic. Each layer of paint shall be continuous over the entire area being painted.

Control sheets with details of the order number, work dates, quantities of paint used and surface areas painted shall be completed by the Contractor for every section of road included in an order. One set of copies of these sheets shall be handed to the Engineer on completion of every individual order.

CA 04.06.09 Applying the retro-reflective beads

Where retro-reflective paint is required, the retro-reflective beads shall be applied by means of a suitable machine in one continuous operation, immediately after the paint has been applied. The rate of application of the beads shall be at least 0,8 kg/litre of paint or such other rate as may be directed by the Engineer. Machines that apply the beads by means of gravity only shall not be used. The beads shall be sprayed onto the paint layer by means of a pressure sprayer.

If specified or instructed by the Engineer, additional surface reflectorization of plastic road-markings shall be applied at a rate and according to the methods specified in BS 3262, 1987, part 3.

CA 04.06.10 Tolerances

Road-markings shall be constructed to an accuracy within the tolerances given below:

(a) Width

The width of lines and other markings shall not be less than the specified width, nor shall it exceed the specified width by more than 10 mm.

(b) Position

The position of lines, letters, figures, arrows, retro-reflective roadstuds and other markings shall not deviate from the true position by more than 100 mm in the longitudinal and 20 mm in the transverse direction.

When an unbroken line and a broken line are painted alongside each other, the beginning and/or the end of the adjacent lines shall coincide.

When existing lines are repainted, the new marking shall not deviate more than 100 mm in the longitudinal direction and 10 mm in the transverse direction from the existing marking.

(c) Alignment of markings

The alignment of the edges of longitudinal lines shall not deviate from the true alignment by more than 10 mm in 15 m.

(d) Broken lines

The length of segments of broken longitudinal lines shall not be shorter than the specified length or deviate by more than 150 mm from the specified length.

CA 04.06.11 General

In broken lines the length of segments and the gap between segments shall be as indicated on the drawings. If these lengths are altered by the Engineer, the ratio of the lengths of the painted section to the length of the gap between painted sections shall remain the same.

Lines on curves, whether broken or unbroken, shall not consist of chords but shall follow the correct radius.

The Contractor shall provide temporary traffic control facilities at his own cost in accordance with specifications to ensure traffic safety where work is being executed. Property and/or road signs damaged by the Contractor, his personnel or his agents shall be repaired or restored at his own cost to their condition as before the damage.

Only materials intended for use on this Contract may be stored on the site.

CA 04.06.12 Faulty workmanship or materials

If any material that does not comply with the requirements is delivered to the site, or is used in the works, or if any work of an unacceptable quality is carried out, such material or work shall be removed, replaced or repaired as required by the Engineer at the Contractor's own cost.

While work is in progress, tests shall be carried out on materials and/or the quality of work to ensure compliance with the specified requirements. The sampling methods are specified under the appropriate sampling and testing methods. The sampling methods described in TMH5 shall be followed where applicable. (TMH5 is published for the Committee of State Road Authorities by the National Institute for Transport and Road Research - presently the Division of Road and Transport Technology - as part of the series Technical Methods for Highways.)

CA 04.06.13 Protection

After the paint has been applied, the road markings shall be protected against damage by traffic or other causes. The Contractor shall be responsible for erecting, placing and removing all warning boards, flags, cones, barricades and other protective measures that may be necessary in terms of any statutory provisions and/or as may be recommended in the South African Road Traffic Signs Manual and specified in Road Note 13.

CA 04.07 CHEMICAL CONTROL OF VEGETATION AND ERADICATION OF UNDESIRABLE VEGETATION

CA 04.07.01 General

This section covers the eradication of declared and undesirable vegetation, as well as the chemical control of vegetation growth through the application of herbicide.

CA 04.07.02 Execution of work

The eradication of undesired vegetation and chemical control of vegetation growth shall be executed where directed by the written instruction of the Engineer.

Herbicide shall normally only be applied in the spring or summer during the period when the vegetation to be killed is growing strongly.

The Contractor's attention is drawn to the requirement that herbicides may only be applied by duly registered, competent contractors in possession of an AVCASA certificate. Proof of such registration shall be furnished on demand to the Engineer.

The Contractor shall ensure that no damage is caused to other plants inside or adjacent to the treated areas as a consequence of the application of herbicides.

Application shall not be carried out in high winds or wet weather.

The following herbicides may **not** be used:

- Agents of an explosive, flammable, volatile or corrosive nature
- Sodium chlorate
- Volatile low hormone type herbicides
- Agents which are not registered in the Republic of South Africa.

The Contractor shall state the brand name of the herbicide on which the tendered rate is based, which shall be subject to the approval of the Engineer, prior to the application thereof.

The agent shall be guaranteed to kill at least 90% of the unwanted growth with one application and shall have a residual effect which controls the growth of such vegetation effectively for one growing season. The herbicide should be strictly applied at the rate recommended by the manufacturer.

(a) Chemical control of vegetation growth

Subject to written approval by the Engineer beforehand, spraying shall be executed in the following designated areas:

- (i) Shoulder weed spray shall comprise the spraying of a 300 mm wide strip of herbicide directly adjacent to the road shoulder. The spraying of shoulders may take place only after the shoulder strips have been cut.
- (ii) Where vegetation is encroaching onto the road shoulder an increased width of 500 mm shall be sprayed along the edge with 200 mm on the black top surface and 300 mm on the shoulder vegetation.
- (iii) Vegetation under guard-rails shall be controlled by spraying under the guard-rail to a width of 500 mm;
- (iv) Openings, cracks and joints between the road pavement and concrete, as well as between paving stones and concrete blocks – shall be measured only for the area between joints, cracks or openings treated;
- (v) Up to a maximum distance of 500 mm around the poles at kilometre markers, road signs and guard-rail posts;
- (vi) Between the road reserve fence and a neighbouring solid wall. Here the Contractor may use only contact herbicides which are absorbed by the leaves and which do not have a detrimental effect on the soil;
- (vii) Entire areas invaded by weeds; Where interlocking paving areas are to be treated, a quantity of one third (1/3) of the entire surface shall be measured for payment.
- (viii) On block paved areas adjacent to concrete median barriers or steel guard-rails. These areas may have slopes to 1:1 grades.

The type of herbicide to be used, the correct spray rate, the method of application and when applied, shall be as specified in the Particular Specifications.

(b) The eradication of weeds

The eradication of declared and undesirable vegetation shall take place in the road reserve during the contract period over the whole length of the sections of road involved, and may include localised patches of noxious weeds, invader plants and other undesired vegetation.

Subject to the Engineer's approval, certain aspects, such as the treatment of the stumps of felled trees, may be carried out by the Contractor. The Contractor shall ensure that no damage whatsoever is caused to any plants inside or adjacent to the areas treated as a consequence of the application of the herbicides, either during or after application. This also includes areas outside the road reserve.

The type of weed killer to be used, the correct application rates and when applied, shall be as specified and according to the manufacturer's instructions.

CA 04.07.03 Quality standard

Eradication of undesired vegetation shall be carried out as specified and to the satisfaction of the Engineer. The herbicide shall be applied at the correct rate to prevent regrowth and the application confined to the undesired vegetation.

Areas shall be left neat and tidy and all vegetation cuttings removed where instructed.

CA 04.07.04 Plant and equipment

Vegetation shall be eradicated using knapsacks or portable weed spray machines.

It is important that the equipment be in good working condition. The equipment shall distribute the herbicide evenly without spilling. The nozzle shall be able to move close to the ground in order to prevent mist spray blowing away and killing plants which have to remain. The equipment shall also be safe for the workers, as well as for the travelling public.

CA 05 MEASUREMENT AND PAYMENT

CA.01 REPAIR OF GRAVEL WEARING COURSE

CA.01.01 Reshaping the wearing course by:

- (a) Grading only Unit: square metre (m²)
- (b) Ripping, redistributing and compacting Unit: square metre (m²)
- (c) Importing, placing and compacting material from commercial sources..... Unit: cubic metre (m³)

The unit of measurement for CA.01.01 (a) and (b) shall be the square metre surface area graded or ripped and re-compacted to a depth of 150 mm, as instructed by the Engineer.

The unit of measurement for CA.01.01 (c) shall be the cubic metre of compacted material imported from commercial sources as instructed by the Engineer and measured in place.

The tendered rates shall include full compensation for providing all plant, labour, equipment and materials required and for reshaping and/or constructing the wearing course as instructed by the Engineer. The tendered rates shall also include full compensation for the cost of testing to ensure the finished wearing course complies with the specified requirements, and for disposing of surplus material.

CA.01.02 Overhaul on surplus material Unit: cubic metre kilometre (m³-km)

The unit of measurement shall be the cubic metre of material hauled in excess of 1,0 km, the volume determined from the rated capacity of the truck multiplied by the overhaul distance. All trucks shall be fully loaded to their rated capacity.

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

CA 02 SURFACE REPAIRS OF CONCRETE PAVEMENTS

CA.02.01 Patching of concrete:

- (a) (Thickness stated) Unit: square metre (m²)
- (b) Etc for other thicknesses Unit: square metre (m²)

The unit of measurement shall be the square metre of new concrete installed.

The tendered rates shall include full compensation for all the necessary labour, plant, equipment, tools and materials required for breaking out the existing concrete, disposing of the debris, compacting the exposed pavement layer, supplying, placing and finishing off the new concrete, and constructing isolation joints. The tendered rates shall also include full compensation for providing adequate accommodation of traffic where necessary. No separate payment shall be made for breaking out the existing concrete, sealing the joints and disposing of material removed.

CA.03 PAVEMENT LAYERS AND ASPHALT SURFACE REPAIR

CA.03.01 Excavation in existing pavements for patching..... Unit: cubic metre (m³)

The unit of measurement shall be the cubic metre of material excavated from the existing pavement irrespective of the type of material. The quantity shall be computed in accordance with the authorised dimensions of the excavation.

The tendered rate shall include full compensation for demarcating the excavation and excavating and disposing and/or stockpiling of the material, including haul over a free-haul distance of 1,0 km.

Payment will not distinguish between the different types of pavement material excavated.

CA.03.02 Backfilling of excavations for patching with:

(a) Chemically stabilized gravel excavated from the existing pavement:

(i) Areas up to and including 10 m² Unit: cubic metre (m³)

(ii) Areas larger than 10 m² up to and including 50 m² Unit: cubic metre (m³)

(iii) Areas larger than 50 m² Unit: cubic metre (m³)

(b) Emulsion-treated crushed stone pavement:

(i) Areas up to and including 10 m² Unit: cubic metre (m³)

(ii) Areas larger than 10 m² up to and including 50 m² Unit: cubic metre (m³)

(iii) Areas larger than 50 m² Unit: cubic metre (m³)

(c) Asphalt base (hot mixed)..... Unit: ton (t)

(d) Asphalt surfacing (continuously graded medium)..... Unit: ton (t)

The unit of measurement shall be the cubic metre of chemically stabilized gravel or emulsion-treated crushed stone or the ton of asphalt placed in accordance with the specified requirements. The quantity will be computed in accordance with the authorised dimensions of the layer in the case of gravel or crushed stone and in accordance with the certified weighbridge tickets issued in the case of asphalt. Payment will not be made for wasted material.

The tendered rates shall include full compensation for providing all the material, irrespective of its origin, for all mixing, placing, compacting, including the floor, and finishing as specified in this section and other sections of the appropriate specifications, for all transport, work in restricted areas, and also for all machinery, equipment, labour, tack coat, supervision and other incidentals for executing the work as specified.

The tendered rates for chemically stabilized gravel shall also include full compensation for stabilizing and providing the stabilizing agent.

The tendered rates for emulsion-treated crushed stone shall also include full compensation for supplying and mixing with emulsion, stabilizing and providing the stabilizing agent.

Payment for hot-mixed asphalt base and surfacing will not distinguish between the various types of asphalt and will allow for priming.

CA.03.03 Alternative method of surfacing with cold mix asphalt from the following sources:

Patching of pavement layers:

(a) Commercial sources (indicate thickness)Unit: square metre (m²)

(b) Mixed on site as specified (indicate thickness)...Unit: square metre (m²)

The unit of measurement for patching of asphalt pavement shall be the square metre of pavement patched, measured to the nearest square metre.

The tendered rate shall include full compensation for procuring, furnishing, and storing of all materials, providing and transporting all plant, labour and equipment necessary for cutting back the edges, excavation, removing excavated and loose material and disposal thereof, priming, surfacing with specified material, compaction and trimming as specified in this section.

CA.03.04 Additional backfilling up to the 500 mm below surface level and compaction to 90 % of modified AASHTO density Unit: cubic metre (m³)

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

The tendered rate shall include full compensation for materials, labour, tools and equipment necessary for backfilling material up to the 500 mm below surface level as specified, irrespective of the size of area to be backfilled.

CA.03.05 Binder variations

(a) Penetration-grade bitumen..... Unit: ton (t)

(b) RTH/RTL road tars Unit: ton (t)

The unit of measurement in respect of increases or decreases in the bituminous binder from that specified in the nominal mix shall be the ton.

Payment for variations shall be made as specified in clause CA.04.06.

CA.03.06 Variation in active filler content

- (a) Cement Unit: ton (t)
- (b) Lime Unit: ton (t)
- (c) Milled granulated blast-furnace slag Unit: ton (t)
- (d) Fly-ash Unit: ton (t)

The unit of measurement in respect of increases or decreases in the active filler content for base and surfacing mixtures from that specified in the nominal mix 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 Clause CA 04.04.

CA.04 SURFACE PATCHING OF SURFACED ROADS

CA.04.01 Trimming the edges and edge breaks of the existing surfacing Unit: metre (m)

The unit of measurement for trimming the edges shall be a metre of pavement edge cut back and trimmed as specified measured along the centre line of the road.

The tendered rate for trimming the edges shall include full compensation for cutting back the edges in accordance with instructions, excavating the material to the specified depth and removing all excavated and loose material. Payment for the backfilling of the edge breaks with hot-mix continuously graded asphalt will be made under item CA.04.04.

The tendered rates shall include full compensation for all transport, handling, labour, material and all incidentals necessary for completing all the work in accordance with the specifications, and also for work in restricted areas.

CA.04.02 Pothole repair using hot-mix continuously graded asphalt Unit: ton (t)

The unit of measurement for repairing surfacing shall be the ton of asphalt applied for the repair of the surfacing, irrespective of the thickness or number of layers.

The tendered rates shall include full compensation for procuring, furnishing, and storing of all materials, providing and transporting all plant, labour and equipment necessary for cutting back the edges, excavation, removing excavated and loose material and disposal thereof, priming, backfilling with the approved product, compaction and trimming as specified in this section.

The quantity shall be calculated by measuring the volume of material used, multiplied by the density of the compacted material.

CA.04.03 Pothole repair using cold mix asphalt surfacing from the following sources:

(a) Commercial sources Unit: ton (t)

(b) Mixed on site as specified Unit: ton (t)

The unit of measurement for surfacing repair shall be the ton of cold mix asphalt applied for the repair of surfacing, irrespective of the thickness or number of layers.

The tendered rates shall include full compensation for procuring, furnishing, and storing of all materials, providing and transporting all plant, labour and equipment necessary for cutting back the edges, excavation, removing excavated and loose material and disposal thereof, priming, backfilling with the approved product, compaction and trimming as specified in this section.

The quantity shall be calculated by measuring the volume of material used, multiplied by the density of the compacted material.

CA.04.04 Repairing edge breaks using hot-mix continuously graded asphalt - medium grade Unit: ton (t)

The unit of measurement for repairing edge breaks shall be the ton of asphalt applied for the repair of edge breaks, irrespective of the thickness or number of layers.

The tendered rates shall include full compensation for compacting the surface on which the new edge is to be constructed, procuring, furnishing, and mixing all materials and compacting and trimming the asphalt to the required lines and levels. It shall also include full compensation for applying a tack coat of emulsion to the surface to be treated.

The tendered rates shall include full compensation for all transport, handling, labour, material and all incidentals necessary to complete all the work as specified.

The quantity shall be calculated by measuring the volume of material used, multiplied by the density of the compacted material. No extra payment will be made in regard to this item for producing small quantities of asphalt.

CA.04.05 Mechanical sweeping of road surfaces.....Unit: square metre (m²)

The unit of measurement for the mechanical sweeping of the road surface shall be the area of road swept, measured in square metres.

The tendered rate shall include full compensation for the provision of all equipment, use and maintenance thereof and all labour costs.

CA.05 ERECTION AND REPAIR OF PERMANENT ROAD TRAFFIC SIGNS

CA.05.01 Erection or reinstatement of road sign boards

- (a) Area not exceeding 2 m²Unit: square metre (m²)

The unit of measurement shall be the square metre of completed road sign erected as required in the Project Specification, instructions or drawings issued by the Engineer.

The tendered rates shall include full compensation for attaching the road signboard to a road sign support structure, or to an overhead road sign support structure or to an overbridge and for all equipment, labour, supervision, nuts, bolts, transport, handling, etc, necessary for the installation of the road sign board.

CA.05.02 Road sign supports (overhead road sign structures excluded)

- (a) Steel tubing of (76 mm diameter and 3 mm wall thickness) Unit: metre (m)

The unit of measurement for CA.07.02(a) for erecting supporting structures manufactured from steel tubing shall be the metre of steel tubing used. Bolts and other accessories shall not be measured.

The tendered rates shall include full compensation for erecting the road sign supports, including all bolts, screws, rivets, welding and accessories, together with the painting and galvanizing required and the provision and treatment of breakaway holes in timber supports.

The tendered rates shall also include full compensation for tying up, clearing, trimming, disposing of material at approved dumping sites provided by the Contractor, and finishing the area around each sign footing.

Overhead road sign supporting structures shall not be measured and paid for under this item, but shall be considered as specialised structural work.

CA.05.03 Excavation and backfilling for road sign supports Unit: cubic metre (m³)

The unit of measurement shall be the cubic metre of excavation measured in place according to the neat dimensions of the footings or excavations as shown on the drawings or directed by the Engineer. In the case of timber posts not in concrete, the plan area of the excavated hole shall be taken as 0,15 m², irrespective of the actual size of the excavated hole.

The tendered rate shall be in full compensation for excavating, backfilling and compacting the backfill material, for the disposal of all surplus excavated material, and for providing the backfill material.

CA.05.04 Extra over item CA.07.03 for cement-treated soil backfill Unit: cubic metre (m³)

The unit of measurement shall be the cubic metre.

The tendered rate shall include full compensation for the additional cost of providing and mixing in cement.

CA.05.05 Extra over item CA.07.03 for rock excavation Unit: cubic metre (m³)

The unit of measurement shall be the cubic metre.

The tendered rate shall include full compensation for the additional cost of excavating in rock.

CA.05.06 Gravel drainage layer below road sign footings Unit: cubic metre (m³)

The unit of measurement is the cubic metre of compacted gravel placed below road sign footings in accordance with the details on the drawings. The quantity will be calculated from the authorised dimensions, and gravel placed outside the authorised dimensions will not be measured for payment.

The tendered rate shall include full compensation for procuring, furnishing and placing the gravel.

CA.05.07 Hazard plates (600 x 150 mm) Unit: number

The unit of measurement is the number of each size of hazard plate erected complete in accordance with the details on the drawings.

The tendered rate shall include full compensation for excavating, disposing of excavated material (including all haul), erecting and for placing and compacting the soilcrete backfilling.

CA.05.08 Repair of road sign faces Unit: square metre (m²)

The unit of measurement shall be the square metre of sign face repaired on the instruction of the Engineer. Only the portion of the sign face actually repaired shall be measured for payment.

The tendered rate shall include full compensation for procuring and furnishing all the necessary material, labour and equipment and for repairing as specified.

CA.06 ROAD MARKINGS

CA.06.01 Retro-reflective road-marking paint

(a) Longitudinal lines:

- (i) 100 mm wide broken or unbroken lines, white, yellow or redUnit: metre (m)
- (ii) 150 mm wide broken or unbroken lines, white, yellow or redUnit: metre (m)
- (iii) Broken or unbroken lines, white or yellow, other widthsUnit: metre (m)

(b) Transverse lines and other markings:

- (i) Broken or unbroken lines, white or yellow..... Unit: square metre (m²)
- (ii) Lettering and symbols, white or yellow, repainting existing markings Unit: square metre (m²)
- (iii) Lettering and symbols, white or yellow, new markings Unit: square metre (m²)
- (iv) Traffic island markings, white or yellow repainting existing markings Unit: square metre (m²)
- (v) Traffic island markings, white or yellow new markings Unit: square metre (m²)

The unit of measurement for subitem CA.08.01(a) shall be a metre of line of each specified width of line, for widths not exceeding 150 mm, and the quantity paid for shall be the actual length of line painted in terms of an official order, measured to the nearest metre. The length of gaps in broken lines shall not be measured for payment.

The unit of measurement for subitem CA.08.01(b) shall be a square metre and the quantity to be paid for shall be the actual surface area of the lettering, symbols, traffic island markings or lines completed in terms of an official order, measured to the nearest tenth of a square metre.

The tendered rate per metre or per square metre, as the case may be, shall include compensation for procuring and providing all the necessary labour, constructional plant, tools, equipment and materials, including the retro-reflective beads. The tendered rate shall also include full compensation for surface preparation, for painting the road markings and applying the retro-reflective beads, for protection and temporary traffic control facilities, maintenance, and for all incidentals necessary to complete and maintain the road markings in accordance with the provisions of the contract, including the setting-out of lettering, symbols and traffic island markings, but excluding setting out and premarking the lines.

CA.06.02 Setting out and premarking of lines
(excluding traffic island markings, lettering
and symbols) Unit: kilometre (km)

The unit of measurement for setting out and premarking lines shall be a kilometre of line set out and premarked. If two or more parallel lines lie in a strip with a maximum width of 1,0 m the setting out and premarking of the lines will be measured once only as if it is a single line.

The tendered rate shall include full compensation for setting out and premarking the lines in accordance with an official order, including all materials, and measured to the nearest tenth of a kilometre.

CA.06.03 Removal of road markings:

- (a) Removal of markings by means of
grit-blasting Unit: square metre (m²)
- (b) Removal of markings by other mechanical
methods (The tenderer shall state the method
he intends to use) Unit: square metre (m²)
- (c) Removal of markings by chemical methods
(The tenderer shall state the method he intends
to use) Unit: square metre (m²)

The unit of measurement for the removal of road markings shall be a square metre and the quantity paid for is the actual surface area of the markings removed in terms of an official order, measured to the nearest tenth of a square metre.

The tendered rate shall include full compensation for removing the markings, including all material.

CA.07 CHEMICAL CONTROL OF VEGETATION AND ERADICATION OF UNDESIRABLE
VEGETATION

CA.07.01 Chemical control of vegetation:

- (a) 300 mm wide strip Unit: kilometre (km)
- (b) 500 mm wide strip Unit: kilometre (km)
- (c) racks and joints between road pavement and
concrete drains, paving stones or concrete blocks Unit: metre (m)
- (d) Around kilometre markers, road signs and
guardrail posts Unit: square metre (m²)
- (e) Between road reserve fence and a solid wall Unit: square metre (m²)
- (f) Area covered by interlocking blocks Unit: square metre (m²)
- (g) Entire area invaded by weeds Unit: square metre (m²)
- (h) (Any other area as specified)

The unit of measurement for items CA.09.01(a) and (b) above shall be the kilometre of road treated as described in these specifications. The distance treated will be measured once for each strip so treated. The unit of measurement for item CA.09.01(c) above

shall be the length of crack or joint treated as described in these specifications. The length treated will be measured once along the length of the crack. The unit of measurement for items CA.09.01(d), (e), (f) and (g) above shall be the square metre of road reserve treated as described in these specifications.

The Contractor is to assess the number of different types of places where application of chemicals will be required and to make provision accordingly for the fluctuating chemical demand per kilometre of road.

The tendered rate shall include full compensation for the supply of chemicals, plant, equipment and labour for the spraying of the chemical liquids in accord with the manufacturers specifications.

The tendered rates shall be fully inclusive of any costs arising from restricted working conditions due to the nature of the site or traffic flow.

Payment will be made as follows:

- (a) 60% will be payable after application
- (b) The remaining 40% will be payable once 90% of the vegetation has been controlled to the satisfaction of the Engineer.

CA.07.02 Eradication of weeds (chemical) Unit: square metre (m²)

The unit of measurement for the eradication of weeds by means of spraying will be the square metre treated in this way by a selected subcontractor.

The tendered rate shall include full compensation for the supply of all chemicals, machinery, labour and equipment to spray the herbicides according to the instructions of the manufacturers.

Payment of 60% of the value of the spraying done will be made when visible results are obtained (usually 14 days after application). The remaining 40% of the value of the work will be payable when at least 90% of unwanted growth has been destroyed.

CA.08 CONCRETE SPEED HUMPS

CA.08.01 Repair of concrete speed humps Unit: number

The unit of measurement shall be the number of speed humps repaired.

The tendered rate shall include for the removal of the remainder of the existing speed hump and the replacement with a 150 mm high concrete speed hump to the Engineer's satisfaction. The width and length of the speed hump shall be the same as for the original, unless otherwise directed by the Engineer, and the concrete shall be of the same type and strength as used for concrete patching.

The tendered rate shall also be fully inclusive of all materials, machinery and labour costs.

CB STORMWATER DRAINAGE

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CB 01 SCOPE

This specification covers the materials, equipment, methods, testing and work required for the repair and maintenance of existing stormwater drainage systems. It covers both surface and underground drainage systems.

This specification shall form an integral part of the repair and maintenance contract document and shall be read in conjunction with portion 3: Additional Specifications included in this document.

Where a particular specification has been included in the documents to supplement Technical Specification CB: Stormwater drainage, this technical specification shall act as a guideline to the Particular Specification and, in the event of any discrepancies between the Technical Specification and the Particular Specification, the latter shall take precedence. The Contractor shall at all times adhere to this technical specification, unless otherwise specified in the applicable Particular Specification.

CB 02 STANDARD SPECIFICATIONS

CB 02.01 GENERAL STANDARD SPECIFICATIONS, REGULATIONS AND CODES

The latest edition, including all amendments up to date of tender, of the following specifications, publications and codes of practice shall be read in conjunction with this specification and shall be deemed to form part thereof:

- PW 371 - Specification of Materials and Methods to be used

- SANS 1200 DB - Earthworks (pipe trenches)
- SANS 1200 DK - Gabions and pitching
- SANS 1200 G - Concrete (structural)
- SANS 1200 LB - Bedding (pipes)
- SANS 1200 LE - Stormwater drainage
- SANS 1200 MK - Kerbing and channelling

CB 02.02 OCCUPATIONAL HEALTH AND SAFETY ACT OF 1993

The contractor shall be required to comply with the occupational health and safety act 85 of 1993, construction regulations 2014 and related regulations.

CB 02.03 MANUFACTURERS' SPECIFICATIONS, CODES OF PRACTICE AND INSTALLATION INSTRUCTIONS

All equipment and materials shall be installed, serviced and repaired strictly in accordance with the manufacturers' specifications, instructions and codes of practice.

CB 02.04 MUNICIPAL REGULATIONS, LAWS AND BY-LAWS

All municipal regulations laws, by-laws and special requirements of the Local Authority shall be adhered to unless otherwise specified.

CB 03 OPERATING AND MAINTENANCE MANUALS

No operating and maintenance manuals will be required for Stormwater.

The Contractor shall use the maintenance control plan (see SA) to schedule routine preventative maintenance activities.

CB 04 EXECUTION OF REPAIR WORK

CB 04.01 GENERAL

The Contractor shall investigate and inspect all areas of the installation to confirm the extent of the repair work required and shall report to the Engineer. The Engineer will thereafter indicate any areas to be repaired and shall instruct the Contractor with regard to the repair work to be done.

At the start of the repair and maintenance contract all the systems and installations shall be repaired as specified in the Particular Specification. This repair work shall include but not be limited to the details specified in the Particular Specification.

All repair work shall be executed using approved materials and equipment suitable to the systems and/or installations they serve.

All materials and equipment shall comply fully with the requirements as specified for each installation.

The said repair work shall be executed in accordance with the relevant codes of practice, standards, regulations, municipal laws and by-laws, manufacturer's specifications and codes of practice and all additional and particular specifications included in this document.

All new, materials and systems shall be furnished with a written guarantee with a defects liability period of twelve (12) months from date of completion of repair work. These guarantees shall be furnished in favour of the Department of Public Works. On completion of the required and specified repair work the systems, installations and equipment shall be commissioned and handed over to the satisfaction of the Engineer.

Repair work items for the stormwater drainage systems shall be categorised under the following headings:

- (a) Prefabricated culvert installation and repair of existing culverts and structures.
- (b) Cleaning of prefabricated culverts.
- (c) Concrete channel construction and repair of existing channels.
- (d) Cleaning of concrete drains and channels.
- (e) Cleaning of earth channels.
- (f) Construction and repair of brickwork inlet structures.
- (g) Provision of lockable stormwater grid inlets.
- (h) Cleaning of pipelines.

CB 04.02 PREFABRICATED CULVERT INSTALLATION AND REPAIR OF EXISTING CULVERTS AND STRUCTURES

This section covers the work in connection with the construction of prefabricated pipe and portal culverts and stormwater structures such as manholes, grid inlets and the like.

It also covers the removal and replacement of damaged and broken prefabricated culverts, as well as repairs to existing culverts and stormwater structures.

CB 04.02.01 Construction

Prefabricated culverts shall be constructed or replaced in accordance with the specifications at the locations indicated by the Engineer.

(a) Excavation

The width of the excavation shall be sufficient to allow the proper laying, bedding and backfilling of culverts. The widths of the excavation for each type and size of culvert shall be as set out in SANS 1200 DB.

The depth of the excavation for each type and size of culvert shall depend on site conditions and the amount by which the excavation is to exceed the proposed level of the invert of the culvert and shall be sufficient to allow the type and thickness of bedding material instructed by the Engineer.

Where excavation is to be carried out through asphalt premix or concrete, the asphalt/concrete shall be cut neatly and vertically with approved sawing equipment before the asphalt/concrete is removed.

Excavations shall commence from the outlet end of culverts to be installed.

(b) Classification of excavation

All excavations shall be classified as follows for payment purposes:

(i) Hard material

Material which cannot be excavated except by drilling and blasting, or with the use of pneumatic tools or mechanical breakers, and boulders exceeding 0,10 m³ shall be classified as hard material.

Where more than 40% of any material (by volume) consists of boulders each exceeding 0,10 m³ in size, the material shall be classified as hard material.

(ii) Soft material

All material not classified as hard material shall be classified as soft material.

Notwithstanding the above classification, all material excavated from previously constructed fills, subgrades and subbases shall be classified as soft material.

(c) Disposal of excavated material

Where excavated material does not comply with the requirements for backfilling material as specified or is surplus to backfilling requirements, such excavated material shall be removed from the site and disposed of.

Material suitable for use in the works, however, shall be used as prescribed.

(d) Removal of damaged culverts

Where indicated by the Engineer damaged sections of prefabricated culverts shall be completely removed and replaced with new units.

Excavation shall be carried out as described for new culvert installation and the excavated material shall be, if suitable, preserved for backfilling. The damaged culvert units shall be disposed of.

(e) Laying of concrete pipe culverts

Concrete pipe culverts shall be laid on class A or B bedding as directed by the Engineer. The inside of the culverts shall be smooth and without any displacement and all pipes shall be laid true to line and level with a minimum slope of 2% or as directed by the Engineer.

(i) Class A bedding - see SANS 1200 LB

(ii) Class B bedding - see SANS 1200 LB

(iii) Rock foundation

Where rock, shale or hard material is encountered on the bottom of excavations a bed of fine material as required for class B bedding shall be placed before laying the pipe.

(iv) Concrete casing

Where ordered by the Engineer a pipe shall be encased in concrete according to the Engineer's instructions.

(f) Laying of concrete portal culverts

Portal culverts shall be laid on prefabricated floor slabs. A layer of fine-grained material of at least 75 mm thick shall be placed on the bottom of the excavation, levelled, compacted and trimmed to line and grade to form a bed to receive the precast slabs.

The portal portions of portal culverts shall be placed accurately and symmetrically on the floor slabs with a thin layer of mortar of one part of cement and six parts of sand between the contact surfaces to ensure a firm and uniform support.

(g) Extension of existing culverts

Where existing culverts require extension or where damaged sections are replaced the new sections shall be placed at the same grade and, where it joins the existing structure, at the same level as the existing structure.

Any sections of existing wing walls, approach slabs and head walls which may obstruct any new work shall be demolished and removed. The demolition and reconstruction of new inlet and outlet structures shall be paid for under the relevant sections in the specification.

(h) Construction of culverts in half widths in existing roads

To allow the free flow of traffic at all times the culverts shall be constructed in half widths. The downstream section shall be constructed first and the end of the excavation adjoining the traffic lane shall be properly supported to prevent displacement from occurring.

(i) Repairing of cracks and joints

Where instructed by the Engineer cracks in existing culverts and culvert joints which have opened shall be caulked with material specified in the Particular Specification.

(j) Backfilling of prefabricated culverts

The backfill material shall be material selected from the excavation mixed with 80 kg Portland cement with every cubic metre of excavated material.

Generally the backfill material shall be a sandy material, but may contain larger particles up to 38 mm and shall have a plasticity index not exceeding 12.

In the case of concrete pipe culverts on class B bedding the backfilling material shall be tamped in under the flanks of the culverts to provide a uniform bedding, all to the satisfaction of the Engineer.

Backfilling alongside and over the culverts to the underside of the pavement layers shall be placed at optimum moisture content and compacted to a minimum of 90% of modified AASHTO density in layers not exceeding 150 mm after compaction. Where approved by the Engineer, testing may be done with a dynamic cone penetrometer (DCP). The average penetration rate recorded after every 5 blows for each layer shall not exceed 50. The full depth of a layer shall be tested.

Backfilling shall be carried out simultaneously and equally on both sides of a culvert to prevent unequal lateral forces from occurring and the ends of culverts shall be protected to prevent the backfill material from spilling beyond the required levels.

(k) Reinstatement of pavement layers

Unless otherwise instructed by the Engineer the pavement layers shall be reinstated as follows:

- (i) Selected layers shall be of at least a G5 quality and shall be compacted to at least 93% of modified AASHTO density.
- (ii) Material for the subbase layers shall be stabilized with 3% cement and compacted to 95% of modified AASHTO density and shall be at least a G5 quality.
- (iii) The material for the base layer shall be stabilized with 5% cement and compacted to at least 97% of modified AASHTO density and shall be at least a G3 quality.
- (iv) The surfacing layer shall consist of a medium continuously graded asphalt compacted to 94% of Marshall density. The thickness of the surfacing layer shall be at least 25 mm. A 60% cationic emulsion shall be applied at 0,4 litre/m² to the top of the base layer before the surfacing layer is placed.

The soil cement shall be mixed on site with suitable concrete mixers and the water and cement contents shall be carefully controlled.

(l) Repair of stormwater manholes, grid inlets and the like

Repair work will be undertaken on the structures indicated on the drawings, or as directed by the Engineer. All repair work will comply with the construction and quality requirements of SANS 1200 LE.

CB 04.02.02 Quality standard

Culverts shall be constructed true to lines and levels with the inside smooth and without any displaced joints.

CB 04.02.03 Materials

The prefabricated culvert units shall be factory produced by a reputable manufacturer of these units and shall comply with the following requirements:

(a) Prefabricated concrete pipe culvert units

Prefabricated concrete pipe culvert units shall comply with the requirements of SANS 677. Pipes with ogee joints shall be provided, unless otherwise specified. Pipes subjected to traffic loadings shall be class 100 D; all other pipes shall be class 50 D.

(b) Portal prefabricated concrete culvert units

Portal prefabricated concrete culvert units shall comply with the requirements of SANS 986.

(c) Other types of prefabricated culverts

If required, other types of prefabricated culverts will be specified in the Particular Specification.

(d) Manhole covers, grid inlets, etc

Manholes, grid inlets, etc, shall have covers and frames complying with SANS 558.

CB 04.03 CLEANING OF PREFABRICATED CULVERTS

The work involved under this section is the removal of silt and debris from prefabricated culverts including the cleaning of inlet and outlet structures.

CB 04.03.01 Construction

Prior to cleaning any prefabricated culverts, the Contractor shall arrange with the Engineer for an inspection of the stormwater network. The Contractor shall provide adequate equipment, such as torches, lights, mirrors, etc, to enable a basic visual inspection of all the culverts. Based on this inspection, the Engineer will instruct the Contractor as to which sections of the network require cleaning.

Material removed from the culverts shall be disposed of where instructed by the Engineer. Rubble and waste material shall be disposed of at the nearest appropriate solid waste disposal site, unless otherwise directed by the Engineer.

The Contractor must ensure that all material being removed is removed before or at the nearest accessible downstream structure. No additional payment will be made for the removal of material which, as a result of cleaning operations, find its way into a previously clean section of the culvert network.

CB 04.03.02 Quality standard

Prefabricated culverts shall be cleaned of all silt and debris such that all surfaces are clearly visible and accessible for inspection.

All spoil material shall be spread neatly and shall not wash back into drainage trenches.

The size of the culverts for the different categories will be determined as follows:

- (a) For pipe culverts - diameter
- (b) For portal culverts - width.

CB 04.04 CONCRETE CHANNEL CONSTRUCTION AND REPAIR OF EXISTING CHANNELS

This section covers the construction of new concrete lined drains where required and the maintenance of existing concrete drains. It includes the construction of kerb and channel combinations and repairs where required.

CB 04.04.01 Construction

The Engineer will indicate the locations where new drains are to be constructed to improve drainage and shall instruct where repairs to existing drains are to be carried out.

Construction of the following type of concrete drains may be required:

- (a) Concrete lining to open drains
- (b) Concrete pipes
- (c) Kerbing channelling combination.

Concrete drains shall be constructed in accordance with the details shown on the drawings or as directed by the Engineer.

(a) Excavation and preparation of bedding

The excavations shall be neatly trimmed to lines and levels so as to permit the accurate construction of the concrete linings. All loose material shall be well rammed at the optimum moisture content for the material used.

Where excavations are in hard material, overbreak shall be backfilled with concrete of the same class as specified for the lining.

In the case of kerbs and channels the trenches shall be excavated to the required depths and the bedding material shall be well rammed before placing the concrete.

Where wash-aways have occurred, any cavities or voids in the foundation material must be backfilled in layers not exceeding 150 mm in thickness and compacted to 90% of modified AASHTO density.

(b) Concrete linings

Concrete lining of open drains shall be cast in situ only and the exposed surfaces shall be given a class U2 (wood-floated) surface finish.

Sealed joints in concrete shall be in accordance with the details indicated on the drawings and joints shall be painted with a coat of approved bituminous emulsion containing 60% of pure bitumen by mass.

Expansion joints shall be made in accordance with the drawings.

(c) Half-round channels

Cast in situ half-round channels shall be constructed in accordance with the drawings, or to fit existing sections.

(d) Kerbing and channelling

Kerbing shall include barrier kerbs, mountable and semi-mountable types. All the elements shall be prefabricated units with cast in situ channelling unless otherwise specified by the Engineer.

Kerbing and channelling shall be laid on the approved bedding with close joints filled with 3:1 sand: cement mortar not exceeding 10 mm in thickness and neatly pointed with a pointing trowel. Kerbing shall be propped with class 15/19 in-situ concrete at each joint (size: 300 mm long x 200 mm wide x 80% of kerb height).

(e) Concrete cast against existing surfaced edges

Where concrete lining or concrete channelling in kerb and channel combinations is to be cast against existing surfacing the edge shall first be cut, before excavation, with approved sawing equipment to provide a neat straight edge. Care shall be taken during the placing of the concrete not to spill concrete onto the adjacent surfacing. Any concrete stains shall be removed by the Contractor at his own expense.

(f) Reinstatement of damaged existing structures

Damaged existing structures shall be demolished to the extent directed by the Engineer on site and the resulting debris shall be spoiled.

The reinstatement of damaged sections shall be carried out to the same standards prescribed for new construction and shall be paid for under the relevant items scheduled for new structures.

Provision shall be made for the reinstatement of existing damaged prefabricated concrete half round channels.

(g) Inlet and outlet structures

The structures shall be constructed in accordance with the requirements specified in the relevant section in this specification.

CB 04.04.02 Quality standard

The drains shall be constructed neatly to the dimensions shown on the drawings and within the specified dimensional and alignment tolerances.

Repairs to drains shall be in uniformity with existing structures.

CB 04.04.03 Materials

(a) Concrete

Concrete for the various structural components shall comply with the class detailed on the drawings. Concrete in channel linings shall be class 20/19.

(b) Steel reinforcement

(i) Steel bars

Steel reinforcing bars shall comply with the requirements of SANS 920.

(ii) Welded steel mesh

Welded steel mesh shall comply with the requirements of SANS 1024.

CB 04.05 CLEARING OF CONCRETE DRAINS AND CHANNELS

This section covers the work in connection with the removal of silt, debris and vegetation causing obstruction to flow in concrete drains and channels constructed from any type of material.

CB 04.05.01 Construction

Concrete channels shall be cleaned where instructed by the Engineer. Generally, channels shall be cleaned when depth of silt in invert exceeds 100 mm, or when other foreign matter is present.

Material removed from channels shall either be loaded and removed from the site or disposed of adjacent to channels where it cannot be washed back into the channel as directed by the Engineer.

Where material is spoiled adjacent to channels the Contractor shall ensure that the material is spread neatly and well clear of the top of the channels where it will not wash back. Material removed from kerb and channel combinations, side drains or from other channels where directed by the Engineer shall be transported to spoil.

Vegetation growing in channel joints and cracks shall be removed with roots to prevent re-growth.

Vegetation growing over channels from the edges shall be slashed at the concrete edges and disposed of. Undesirable vegetation shall be removed with roots and spoiled where directed by the Engineer.

CB 04.05.02 Quality standard

Concrete drainage channels shall be clear of any obstruction such that the concrete surfaces are clearly visible.

CB 04.06 CLEANING OF EARTH CHANNELS

This section covers the work involved in cleaning of all earth drains and channels, repairs to damaged earth drains and channels, as well as construction and repairs of banks and dykes.

CB 04.06.01 Execution of work

(a) Drains

Earth side drains and channels shall be cleaned of all debris, silt and vegetation when instructed by the Engineer.

Silt and debris excavated from the drains shall be deposited and spread neatly in close proximity of the drains where it will not wash back.

Scoured and eroded sections of drains shall be backfilled with suitable material obtained from the side of the road or from suitable sources indicated by the Engineer. The backfill material shall be compacted at the optimum uniform moisture content in layers not exceeding 100 mm after compaction. The Contractor shall use suitable compaction equipment to produce repairs that will not erode or scour again.

If in the opinion of the Engineer drains require protective covering against scouring and erosion, such work shall be executed in accordance with the relevant section of this specification.

(b) Construction and repair of banks and dykes

Material for the construction and repair of banks and dykes shall be an approved soil or gravel obtained from sources approved by the Engineer. It shall be positioned in such a way that water will flow on the natural ground and against the bank.

Banks and dykes shall be properly compacted in layers not exceeding 150 mm in thickness. If approved by the Engineer, mitre banks may also be constructed of hand-packed stone, provided that the interstices are filled with an approved cohesive soil.

CB 04.06.02 Quality standard

Drainage channels shall be clear of any obstructions and no scouring, erosion or pooling shall be evident.

Existing fill and cut slopes and invert grades of drains shall be maintained.

CB 04.07 CONSTRUCTION AND REPAIR OF BRICKWORK INLET STRUCTURES

CB 04.07.01 Reinstatement of damaged existing structures

Damaged existing structures shall be demolished to the extent indicated by the Engineer on site and the resulting debris spoiled.

The reinstatement of damaged sections shall be carried out to the same standards prescribed for new construction and shall be paid for under the relevant items scheduled for new structures.

CB 04.07.02 Lowering of inlet structures

Existing structures which are not functional due to the inlet being above the surrounding pavement level or ground level shall be demolished to the extent indicated by the Engineer and reinstated at the correct level to the same standard prescribed for new construction.

CB 04.08 PROVISION OF LOCKABLE STORMWATER GRID INLETS

Stormwater inlet structures shall be provided with lockable grids where required by the Engineer. These shall be in the form of a steel bar secured to the base of the catch pit and long enough to just protrude through the inlet grid. There shall be a hole in the end of the bar to allow a padlock to be positioned such that the grid will be immovable.

The steel bar shall be treated to avoid corrosion.

Padlocks shall be provided for all grid inlets. They shall be of a type suitable for outdoor use, or as specified in the Project Specifications.

CB 04.09 CLEANING OF PIPELINES

The work under this section involves the removal of silt and debris from pipelines, including the cleaning of inlet and outlet structures.

CB 04.09.01 Construction

Before cleaning any pipelines, the Contractor shall arrange with the Engineer for an inspection of the stormwater network. The Contractor shall provide adequate equipment such as torches, lights, mirrors and TV surveillance equipment, etc, to enable a basic visual inspection of all pipes. Based on this inspection, the Engineer will instruct the Contractor as to which sections of the network require cleaning and where detailed inspections are required.

Material removed from the pipes shall be disposed of where instructed by the Engineer. Rubble and waste material shall be disposed of at the nearest appropriate solid waste disposal site, unless directed otherwise by the Engineer.

The Contractor shall ensure that all material is removed at the nearest accessible structure. No additional payment will be made for the removal of material from previously cleaned sections of the network.

CB 04.09.02 Quality standard

Pipes shall be cleaned of all silt and debris.

All spoil material shall be spread neatly to ensure that it will not return to the drainage trenches.

The pipe sizes for the different categories will be determined by diameter.

CB 05 MEASUREMENT AND PAYMENT

CB.01 PREFABRICATED CULVERT INSTALLATION AND REPAIR OF EXISTING CULVERTS AND STRUCTURES

CB.01.01 Excavation:

(a) Excavation of soft material within the following depth ranges below the surface level:

- (i) 0 m up to and including 1,5 m..... Unit: cubic metre (m³)
- (ii) Exceeding 1,5 m up to and including 3,0 m.. Unit: cubic metre (m³)
- (iii) Exceeding 3,0 m up to and including 4,5 m.. Unit: cubic metre (m³)
- (iv) Etc in increments of 1,5 m

(b) Excavating hard material irrespective of depth Unit: cubic metre (m³)

The unit of measurement shall be the cubic metre of material excavated within the specified dimensions, authorised by the Engineer in each case. Excavation in excess of widths specified or authorised shall not be measured for payment.

Irrespective of the total depth of the excavation, the quantity of material in each depth range shall be measured separately.

When measuring excavation for the removal of existing culverts, the volume occupied by the culvert shall not be subtracted from the calculated volume of excavation.

The tendered rates shall include full compensation for all excavation (including around structures), levelling, temporary timbering, shoring and strutting, for preparing the bottom of the excavation for the culvert beds, the disposal of unstable

material unsuitable for backfilling, keeping the excavation safe, dealing with any surface or subsurface water and for any other operations necessary for completing the work as specified.

Payment shall distinguish between soft and hard material.

CB.01.02 Backfilling and reinstatement of pavement layers:

(a) In-situ fill or cut material compacted to 90% of modified AASHTO density Unit: cubic metre (m³)

(b) Selected layers compacted to 93% of modified AASHTO density Unit: cubic metre (m³)

(c) Cement stabilized subbase layer compacted to 95% of modified AASHTO density Unit: cubic metre (m³)

The unit of measurement for CB.01.02(a) and (b) shall be the cubic metre of gravel material placed and compacted according to authorised dimensions on drawings.

The unit of measurement for CB.01.02(c) shall be the cubic metre of stabilized material placed and compacted according to authorised dimensions.

The tendered rates shall include full compensation for procuring and furnishing, placing, compaction and finishing of materials, labour, tools and equipment for executing the work to the satisfaction of the Engineer.

CB.01.03 Prefabricated culverts:

(a) On class A bedding (type and diameter indicated) Unit: metre (m)

(b) On class B bedding (type and diameter indicated) Unit: metre (m)

(c) Portal culverts with prefabricated floor slabs (type and size indicated) Unit: metre (m)

The unit of measurement for prefabricated culverts shall be the metre of culvert laid. The length shall be measured along the soffit of the culvert.

The tendered rates shall include full compensation for providing, testing, loading, transporting and unloading the culverts, for providing and placing the bedding material where required, and for the installation, laying and jointing of the culverts as specified including cutting them on the site and removing any waste.

CB.01.04 Cast in-situ concrete and formwork in stormwater structures:

(a) Class 20 concrete Unit: cubic metre (m³)

(b) Class 25 concrete Unit: cubic metre (m³)

The unit of measurement shall be the cubic metre of concrete in place. Quantities shall be calculated from the dimensions shown on the drawings or as authorised.

The tendered rates shall include full compensation for procuring and furnishing all the materials, storing the materials, providing all plant, mixing, transporting, placing and compacting the concrete, forming the inserts, construction joints and contraction joints, curing and protecting the concrete, repairing defective surfaces and finishing the concrete surface as specified.

CB.01.05 Replacement of manhole covers, grid inlets, etc

(a) SANS 558 Type 4 - covers, grids, etc:

- (i) Maximum dimension up to and including 300 mm..... Unit: number
- (ii) Maximum dimension 301 mm to 600 mm..... Unit: number
- (iii) Maximum dimension 601 mm to 900 mm Unit: number
- (iv) Maximum dimension over 900 mm..... Unit: number

(b) SANS 558 Type 4 - frames only for covers, grids, etc:

- (i) Maximum dimension up to and including 300 mm..... Unit: number
- (ii) Maximum dimension 301 mm to 600 mm..... Unit: number
- (iii) Maximum dimension 601 mm to 900 mm Unit: number
- (iv) Maximum dimension over 900 mm..... Unit: number

(c) SANS 558 Type 2A - covers, grids, etc:

- (i) Maximum dimension up to and including 300 mm..... Unit: number
- (ii) Maximum dimension 301 mm to 600 mm..... Unit: number
- (iii) Maximum dimension 601 mm to 900 mm..... Unit: number
- (iv) Maximum dimension over 900 mm..... Unit: number

(d) SANS 558 Type 2A - frames only for covers, grids, etc:

- (i) Maximum dimension up to and including 300 mm..... Unit: number
- (ii) Maximum dimension 301 mm to 600 mm..... Unit: number
- (iii) Maximum dimension 601 mm to 900 mm..... Unit: number
- (iv) Maximum dimension over 900 mm..... Unit: number

The unit of measurement shall be the number of covers or frames installed. The classification of the size of each cover or frame will be based on the nominal dimensions of the unit and not on the actual dimensions.

The tendered rates shall include full compensation for procuring, furnishing and placing the new covers, grids and/or frames. The tendered rates shall also include full compensation for removing and disposing of the damaged covers, grids and/or frames.

CB.02 CLEANING OF PREFABRICATED CULVERTS

CB.02.01 Cleaning of prefabricated culverts and inlet structures (average depth of material removed not more than 100 mm):

(a) Prefabricated concrete pipes and portal culverts:

- (i) Up to and including 500 mm Unit: metre (m)
- (ii) 501 mm to 750 mm Unit: metre (m)
- (iii) 751 mm to 950 mm Unit: metre (m)
- (iv) 951 mm to 1250 mm Unit: metre (m)
- (v) 1251 mm to 1500 mm Unit: metre (m)
- (vi) 1501 mm to 2100 mm Unit: metre (m)

(b) Prefabricated corrugated metal culverts:

- (i) Up to and including 500 mm Unit: metre (m)
- (ii) 501 mm to 750 mm Unit: metre (m)
- (iii) 751 mm to 950 mm Unit: metre (m)
- (iv) 951 mm to 1250 mm Unit: metre (m)
- (v) 1251 mm to 1500 mm Unit: metre (m)
- (vi) 1501 mm to 2100 mm Unit: metre (m)

The unit of measurement shall be the metre of culvert cleaned (depth of material removed is on average not more than 100 mm), measured once along the soffit of the culvert. For multiple culverts each individual culvert shall be measured separately.

The tendered rates shall include full compensation for removing the material, for disposing of the material in an appropriate manner and ensuring that the material will not wash into drainage trenches.

CB.02.02 Cleaning of prefabricated culvert and inlet and outlet structures (average depth of material removed is more than 100 mm):

(a) Prefabricated concrete pipes and portal culverts:

- (i) Up to and including 500 mm Unit: metre (m³)
- (ii) 501 mm to 750 mm Unit: metre (m³)
- (iii) 751 mm to 950 mm Unit: metre (m³)
- (iv) 951 mm to 1250 mm Unit: metre (m³)
- (v) 1251 mm to 1500 mm Unit: metre (m³)
- (vi) 1501 mm to 2100 mm Unit: metre (m³)

(b) Prefabricated corrugated metal culverts:

- (i) Up to and including 500 mm Unit: metre (m³)
- (ii) 501 mm to 750 mm Unit: metre (m³)
- (iii) 751 mm to 950 mm Unit: metre (m³)
- (iv) 951 mm to 1250 mm Unit: metre (m³)
- (v) 1251 mm to 1500 mm Unit: metre (m³)

The unit of measurement shall be the cubic metre of material removed (depth of material removed is on average more than 100 mm). The quantity of material to be removed shall be measured in place for each individual culvert.

The tendered rates shall include full compensation for removing the material from the culvert, for loading the material onto trucks, for transporting the material within a free-haul distance of 1,0 km and for spoiling the material as specified.

CB.02.03 Provision of equipment for visual inspection of underground culvert network Unit: lump sum

The tendered sum shall include full compensation for the provision of suitable equipment, such as torches, lights and mirrors, etc, to enable a basic visual inspection of the culvert network.

CB.02.04 Visual inspection of underground culvert network Unit: metre (m)

The tendered rate shall include full compensation for all processes necessary to complete a thorough check of the culvert network, including lifting and replacing manhole covers, using relevant equipment and any clearing necessary to allow the visual inspection to proceed.

CB.03 CONCRETE CONSTRUCTION AND REPAIR

CB.03.01 Excavation:

(a) For open drains:

(i) Soft material..... Unit: cubic metre (m³)

(ii) Hard material Unit: cubic metre (m³)

(b) For half-round channels and kerbing and channelling:

(i) Soft material..... Unit: cubic metre (m³)

(ii) Hard material Unit: cubic metre (m³)

The unit of measurement shall be the cubic metre of material excavated in accordance with the authorised dimensions measured in place.

The tendered rates shall include full compensation for all plant, labour and tools necessary for excavating the material to the required dimensions, including trimming the excavation before placing concrete, disposing of the material from the site.

CB.03.02 Cast in-situ concrete:

(a) Linings (class indicated)..... Unit: cubic metre (m³)

(b) Half-round channels..... Unit: cubic metre (m³)

(c) Channels for kerb and channel (class indicated).... Unit: cubic metre (m³)

(d) Speed humps (class indicated)..... Unit: cubic metre (m³)

(e) Inlet cover slabs (class indicated)..... Unit: cubic metre (m³)

The unit of measurement shall be the cubic metre of concrete placed in situ. The quantity shall be calculated in accordance with the authorised dimensions.

The tendered rates shall include full compensation for procuring and furnishing all material and for all work necessary for mixing, placing and finishing the concrete to the authorised dimensions, including providing and erecting of formwork, for sawing of asphalt layers and for providing expansion and contraction joints as included on drawings or as instructed by the Engineer.

CB.03.03 Backfill below channels Unit: cubic metre (m³)

The unit of measurement shall be the cubic metre of backfill as may be instructed by the Engineer to be placed below channels.

The tendered rate shall include full compensation for furnishing, procuring, placing and compacting concrete.

CB.03.04 Precast concrete kerbing:

(a) Supply and install (type indicated) Unit: metre (m)

(b) Install only (type indicated) Unit: metre (m)

The unit of measurement shall be the metre of precast kerbing complete as constructed, measured along the face of the kerb.

The tendered rate for CB.03.04(a) shall include full compensation for preparing of bedding, furnishing and installing all materials and supporting the kerb with in situ concrete, for backfilling behind kerbs, all complete as specified.

The tendered rate for CB.03.04(b) shall include full compensation for preparing of bedding, furnishing and installing all materials and reinstalling existing kerbing, all complete as specified.

CB.03.05 Steel reinforcement:

(a) Mild steel bars Unit: ton (t)

(b) High-tensile steel bars Unit: ton (t)

(c) Welded steel mesh Unit: kilogram (kg)

The unit of measurement for steel bars shall be the ton of reinforcing, and kilogram of welded steel in place in accordance with the drawings or as authorised. Ties, stools and other steel used for positioning the reinforcing steel shall be measured as steel reinforcement.

The tendered rate shall include full compensation for supplying, delivering, cutting, bending, welding, trial weld joints, placing and fixing the steel reinforcement including all tying wire, spacers and waste.

CB.03.06 Sealed joints in concrete lining open drains (type indicated) Unit: metre (m)

The unit of measurement shall be the metre of completed joint of each size and type.

The tendered rate shall include full compensation for supplying all material and for all labour, tools, formwork and incidentals necessary for sealing the joint as shown on the drawings or specified in the Project Specifications.

CB.03.07 Demolition and removal of damaged existing structures:

(a) Plain concrete Unit: cubic metre (m³)

(b) Reinforced concrete Unit: cubic metre (m³)

(c) Kerbing and channelling Unit: metre (m)

(d) Half-round channels Unit: metre (m)

The unit of measurement for CB.03.07(a) and (b) shall be the cubic metre of existing material demolished, determined from 70% of the rated cubic metre capacity of the truck used to remove the material.

The unit of measurement for CB.03.07 (c) and (d) shall be the metre length of kerbing and channelling or half-round channels removed.

The tendered rates shall include full compensation for all labour, equipment and tools for removal of the damaged sections, trimming the bedding and for loading, transporting and disposing of the material from the site.

The reinstatement of damaged sections shall be paid for under the relevant items for constructing new structures.

CB.03.08 Concrete side beams Unit: cubic metre (m³)

The unit of measurement shall be the cubic metre of concrete in side beams constructed as instructed.

The tendered rate shall include full compensation for furnishing all material and labour including formwork as necessary, placing concrete and shaping all surfaces and all excavations required.

CB.03.09 Overhaul on material for haul in excess of 1,0 km:

(a) Excavated material to spoil Unit: cubic metre kilometer (m³-km)

(b) Existing structures demolished Unit: cubic metre kilometer (m³-km)

The unit of measurement shall be the cubic metre of loose material hauled in excess of 1,0 km, measured according to the rated capacity of the truck used, multiplied by the average overhaul distance.

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

CB.04 CLEANING OF CONCRETE DRAINS AND CHANNELS

CB.04.01 Cleaning of concrete drainage channels:

(a) Remove material and load for spoil:

- (i) Channels in kerbing-channelling combinations and side drains Unit: metre (m)
- (ii) Other drains and channels within the following invert width ranges:
 - (1) Less than 1,0 m Unit: metre (m)
 - (2) 1,0 m up to and including 2,0 m..... Unit: metre (m)
 - (3) Exceeding 2,0 m up to and including 3,0 m..... Unit: metre (m)

(b) Remove material and dispose of adjacent to channels:

- (i) Channels in kerbing-channelling combinations and side drains Unit: metre (m)
- (ii) Other drains and channels within the following invert width ranges:
 - (1) Less than 1,0 m Unit: metre (m)
 - (2) 1,0 m up to and including 2,0 m..... Unit: metre (m)
 - (3) Exceeding 2,0 m up to and including 3,0 m..... Unit: metre (m)

The unit of measurement shall be the metre of channel cleaned, measured once along the invert of the channel.

The tendered rates shall include full compensation for all labour and equipment required for removing the material from channels irrespective of the depth of silt and debris and for loading, off-loading and spreading when material removed is intended for spoiling at designated spoil sites. The tendered rates shall also include full compensation for the removal of vegetation in channels and growing over the edges of channels.

The tendered rates shall also include for transporting the excavated material to spoil sites.

Where material is disposed of adjacent to the channels, the tendered rate shall include full compensation for removing the material from the channels, irrespective of the depth of silt and debris, spoiling and spreading the material adjacent to the channel where it cannot be washed back in to the channel.

CB.04.02 Overhaul of material hauled in excess of the free-haul distance of 1,0 kmUnit: cubic metre kilometer (m³-km)

The unit of measurement shall be the cubic metre of material hauled to spoil, the volume to be determined from the rated capacity of the truck multiplied by the average overhaul distance. All trucks shall be fully loaded to their rated capacity.

The tendered rate shall include full compensation for hauling the material the average overhaul distance to the designated spoil site.

CB.05 CLEANING AND MAINTENANCE OF EXISTING EARTH CHANNELS

CB.05.01 Cleaning earth drains and channels..... Unit: cubic metre (m³)

The unit of measurement shall be the cubic metre of material cleaned out of the drain.

The tendered rate shall include full compensation for all labour and equipment required for removing the obstruction from drains, irrespective of depth of silt and debris and disposal of the excavated material as described.

CB.05.02 Repairing of earth drains and channels..... Unit: cubic metre (m³)

The unit of measurement shall be the cubic metre of compacted material calculated from the dimensions measured in place. The tendered rate shall include full compensation for trimming the eroded area to firm surrounding material, for procuring, transporting placing and compacting the backfill material.

CB.05.03 Banks and dykes Unit: cubic metre (m³)

The unit of measurement shall be the cubic metre of in place in banks or dykes, calculated in accordance with authorised dimensions.

The tendered rate shall include full compensation for procuring, transporting furnishing, placing, watering, compacting, shaping and trimming of material in the banks and dykes.

CB.05.04 Cleaning of vegetation at inlet and outlet structures (5 m x 5 m)Unit: square metre (m²)

The unit of measurement shall be the area measured in square metres, cleared of all vegetation blocking the inlet and outlet structures.

The tendered rate shall include for labour, clearing of vegetation, removing to spoil of vegetation and tools to complete the work to the approval of the Engineer.

CB.05.05 Overhaul of material in excess of the free-haul distance of 1,0 kmUnit: cubic metre kilometre (m³-km)

The unit of measurement shall be the cubic metre of imported material, nett volume of material compacted in place, multiplied by the average overhaul distance in excess of 1,0 km. The tendered rate shall include full compensation for hauling the material the distance from the designated source in excess of 1,0 km.

CB 06 REPAIR AND CONSTRUCTION TO EXISTING BRICKWORK INLETS

CB.06.01 Demolition and removal of existing structures Unit: cubic metre (m³)

The unit of measurement shall be the cubic metre of existing material demolished. The tendered rates shall include full compensation for all labour, equipment and slabs for the removal of the section, trimming the bedding and for loading, transporting and disposing of the material from the site.

CB 06.02 Repair of brickwork inlet structures Unit: number

The unit of measurement shall be the number of inlet structures repaired.

The tendered rate shall include full compensation for furnishing all material and labour necessary for restoring the inlet structure to an as new state.

CB.06.03 Reconstruction of brickwork inlet structures Unit: number

The unit of measurement shall be the number of inlet structures completely rebuilt.

The tendered rate shall include full compensation for furnishing all material and labour necessary for rebuilding the inlet structure to a complete state.

CB.07 LOCKABLE GRID INLETS

CB.07.01 Provision of lockable grid inlets..... Unit: number

The unit of measurement shall be the number of grid inlets fitted with a steel bar suitable for locking the inlet cover down.

The tendered rate shall include full compensation for all labour, equipment and tools, rust protection and any other function necessary for the secure installation of the bar.

CB.07.02 Provision of padlocks..... Unit: number

The unit of measurement shall be the number of padlocks provided for lockable grid inlets.

The tendered rate shall include purchasing and installation of all padlocks, as well as providing a full set of labelled keys to the User Client.

CB 08

CLEANING OF PIPELINES

CB.08.01

Cleaning of pipes and inlet structures (average depth of material removed not exceeding 100 mm):

(a) Up to and including 300 mm Unit: metre (m)

(b) Exceeding 300 mm up to and including 450 mm Unit: metre (m)

(c) Exceeding 450 mm up to and including 600 mm Unit: metre (m)

(d) Exceeding 600 mm up to and including 800 mm Unit: metre (m)

(e) Exceeding 800 mm up to and including 1000 mm Unit: metre (m)

The unit of measurement shall be the metre of pipe cleaned, (depth of material removed is on average not more than 100 mm) measured once along the soffit of the pipe. For multiple pipes each individual pipe shall be measured separately.

The tendered rates shall include full compensation for removing the material, for disposing of the material in an appropriate manner and ensuring that the material will not wash into drainage trenches.

CB.08.02

Cleaning of pipes and inlet and outlet structures (average depth of material removed exceeding 100 mm):

(a) Up to and including 300 mm Unit: metre (m³)

(b) Exceeding 300 mm up to and including 450 mm Unit: metre (m³)

(c) Exceeding 450 mm up to and including 600 mm Unit: metre (m³)

(d) Exceeding 600 mm up to and including 800 mm Unit: metre (m³)

(e) Exceeding 800 mm up to and including 1000 mm Unit: metre (m³)

The unit of measurement shall be the cubic metre of material removed (depth of material removed is on average more than 100 mm). The quantity of material to be removed shall be measured in place for each individual pipe.

The tendered rates shall include full compensation for removing the material from the pipe for loading the material onto trucks and for transporting the material from the site.

CB.08.03

Overhaul of material hauled in excess of 1,0 km free-haul distance Unit: cubic metre kilometre (m³-km)

The unit of measurement shall be the cubic metre of material hauled to spoil in excess of the free-haul distance of 1,0 km, the volume to be determined from the rated capacity of the truck, multiplied by the average overhaul distance. All trucks shall be fully loaded to their rated capacity.

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

**CB.08.04 Provision of equipment for visual inspection
of underground pipe network Unit: sum**

The tendered sum shall include full compensation for the provision of suitable equipment, such as torches, lights and TV surveillance equipment, etc, to enable a basic visual inspection of the pipe network.

CB.08.05 Visual inspection of underground pipe network Unit: metre (m)

The tendered rate shall include full compensation for all processes necessary to complete a thorough check of the stormwater network including lifting and replacing manhole covers and inlet covers, using relevant equipment and any clearing necessary to allow the visual inspection to proceed.

C3.3 Annexures

C3.3.1 Additional Specification: Site Specific Inventory

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SS SITE SPECIFIC INVENTORY

CONTENTS

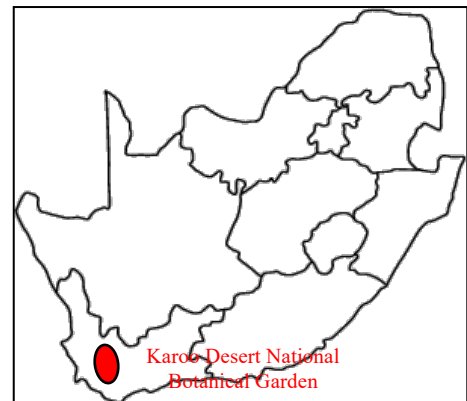
SS 01	SCOPE
SS 02	SITE LOCALITY INFORMATION
SS 03	SITE INVENTORY
SS 04	SCOPE DEFINITION
SS 05	ADDITIONAL SITE-SPECIFIC INFORMATION

SS 01 SCOPE

This Additional Specification (SS: Site Specific Inventory) covers the inventory of Karoo Desert National Botanical Garden included as part of the contract in order to assist the Contractor with the scope of work regarding specific repair and upgrading requirements. Additional Specification SS: Site Specific Inventory, should be read in conjunction with all other technical and additional specifications applicable to this contract.

SS 02 SITE LOCALITY INFORMATION

The Karoo Desert National Botanical Garden cultivates and displays a wide variety of arid and semi-arid plants. The 154-hectare Garden lies at the foot of the Hex River Mountain range, 120 km North of Cape Town. Only 11 hectares are cultivated, and the remaining 143 hectares are comprised of natural vegetation. The garden houses approximately six residing personnel, 34 day-staff personnel and services about 60 visitors per day on average. The road infrastructure consists of 1,674 m² asphalt surfaced roads, 5,189 m² single seal surfaced roads, 2,146 m² nursery and offices parking, 441 m² visitor parking and gravel service road of 4,217m². Roads are between 4 m and 5 m wide.



Karoo Desert National Botanical Garden is situated at Roux Rd, Panorama, (off National Rd), Worcester, Western Cape, South Africa.
GPS Co-ordinates: 33°37'00.2"S; 19°27'01.7"E

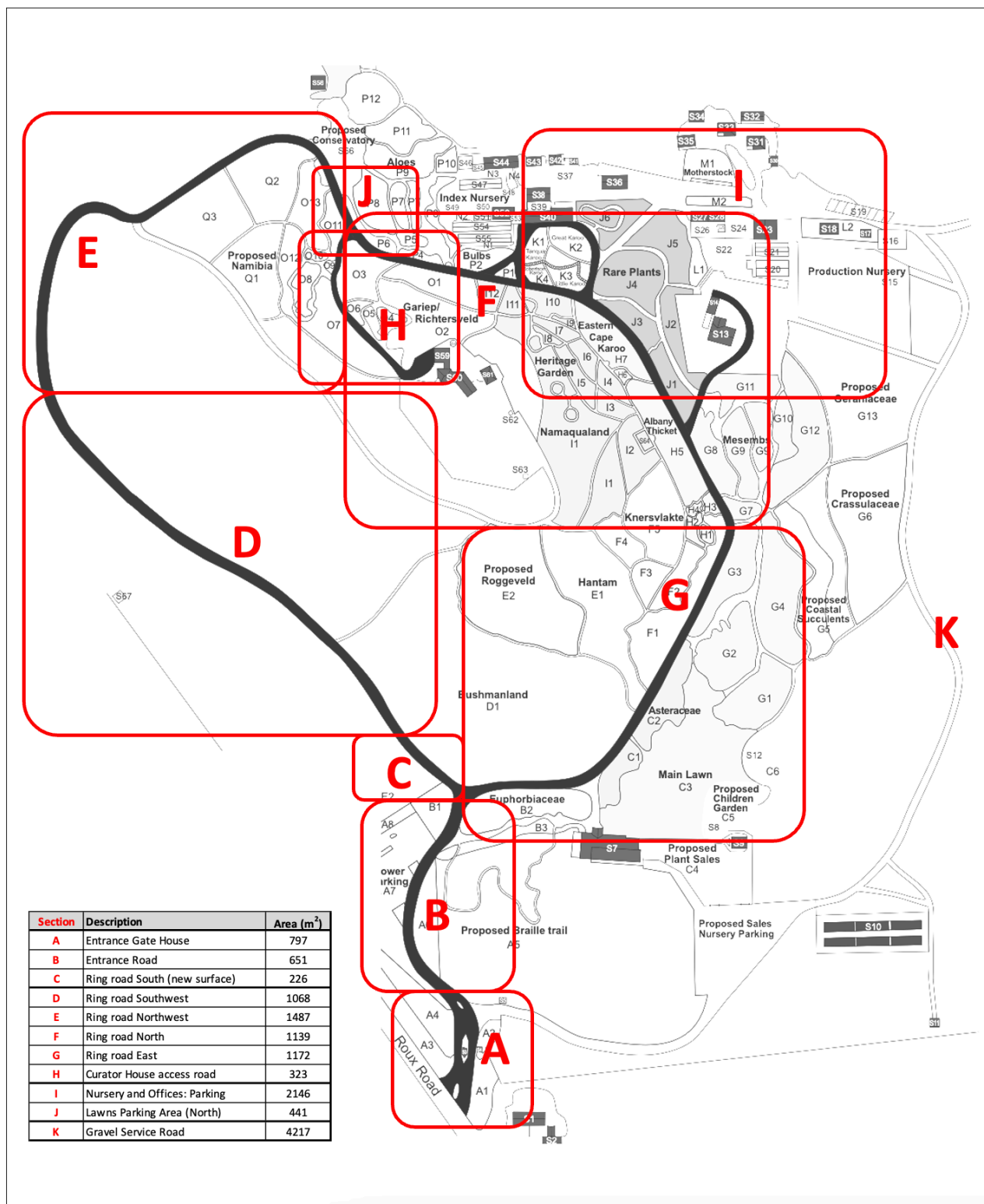


Figure 2.1: Road Sections

SS 03 SITE INVENTORY

SS 03.01 RING ROAD

The parking area and access road is in an operative condition and was provided with a premix asphalt layer. The ring road seal (multiple single seals) is however in a very poor condition due to the disintegration and failure of the surface seal. Potholes, cracking and ravelling are evident and will be totally dysfunctional within the next two years.



Figure 3.1: Ring road profile

The roads foundation layer works appears to be intact, and remain suitable for its intended design purpose. The entire ring road will be paved with interlocking paving.

PAVEMENT CLASS AND DESIGN BEARING CAPACITY (80KN AXLES/LANES)

ROAD CATEGORY	ES1 (0,3-1,0x106)	FOUNDATION
UC: Residential access collectors, car parks and lightly trafficked bus routes	60 S-A S-B or S-C 20 SND 125 C4	150 G7 150 G9 G10

LAYER WORKS SPECIFICATION: SECTIONS I & J: PAVEMENT LAYERWORKS TABLE

Lower Selected layer	150 mm Imported selected G7 Material (foundation)
Upper Selected layer	150 mm Imported selected G5 Material (foundation)
Base	125 mm C4 Material stabilised with ordinary Portland cement
Surfacing	80 mm Class 35MPa Concrete paving blocks on 20mm layer of sand

LAYER WORKS SPECIFICATION: SECTIONS A - H: PAVEMENT LAYERWORKS TABLE

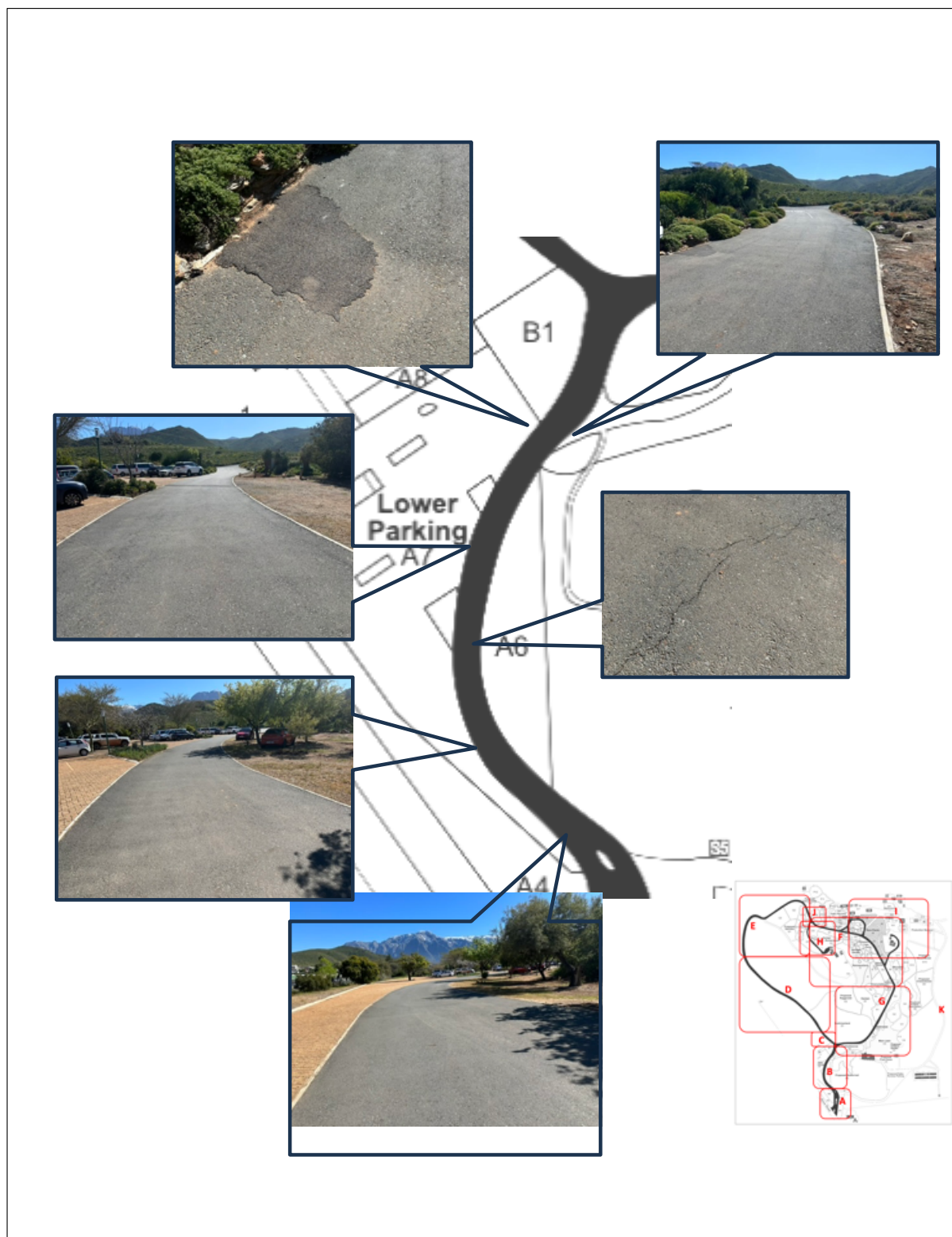
Upper Selected layer	150 mm Imported selected G5 Material (foundation)
Base	125 mm C4 Material stabilised with ordinary Portland cement
Surfacing	80 mm Class 35MPa Concrete paving blocks on 20mm layer of sand

ENTRANCE GATE HOUSE



The existing asphalt layer shall be removed, and existing surface layers be excavated to a depth of 375 mm (20 mm + 80 mm + 125 mm + 150 mm) below the *existing* asphalt surface level.

SECTION B: ENTRANCE ROAD



The existing asphalt layer shall be removed, and existing surface layers be excavated to a depth of 375 mm (20 mm + 80 mm + 125 mm + 150 mm) below the existing asphalt surface level.

SECTION C: RING ROAD SOUTH



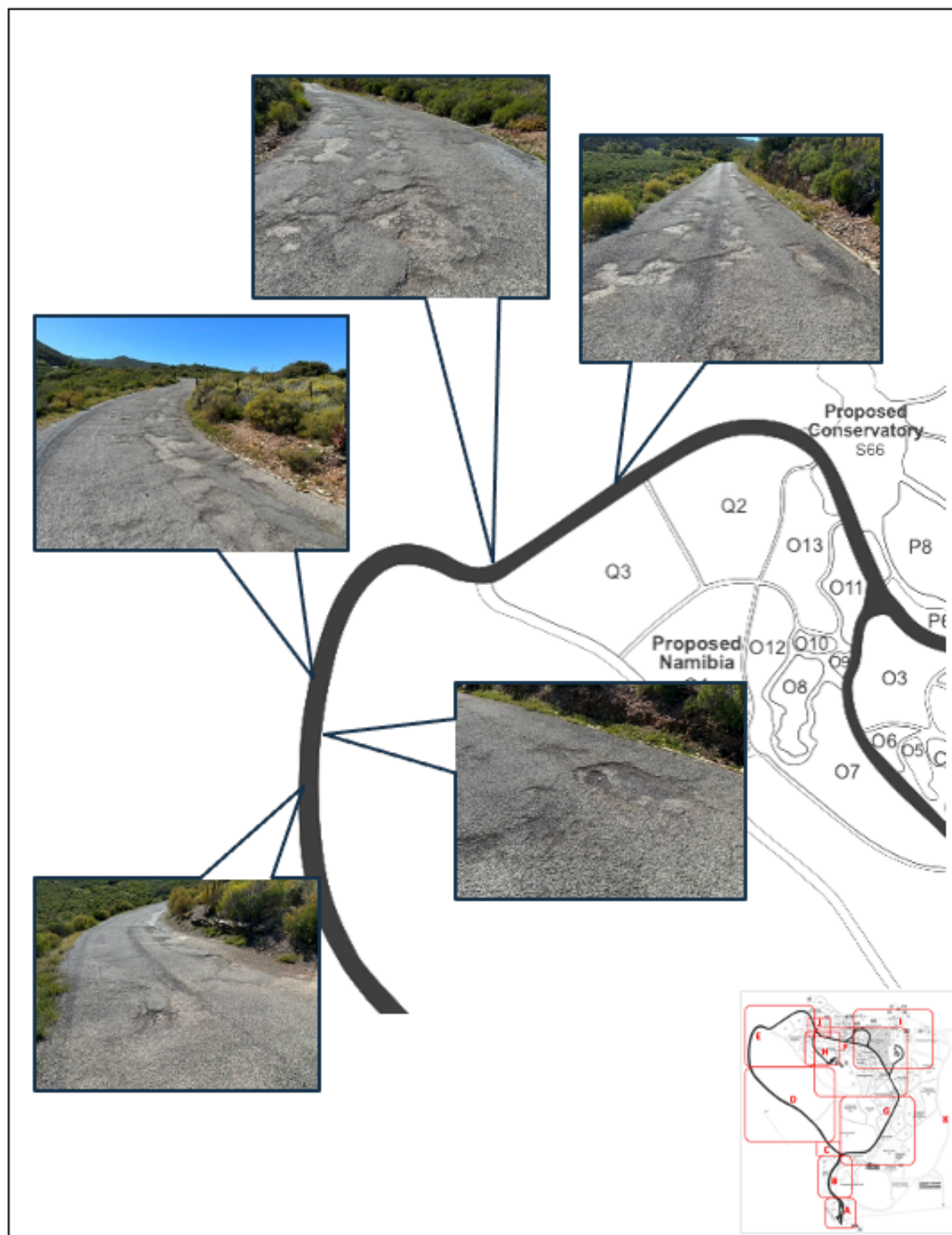
The existing asphalt layer shall be removed, and existing surface layers be excavated to a depth of 375 mm (20 mm + 80 mm + 125 mm + 150 mm) below the existing asphalt surface level.

SECTION D: RING ROAD SOUTHWEST



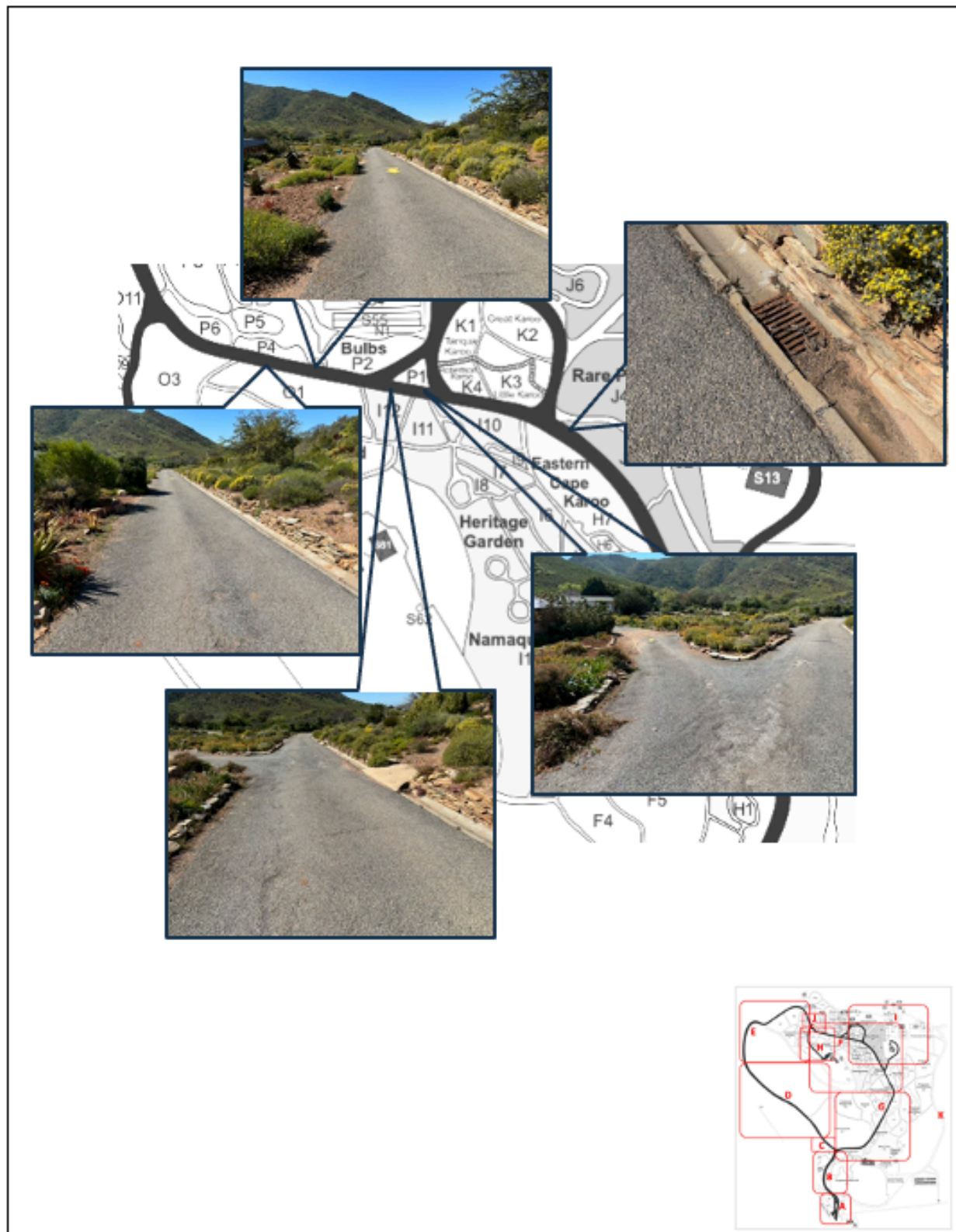
The existing asphalt layer shall be removed, and existing surface layers be excavated to a depth of 375 mm (20 mm + 80 mm + 125 mm + 150 mm) below the existing asphalt surface level.

SECTION E: RING ROAD NORTHWEST



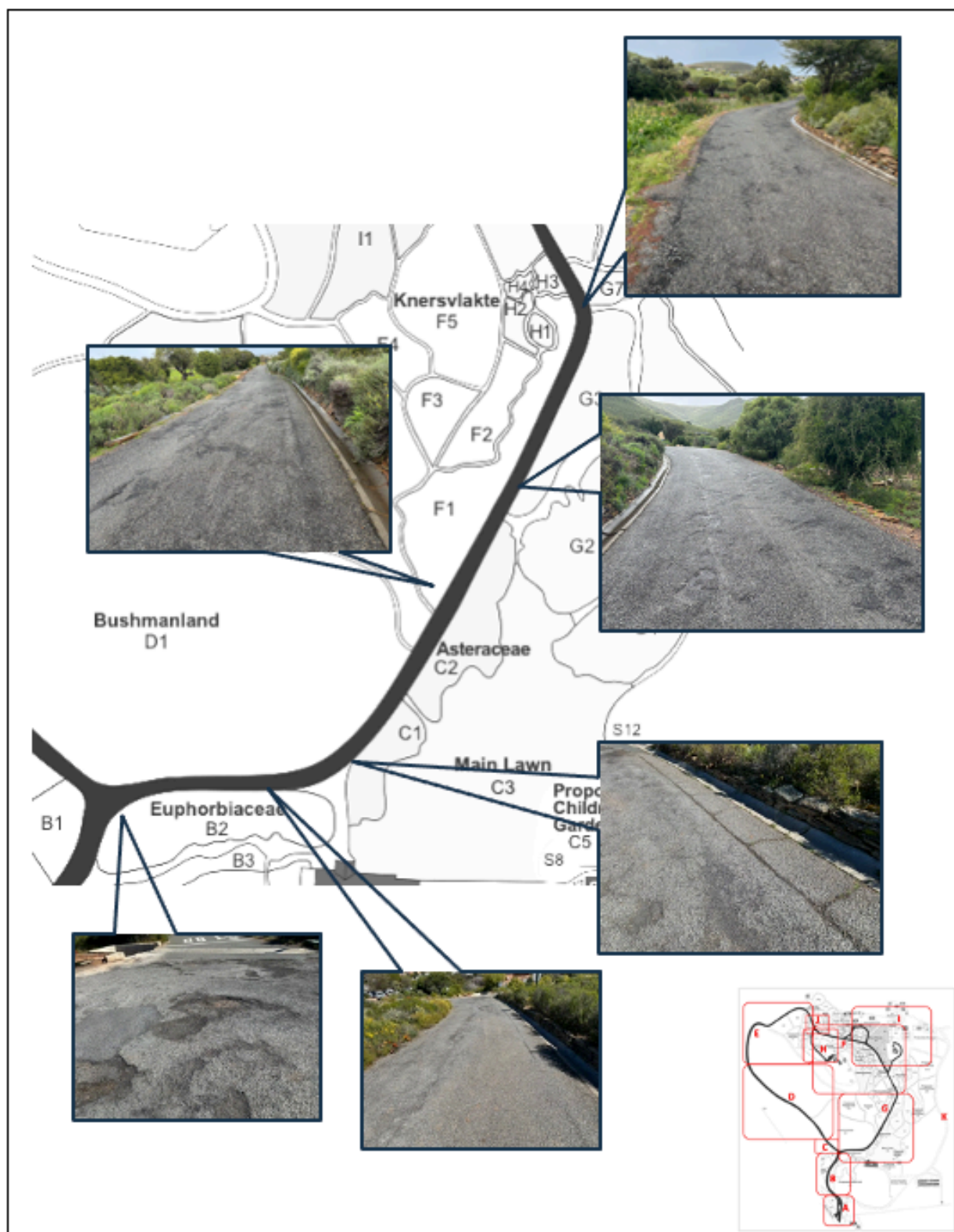
The existing asphalt layer shall be removed, and existing surface layers be excavated to a depth of 375 mm (20 mm + 80 mm + 125 mm + 150 mm) below the existing asphalt surface level.

SECTION F: RING ROAD NORTH



The existing asphalt layer shall be removed, and existing surface layers be excavated to a depth of 375 mm (20 mm + 80 mm + 125 mm + 150 mm) below the existing asphalt surface level.

SECTION G: RING ROAD EAST



The existing asphalt layer shall be removed, and existing surface layers be excavated to a depth of 375 mm (20 mm + 80 mm + 125 mm + 150 mm) below the existing asphalt surface level.

SECTION H: CURATOR HOUSE ACCESS ROAD



The existing asphalt layer shall be removed, and existing surface layers be excavated to a depth of 375 mm (20 mm + 80 mm + 125 mm + 150 mm) below the existing asphalt surface level.

SECTION H: NURSERY AND OFFICE PARKING



The existing asphalt layer shall be removed, and existing surface layers be excavated to a depth of 375 mm (20 mm + 80 mm + 125 mm + 150 mm) below the existing asphalt surface level.

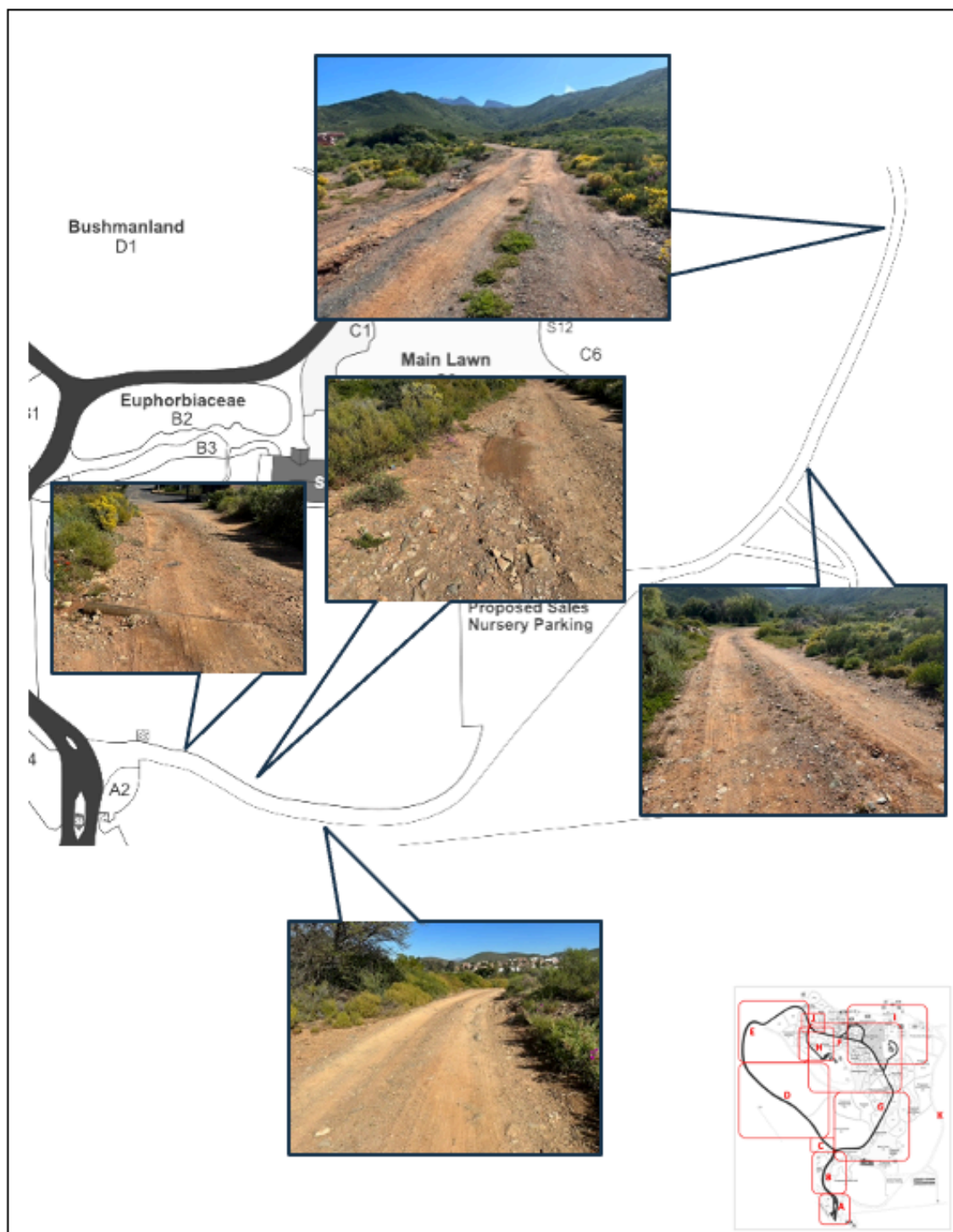
SECTION J: LAWNS PARKING AREA (NORTH)



The road base layer to be ripped 125 mm deep and disposed of and replaced with 125mm C4 stabilised base layer supporting the proposed new brick pavers. The road base layer is also damaged in certain areas. The proposed new parking areas will be constructed with completely new layer works. The parking area barrier kerbs are non-existent and new kerb should be installed.

The gravel service road shows excessive stormwater damage.

SECTION K(2): GRAVEL SERVICE ROAD (SOUTH)



- Grading of surfaced roads
- Filling uneven areas
- Importing 300 mm of G5 material in layers of 150 mm and compact to 97% Mod ASHTO
- Construct large V-drains across the road section.
- Construct new earth drains and concrete side drains
- Install stormwater pipes at various sections along the route.

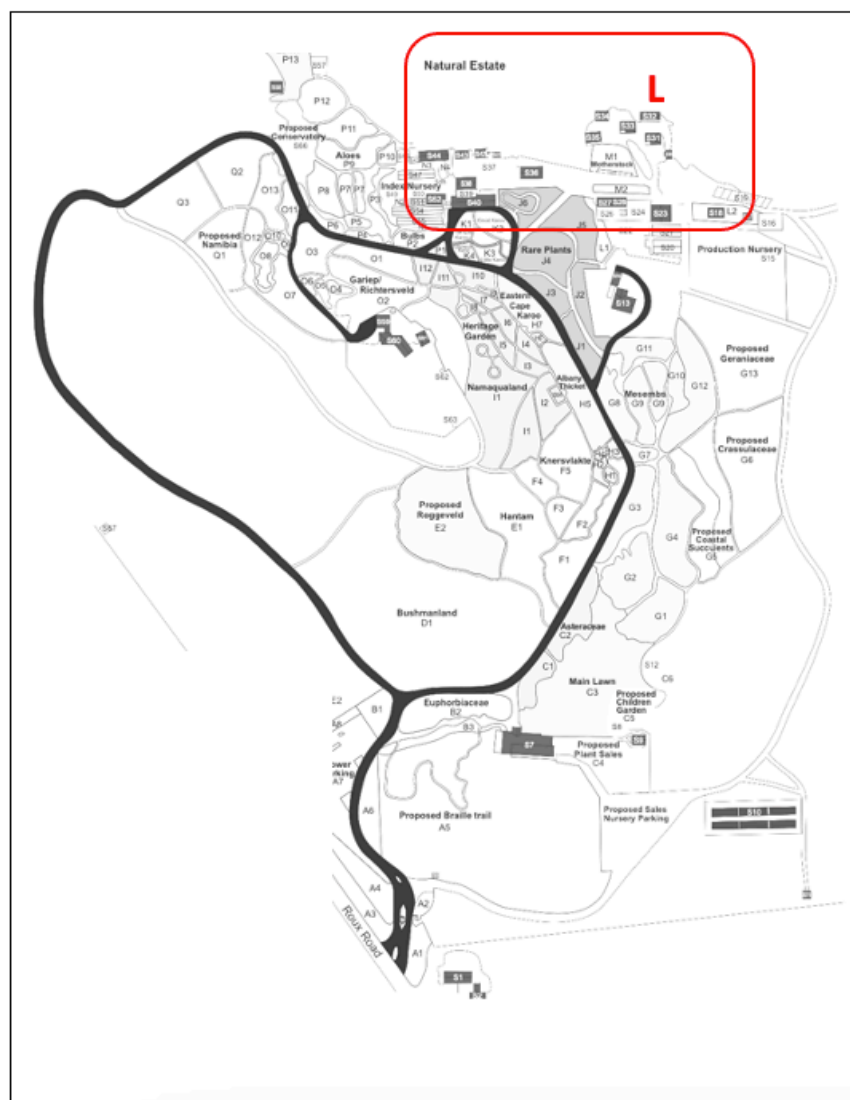
SS 03.03 STORMWATER

The gravel service road shows excessive stormwater damage.

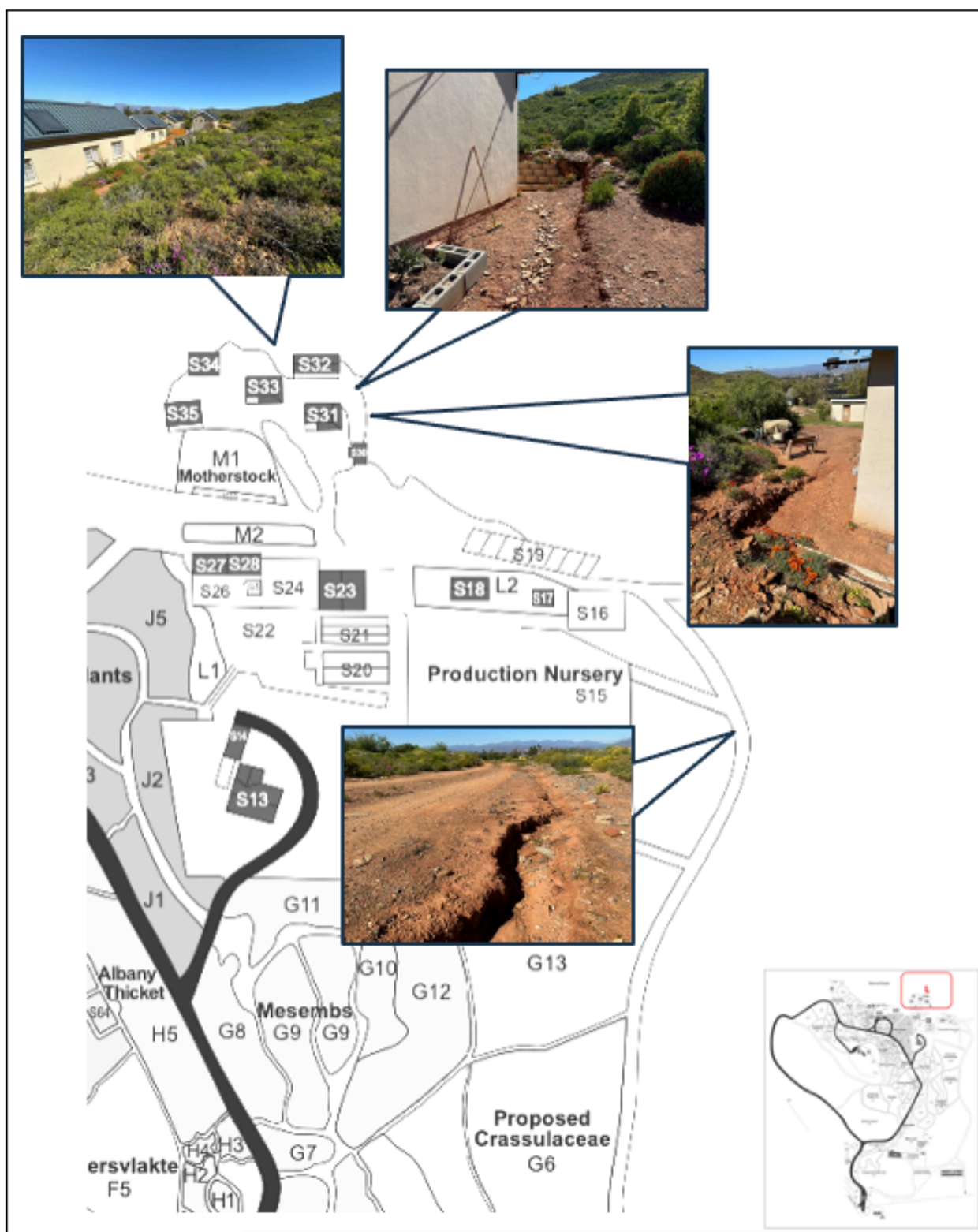
The current stormwater system is hardly functional and requires refurbishment and amendments. Two stormwater systems are present on terrain namely the Building Reticulation system and Roads Drainage system. Both systems consist of surface and sub-surface components. The half round stormwater channel applicable to the ring road is in an acceptable condition and fit for purpose. Water is disposed from the road into the channel and discharged at the bottom of the ring road section.

The stormwater drainage for the gravel service road is non-existent. During heavy rains water from higher terrain on site are flowing onto the gravel service road and excessive damages occur due to the lack of stormwater management. V-drains along the route should be installed.

Stormwater management at the residential houses must also be attended to. The existing earth drain on the northern side of the residential house is in part a solution, but not effective as the water is discharged next to the most eastern house and create water damage and even more erosion downhill.



SECTION L: STORM WATER



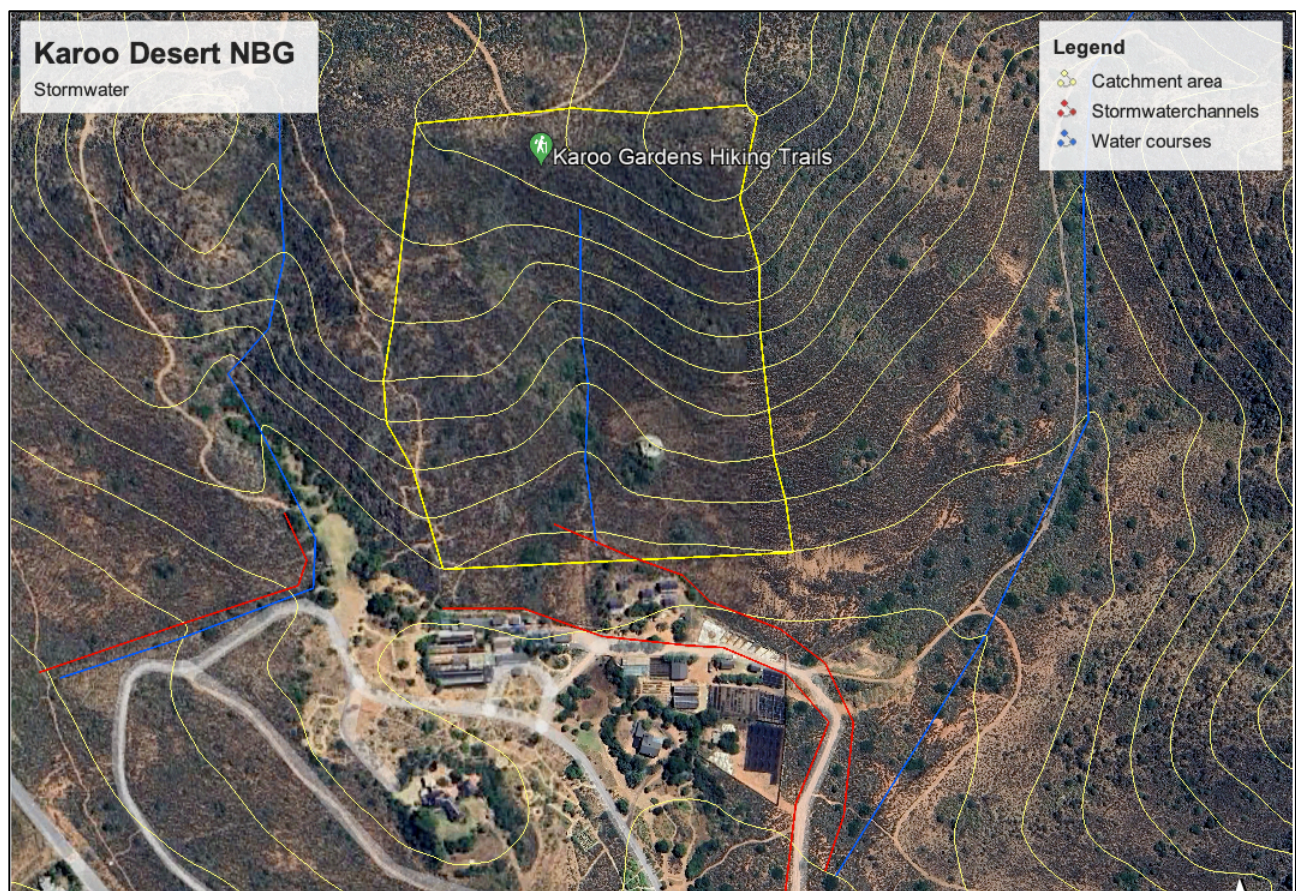


Figure 3.2: Proposed Storm Water Drains and Structures

There will be major repairs required to the stormwater channels on the ring road as a result of new interlocking paving and chutes diverting water from the road will be upgraded, to ensure that water is drained from the road surface as quickly as possible. During the construction of the new interlocking paving and layer works on the ring road, care will be taken to ensure that surface water drains to the side channels or into the veld. Additional chutes might be required.

There is no proper storm water drainage on the gravel road, which results in damage to the road surface and layer works with every rainstorm. The existing open drain behind (above) the houses be extended to the gravel service road, as indicated on the photograph above, and replaced with an open concrete channel & kerb combination. This channel will then be linked to the proposed concrete side drains on the gravel service road as indicated in Figure 3.2. Stormwater from the eastern side will be diverted to the downstream side (west) of the gravel road by constructing various concrete drifts across the existing gravel road.

The existing cut off channel behind the residential houses is currently overgrown and discharges the runoff onto the last residential erf. This channel will be lined with concrete and extended to link with the proposed side drains for the gravel service road.

SS 04 **SCOPE DEFINITION**

The description of the works given above is not necessarily complete and shall not limit the work to be carried out by the Contractor under this contract.

Approximate quantities of each type of work are given in the contract Schedule of Quantities.

This specification covers infrastructure at the following areas:

- Existing Ring Road Upgrades and Repairs (Kirstenbosch Interlocking Paving)
- Gravel Service Road Upgrades and Repairs
- Stormwater Management and new infrastructure

SS 05 **ADDITIONAL SITE-SPECIFIC INFORMATION**

Additional site-specific information, including asset inventory list, site specific information, bulk water and sewer installations and ablution facilities are attached to this Additional Specification SS: Site Specific Inventory.

C4 Site Information

PA HEALTH AND SAFETY SPECIFICATION

PA1 DESCRIPTION OF WORK

The Contract shall comprise the supply of all labour, materials, workmanship, machinery, equipment, transport, attendance on others and everything stated or implied which is, or may be, necessary in and for the entire completion of all the following works:

- Establishment
- Scope of works:
 - Surface repair and layer works
 - Paving of 80 mm interlocking paving of ring road
 - Paving of 80 mm interlocking paving of parking areas
 - Repair of gravel wearing course
 - Earth drains and concrete side drains
 - Stormwater structures and drains
 - Stormwater pipes and inlet/outlet structures
- Compliance to regulations relating to Health and Safety and the Environmental Management Acts

PA2 DESCRIPTION OF THE SITE

The Karoo Desert National Botanical Garden (NBG) is located in Worcester in the Western Cape.
GPS Co-ordinates: 33°37'00.2"S; 19°27'01.7"E.

PA3 APPLICATION OF CONSTRUCTION REGULATIONS 2014

The intended construction work falls within the scope of "construction work" as defined in the Construction Regulations, 2014 made under the Occupational Health and Safety Act no. 85 of 1995, as amended ("the Act").

PA4 POTENTIAL SOURCES OF RISK

The following potential sources of risk to the health and safety of persons on the site have been identified, and must, as a minimum, be appropriately addressed by the Principal Contractor in the Principal Contractor's Health and Safety Plan. In addition, the Principal Contractor must perform its own risk assessments to enable it to take the necessary precautions to protect the health and safety of persons on the site, to comply with the Principal Contractor's obligations under the Act and all Regulations made there under, including the Construction Regulations. All such precautionary measures and procedures must be included in the Principal Contractor's Health and Safety Plan, which must be submitted to the Client for review and approval and where applicable should include:

- Excavation work
Ground conditions for the purposes of safe excavation shall be assessed by a competent person. The ground type and condition and water table shall be logged in accordance with Civil Engineering practice.
- Scaffolding
- Material hoists
- Construction vehicles and mobile equipment
- Electrical installations and electrical machinery
- Housekeeping
- Stacking and storage practices
- Fire risks and fire precautions

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THE APPOINTMENT OF A CONTRACTOR FOR UPGRADE TO THE EXISTING RING ROAD, REPAIR OF THE GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE - Contract: G495/2023

- Welfare facilities on the site
- Air compressors
- Hot work (steel cutting and welding)
- Noise
- Portable electrical tools
- Compressed gases and vessels under pressure
- Intoxicated persons on site
- Existing underground water, electricity and other services
- Use of ladders
- Dust
- Inadequate or fragile coverings
- Explosives
- Testing of pipelines. The contractor's attention is drawn to large forces existing on pipelines, specials and supports during pressure testing, and shall ensure that structures are properly secured during testing to withstand the pressures and forces.

PA5 HEALTH AND SAFETY MANAGEMENT SYSTEM**Health and Safety Philosophy**

The Client is required to ensure a working environment which, as far as reasonably practicable, is safe and without risk to the health of persons on the site.

PA5.1 Contractor Health and Safety Management System

The Principal Contractor will ensure and demonstrate to the Client that he, and all contractors to be appointed on this construction project, has adequately allowed for the cost of health and safety measures which may be required during the construction work.

PA5.2 Appointment of Client's Health and Safety Adviser

The Client will appoint a Health and Safety Adviser who will visit the site regularly to monitor and audit the execution of the contractor's Health and Safety Plans on behalf of the Client, without thereby limiting the contractor's own responsibility for health and safety, or attracting any vicarious responsibility or liability for the contractor's acts or omissions.

PA5.3 Occupational Health and Safety Act Section 37(2) Agreements

The Principal Contractor, as well as all contractors, must sign the Client's Section 37(2) agreement before commencement of their particular work.

For purposes of general communication regarding construction work progress, the Client appoints the Engineer.

PA6 CONTRACTOR HEALTH AND SAFETY PLANS

Each contractor and sub-contractor working on the site must prepare a Health and Safety Plan to address and manage all applicable sources of risk as per items under point 4 of this specification as well as any other sources of risk which are identified during the contractor's own risk assessments. The Principal Contractor shall incorporate these into a single Health and Safety Plan for the execution of the entire contract works ("the Health and Safety Plan"). Should any further risks be identified in the course of the construction work, such risks must be assessed and addressed in amended Health and Safety Plans which must then be submitted to the Client for approval.

The Health and Safety Plan must also address the following matters:

- i) Legal appointments required by the Act and any Regulations under the Act.
- ii) Procedures for compliance with all requirements of the Act and in particular Sections 8 and 9 of the Act.
- iii) Undertaking and procedure to stop any work which endangers the safety or health of any person.
- iv) System for recording and reporting of incidents both internal and external to the Department of Labour.
- v) Copy of the Act and its Regulations to be kept on the site and to be readily available to employees.
- vi) Incident register to be kept on the site.
- vii) Employment of only persons who are competent and have the necessary knowledge, training, qualifications and experience to perform the required construction work safely and effectively.

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THE APPOINTMENT OF A CONTRACTOR FOR UPGRADE TO THE EXISTING RING ROAD, REPAIR OF THE GRAVEL SERVICE ROAD AND STORMWATER MANAGEMENT FOR SANBI AT THE KAROO DESERT NATIONAL BOTANICAL GARDEN IN WORCESTER, WESTERN CAPE - Contract: G495/2023

- viii) Appointment of only competent, knowledgeable, trained, qualified and experienced persons to supervise the construction work.
- ix) Procedures and arrangements for first aid facilities on the site.
- x) Procedures and arrangements for prompt reporting of injuries and other losses / incidents.
- xi) Emergency plans to deal effectively with potential site emergencies.
- xii) Use of effective processes for the identification and close out of root causes of incidents and accidents.
- xiii) Attendance by all contractors of monthly site health and safety meetings.
- xiv) Demonstration by all contractors of their health and safety monitoring and auditing systems to ensure compliance with their Health and Safety Plans, as part of their Health and Safety Plans.
- xv) Effective site health and safety induction programme for all workers on the site.

PA7 ADDITIONAL DUTIES OF PRINCIPAL CONTRACTOR

- i) The Principal Contractor must notify the Department of Labour of the intention to carry out construction work.
- ii) The Principal Contractor must coordinate the activities of all contractors and sub-contractors in the interest of health and safety.
- iii) The Principal Contractor must carry out all other duties described in Regulation 5 of the Construction Regulations 2003.
- iv) The Principal Contractor must register in terms of the Compensation for Occupational Injuries and Diseases Act or any other compensation funds approved by the Commissioner for its workmen, and provide to the Client proof thereof and also that it is in good standing with the Compensation Commissioner or approved insurer.

PA8 GENERAL

- i) Nothing contained in or omitted from this Health and Safety Specification, or the Health and Safety Plan based on this specification, shall relieve the Principal Contractor of any of its obligations or liabilities.
- ii) The Client shall not be liable for any civil claim because of anything contained in or omitted from this Health and Safety Specification.

PA9 MEASUREMENT AND PAYMENT

In addition to the allowance that the contractor would normally make in his rates for Health and Safety Aspects, the contractor shall price for all things necessary required to fulfil the requirements of the OHS Act and Regulations in the items scheduled in Schedule 1, General A.