

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

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**SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI)**

**Contract No: G497/2023**

**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY**

**PROCUREMENT DOCUMENT**

**DECEMBER 2023**

**Issued by:**

South African National Biodiversity Institute  
Private Bag X101  
Silverton  
0184  
Gauteng

**Prepared by:**

Virtual Consulting Engineers VCE (PTY) LTD  
P.O. Box 82  
Crawford  
7779  
Cape Town

**Contact:**

Supply Chain Management  
E-mail: [sanbi.tenders@sanbi.org.za](mailto:sanbi.tenders@sanbi.org.za)

**Contact:**

Mr M.S Ishmail  
Tel: 021 685 0789  
E-mail: [shahien@virtualconsulting.co.za](mailto:shahien@virtualconsulting.co.za)

**Name of tenderer:** .....

**Address:** .....

**Tel no.:** ..... **Fax no.:** .....

**Email:** .....

**South African National Biodiversity Institute**

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Contract: **SANBI G497/2023**

**PART T: THE TENDER**  
**Part T1: Tendering Procedures**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI: G497/2023</b>

<b>Advertising date:</b>	<b>14 December 2023</b>	<b>Closing date:</b>	<b>8 February 2024</b>
<b>Closing time:</b>	<b>11:00</b>	<b>Validity period:</b>	<b>90 Days</b>

**T1.1 Tender Notice and Invitation to Tender****THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE INVITES TENDERERS FOR THE PROVISION OF:**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Betty's Bay.

It is estimated that tenderers should have a CIDB contractor grading of **3GB** or higher.

**Tender documents will be available** as from **14 December 2023** and will be available **ONLINE ONLY** on:

- SANBI website [www.sanbi.org](http://www.sanbi.org) (click on "Opportunities")
- CIDB Website
- National e-Tender Publication Portal

A compulsory briefing session will take place on site on **19 January 2024 at 10:30** in the **Clivia Hall** at the Harold Porter National Botanical Garden, Betty's Bay. Bidders are encouraged to direct all technical and bidding procedure enquiries to the email address below.

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](mailto:sanbi.tenders@sanbi.org.za)  
Cc: [shahien@virtualconsulting.co.za](mailto:shahien@virtualconsulting.co.za) and [A.Hendricks@sanbi.org.za](mailto:A.Hendricks@sanbi.org.za)  
Cut-off date for enquiries: **31 January 2024 at 11:00**

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

<b>SANBI Representative (Technical Queries Only)</b>	Mr Shahien Ishmail Virtual Consulting Engineers VCE (Pty) Ltd <a href="mailto:shahien@virtualconsulting.co.za">shahien@virtualconsulting.co.za</a>
<b>SANBI SCM Representative</b>	<a href="mailto:sanbi.tenders@sanbi.org.za">sanbi.tenders@sanbi.org.za</a>

The closing time and date for the receipt of tenders is **8 February 2024 on 11:00**.

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay

Contract: **SANBI G497/2023**

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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.

**South African National Biodiversity Institute**

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Contract: **SANBI G497/2023**

**PART T: THE TENDER**  
**Part T1: Tendering Procedures**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI: G497/2023</b>

**T1.2 Tender Data**

The conditions of tender are the Standard Conditions of Tender as contained in Annex C of the CIDB Standard for Uniformity in Engineering and Construction Works Contracts – August 2019. (See [www.cidb.org.za](http://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.

<b>Clause number</b>	<b>Tender Data</b>
C.1.1.1	<p>The Employer is: South African National Biodiversity Institute (SANBI):</p> <p>The Employer's domicilium citandi et executandi (permanent physical business address) is: Pretoria National Botanical Garden 2 Cussonia Avenue, Biodiversity Centre Brummeria, Pretoria</p> <p>The Employer's address for communication relating to this project is: Private Bag X101 Silverton 0184</p>
C.1.2	<p>The Tender Documents issued by the Employer comprise the following documents:</p> <p><b>PART T: THE TENDER</b> <b>Part T1: Tendering procedures</b> T1.1 - Tender notice and invitation to tender T1.2 - Tender data <b>Part T2: Returnable documents</b> T2.1 - List of returnable documents T2.2 - Returnable documents/schedules</p> <p><b>PART C: THE CONTRACT</b> <b>Part C1: Agreements and Contract data</b> C1.1 - Form of offer and acceptance C1.2 - Contract data C1.3 - Construction guarantee C1.4 - Occupational Health &amp; Safety Agreement 37(2) <b>Part C2: Pricing Data</b> C2.1 - Pricing Instructions C2.2 - Bill of Quantities</p>

**South African National Biodiversity Institute**

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Contract: **SANBI G497/2023**

Clause number	Tender Data
	<p><b>Part C3: Scope of Works</b> C3.1 - Description of the works C3.2 - Construction</p> <p><b>Part C4: Site Information</b> C4.1 - Site location</p> <p><b>Annexures</b> Annexure A – Health and Safety Specification Annexure B – Drawings and Design Report</p>
C.1.4	<p>The employer's agent is:</p> <p>Virtual Consulting Engineers VCE (PTY) LTD <b>Contact Person: Shahien Ishmail</b> <b>Tel:</b> 021 685 0789 / 083 455 6644 <b>Fax:</b> 086 655 2690 <b>E-mail:</b> shahien@virtualconsulting.co.za</p>
C.2.1	<p>Only those tenderers who satisfy the following eligibility criteria are eligible to submit tenders Only those tenderers who score the minimum score in respect of the quality criteria stated in C.3.11.1 of this Tender Data shall be considered responsive and have their tenders evaluated further.</p> <p>(a) CIDB registration / NHBRC 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 <b>3GB</b> class of construction work, are eligible to have their tenders evaluated. The contractor must <b>ALSO</b> be registered with the NHBRC as a homebuilder.</p> <p>Joint ventures are eligible to submit tenders provided that:</p> <ol style="list-style-type: none"> <li>every member of the joint venture is registered with the CIDB;</li> <li>the lead partner has a contractor grading designation in the <b>3GB</b> class of construction work; and</li> <li>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 <b>3GB</b> class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.</li> </ol> <p>(b) National Treasury Central Supplier Database Tenderers who are not registered on the National Treasury Central Supplier Database at close of tender, shall submit a copy of their application of registration, with their tender submission. Tenders received from such tenderers who have not submitted proof of their registration within 21 days after the closing date for tender submissions, will not be considered.</p>
C.2.6	<p>Failure to apply instructions contained in addenda may render a tenderer's offer non-responsive in terms of clause C.3.8.</p>
C.2.7	<p>The arrangements for a compulsory clarification meeting are as stated in the Tender Notice and Invitation to Tender.</p>

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Contract: **SANBI G497/2023**

Clause number	Tender Data
	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
C.2.8	Request clarifications at least 7 working days before the closing time.
C.2.12	<p>Main tender offers are required to be submitted together with alternative tenders.</p> <p>If a tenderer wishes 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>
C.2.13.6	A two-envelope procedure will be followed as described in clause C.2.13.7.
C.2.13.7	<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"> <li>• Original: one (1) original document marked "Original" <b>including</b> Form of Offer and Acceptance, Estimated monthly expenditure and Priced Bills of Quantity; and</li> <li>• Memory Stick: one (1) document pack <b>without any</b> pricing on a <b>memory stick</b></li> </ul> <p>Financial or pricing details should <b>ONLY</b> be included in the printed document pack marked '<b>ORIGINAL</b>', and not in the PDF file(s) of the document(s) on the <b>memory stick</b>.</p> <p><b>NB:</b> 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 <b>disqualified</b>. (Please put them in one envelope)</p> <p><b>INCLUSION OF ANY PRICING INFORMATION ANYWHERE ON THE MEMORY STICK WILL LEAD TO THE BID BEING DISQUALIFIED.</b></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"> <li>• The address as stated in C.2.15.1 below</li> <li>• The identification details as stated in C.2.15.1 below</li> <li>• Name of the Tenderer</li> <li>• The words "Not be opened before the Tender opening"</li> </ul>

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Clause number	Tender Data
C.2.13.9	Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted.
C.2.15.1	<p>The Employer's address for delivery of tender offers and identification details to be shown on each tender offer package are:</p> <p><b>Location of Tender box:</b> Biodiversity Centre</p> <p><b>Physical address:</b> Pretoria National Botanical Garden 2 Cussonia Avenue Brummeria Pretoria</p> <p><b>Identification details:</b> Tender number: <b>SANBI: G497/2023</b></p> <p><b>Title of Tender:</b> <b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b></p>
C.2.15.2	The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender.
C.2.16.1	The tender offer validity period is <b>90 days</b> .
C.2.16.3	<p>Where a tenderer, at any time after the opening of his tender offer but prior to entering a contract based on his tender offer:</p> <ol style="list-style-type: none"> <li>(1) withdraws his tender;</li> <li>(2) gives notice of his inability to execute the contract in terms of his tender; or</li> <li>(3) fails to comply with a request made in terms of C.2.17, C.2.18 or C.3.9</li> </ol> <p>such tenderer shall be barred from tendering on any of the Employer's future tenders for a period to be determined by the Employer, but not less than six (6) months, from the date of tender closure. The Employer may fully or partly exempt a tenderer from the provisions of this condition if he is of the opinion that the circumstances justify the exemption</p>
C.2.18	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.
C.2.22	Tender Documents will <b>not be returned</b> to bidders
C.2.23	<p>The tenderer is required to submit with his tender following <b>(failure to provide below documentation will result in the tender being rejected)</b>:</p> <ol style="list-style-type: none"> <li>1) A copy of the Central Suppliers Database (CSD) registration report or registration number.</li> <li>2) A printed copy of the Active Contractor's Listing off the CIDB website (<a href="http://www.cidb.org.za">www.cidb.org.za</a>)</li> <li>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.</li> <li>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."</li> <li>5) The signed compulsory Site Briefing Certificate.</li> </ol>
C.3.1.1	The Employer shall respond to clarifications received up to 7 working days before the tender closing time.
C.3.2	The Employer shall issue addenda until 5 working days before the tender closing time.



**South African National Biodiversity Institute**

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Contract: **SANBI G497/2023**

Clause number	Tender Data
C.3.4.1	The tenders will not be opened in public
C.3.5.1	Follow procedure as described in clause C.2.13.7
C.3.7	In the event of disqualification, the Employer may, at his sole discretion, impose a specified period during which tender offers will not be accepted from the offending tenderer and report same to the CIDB and National Treasury.
C.3.11.1	The procedure for the evaluation of responsive tenders is stated in <b>Annexure A</b> .
C.3.13	<p>In addition to the requirements of the Condition of Tender, offers will only be accepted if:</p> <ul style="list-style-type: none"><li>a) the tenderer submits <b>a copy of the CSD registration report or registration number</b> (refer to T2.1.13);</li><li>b) the tenderer is registered with the Construction Industry Development Board in an appropriate contractor grading designation (refer to T2.1.12);</li><li>c) the Tenderer or any of its directors/shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector;</li><li>d) 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);</li><li>e) the tenderer is registered and in good standing with the compensation fund issued by the Department of Labour (Letter of good standing with COIDA);</li><li>f) the employer is reasonably satisfied that the tenderer has in terms of the Construction Regulations, 2014, issued in terms of the Occupational Health and Safety Act, 1993, the necessary competencies and resources to carry out the work safely.</li><li>g) A copy of Tax Compliance Status Pin or CSD report.</li><li>h) the tenderer submits <b>a copy of the NHBRC certificate</b> (refer to T2.1.19);</li></ul>

**Annexure A**

This annexure contains all the criteria that the Employer shall use to evaluate tenders. In accordance with clause C.3.11 of the Standard conditions of tender. No other factors, methods or criteria shall be used. The tenderer shall provide all the information requested in the forms included in Part T2.2 – Returnable schedules.

Tenders shall be evaluated in three stages as follows

- Stage 1 – Evaluation of Eligibility and Administrative compliance
- Stage 2 – Evaluation of Functionality
- Stage 3 – Evaluation of Tender Price and Preference

**1 Stage 1: Eligibility and Administrative compliance**

The first stage will determine whether bids are compliant with all mandatory and disqualifiable submission requirements. Bidders that are deemed compliant will be eligible for further evaluation.

The criteria as identified in Clauses C.2.23 and C.3.13 in the Tender Data will be used to determine the tender's eligibility.

For administrative compliance the tenderers must complete all the returnable forms in Part T2.2, the Bill of Quantities, and the Offer section in Part C1.1.

**2 Stage 2: Functionality**

The tenderers who complied with the eligibility and administrative criteria in stage 1 are considered for further evaluation on their capability to execute the project.

In this stage tenders will be evaluated on functionality according to the criteria listed below. Tenderers who fail to score a minimum of 70 points out of a possible 100 points on functionality criteria will not be eligible for further consideration.

**Scoring quality**

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.

FUNCTIONALITY CRITERIA				
ID	CRITERIA	POINTS		
1	Implementation method and project plan or programme	25		
	(a) Project methodology	(15)		
	<ul style="list-style-type: none"><li>• Method to be followed in delivering this project, the methodology and approach must be specific to the project and location of works.</li><li>• It should include team Organogram of the people who will be working on the project tendered.</li><li>• Time and quality management of the project</li><li>• A 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.</li></ul>			
	<table><tr><th>Sub-Criteria</th><th>Points</th></tr><tr><td>No Methodology</td><td>0</td></tr></table>		Sub-Criteria	Points
Sub-Criteria	Points			
No Methodology	0			

**South African National Biodiversity Institute**

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	<table><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>	Poor Methodology	3	Average Methodology	6	Above Average Methodology	9	Good Methodology	12	Comprehensive (Exceptional) Methodology	15											
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	<p><b>(b) Weekly plan/programme with milestones</b></p> <ul style="list-style-type: none"><li>• The programme should indicate the sequence of work execution.</li><li>• Milestones and resources linked to the activity.</li><li>• It should be practical, realistic and include all activities linked to the project.</li></ul>	(10)																				
	<table><tr><th>Sub-Criteria</th><th>Points</th></tr><tr><td>No Programme</td><td>0</td></tr><tr><td>Poor Programme</td><td>2</td></tr><tr><td>Average Programme</td><td>4</td></tr><tr><td>Above Average Programme</td><td>6</td></tr><tr><td>Good Programme</td><td>8</td></tr><tr><td>Comprehensive (Exceptional) Programme</td><td>10</td></tr></table> <p>Note: The Bidder must take cognisance of the weather measurements recorded for the last 10 years – Refer site information Section C4.1.2</p>	Sub-Criteria	Points	No Programme	0	Poor Programme	2	Average Programme	4	Above Average Programme	6	Good Programme	8	Comprehensive (Exceptional) Programme	10							
Sub-Criteria	Points																					
No Programme	0																					
Poor Programme	2																					
Average Programme	4																					
Above Average Programme	6																					
Good Programme	8																					
Comprehensive (Exceptional) Programme	10																					
2	<p>Contractor's Experience</p> <ul style="list-style-type: none"><li>• Three relevant reference letters regarding work of similar scope and scale completed in the last ten (10) years</li></ul> <table><tr><th>Sub-Criteria</th><th>Points</th></tr><tr><td>One relevant reference letter</td><td>5</td></tr><tr><td>Two relevant reference letters</td><td>10</td></tr><tr><td>Three relevant reference letters or more</td><td>15</td></tr></table> <ul style="list-style-type: none"><li>• List of at least five other similar projects with appointment letters, completion certificates and telephonic references indicating work of similar value completed in the last ten (10) years.</li></ul> <table><tr><th>Sub-Criteria</th><th>Points</th></tr><tr><td>One relevant Project</td><td>5</td></tr><tr><td>Two relevant Projects</td><td>10</td></tr><tr><td>Three relevant Projects</td><td>15</td></tr><tr><td>Four relevant Projects</td><td>20</td></tr><tr><td>Five relevant Projects</td><td>25</td></tr></table> <p><b>Notes:</b> Supporting documents required to support the claims above, (Corresponding orders/appointment letters, completion certificates and reference letters for projects must be submitted as proof). Bidders must submit all the requested documents as proof in order</p>	Sub-Criteria	Points	One relevant reference letter	5	Two relevant reference letters	10	Three relevant reference letters or more	15	Sub-Criteria	Points	One relevant Project	5	Two relevant Projects	10	Three relevant Projects	15	Four relevant Projects	20	Five relevant Projects	25	<p>40</p> <p>(15)</p> <p>(25)</p>
Sub-Criteria	Points																					
One relevant reference letter	5																					
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Contract: **SANBI G497/2023**

	<p>to be awarded the points.</p> <ul style="list-style-type: none"><li>Both appointment letters and reference letters must be on the employer's letterhead, dated and signed by the employer.</li><li>Failure to complete and sign schedule of the tenderer`s experience will result in the bidder forfeiting these points.</li></ul>													
3	<p>Contractor's Resources – Personnel and Plant</p> <p>Proposed personnel:</p> <ul style="list-style-type: none"><li>CVs for proposed key personnel <b>(At least 3 – Contracts Manager, Site Agent &amp; OHS Officer)</b> indicating:<ul style="list-style-type: none"><li>Previous work experience</li><li>Total number of years' working experience in construction</li><li>Individual experience on relevant similar work in last five years</li><li>Certified copies of Qualifications or artisan's certification or other recognised training courses completed</li><li>Valid Professional Registration for Contracts Manager (ECSA or SACPCMP) and OHS Agent (SACPCMP)</li></ul></li></ul> <table><tr><th>Sub-Criteria</th><th>Points</th></tr><tr><td>Combined CV experience of less than 5 years</td><td>5</td></tr><tr><td>Combined CV experience of more than 5 years</td><td>10</td></tr><tr><td>Combined CV experience of more than 10 years</td><td>15</td></tr><tr><td>Combined CV experience of more than 15 years</td><td>20</td></tr><tr><td>Combined CV experience of more than 20 years</td><td>25</td></tr></table> <p>Plant:</p> <ul style="list-style-type: none"><li>Equipment owned by contractor</li><li>Equipment to be rented (if any) – with preferred rental companies</li></ul>	Sub-Criteria	Points	Combined CV experience of less than 5 years	5	Combined CV experience of more than 5 years	10	Combined CV experience of more than 10 years	15	Combined CV experience of more than 15 years	20	Combined CV experience of more than 20 years	25	<p>35</p> <p>(25)</p> <p>(10)</p>
Sub-Criteria	Points													
Combined CV experience of less than 5 years	5													
Combined CV experience of more than 5 years	10													
Combined CV experience of more than 10 years	15													
Combined CV experience of more than 15 years	20													
Combined CV experience of more than 20 years	25													
TOTAL		100												

Functionality shall be scored by not less than three evaluators in accordance with the following schedules:

Each evaluation criterion will be assessed in terms of five indicators – no response, poor, satisfactory, acceptable, good, and very good. Scores ranging from 0 to 5 will be allocated to no response, very poor, poor, acceptable, good, and very good responses, respectively. The scores submitted by each of the evaluators will be averaged, weighted, and then totalled to obtain the final score for functionality. The prompts for judgment and the associated scores used in the evaluation of quality shall be as follows:

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 aspect of the requirements and evidence given of skill / experience sought

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

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

#### **3.3 Financial and Preference**

After calculation of the scores for Tender Price and for Preference, a combined score will be calculated as follows:

$$NT = NF + NP$$

Where:

$NT$  = Total score for tender under consideration

$NF$  = Score for Tender Price

$NP$  = Score for Preference

The tender with the highest score should be recommended for appointment.

## Annexure C

### Standard Conditions of Tender

#### C.1 General

##### C.1.1 Actions

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

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

*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.

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

##### C.1.2 Tender Documents

The documents issued by the employer for the purpose of a tender offer are listed in the tender data.

##### C.1.3 Interpretation

C.1.3.1 The tender data and additional requirements contained in the tender schedules that are included in the returnable documents are deemed to be part of these conditions of tender.

C.1.3.2 These conditions of tender, the tender data and tender schedules which are required for tender evaluation purposes, shall form part of any contract arising from the invitation to tender.

C.1.3.3 For the purposes of these conditions of tender, the following definitions apply:

a) **conflict of interest** means any situation in which:

- i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfill his or her duties impartially;
- ii) an individual or tenderer is able to exploit a professional or official capacity in some way for their personal or corporate benefit; or
- iii) incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.

b) **comparative offer** means the price after the factors of a non-firm price and all unconditional discounts it can be utilised to have been taken into consideration;

c) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process;

- d) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels;

#### **C.1.4 Communication and employer's agent**

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

#### **C.1.5 Cancellation and Re-Invitation of Tenders**

C.1.5.1 An employer may, prior to the award of the tender, cancel a tender if-

- a) due to changed circumstances, there is no longer a need for the engineering and construction works specified in the invitation;
- b) funds are no longer available to cover the total envisaged expenditure; or
- c) no acceptable tenders are received.
- d) there is a material irregularity in the tender process.

C.1.5.2 The decision to cancel a tender invitation must be published in the same way the original tender invitation was advertised

C.1.5.3 An employer may only with the prior approval of the relevant treasury cancel a tender invitation for the second time.

#### **C.1.6 Procurement procedures**

##### **C.1.6.1 General**

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

##### **C.1.6.2 Competitive negotiation procedure**

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

C.1.6.2.2 All responsive tenderers or at least a minimum of not less than three responsive tenderers that are highest ranked in terms of the evaluation criteria stated in the tender data shall be invited to enter competitive negotiations based on the principle of equal treatment, keeping confidential the proposed solutions and associated information.

Notwithstanding the provisions of C.2.17, the employer may request that tenders be clarified, specified, and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

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

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

**C.1.6.3 Proposal procedure using the two stage-system**

**C.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.

**C.1.6.3.2 Option 2**

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

C.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.

**C.2 Tenderer's obligations**

**C.2.1 Eligibility**

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

C.2.1.2 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.

**C.2.2 Cost of tendering**

C.2.2.1 Accept that, unless otherwise stated in the tender data, the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer comply with requirements.

C.2.2.2 The cost of the tender documents charged by the employer shall be limited to the actual cost incurred by the employer for printing the documents. Employers must attempt to make available the tender documents on its website so as not to incur any costs pertaining to the printing of the tender documents.

**C.2.3 Check documents**

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

**C.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.

**C.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.

**C.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.



**C.2.7 Clarification meeting**

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

**C.2.8 Seek clarification**

Request clarification of the tender documents, if necessary, by notifying the employer at least five (5) working days before the closing time stated in the tender data.

**C.2.9 Insurance**

Be aware that the extent of insurance to be provided by the employer (if any) might not be for the full cover required in terms of the conditions of contract identified in the contract data. The tenderer is advised to seek qualified advice regarding insurance.

**C.2.10 Pricing the tender offer**

C.2.10.1 Include in the rates, prices, and the tendered total of the prices (if any) all duties, taxes except Value Added Tax (VAT), and other levies payable by the successful tenderer, such duties, taxes and levies being those applicable fourteen (14) days before the closing time stated in the tender data.

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

C.2.10.3 Provide rates and prices that are fixed for the duration of the contract and not subject to adjustment except as provided for in the conditions of contract identified in the contract data.

C.2.10.4 State the rates and prices in Rand unless instructed otherwise in the tender data. The conditions of contract identified in the contract data may provide for part payment in other currencies.

**C.2.11 Alterations to documents**

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

**C.2.12 Alternative tender offers**

C.2.12.1 Unless otherwise stated in the tender data, submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted as well as a schedule that compares the requirements of the tender documents with the alternative requirements that are proposed.

C.2.12.2 Accept that an alternative tender offer must be based only on the criteria stated in the tender data or criteria otherwise acceptable to the employer.

C.2.12.3 An alternative tender offer must only be considered if the main tender offer is the winning tender.

**C.2.13 Submitting a tender offer**

C.2.13.1 Submit one tender offer only, either as a single tendering entity or as a member in a joint venture to provide the whole of the works identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.

C.2.13.2 Return all returnable documents to the employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.

C.2.13.3 Submit the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the employer.

C.2.13.4 Sign the original and all copies of the tender offer where required in terms of the tender data. The employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.

- C.2.13.5 Seal the original and each copy of the tender offer as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.
- C.2.13.6 Where a two-envelope system is required in terms of the tender data, place and seal the returnable documents listed in the tender data in an envelope marked "financial proposal" and place the remaining returnable documents in an envelope marked "technical proposal". Each envelope shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.
- C.2.13.7 Seal the original tender offer and copy packages together in an outer package that states on the outside only the employer's address and identification details as stated in the tender data.
- C.2.13.8 Accept that the employer will not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.
- C.2.13.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the tender data.

**C.2.14 Information and data to be completed in all respects**

Accept that tender offers, which do not provide all the data or information requested completely and in the form required, may be regarded by the employer as non-responsive.

**C.2.15 Closing time**

- C.2.15.1 Ensure that the employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Accept that proof of posting shall not be accepted as proof of delivery.
- C.2.15.2 Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.

**C.2.16 Tender offer validity**

- C.2.16.1 Hold the tender offer(s) valid for acceptance by the employer at any time during the validity period stated in the tender data after the closing time stated in the tender data.
- C.2.16.2 If requested by the employer, consider extending the validity period stated in the tender data for an agreed additional period with or without any conditions attached to such extension.
- C.2.16.3 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. If the validity period stated in C.2.16 lapses before the employer evaluating tender, the contractor reserves the right to review the price based on Consumer Price Index (CPI).
- C.2.16.4 Where a tender submission is to be substituted, a tenderer must submit a substitute tender in accordance with the requirements of C.2.13 with the packages clearly marked as "SUBSTITUTE".

**C.2.17 Clarification of tender offer after submission**

Provide clarification of a tender offer in response to a request to do so from the employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.

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

**C.2.18 Provide other material**

- C.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment.

Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employer's request, the employer may regard the tender offer as non-responsive.

C.2.18.2 Dispose of samples of materials provided for evaluation by the employer, where required.

**C.2.19 Inspections, tests and analysis**

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

**C.2.20 Submit securities, bonds and policies**

If requested, submit for the employer's acceptance before formation of the contract, all securities, bonds, guarantees, policies and certificates of insurance required in terms of the conditions of contract identified in the contract data.

**C.2.21 Check final draft**

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

**C.2.22 Return of other tender documents**

If so instructed by the employer, return all retained tender documents within twenty-eight (28) days after the expiry of the validity period stated in the tender data.

**C.2.23 Certificates**

Include in the tender submission or provide the employer with any certificates as stated in the tender data.

**C.3 The employer's undertakings**

**C.3.1 Respond to requests from the tenderer**

C.3.1.1 Unless otherwise stated in the tender Data, respond to a request for clarification received up to five (5) working days before the tender closing time stated in the Tender Data and notify all tenderers who collected tender documents.

C.3.1.2 Consider any request to make a material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying 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;
- b) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or
- c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

**C.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 (3) working 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 collected tender documents.

**C.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.

**C.3.4 Opening of tender submissions**

- C.3.4.1 Unless the two-envelope system is to be followed, open valid tender submissions in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data. Tender submissions for which acceptable reasons for withdrawal have been submitted will not be opened.
- C.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, number of points claimed for specific goals and time for completion for the main tender offer only.
- C.3.4.3 Make available the record outlined in C.3.4.2 to all interested persons upon request.

**C.3.5 Two-envelope system**

- C.3.5.1 Where stated in the tender data that a two-envelope system is to be followed, open only the technical proposal of valid tenders in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data and announce the name of each tenderer whose technical proposal is opened.
- C.3.5.2 Evaluate functionality of the technical proposals offered by tenderers, then advise tenderers who remain in contention for the award of the contract of the time and place when the financial proposals will be opened. Open only the financial proposals of tenderers, who score in the functionality evaluation more than the minimum number of points for functionality stated in the tender data, and announce the score obtained for the technical proposals and the total price and any points claimed on Specific Goals. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for functionality.

**C.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.

**C.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.

**C.3.8 Test for responsiveness**

- C.3.8.1 Determine, after opening and before detailed evaluation, whether each tender offer properly received:
- complies with the requirements of these Conditions of Tender,
  - has been properly and fully completed and signed, and
  - is responsive to the other requirements of the tender documents.
- C.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:
- detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,
  - significantly change the Employer's or the tenderer's risks and responsibilities under the contract, or
  - affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

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

**C.3.9 Arithmetical errors, omissions and discrepancies**

- C.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.
- C.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 C.3.11 for:
- a) the gross misplacement of the decimal point in any unit rate;
  - b) omissions made in completing the pricing schedule or bills of quantities; or
  - c) arithmetic errors in:
    - (i) line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or
    - (ii) the summation of the prices.
- C.3.9.3 Notify the tenderer of all errors or omissions that are identified in the tender offer and either confirm the tender offer as tendered or accept the corrected total of prices.
- C.3.9.4 Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:
- a) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.
  - b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

**C.3.10 Clarification of a tender offer**

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

**C.3.11 Evaluation of tender offers**

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

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

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

**The activities associated with evaluating tender offers are as follows:**

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

**C.3.11.1 General**

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

**C.3.12 Insurance provided by the employer**

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

**C.3.13 Acceptance of tender offer**

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

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

**C.3.14 Prepare contract documents**

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

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

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

**C.3.15 Complete adjudicator's contract**

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

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
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**C.3.16 Registration of the award**

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

**C.3.17 Provide copies of the contracts**

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

**C.3.18 Provide written reasons for actions taken**

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

**PART T: THE TENDER**  
**Part T2: Returnable Documents**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

**T2.1 List of Returnable Documents**

**1. RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES**

<b>Tender document name</b>	<b>Number of pages issued</b>	<b>Returnable document</b>
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
Compensation of Occupational Injuries and Disease Act (COIDA) (T2.1.18)	1 Page	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

**2. OTHER DOCUMENTS REQUIRED FOR TENDER EVALUATION PURPOSES**

<b>Tender document name</b>	<b>Number of pages issued</b>	<b>Returnable document</b>
Bidders Disclosure (T2.1.10)	2 Pages	<input checked="" type="checkbox"/> Yes <input 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
Copy of CSD Registration Certificate (T2.1.14)	1 Page	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Financial Reference (T2.1.15)	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
Proof of Liability Insurance (T2.1.22)	1 Page	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No



**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
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**3. RETURNABLE SCHEDULES THAT WILL BE INCORPORATED INTO THE CONTRACT**

<b>Tender document name</b>	<b>Number of pages issued</b>	<b>Returnable document</b>
Record of Addenda to Tender Documents (T2.1.16)	1 Page	■ Yes   □ No
Compulsory Enterprise Questionnaire (T2.1.17)	3 Pages	■ Yes   □ No

**4. OTHER DOCUMENTS THAT WILL BE INCORPORATED INTO THE CONTRACT**

<b>Tender document name</b>	<b>Number of pages issued</b>	<b>Returnable document</b>
Applicable Form of Guarantee	3 Pages	■ Yes   □ No
Priced Bill of Quantities	100 Pages	■ Yes   □ No

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

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
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**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)	
T2.1.19	NHBRC Registration Certificate	
T2.1.22	Proof of Liability Insurance	
SBD 9	Certificate of Independent Quotation Determination	

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

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**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	

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
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**PART T: THE TENDER**  
**Part T2: Returnable Documents**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

**T2.2 Returnable documents/Schedules**

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

**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.

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
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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**

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
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**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: .....



**South African National Biodiversity Institute**

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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 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**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay

Contract: **SANBI G497/2023**

	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.

**South African National Biodiversity Institute**

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**T2.1.04: SCHEDULE OF PROPOSED SUBCONTRACTORS**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

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.

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

<b>Name of representative</b>	<b>Signature</b>	<b>Capacity</b>	<b>Date</b>

<b>Name of organisation:</b>	
------------------------------	--

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

**T2.1.05: CAPACITY OF TENDERER**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

- 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.)*

<b>Skilled technicians employed</b>		<b>Unskilled employees employed</b>	
<b>Categories of technicians</b>	<b>Number</b>	<b>Categories of employees</b>	<b>Number</b>

**1.1. Provide full particulars of:**

<b>Machinery</b>	<b>Equipment</b>	<b>Workshops</b>

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".

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
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**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 commencement	Scheduled date of completion
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

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".

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
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**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									

<b>Name of Tenderer</b>	<b>Signature</b>	<b>Date</b>

---

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
$Ps = 80 \left( 1 - \frac{Pt - P_{min}}{P_{min}} \right)$	or	$Ps = 90 \left( 1 - \frac{Pt - P_{min}}{P_{min}} \right)$

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

## 4. 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



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**

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

[TICK APPLICABLE BOX]

**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]

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

[illegible]

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

**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 .....
	COMPLETION OF CONTRACT
TOTAL	R .....

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

**T2.2.09: Compulsory Site Inspection Meeting Certificate**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>BID No.:</b>	<b>SANBI G497/2023</b>

This is to certify that I, \_\_\_\_\_ representing  
\_\_\_\_\_ in the company of  
\_\_\_\_\_ visited the site on: \_\_\_\_\_

I have made myself familiar with all local conditions likely to influence the work and the cost thereof. I further certify that I am satisfied with the description of the work and explanations given at the site inspection meeting and that I understand perfectly the work to be done, as specified and implied, in the execution of this contract.

Name of Tenderer	Signature	Date

Name of Principal Agent	Signature	Date

**T2.1.10: Bidders Disclosure**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

**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 interest<sup>1</sup> 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**

2.3.1 If so, furnish particulars:

.....  
.....

<sup>1</sup> 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.

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".

### 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 consortium<sup>2</sup> 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

<sup>2</sup> 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**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

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**

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

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

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

The Tenderer shall provide a printed copy of the Active Contractor's Listing off the CIDB website. ([www.cidb.org.za](http://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: .....

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay

Contract: **SANBI G497/2023**

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**T2.1.14: COPY OF CSD REGISTRATION CERTIFICATE**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

A copy of Central Suppliers Database (CSD) Registration Certificate must be included for evaluation purposes.

**T2.1.15: FINANCIAL REFERENCES**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

**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 C3.8.
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**

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

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

**T2.1.16: RECORD OF ADDENDA TO TENDER DOCUMENTS**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

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)*

	<b>Date</b>	<b>Title or Details</b>
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

**T2.1.17: 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: PSIRA 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"/> 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 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"/> a member of an accounting authority of any national or provincial public entity   |
| <input type="checkbox"/> an official of any municipality or municipal entity                   | <input type="checkbox"/> an employee of Parliament or a provincial legislature   |

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

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"/> 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 any provincial legislature                                |  |
| <input type="checkbox"/> a member of the National Assembly or the National Council of Province | <input type="checkbox"/> a member of an accounting authority of any national or provincial public entity   |
| <input type="checkbox"/> a member of the board of directors of any municipal entity            | <input type="checkbox"/> an employee of Parliament or a provincial legislature   |
| <input type="checkbox"/> an official of any municipality or municipal entity                   |  |

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**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

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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: .....



**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

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

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

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.

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay

Contract: **SANBI G497/2023**

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**T2.1.19: NATIONAL HOME BUILDERS REGISTRATION COUNCIL (NHBRC)**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

The tender shall append their NHBRC registration certificate.

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay

Contract: **SANBI G497/2023**

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**T2.1.22: PROOF OF LIABILITY INSURANCE**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

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 quotations<sup>1</sup> 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) <sup>2</sup> 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:

<sup>1</sup> Includes price quotations, advertised competitive Bids, limited Bids and proposals.

<sup>2</sup> 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:

**SANBI: GXXXX/2023: REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY**

(Bid Number and Description)

in response to the invitation for the quote made by:

**SOUTH AFRICAN NATIONAL BIODIVERSITY CONSERVATION CENTRE (SANBI)**

(Name of Institution)

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 consortium<sup>3</sup> 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.  
**<sup>3</sup> 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 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

**PART C: THE CONTRACT**  
**Part C1: Agreement and Contract Data**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

**C1.1 Form of Offer and Acceptance**

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for:  
**THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY**

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 .....

**[Failure of a Tenderer to complete and sign this form will invalidate the tender]**

## **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**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay

Contract: **SANBI G497/2023**

---

**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]*

20.....*[year]*

at ..... *[place]*

For the Contractor:

.....  
Signature

.....  
Name

.....  
Capacity

Signature and name of witness:

.....  
Signature

.....  
Name

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

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**PART C: THE CONTRACT**  
**Part C1: Agreement and Contract Data**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

**C1.2 Contract Data**

The Conditions of Contract are the **JBCC Series 2000 Principal Building Agreement (July 2007 Edition 5.0 - Reprint 1)** published by the Joint Building Contract Committee. Copies of these documents may be obtained from the **Association of South African Quantity Surveyors** (011-315 4140), the **Master Builders Association** (011-205 9000), the **South African Association of Consulting Engineers** (011-463 2022) or the **South African Institute of Architects** (011-486 0684).

The JBCC Principal Building Agreement Contract Data EC and the JBCC Principal Building Agreement Contract Data CE form an integral part of this agreement.

The **ASAQS Preliminaries (November 2007 Edition)** published by the Association of South African Quantity Surveyors for use with the said JBCC Principal Building Agreement shall be deemed to be incorporated in the bills of quantities.

The **Model Preambles for Trades (2008 Edition)** as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in the bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained.

## **Section C1.2.1: Contract Data: Employer to Contractor (EC)**

### ***Employer Addendum Code 2101-EC***

**For information purposes only. To be signed on appointment.**

#### **Introduction**

This addendum contains all variables referred to in the **Principal Building Agreement** that are the responsibility of the Contractor to provide the appropriate information that is necessary for the Contractor to complete his tender. The Addendum must be completed in full and included in the tender documents. The Addendums "Contract Data – EC", "Contract Data – CE", "Contract Data – ES" and "Contract Data – SE" form part of the contract between the parties.

#### **Definitions**

The definitions used in this document and the interpretation thereof are as listed in the Principal Building Agreement. The work or phrase of a definition is in bold text and shall bear the meaning assigned to it in the Principal Building Agreement. Where such word or phrase is not highlighted it shall bear the meaning consistent with the context of its use. The listed defined word or phrase does not qualify as a definition where information required to be stated in the contract data has not been provided.

#### **Provision of Contract Data**

Spaces requiring information must be filled in, shown as "not applicable" or deleted and not left blank. Where choices are offered, the non-applicable items are to be clearly struck out. Where insufficient space is provided the additional information should be annexed hereto and cross referenced to the applicable clause of the contract data.

#### **Reference Clauses**

Where relevant the Principal Building Agreement clause applicable to the required information is printed in italics under the Contract Data clause number i.e. [27.4.2]

#### **TABLE OF CONTENTS**

<b>Section No.</b>	<b>Description</b>
1.0	CONTRACTING AND OTHER PARTIES
2.0	CONTRACT AND SITE INFORMATION
3.0	INSURANCES AND SECURITIES
4.0	PRACTICAL COMPLETION DATES AND PENALTIES
5.0	DOCUMENTS AND GENERAL
6.0	CHANGES MADE TO THE STANDARD JBCC DOCUMENT
7.0	DECLARATION BY THE PRINCIPAL AGENT

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

**CONTRACT DATA – EMPLOYER****1.0 CONTRACTING AND OTHER PARTIES**

1.1 [1.2]	<b>Employer:</b>	South African National Biodiversity Institute	
	<b>Postal Address:</b>	Private Bag X101, Silverton, Gauteng	<b>Code:</b> 0184
	<b>Physical Address:</b>	Pretoria National Botanical Garden 2 Cussonia Avenue, Brummeria, Gauteng	<b>Code:</b> 0184
	<b>Tel no.:</b>	012 843 5000	<b>Fax no.:</b> 012 843 5205
	<b>VAT no.</b>		
	<b>E-mail:</b>		
1.2 [5.1]	<b>Principal Agent:</b>	Virtual Consulting Engineers VCE (Pty) Ltd	<b>Person:</b> Mr Shahien Ishmail
	<b>Postal Address:</b>	P.O. Box 82, Crawford	<b>Code:</b> 7779
	<b>Tel no.:</b>	021 685 0789	<b>Fax no.:</b> 086 655 2690
	<b>E-mail:</b>	shahien@virtualconsulting.co.za	
1.2 [5.2]	<b>Agent (1):</b>		<b>Person:</b>
	<b>Agent's Service:</b>		
	<b>Postal Address:</b>		<b>Code:</b>
	<b>Tel no.:</b>		<b>Fax no.:</b>
	<b>E-mail:</b>		
1.3 [5.2]	<b>Agent (2):</b>		<b>Person:</b>
	<b>Agent's Service:</b>		
	<b>Postal Address:</b>		<b>Code:</b>
	<b>Tel no.:</b>		<b>Fax no.:</b>
	<b>E-mail:</b>		
1.4 [5.2]	<b>Agent (3):</b>		<b>Person:</b>
	<b>Agent's Service:</b>		
	<b>Postal Address:</b>		<b>Code:</b>
	<b>Tel no.:</b>		<b>Fax no.:</b>
	<b>E-mail:</b>		
1.5	<b>Agent (4):</b>		<b>Person:</b>

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".

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

[5.2] **Agent's Service:** \_\_\_\_\_  
**Postal Address:** \_\_\_\_\_ **Code:** \_\_\_\_\_  
**Tel no.:** \_\_\_\_\_ **Fax no.:** \_\_\_\_\_  
**E-mail:** \_\_\_\_\_

1.6  
[5.2] **Agent (5):** \_\_\_\_\_ **Person:** \_\_\_\_\_  
**Agent's Service:** \_\_\_\_\_  
**Postal Address:** \_\_\_\_\_ **Code:** \_\_\_\_\_  
**Tel no.:** \_\_\_\_\_ **Fax no.:** \_\_\_\_\_  
**E-mail:** \_\_\_\_\_

1.7  
[5.2] **Agent (6):** \_\_\_\_\_ **Person:** \_\_\_\_\_  
**Agent's Service:** \_\_\_\_\_  
**Postal Address:** \_\_\_\_\_ **Code:** \_\_\_\_\_  
**Tel no.:** \_\_\_\_\_ **Fax no.:** \_\_\_\_\_  
**E-mail:** \_\_\_\_\_

1.8  
[5.2] **Agent (7):** \_\_\_\_\_ **Person:** \_\_\_\_\_  
**Agent's Service:** \_\_\_\_\_  
**Postal Address:** \_\_\_\_\_ **Code:** \_\_\_\_\_  
**Tel no.:** \_\_\_\_\_ **Fax no.:** \_\_\_\_\_  
**E-mail:** \_\_\_\_\_

1.9  
[5.5] **Interest of principal agent or other agent in the project.** (Yes / No) 

<b>No</b>
-----------

  
Details where "yes": **N/A**

1.10 The **principal agent** named in 1.2 above is responsible for the preparation of the **contract data** schedule and must be contacted should the **contractor** be uncertain of the information provided or to be provided. Failure to complete the **contract data** schedule in full may result in the tender being disqualified.

**2.0 CONTRACT AND SITE INFORMATION**

2.1  
[1.7] The **law** applicable to this **agreement:** (Country / State) 

<b>RSA</b>
------------

2.2  
[1.1] **Works** identification: REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY

2.3 Site description: Harold Porter National Botanical Garden, Cape Town

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

[1.1]

2.4 Possession of the **site** (Date)  
[15.2.1] is to be given on:

**Within 5 (five) working days after receipt of documentary evidence that:**

- **Insurances have been effected [12.2];**
- **Security has been provided to the Employer [14.1];**
- **Contractor's Lien has been signed;**
- **Safety Plan has been approved by the Employer.**

2.5 Period for the commencement of the **works** after the (Working days)  
[15.3] contractor takes possession of the **site**: **5 (Five)**

2.6 Completion of the works in **sections** is (Yes / No) **No** (No. of sections) **N/A**  
[15.4], required.  
[28.0]

2.7 Waiver of the **contractor's** lien or right of continuing possession is (Yes / No) **No**  
[3.3], required.  
[31.16.2]

2.8 Defined restrictions to the **site** area. Where "yes" the specific requirements are described below or detailed in the **contract documents**. (Yes / No) **Yes**  
[16.1]

2.9 Geotechnical investigation of the **site** has been undertaken. (Yes / No) **N/A**  
[16.4] Where "yes" the results are included in the **contract documents**.

2.10 Existing premises will be occupied. Where "yes" the specific requirements are described below or detailed in the **contract documents**. (Yes / No) **No**  
[16.6]

2.11 Provision of temporary services is required. Where "yes" the specific requirements are described below or detailed in the **contract documents**. (Yes / No) **Yes**  
[16.7]

2.11.1 **Water** Option A Contractor – his cost  
Option B Employer – free of charge  
Option C Contractor – metered (contractor cost) (A, B or C) **B**

2.11.2 **Electricity** Option A Contractor – his cost  
Option B Employer – free of charge  
Option C Contractor – metered (contractor cost) (A, B or C) **B**

2.11.3 **Telecom** Option A Contractor – his cost  
Option B Employer – free of charge  
Option C Contractor – metered (contractor cost) (A, B or C) **A**

2.11.4 **Ablutious** Option A Contractor – his cost  
Option B Employer – free of charge  
Option C Contractor – metered (contractor cost) (A, B or C) **A**

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

2.12 [16.8]	Protection of existing trees and shrubs is required. Where "yes" the specific requirements are described below or detailed in the <b>contract documents</b> .	(Yes / No)	<b>No</b>
<b>3.0 INSURANCE AND SECURITIES</b>			
3.1 [10.1.1], [12.6]	Contract works insurance to be effected by:	(Employer / Contractor)	<b>Contractor</b>
	For the sum of:	(Amount)	<b>Contract Sum Plus 20%</b>
	With a deductible of:	(Amount)	<b>R20 000</b>
3.2 [10.1.2], [11.1-3], [12.6]	Supplementary / Special insurance to be effected by:	(Employer / Contractor)	<b>N/A</b>
	For the sum of:	(Amount)	<b>N/A</b>
	With a deductible of:	(Amount)	<b>N/A</b>
3.3 [10.1.3], [12.6]	Public liability insurance to be effected by:	(Employer / Contractor)	<b>Contractor</b>
	For the sum of:	(Amount)	<b>R5 000 000 per claim</b>
	With a deductible of:	(Amount)	<b>R20 000</b>
3.4 [11.1.1]	Support insurance to be effected by:	(Employer / Contractor)	<b>N/A</b>
	For the sum of:	(Amount)	<b>N/A</b>
	With a deductible of:	(Amount)	<b>N/A</b>
3.5 [11.1.2-3], [12.1]	Special insurance to be effected by:	(Employer / Contractor)	<b>N/A</b>
	Type:	<b>N/A</b>	
	For the sum of:	(Amount)	<b>N/A</b>

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".



**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
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With a deductible of:		(Amount)	<b>N/A</b>
<b>4.0</b>	<b>PRACTICAL COMPLETION DATES AND PENALTIES</b>		
4.1	For the <b>works</b> as a whole:	<b>Date</b>	<b>Penalty Amount</b>
[24.3.1], [30.1-36]	The date for <b>practical completion</b> and the <b>penalty</b> per <b>calendar day</b> is:	<b>7 months after date of site handover (Excl. Builders Holiday)</b>	<b>R810-00 per calendar day (Excl. VAT)</b>
<b>Or</b>			
4.2	For the <b>works</b> in <b>sections</b> :	<b>Date</b>	<b>Penalty Amount</b>
[24.3.1], [28.1]	The date for <b>practical completion</b> and the <b>penalty</b> per <b>calendar day</b> is:		
	Section 1	<b>N/A</b>	<b>R</b>
	Section 2	<b>N/A</b>	<b>R</b>
	Section 3	<b>N/A</b>	<b>R</b>
	Section 4	<b>N/A</b>	<b>R</b>
<b>5.0</b>	<b>DOCUMENTS AND GENERAL</b>		
5.1	Construction document copies to be supplied to the <b>contractor</b> free of charge.	(No. of copies)	<b>3</b>
[3.7]			
5.2	The <b>priced document</b> may be used as a specification of <b>materials and goods</b> and work methods.	(Yes / No)	<b>Yes</b>
[3.9]			
5.3	The <b>contractor</b> shall provide a schedule of rates.	(Yes / No) <b>No</b>	(Addendum No.) <b>Refer to Bill of Quantities</b>
[3.10]			
5.4	Changes made to <b>JBCC</b> standard documents.	(Yes / No) <b>Yes</b>	(Addendum No.) <b>Refer to Point 6 below</b>
[3.11]			
5.5	On acceptance of the tender the <b>priced document</b> is to be submitted within the stated <b>working days</b> .	(No. of days)	<b>Priced document to be submitted with Tender</b>
[15.1.1]			
5.6	Work to be undertaken by <b>direct contractors</b> .	(Yes / No) <b>No</b>	(Addendum No.) <b>N/A</b>
[22.2]			
5.7	On achievement of practical completion the <b>contractor</b> is to hand over all certificates and manuals etc. related to the works.		
[24.9]			
5.8	Interim <b>payment certificate</b> to be issued by:	(Date of Month)	<b>25<sup>th</sup></b>
[31.1]			

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".

5.8  
[4.1]

The following items of works shall be designed by the Contractor:

(1) Certificates of completion

(2) All guarantees

(3)

(4)

(5)

(6)

## 6.0 STATE PROVISIONS AND SUBSTITUTIONS

6.1 *Replace the following definitions with:*

**"CONSTRUCTION PERIOD"** means the period commencing on the date of acceptance of the bid as stated in [15.2.1] And ending on the date of **practical completion**

**"INTEREST"** means the 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).

6.2  
[3.6] *Replace the last sentence with the following:*

The original signed set of contract documents shall be held by the **Employer**.

6.3  
[5.1] *Replace the clause with the following:*

In terms of the clauses listed hereunder the **Employer** has retained its authority and has not given a mandate to the **Principal Agent**. The **Employer** shall sign all documents in relation to the following clauses:

20.1, 20.7, 26.2.1, 26.3.1, 29.1, 29.2, 29.4.1, 29.4.3, 29.7, 29.8, 32.1, 32.6.2, 32.15, 34.3

Copies of the signed documents shall be provided to the **Principal Agent**.

6.4  
[8.4] *Replace the clause with the following:*

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 the **Contractor** may deem necessary.

6.6  
[9.3] *Add the following clause:*

The **Employer's** rights to claim damages for the **Contractor's** omissions and actions will not be affected.

6.7  
[10.1] *Replace the clause with the following:*

The **Contractor** shall effect contract works insurances and, where available, supplementary insurance in respect of civil commotion, riot and strike shall be effected for the **works** for the Contractor's all risk and, in addition, covering the **Contractor's** subcontractors. Such insured amounts shall include the full value of materials and goods supplied by the **Employer** to the

Contractor. Supplementary insurance shall not be effected where the **Employer** makes such an election as stated in [11.1.2 – 3]

6.8  
[11.2] *Add the following clause:*

The **Contractor** shall effect public liability insurance for not less than the amount and the deductible as stated in [10.1.3]. In addition the **Contractor** shall effect any relevant workmen's compensation or similar insurances as are required by law. The **Contractor** shall ensure that his sub-contractors effect their own similar insurances.

6.9  
[11.3] *Add the following clause:*

Should the **Employer** decide that the execution of the works could cause the weakening or interference with the support of the land adjacent to the **site**, the **Employer** shall state in [11.1.1] That the **Contractor** shall effect support insurance

6.12  
[12.3] *Replace the clause with the following:*

Where the **Contractor** fails to effect any of the required insurances or to keep them in force, the **Employer** may cancel this agreement in terms of clause [36.0]

6.14  
[14.1] *Replace the clause with the following:*

Security:

The securities to be provided by the **Contractor** are:

- (1) Variable construction guarantee
- (2) Fixed construction guarantee
- (3) Advance payment guarantee

6.14  
[15.2.1] *Replace the clause with the following:*

Give the **Contractor** possession of site within ten (10) **working days** of the commencement of the **construction period** provided that the **Contractor** has complied with the terms of [15.1.1] and [15.1.2]

6.15  
[25.3] *Replace the clause with the following:*

Should the **Principal Agent** not issue a **works completion** list, in terms of [25.1] or [25.2.2], within seven (7) **calendar days** from the end of the inspection period, the **Contractor** shall notify the **Employer** and **Principal Agent**. Should the **Principal Agent** not issue such **works completion** list within seven (7) **calendar days** of such notice, the **Employer** may within seven (7) **calendar days** issue to the **Contractor** a **works completion** list. Should the **Employer**:

6.16  
[25.3.1] *Replace the clause with the following:*

Not issue such **works completion** list within seven (7) **calendar days**, then the **certificate of works completion** shall be deemed to have been issued on the date of expiry of the initial notice period and **works completion** shall be deemed to have been achieved on such date.

6.17  
[25.3.2] *Replace the clause with the following:*

Issue a **works completion** list and the work on the **works completion** list not have been completed or where further **defects** have become apparent, the **Employer** shall forthwith identify such items on the updated **works completion** list and notify the **Contractor**. The **Contractor** shall

repeat the procedure in terms of [25.2.2] until such items have been completed to the satisfaction of the **Employer**.

6.18  
[26.1] *Replace the clause with the following:*

The defects liability period for the works shall commence on the date of works completion and end after three hundred and sixty-five (365) **calendar days** for items stated in the **bills of quantities**.

6.19  
[26.4] *Replace the clause with the following:*

Should the **Principal Agent** not issue a **defects** list in terms of [26.2.2 or 26.3.2], within seven (7) **calendar days** from the end of the **defects** liability period, the **Contractor** shall notify the **Employer** and **Principal Agent**. Should the **Principal Agent** not issue such **defects** list within seven (7) **calendar days** of receipt of such notice, the **Employer** may within seven (7) **calendar days** issue to the **Contractor** a **defects** list. Should the **Employer**:

6.20  
[26.4.1] *Replace the clause with the following:*

Not issue such **defects** list within seven (7) **calendar days**, then the **certificate of final completion** shall be deemed to have been issued on the date of expiry of the initial notice period and **final completion** shall be deemed to have been achieved on such date.

6.21  
[26.4.2] *Replace the clause with the following:*

Issue a **defects** list and the work on the **defects** list has not been completed or where further **defects** have become apparent, the **Employer** shall forthwith identify such items on the updated **defects** list and notify the **Contractor**. The **Contractor** shall repeat the procedure in terms of [26.3.2] until such items have been completed to the satisfaction of the **Employer**

6.22  
[26.6] *Replace the clause with the following:*

A **certificate of final completion** issued in terms of [26.0] shall be *prima facie* evidence as to the sufficiency of the **works** and that the Contractor's obligations in terms of [2.0] and [15.0] have been fulfilled other than for **latent defects**.

6.23  
[27.1] *Replace the clause with the following:*

The **latent defects** liability period shall commence at the start of the **construction period** and end ten (10) years from the date of **final completion** where **final completion** in terms of [26.0] is achieved.

6.24  
[27.2] *Replace the clause with the following:*

Where cancellation of this **agreement** occurs before the achievement of **final completion** the **latent defects** liability period shall end ten (10) years from the date of cancellation.

6.27  
[31.4.2] *Replace the clause with the following:*

A reasonable estimate of the value of **materials and goods** in terms of [31.6] unless the **Employer** elects not to pay for such.

6.29  
[31.9] *Replace the clause with the following:*

The **Employer** shall pay the **Contractor** the amount certified within thirty (30) **calendar days** of the date for issue of the **payment certificate**. Payment shall be subject to the **Contractor** giving the **Employer** a **tax** invoice for the amount due.

6.30 *Replace the last sentence with the following:*  
[31.11.2]

The principle agent shall calculate such default 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).

6.31 *Replace the clause with the following:*  
[31.12]

Where a **payment certificate** reflects an amount in favour of the **Employer**, the **Contractor** shall pay the amount certified within twenty-one (21) **calendar days** of the date of issue of the **payment certificate**. Where such an amount has not been paid, the **Contractor** shall be liable for default interest and the **Principal Agent** shall include such an amount in the **recovery statement** in terms of [33.0]. Payment shall be subject to the **Employer** giving the **Contractor** a **tax** invoice for the amount due. The **Principal Agent** shall calculate such 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).

6.32 *Replace the clause with the following:*  
[34.1]

The **Contractor** shall cooperate with and assist the **Principal Agent** in the preparation of the **final account** by timeously providing all relevant documents on request. The **Principal Agent** shall issue the final account to the **Contractor** within one hundred and twenty (120) **working days**.

6.33 *Add the following clause:*  
[34.2]

The **Principal Agent** shall allow the **Employer** twenty (20) **working days**, within the period provided in [34.1] to accept the **final account** before presentation to the **Contractor** in terms of [34.3]

6.34 *Add the following:*  
[34.5]

The final payment certificate shall be issued by the **Employer**.

6.35 *Replace the clause with the following:*  
[34.9]

The **Employer** shall concurrently with the issue of the final **payment certificate** issue a statement to the **Contractor** showing the total amount of **tax** certified.

6.36 *The **Employer** shall pay to the **Contractor** the amount certified for payment in the final **payment certificate** within thirty (30) **calendar days** of the date of issue of the final **payment certificate** subject to the **Contractor** giving the **Employer** a **tax** invoice for the amount due.*  
[34.10]

6.37 *Replace the last sentence with:*  
[34.12]

Such interest shall be calculated 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).

6.38 *Replace the clause with the following:*  
[36.1]

The **Employer** may, without prejudice of any other rights available to him, cancel this **agreement** where the **Contractor**:

6.39 *Replace the clause with the following:*  
[36.2]

Where the **Contractor** is in default, the **Employer** may notify the **Contractor**, either directly or through the **Principal Agent**, of his default and of the **Employer's** intention to cancel this **agreement** in terms of [36.1], should the default not be remedied.

6.40 *Replace the clause with the following:*  
[37.2]

Where the **Employer** considers cancelling this **agreement** in terms of [37.1] the **Employer** shall notify the **Contractor** of the **Employer's** intention to cancel this **agreement**.

6.41 *Add the following clause:*  
[39.2]

The **Employer** shall be entitled at any time to unilaterally terminate or cancel this **agreement** or any part thereof. Save for the following the **Contractor** shall not be entitled to claim any other amounts whatsoever in respect of such termination or cancellation of this **agreement**. The **Employer** shall be obliged to pay the **Contractor** as damages and/or loss of profit the lesser of:

6.42 *Add the following clause:*  
[39.2.1]

An amount not exceeding ten per cent (10%) of the **contract sum**.

6.43 *Add the following clause:*  
[39.2.2]

Ten per cent (10%) of the value of incomplete work.

6.43 *Add the following clause:*  
[39.2.3]

The **Contractor's** actual damage or loss as determined by the **Employer** after receipt of evidence substantiating any such damage or loss.

6.44 *Replace the clause with the following:*  
[40.2.2]

Litigation where the **Employer** so elects. Institution of the action shall be commenced and process served with one (1) year from the date of existence of the dispute, failing which the dispute shall lapse.

## 7.0 CHANGES MADE TO THE STANDARD JBCC DOCUMENT

Changes made to the standard JBCC document are listed in section 6 above.

## 8.0 DECLARATION BY THE PRINCIPAL AGENT

I, the Principal Agent named in 1.2 above, declare that the information provided above is complete and accurate at the time of calling for tenders. Where necessary, should any of the above information need to be varied, tenderers will be forthwith informed thereof in writing,

.....  
Principal Agent

.....  
Date

## Section C1.2.2: Contract Data: Contractor to Employer (CE)

### **Contractor Addendum Code 2101-CE**

#### **Introduction**

This addendum contains all variables referred to in the Principal Building Agreement that are the responsibility of the Contractor to provide the appropriate information that is necessary for the Contractor to complete his tender. The Addendum must be completed in full and included in the tender documents. The Addendums "Contract Data – EC", "Contract Data – CE", "Contract Data – ES" and "Contract Data – SE" form part of the contract between the parties.

#### **Definitions**

The definitions used in this document and the interpretation thereof are as listed in the Principal Building Agreement. The work or phrase of a definition is in **bold text** and shall bear the meaning assigned to it in the Principal Building Agreement. Where such word or phrase is not highlighted it shall bear the meaning consistent with the context of its use. The listed defined word or phrase does not qualify as a definition where information required to be stated in the **contract data** has not been provided.

#### **Provision of Contract Data**

Spaces requiring information must be filled in, shown as "not applicable" or deleted and not left blank. Where choices are offered, the non-applicable items are to be clearly struck out. Where insufficient space is provided the additional information should be annexed hereto and cross referenced to the applicable clause of the **contract data**.

#### **Reference Clauses**

Where relevant the Principal Building Agreement clause applicable to the required information is printed in italics under the Contract Data clause number i.e. [27.4.2]

#### **TABLE OF CONTENTS**

Section No.	Description
1.0	CONTRACTING PARTY
2.0	SECURITIES
3.0	PAYMENT AND ADJUSTMENT OF PRELIMINARIES
4.0	EMPLOYER CHANGES TO JBCC STANDARD DOCUMENTS
5.0	THE TENDER

## CONTRACT DATA – CONTRACTOR

### 1.0 CONTRACTING PARTY

1.1

[1.2]

**Contractor:**

**Postal Address:**

**Code:**

**Physical  
Address:**

**Code:**

**E-mail:**

**Tel no.:**

**Fax no.:**

**VAT no.:**

### 2.0 SECURITIES

2.1 The security provisions selected are:

2.1.1

[14.3  
]

Variable Construction Guarantee

(Yes / No)

2.1.2

[14.4  
]

Fixed Construction Guarantee and Payment Reduction

(Yes / No)

2.1.3

[14.5  
]

Advanced Payment is required. Where "Yes"

Amount

**N/A**

2.1.4

[14.5  
]

An Advance Payment Guarantee to be provided

(Yes / No)

**No**

### 3.0 PAYMENT AND ADJUSTMENT OF PRELIMINARIES

#### 3.1 Payment of preliminaries

The payment of preliminaries shall be according to the option selected by the **contractor**. The amount included in each monthly **payment certificate** in respect of preliminaries as stated in the **contract data** shall be:

##### 3.1.1 Option A

Assessed by the **principal agent** as an amount prorated to the value of the work duly executed in the same ratio as the preliminaries bears to the **contract sum** excluding:

- The amount for preliminaries
- Any contingency sum
- Any amount in respect of **CPAP**



All inclusive of **tax**.

### 3.1.2 **Option B**

Calculated from the priced items in the **bills of quantities / lump sum document**. The **contractor** and the **principal agent** shall agree on a division of the priced preliminaries items into:

- An initial or establishment charge
- A monthly charge
- A final or disestablishment charge

All inclusive of **tax**.

In arriving at such a division cognizance shall be taken of such factors as:

- Premiums for annually renewable insurance policies.
- Plant, scaffolding and the like remaining the property of the **contractor** or the hiring company and the capital costs thereof not treated as part of the initial charge.

Where the initial **construction period** is extended the monthly charge shall be recalculated on the same basis as was originally applied but taking into account the revised **construction period** and the amounts already paid to the **contractor**.

Should the **contractor** and the **principal agent** be unable to agree such division then the **principal agent** shall make a division of the amount of preliminaries to be incorporated in the valuations of each monthly **payment certificate**.

### 3.2 **Adjustment of preliminaries**

The amount of items of preliminaries shall be adjusted to take account of the theoretical financial effect which changes in time and/or value have on preliminaries. Such an adjustment shall be based on the particulars provided by the **contractor** for this purpose in terms of Option A or B and shall preclude any further adjustment of preliminaries.

Adjustment of preliminaries in terms of Options A or B shall apply notwithstanding the actual employment of resources by the **contractor** in the execution of the **works**. The adjustment of preliminaries shall be based on the options as selected in the **contractor's tender**.

For the adjustment of the preliminaries both the **contract sum** and the **contract value** shall exclude:

- The amount of preliminaries
- Any contingency sum
- Any amount in respect of **CPAP**

All inclusive of **tax**.

#### 3.2.1 **Option A**

The amount of preliminaries shall be adjusted in the following categories:

- An amount which shall not be varied.
- An amount which shall be varied in proportion to the **contract value** as compared with the **contract sum**.
- An amount which shall be varied in proportion to the **construction period** as compared to the initial **construction period** excluding revisions to the **construction period** for which the **contractor** is not entitled to adjustment of the **contract value** in terms of the **agreement**.

The **contractor** shall, within fifteen (15) working days of taking possession of the **site**, give the **principal agent** a breakdown, subdivided into the above categories, of the amount for preliminaries in tabulated form, all to the satisfaction of the **principal agent**.

Should the **contractor** fail to provide such information within the period stipulated then the amount for preliminaries shall be deemed to be subdivided into the following proportions:

- 10% (ten percent) which amount shall not be varied.
- 15% (fifteen percent) which amount shall be varied in proportion to the **contract value** as compared with the **contract sum**.
- 75% (seventy-five percent) which amount shall be varied in proportion to the **construction period** as compared with the initial **construction period**.

For a lump sum document, should the contractor fail to identify the amount for preliminaries, then such an amount shall be deemed to be 7,5% (seven and a half percent) of the contract sum excluding:

- Any contingency sum
- Any amount in respect of **CPAP**

All inclusive of **tax**.

Where sectional completion is required in terms of the agreement, the contractor shall provide the **principal agent** with the division of the above categorised amounts into sections. Should the **contractor** fail to provide such information within the period stipulated the categorised amounts shall be prorated to the value of each section.

### 3.2.2 Option B

The **contractor** shall, within fifteen (15) **working days** of taking possession of the site, provide the **principal agent** with a detailed breakdown of the amount for preliminaries. This breakdown shall set out, among others, full particulars of administrative, supervisory and other personnel, plant, transport and other resources and charges included in the amount for preliminaries. The **contractor** shall show the periods to which the individual items related with the charge rate for such items by means of a **programme** all to the satisfaction of the **principal agent**.

Where sectional completion is required in terms of the **agreement**, the **contractor** shall provide the **principal agent** with details of the resources required for each section and those that are common to sections. Should the **contractor** fail to provide such information within the period stipulated, Option A shall apply.

### 3.2.3 Payment certificate cash flow

The **contractor** shall provide all reasonable assistance to the **principal agent** in the preparation of cash flow projections of claims for **payment certificates** where required by the **employer**. The projections shall be based on the **programme** and shall be updated as and when the **programme** requires updating. The cooperation of the **contractor** in terms of this item shall not prejudice his right to receive payment in terms of the **agreement**.

3.2.4	The <b>contract value</b> shall be adjusted according <b>CPAP</b> [3.1]	(Yes / No)	<input type="text" value="No"/>
3.2.5	Payment of preliminaries [3.1.1-2]	(A or B)	<input type="text"/>
3.2.6	Adjustment of preliminaries [3.2.1-2]	(A or B)	<input type="text"/>

#### 4.0 EMPLOYER CHANGES TO JBCC STANDARD DOCUMENTS

- 4.1 Changes (if any) in terms of the Employer's Contract Data are accepted [3.11]. Where "no" an addendum referenced to this clause (Yes / No) is to be attached.

**Yes. Refer to  
EC 6**

#### 5.0 THE TENDER

- 5.1 This tender is to be submitted to the principal agent at the street address provided in the invitation to tender before the tender closing date and time stated herein.
- 5.2 By the submission of this tender to the **employer** the tenderer offers and agrees to contract for, execute and complete the **works** for the tender sum as stated below.
- 5.3 Tenders will be opened in public directly after the stated closing time. Only the total tender sum as stated in each tender will be announced.
- 5.4 The lowest or any tender will not necessarily be accepted.
- 5.5 This tender shall remain in full legal force for **one hundred and twenty (120) calendar days**. The tenderer accepts liability for damages as may be suffered by the **employer** should the tender validity period not be honoured.
- 5.6 This tender takes into account all listed items [4.0] for the purpose of preparing and submitting this tender.
- 5.7 The successful tenderer will be appointed in terms of the JBCC Principal Building Agreement.

#### 5.8 TENDER SUM COMPILATION

**Amount**

- 5.8.1 Tenderer's work including **prime cost amounts**

R

- 5.8.2 **Employer allowances** stated by the **principal agent**

R

- 5.8.3 **SUB TOTAL**

R

- 5.8.4 *Add tax* on 5.8.3

R

- 5.8.5 **TOTAL TENDER SUM inclusive of tax**

R

- 5.8.6 Tender Sum in words


Thus done and signed at ..... on .....

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

---

.....  
Name of Signatory

.....  
Capacity of Authorised Signatory

.....  
As witness

.....  
for and on behalf of the Tenderer who  
warrants authorisation hereto

**PART C: THE CONTRACT**  
**Part C1: Agreement and Contract Data**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

**C1.3 Form of Construction Guarantee (Pro Forma)**

**C1.3.1 FIXED CONSTRUCTION GUARANTEE - JBCC 2000 PRINCIPAL BUILDING AGREEMENT  
(Edition 5.0 of July 2007)**

**To:**

South African National Biodiversity Institute  
Private Bag X101  
Silverton  
0184

Sir,

**FIXED CONSTRUCTION GUARANTEE FOR THE EXECUTION OF A CONTRACT  
IN TERMS OF JBCC 2000 (5.0 EDITION JULY 2007)**

1. With reference to the contract between ..... (hereinafter Referred to as the "Contractor") and the South African National Biodiversity Institute (hereinafter referred to as the "Employer"), Contract/Tender No: **SANBI G497/2023 REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY** (hereinafter referred to as the "contract") in the amount of

R .....(insert amount), .....

..... (insert amount in words),  
(hereinafter referred to as the contract sum),

I / We, .....

in my/our Capacity as ..... and hereby  
representing .....

(hereinafter referred to as the "**Guarantor**") advise that the **Guarantor** holds at the **Employer's** disposal  
the sum of R....., (insert amount in figures)

..... (insert amount in words)  
being 5% of the contract sum (excluding VAT), for the due fulfillment of the contract.

2. The **Guarantor** hereby renounces the benefits of the exceptions *non numeratae punia; non causa debiti; excussionis et divisionis; and de duobus vel pluribus reis debendi* which could be pleaded against the enforcement of this guarantee, with the meaning and effect whereof I/we declare myself/ourselves to be conversant, and undertake to the **Employer** the amount guaranteed, on receipt of a written demand from the **Employer** to do so, stating that the **Employer** has a right of recovery against the **Contractor** in terms of 33.0 of the contract.

3. Subject to the above, but without in any way detracting from the **Employer's** rights to adopt any of the procedures provided for in the contract, the said demand can be made by the **Employer**, at any stage prior to the expiry of this guarantee.
4. The amount id by the **Guarantor** in terms of this guarantee may be retained by the **Employer** on condition that upon the issue of the last final **payment certificate**, the **Employer** shall account to the **Guarantor** showing how this amount has been expended and refund any balance due to the **Guarantor**.
5. The **Employer** shall have the absolute right to arrange his affairs with the **Contractor** in any manner which the **Employer** deems fit and the **Guarantor** shall not have the right to claim his release on account of any conduct alleged to be prejudicial to the **Guarantor**. Without derogating from the foregoing, any compromise, extension of the **construction period**, indulgence, release or variation of the **Contractor's** obligation shall not affect the validity of this guarantee.
6. The **Guarantor** reserves the right to withdraw from this guarantee at any time by depositing the guaranteed amount with the **Employer**, whereupon the Guarantor's liability seizes.
7. This guarantee is neither negotiable nor transferable, and
  - (a) must be surrendered to the **Guarantor** at the time when the **Employer** accounts to the **Guarantor** in terms of clause 4 above, or
  - (b) shall lapse on the date of the last **certificate of practical completion**.
8. This guarantee shall not be interpreted as extending the **Guarantor's** liability to anything more than payment of the amount guaranteed.

Signed at ..... on this ..... day of ..... 20.....

**AS WITNESS**

1. ....

2. ....

By and on behalf of

.....  
.....  
.....  
(insert the name and physical address of the  
Guarantor)

Name: .....

Capacity: .....  
(Duly authorised thereto by resolution attached  
marked Annexure A)

Date: .....

- A. **No alterations and/or additions of the wording of this form will be accepted.**
- B. **The physical address of the Guarantor must be clearly indicated and will be regarded as the Guarantor's *domicilium citandi et executandi*, for all purposes arising from this guarantee.**
- C. **This GUARANTEE must be returned to:** .....  
.....

**C1.3.2: VARIABLE CONSTRUCTION GUARANTEE - JBCC 2000 PRINCIPAL BUILDING AGREEMENT  
(Edition 5.0 of July 2007)**

**To:**

South African National Biodiversity Institute  
Private Bag X101  
Silverton  
0184

Sir,

**VARIABLE CONSTRUCTION GUARANTEE FOR THE EXECUTION OF A CONTRACT IN TERMS OF  
JBCC 2000 (5.0 EDITION JULY 2007)**

5. With reference to the contract between ..... (hereinafter referred to as the "**Contractor**") and the **South African National Biodiversity Institute** (hereinafter referred to as the "**Employer**"), **Contract/Tender No: SANBI G497/2023 REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY** (hereinafter referred to as the "contract") in the amount of (hereinafter referred to as the "contract") in the amount of

R .....(insert amount), .....

..... (insert amount in words),

(hereinafter referred to as the contract sum),

I / We, .....

in my/our Capacity as ..... and hereby

representing .....

(hereinafter referred to as the "**Guarantor**") advise that the **Guarantor** holds at the **Employer's** disposal

the sum of R....., (insert amount in figures)

..... (insert amount in words)

being 10% of the contract sum (excluding VAT), for the due fulfilment of the contract.

1. I / We advise that the **Guarantor's** liability in terms of this guarantee shall be as follows:
- (a) From and including the date on which this guarantee is issued and up to and including the date of payment of the amount in the last final **payment certificate**, the **Guarantor** will be liable in terms of this guarantee to the maximum amount of 10% of the **contract sum** (excluding VAT);
- (b) The **Guarantor's** liability shall reduce to 3 % of the **contract value** (excluding VAT) as determined at the date of the last **certificate of practical completion**, subject to such amount not exceeding 10% of the **contract sum** (excluding VAT).
- (c) The **Guarantor's** liability shall reduce to 1 % of the **contract value** (excluding VAT) as determined at the date of the last **certificate of final completion**, subject to such amount not exceeding 10 % of the **contract sum** (excluding VAT).
- (d) This guarantee shall expire on the date of the last **final payment certificate**.
- (e) The **practical completion certificate** and the **final completion certificate** referred to in this guarantee shall mean the certificates issued in terms of the contract.
2. The **Guarantor** hereby renounces the benefits of the exceptions *non numeratae punia; non causa debiti; excussionis et divisionis*; and *de duobus vel pluribus reis debendi* which could be pleaded against

the enforcement of this guarantee, with the meaning and effect whereof I/we declare myself/ourselves to be conversant, and undertake to y the **Employer** the amount guaranteed on receipt of a written demand from the **Employer** to do so, stating that the **Employer** has a right of recovery against the **Contractor** in terms of 33.0 of the contract.

4. Subject to the above, but without in any way detracting from the **Employer's** rights to adopt any of the procedures provided for in the contract, the said demand can be made by the **Employer** at any stage prior to the expiry of this guarantee.
5. The amount id by the **Guarantor** in terms of this guarantee may be retained by the **Employer** on condition that upon the issue of the last **final payment certificate**, the **Employer** shall account to the **Guarantor** showing how this amount has been expended and refund any balance due to the **Guarantor**.
6. The **Employer** shall have the absolute right to arrange his affairs with the **Contractor** in any manner which the **Employer** deems fit and the **Guarantor** shall not have the right to claim his release on account of any conduct alleged to be prejudicial to the **Guarantor**. Without derogating from the foregoing, any compromise, extension of the construction period, indulgence, release or variation of the **Contractor's** obligation shall not affect the validity of this guarantee.
7. The **Guarantor** reserves the right to withdraw from this guarantee at any time by depositing the amount guaranteed with the **Employer**, whereupon the **Guarantor's** liability ceases.
8. This guarantee is neither negotiable nor transferable, and
  - (a) must be surrendered to the **Guarantor** at the time when the **Employer** accounts to the **Guarantor** in terms of clause 5 above, or
  - (b) shall lapse in accordance with clause 2(d) above.
9. This guarantee shall not be interpreted as extending the **Guarantor's** liability to anything more than the payment of the amount guaranteed.

Signed at ..... on this ..... day of ..... 20.....

**AS WITNESS**

1. ....

2. ....

.....  
By and on behalf of

.....  
.....  
*(insert the name and physical address of the Guarantor)*

Name: .....

Capacity: .....  
*(Duly authorised thereto by resolution attached marked Annexure A)*

Date: .....



**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay

Contract: **SANBI G497/2023**

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- A. No alterations and/or additions of the wording of this form will be accepted.**
- B. The physical address of the Guarantor must be clearly indicated and will be regarded as the Guarantor's *domicilium citandi et executandi*, for all purposes arising from this guarantee.**
- C. This GUARANTEE must be returned to: .....**  
.....

**PART C: THE CONTRACT**  
**Part C1: Agreement and Contract Data**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

**C1.4 Occupational Health and Safety Agreement 37(2)**

**AGREEMENT MADE AND ENTERED INTO BETWEEN THE**  
**SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI)**  
(Hereinafter called the "**EMPLOYER**")

.....  
(Contractor / Mandatary / Company / CC Name)

**IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL HEALTH AND SAFETY ACT, ACT NO. 85 OF 1993 AS AMENDED**

I, ....., representing

....., as an Employer in its own right, do hereby undertake to ensure, as far as is reasonably practicable, that all work will be performed, and all equipment, machinery or plant used in such a manner as to comply with the provisions of the Occupational Health and Safety Act (OHSA) and the Regulations promulgated there under.

I furthermore confirm that I am / we are registered with the Compensation Commissioner and that all registration and assessment monies due to the Compensation Commissioner have been fully paid or that I / we are insured with an approved licensed compensation insurer.

COID ACT Registration Number: .....

Or Compensation Insurer: ..... Policy No.: .....

I undertake to appoint, where required, suitable competent persons, in writing, in terms of the requirements of OHSA and the Regulations and to charge him / them with the duty of ensuring that the provisions of OHSA and Regulations as well as the Council's Special Conditions of Contract, Way Leave, Lock-Out and Work Permit Procedures are adhered to as far as reasonably practicable.

I further undertake to ensure that any Sub-contractors employed by me will enter into an Occupational Health and Safety Agreement separately, and that such Sub-contractors comply with the conditions set.

I hereby declare that I have read and understand the appended Occupational Health and Safety Conditions and undertake to comply therewith at all times.

I hereby also undertake to comply with the Occupational Health and Safety Specification and Plan.

Signed at ..... this ..... day of ..... 20 .....

.....  
WITNESS

.....  
MANDATARY

Signed at ..... this ..... day of ..... 20 .....

.....  
WITNESS

.....  
FOR AND ON BEHALF OF THE EMPLOYER

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### **OCCUPATIONAL HEALTH AND SAFETY CONDITIONS**

1. The Chief Executive Officer of the Contractor shall assume the responsibility in terms of Section 16(1) of the Occupational Health and Safety Act (as amended). Should the Contractor assign any duty in terms of Section 16(2), a copy of such assignment shall immediately be provided to the representative of the Employer as defined in the Contract.
2. All work performed on the Employer's premises shall be performed under the supervision of the construction supervisor who understand the hazards associated with any work that the Contractor performs on the site in terms of Construction Regulations 2003.
3. The Contractor shall appoint a Competent Person who shall be trained on any occupational health and safety aspect pertaining to them or to the work that is to be performed.
4. The Contractor shall ensure that he familiarises himself with the requirements of the Occupational Health and Safety Act and that he, his employees, and any sub-contractors, comply with them.
5. Discipline in the interests of occupational health and safety shall be strictly enforced.
6. Personal protective equipment shall be issued by the Contractor as required and shall be worn at all times where necessary.
7. Written safe work procedures and appropriate precautionary measures shall be available and enforced, and all employees shall be made conversant with the contents of these practices.
8. No substandard equipment/machinery/articles or substances shall be used on the site.
9. All incidents referred to in terms of Section 24 of the Occupational Health and Safety Act shall be reported by the Contractor to the Department of Labour and the Employer.
10. The Employer hereby obtains an interest in the issue of any formal inquiry conducted in terms of Section 32 of the Occupational Health and Safety Act and into any incident involving a Contractor and/or his employees and/or his Sub-Contractor/s.
11. No use shall be made of any of the Employer's machinery / plant / equipment / substance / personal protective equipment or any other article without prior arrangement and written approval.
12. No alcohol or any other intoxicating substance shall be allowed on the site. Any person suspected of being under the influence of alcohol or any other intoxicating substance shall not be permitted access to, or allowed to remain on the site.
13. Prior to commencement of any work, verified copies of all documents mentioned in the agreement, must be presented to the Employer.

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

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**PART C: THE CONTRACT**  
**Part C2: Pricing Data and Bill of Quantities**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

**Page**

C2.1	Pricing Instructions	91
C2.2	Bill of Quantities	93

**PART C: THE CONTRACT**  
**Part C2: Pricing Instruction and Bill of Quantities**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

**C2.1 Pricing Instructions**

**1. GENERAL INFORMATION**

- a. Bills of Quantities  
The **bills of quantities** forms part of and must be read and priced in conjunction with all the other documents forming part of the **contract documents**, the Standard Conditions of Tender, Conditions of Contract, Specifications, Drawings, and all other relevant documentation.
- b. Value Added Tax  
The **contract sum** must include for Value Added Tax (VAT). All rates, provisional sums, etc. in the **bills of quantities** must however be net (exclusive of VAT) with VAT calculated and added to the total value thereof in the Final Summary.
- c. Fixed Price Contract  
Tenderers are to take note that contract price adjustments are not applicable to this contract. Tenderers should therefore make provision in the **contract sum**, schedule of rates, etc., for possible price increases during the contract period, as no claims in this regard shall be entertained.

**2. PRICING INFORMATION**

1. These schedules of quantities contain sequentially numbered pages as indicated in the contents list. Tenderers are required to check that the pages in their schedules of quantities are complete. If any pages are duplicated or omitted, or if any quantity or typing is unclear or if the schedules of quantities contain any obvious errors, the tenderer shall immediately notify the engineer so that the problem may be rectified. No responsibility for any errors arising from any of the above shall be accepted by the engineer.
2. The schedules of quantities form part of and shall be read in conjunction with the specification, which contains full description of the work required to be performed and the materials and equipment to be supplied and used in the execution of the works. Tenderers shall refer to the specification for the full meaning and description of work to be executed and materials and equipment to be supplied or used in the execution of the work.
3. Tenders shall be submitted with schedules of quantities completed in full. Non or partial completion of the schedules of quantities shall render tenders liable for disqualification.
4. The total tender price as carried forward to the tender form, after correction for arithmetic extension errors, etc. shall be the contract price as awarded to the successful tenderer. Tenderers are requested to check multiplication and addition of the schedules of quantities. The rate submitted shall be regarded as the price offered per item.
5. No changes, additions, or omissions to the contents of the schedules of quantities shall be permitted. If any changes, additions, or omissions are made these shall not be recognised and the original wording of the schedules of quantities shall apply.
6. The priced schedules of quantities of tender shall be checked by the principal agent. The principal agent reserves the right to request adjustments to one or more individual tender prices and to rectify contradictions and thereby alter the total tender price as submitted. The acceptance of this tender does not preclude the principal agent from querying or requesting of the contractor to adjust the rates at any stage during the contract period or any extension thereto.

7. The responsibility of the accuracy of the quantities included in the schedules, remains with the person who prepared the schedules. The tenderer is relieved from the responsibility of the measurement of quantities at tender stage and the tender amounts shall be for the quantities as listed in the schedules. It is however expected from the tenderer to include for minor construction items such as would be required for the complete execution of works in accordance with the specification.
8. The quantities in these schedules of quantities shall not be used for the ordering of materials.
9. Changes in the scope of works included in the schedule of quantities shall be permitted and shall be measured and priced at the tariffs as included in the schedules of quantities and shall form an addition to or omission from the total of the schedule of quantities. Any changes not covered by any rates in the schedules of quantities shall be agreed and priced as non-schedule items in accordance with the conditions of contract.
10. The extent and value of variations shall be in accordance with the conditions of contract. Variations to the works prior to the execution thereof shall be priced as above. Variations to work already executed shall not necessarily be priced in accordance with the schedule of quantities and shall be judged individually on merit.
11. Except where the separate rate for the material and labour components of any item is specifically called for, the unit price of such item shall be deemed to include the supply and installation of that item.

The description of any items shall, except where otherwise specified, allow for the purchase, delivery, off-loading, storage, packing, lifting, placing, positioning, and fixing in position, cutting and wastage, dies and patterns, models and equipment, temporary work, return of packing material, fixing costs, profit or other obligations of the contract arising out of the conditions of contract.

All items' prices shall exclude VAT but include any other tax or levy as applicable.

All items are measured to the net final quantity as indicated on the drawings with the completed work in the position as indicated on the drawing. All prices and rates shall allow for wastage for whatever reason, irrespective of any other standard measurement which may be currently used elsewhere.

12. Should the contractor identify any additional issues or items which in his opinion are necessary for the complete and proper execution of the works, he shall identify such items in a covering letter attached to his tender and submit rates for these items. Mistakes in the physical measurement of items in the schedules of quantities shall be rectified but no claim shall be considered for the non-measurement of doubtful or minor items or claims resulting of criticism of method of measurement used or descriptions given. The priced schedule of quantities shall not be adjusted on the grounds of the items which in the opinion of the tenderer should have been brought into account unless so detailed in the accompanying letter.
13. The schedule of quantities shall be adjusted to reflect the quantities of materials used on completion of whole or part of the works because of remeasurement, qualification or variations. The remeasured quantities shall form the basis for the calculation of payment certificates. The schedules of quantities are not intended for the ordering of materials, etc. and the contractor is advised to extract the quantities for the ordering of materials directly from the drawings and specification. Any order placed directly from the schedules of quantities shall be solely at the contractor's risk.
14. The unit rates as entered in the schedule of quantities with the exclusion of dayworks items shall in all cases include any present and applicable sales tax or similar statutory duties.

**South African National Biodiversity Institute**

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Contract: **SANBI G497/2023**

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**PART C: THE CONTRACT**  
**Part C2: Pricing Data and Bill of Quantities**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
<b>CONTRACT NO:</b>	<b>SANBI G497/2023</b>

**C2.2 Bill of Quantities**

Item No	Unit	Quantity	Rate	Amount
<b><u>SECTION NO. 1 - P&amp;G</u></b>				
<b><u>BILL NO. 1</u></b>				
<b><u>PRELIMINARIES &amp; GENERAL</u></b>				
<b><u>BUILDING AGREEMENT AND PRELIMINARIES</u></b>				
<b><u>PRELIMINARIES</u></b>				
<p>The JBCC Series 2000 Principal Building Agreement (July 2007 edition 5.0 - reprint 1) prepared by the Joint Building Contract Committee shall be the applicable building agreement, amended as hereinafter described</p> <p>The JBCC Principal Building Agreement Contract Data EC and the JBCC Principal Building Agreement Contract Data CE form an integral part of this agreement</p> <p>The ASAQS Preliminaries (November 2007 edition) published by the Association of South African Quantity Surveyors for use with the said JBCC Principal Building Agreement shall be deemed to be incorporated in these bills of quantities</p> <p>Contractors are referred to the above mentioned documents for the intent and meaning of each clause thereof</p> <p>These clauses are hereinafter referred to by clause number and heading only. Where standard clauses or alternatives are not entirely applicable to this contract such modifications, corrections or supplements as will apply are given under each relevant clause heading and such modifications, corrections or supplements shall take precedence notwithstanding anything contrary contained in the above mentioned documents</p> <p>Where any item is not relevant to this specific contract such item is marked N/A, signifying "not applicable"</p>				
<b>Carried Forward</b>			R	
Section No. 1 PRELIMINARIES & GENERAL Bill No. 1 Preliminaries & General				



<p style="text-align: right;"><b>Brought Forward</b></p> <p><b><u>PREAMBLES FOR TRADES</u></b></p> <p>The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained</p> <p>Supplementary preambles are incorporated in these bills of quantities to satisfy the requirements of this project. Such supplementary preambles shall take precedence over the provisions of the said Model Preambles</p> <p>The contractor's prices for all items throughout these bills of quantities must take account of and include for all of the obligations, requirements and specifications given in the said Model Preambles and in any supplementary preambles</p> <p><b><u>PRICING OF PRELIMINARIES</u></b></p> <p>Should the contractor select Option A in terms of subclause 3.2.1 in the Contract Data - Contractor to Employer (CE) for the purpose of adjustment of these preliminaries, the amount entered into the amount column in these preliminaries is to be divided into one or more of the three categories provided namely Fixed (F), Value Related (V) and Time Related (T)</p> <p>Items not priced in these Preliminaries shall be deemed to be included elsewhere in these Bills of Quantities</p> <p><b><u>SECTION A: JBCC PRINCIPAL BUILDING AGREEMENT</u></b></p> <p><u>Definitions (A1)</u></p> <p>Clause 1.0 - Definitions and interpretation The measuring system used for the preparation of the bills of quantities is the Standard System of Measuring Building Work (sixth edition, revised 1999) Published by the Association of South Africa Quantity Surveyors [1.1]</p> <p>F:..... V:..... T:.....</p>			R	
<p style="text-align: right;"><b>Carried Forward</b></p> <p>Section No. 1 PRELIMINARIES &amp; GENERAL Bill No. 1 Preliminaries &amp; General</p>		Item	R	

<b>Brought Forward</b>		<b>R</b>	
<u>Objective and preparations (A2 - A14)</u>			
Clause 2.0 - Offer acceptance and performance obligations			
F:..... V:..... T:.....	Item		
Clause 3.0 - Documents			
Refer to Annexure A for a list of the contract drawings			
Provision is made in the summary page of these bills of quantities for the inclusion of Value Added Tax (VAT) [3.5]			
The principal agent shall decide which portion of the priced document may be used as a specification of materials and goods or methods, if any [3.9]			
F:..... V:..... T:.....	Item		
Clause 4.0 - Design responsibility			
F:..... V:..... T:.....	Item		
Clause 5.0 - Employer's agents			
F:..... V:..... T:.....	Item		
Clause 6.0 - Contractor's site representative			
F:..... V:..... T:.....	Item		
Clause 7.0 - Compliance with laws and regulations Without limiting the generally of the provisions of clause 7.0, the contractor's attention is drawn to the provisions of the Construction Regulations, 2003 issued in terms of the Occupational Health and Safety Act, 1993. It is specifically stated that the employer shall prepare a document health and safety specification for the works and that the employer shall ensure that the contract has made provision for the cost health and safety measures during the execution of the works. The contractor shall price opposite this item for compliance with the act and the regulations and the reasonable provisions of the aforementioned health and safety specification [7.1]			
F:..... V:..... T:.....	Item		
<b>Carried Forward</b>		<b>R</b>	
Section No. 1 PRELIMINARIES & GENERAL Bill No. 1 Preliminaries & General			

**SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE  
HAROLD PORTER GARDEN - ADDITIONS & ALTERATIONS  
NOV 2023**

Brought Forward		R
Clause 8.0 - Works risk		
F:..... V:..... T:.....	Item	
Clause 9.0 - Indemnities		
F:..... V:..... T:.....	Item	
Clause 10.0 - General insurances		
F:..... V:..... T:.....	Item	
Clause 11.0 - Special insurances		
F:..... V:..... T:.....	Item	
Clause 12.0 - Effecting insurances		
F:..... V:..... T:.....	Item	
Clause 13.0 - Assignment		
F:..... V:..... T:.....	Item	
Clause 14.0 - Security		
F:..... V:..... T:.....	Item	
<u>Execution (A15 - A23)</u>		
Clause 15.0 - Preparation for and execution of the works		
F:..... V:..... T:.....	Item	
Clause 16.0 - Site and access		
F:..... V:..... T:.....	Item	
Clause 17.0 - Contract instructions		
F:..... V:..... T:.....	Item	
Carried Forward		R
Section No. 1 PRELIMINARIES & GENERAL Bill No. 1 Preliminaries & General		

<b>Brought Forward</b>			R
<p>Clause 18.0 - Setting out of the works</p> <p>The contractor shall notify the principal agent if any encroachments of adjoining foundations, buildings, structures, pavements, boundaries, etc. exist in order that the necessary arrangements may be made for the rectification of any such encroachments.</p> <p>F:..... V:..... T:.....</p>	Item		
<p>Clause 19.0 - Temporary works and plant</p> <p>Subclause 19.1.1 - Enclosure of the works</p> <p>Subclause 19.1.2 - Office accommodation</p> <p>F:..... V:..... T:.....</p>	Item		
<p>Clause 19.1.2 - Office accommodation - provide suitable office accommodation for site meetings with tables and chairs for people</p> <p>F:..... V:..... T:.....</p>	Item		
<p>Clause 20.0 - Nominated subcontractors</p> <p>F:..... V:..... T:.....</p>	Item		
<p>Clause 21.0 - Selected subcontractors</p> <p>General attendance of n/s subcontractors for pricing by the contractor shall be in accordance with the n/s agreement. notwithstanding this provision, general attendance shall be deemed to include for the contractor to provide free of charge to any n/s subcontractor such scaffolding as many reasonably be required by such n/s subcontractor for the</p> <p>F:..... V:..... T:.....</p>	Item		
<p>Clause 22.0 - Employer's direct contractors</p> <p>F:..... V:..... T:.....</p>	Item		
<b>Carried Forward</b>			R
<p>Section No. 1</p> <p>PRELIMINARIES &amp; GENERAL</p> <p>Bill No. 1</p> <p>Preliminaries &amp; General</p>			

Brought Forward		R
<p>Clause 23.0 - Contractor's domestic subcontractors</p> <p>F:..... V:..... T:.....</p> <p><u>Completion (A24 - A30)</u></p> <p>Clause 24.0 - Practical completion</p> <p>F:..... V:..... T:.....</p> <p>Clause 25.0 - Works completion</p> <p>F:..... V:..... T:.....</p> <p>Clause 26.0 - Final completion</p> <p>F:..... V:..... T:.....</p> <p>Clause 27.0 - Latent defects liability period</p> <p>F:..... V:..... T:.....</p> <p>Clause 28.0 - Sectional completion</p> <p>F:..... V:..... T:.....</p> <p>Clause 29.0 - Revision of date for practical completion The removal and replacement of materials and/or workmanship which do not conform to specification or drawing shall not constitute grounds for the extension of the construction period nor for the adjustment of the contract value (Clause 29.3)</p> <p>F:..... V:..... T:.....</p> <p>Clause 30.0 - Penalty for late or non-completion: 0.04% of the Contract Amount inclusive of Value Added Tax per Calendar day</p> <p>F:..... V:..... T:.....</p>	<p>Item</p> <p>Item</p> <p>Item</p> <p>Item</p> <p>Item</p> <p>Item</p> <p>Item</p>	
Carried Forward		R
<p>Section No. 1 PRELIMINARIES &amp; GENERAL Bill No. 1 Preliminaries &amp; General</p>		

Brought Forward		R
<p><u>Payment (A31 - A35)</u></p> <p>Clause 31.0 - Interim payment</p> <p>Materials and goods stored off site shall not be included in the amount authorised for payment [31.6.5]</p> <p>F:..... V:..... T:.....</p> <p>Clause 32.0 - Adjustment to the contract value</p> <p>All fluctuations in costs, with the exception of fluctuations in the rate of Value Added Tax, shall be for the account of the contractor.</p> <p>Where prices are submitted by the contractor or n/s subcontractor during the progress of the works in respect of contract instructions or in regard to a claim under the terms of the contract and notwithstanding the fact that such prices may be used in an interim payment certificate, there is to be no presumption of acceptance. Should the principal agent wish to accept any such prices prior to the issue of the final payment certificate, it shall be in writing</p> <p>The contractor shall not receive any mark-up for overheads and profit on any omission of tenant installation work or tenant installation work by others. Claims for loss of profit shall not be entertained [32.2]</p> <p>F:..... V:..... T:.....</p> <p>Clause 33.0 - Recovery of expense and loss</p> <p>F:..... V:..... T:.....</p> <p>Clause 34.0 - Final account and final payment</p> <p>F:..... V:..... T:.....</p> <p>Clause 35.0 - Payment to other parties</p> <p>F:..... V:..... T:.....</p>	<p>Item</p> <p>Item</p> <p>Item</p> <p>Item</p>	
Carried Forward		R
<p>Section No. 1</p> <p>PRELIMINARIES &amp; GENERAL</p> <p>Bill No. 1</p> <p>Preliminaries &amp; General</p>		

	<b>Brought Forward</b>		<b>R</b>
<u>Termination (A36 - A39)</u>			
Clause 36.0 - Termination by employer - contractor's default F:..... V:..... T:.....		Item	
Clause 37.0 - Termination by employer - loss and damage F:..... V:..... T:.....		Item	
Clause 38.0 - Termination by contractor - employer's default F:..... V:..... T:.....		Item	
Clause 39.0 - Termination - cessation of the works F:..... V:..... T:.....		Item	
<u>Dispute (A40)</u>			
Clause 40.0 - Settlement of disputes F:..... V:..... T:.....		Item	
<u>Contract variables (A41 - A42)</u>			
Clause 41.0 - Post tender provisions  The contractor is to complete and submit with his tender the JBCC Principal Building Agreement Contract Data CE F:..... V:..... T:.....		Item	
Clause 42.0 - Contractual agreement The required information of the parties and the amount of the contract sum shall be inserted in the agreement for signature of the agreement by the parties F:..... V:..... T:.....		Item	
<b><u>SECTION B - PRELIMINARIES</u></b>			
<b>Carried Forward</b>			<b>R</b>
Section No. 1 PRELIMINARIES & GENERAL Bill No. 1 Preliminaries & General			

	<b>Brought Forward</b>			<b>R</b>	
	<u>Definitions and interpretation (B1)</u>				
1	Clause 1.0 - Definitions and interpretation				
	F:..... V:..... T:.....	Item			
	<u>Documents (B2)</u>				
	Clause 2.1 - Checking of documents				
	F:..... V:..... T:.....	Item			
	Clause 2.2 - Provisional bills of quantities				
	F:..... V:..... T:.....	Item			
	Clause 2.3 - Availability of construction documentation				
	The budgetary allowances and selected (nominated) subcontract amounts allocated for subsequent trades included in this document will be separately procured, based on multiple procurement of selected (nominated) subcontractors during the construction period				
	F:..... V:..... T:.....	Item			
	<u>Previous work and adjoining properties (B3)</u>				
	Clause 3.1 - Previous work - dimensional accuracy				
	F:..... V:..... T:.....	Item			
	Clause 3.2 - Previous work - defects				
	F:..... V:..... T:.....	Item			
	Clause 3.3 - Inspection of adjoining properties				
	F:..... V:..... T:.....	Item			
	<u>Samples, shop drawings and manufacturer's instructions (B4)</u>				
	Clause 4.1 - Samples of materials				
	F:..... V:..... T:.....	Item			
	<b>Carried Forward</b>			<b>R</b>	
	Section No. 1				
	PRELIMINARIES & GENERAL				
	Bill No. 1				
	Preliminaries & General				



Brought Forward		R
<p>Clause 4.2 - Workmanship samples</p> <p>F:..... V:..... T:.....</p> <p>Clause 4.3 - Shop drawings</p> <p>F:..... V:..... T:.....</p> <p>Clause 4.4 - Compliance with manufacturer's instructions</p> <p>F:..... V:..... T:.....</p> <p><u>Deposits and fees (B5)</u></p> <p>Clause 5.1 - Deposits and fees</p> <p>F:..... V:..... T:.....</p> <p><u>Temporary services (B6)</u></p> <p>Clause 6.1 - Water</p> <p>F:..... V:..... T:.....</p> <p>Clause 6.2 - Electricity</p> <p>F:..... V:..... T:.....</p> <p>Clause 6.3 - Telecommunication facilities</p> <p>F:..... V:..... T:.....</p> <p>Clause 6.4 - Ablution facilities</p> <p>F:..... V:..... T:.....</p> <p><u>Prime cost amounts (B7)</u></p> <p>Clause 7.1 - Responsibility for prime cost amounts</p> <p>F:..... V:..... T:.....</p>	<p>Item</p> <p>Item</p> <p>Item</p> <p>Item</p> <p>Item</p> <p>Item</p> <p>Item</p> <p>Item</p> <p>Item</p>	
Carried Forward		R
<p>Section No. 1</p> <p>PRELIMINARIES &amp; GENERAL</p> <p>Bill No. 1</p> <p>Preliminaries &amp; General</p>		

<b>Brought Forward</b>			R
<u>Special attendance on n/s subcontractors (B8)</u>			
Clause 8.1 - Special attendance			
Insert details against this clause or where provisional sums are stated for any special attendance where specifically required for each n/s subcontractor separately			
F:..... V:..... T:.....	Item		
<u>General (B9)</u>			
Clause 9.1 - Protection of the works			
F:..... V:..... T:.....	Item		
Clause 9.2 - Protection/isolation of existing/sectionally occupied works			
Certain areas of the site will be occupied during the construction period			
F:..... V:..... T:.....	Item		
Clause 9.3 - Security of the works			
F:..... V:..... T:.....	Item		
Clause 9.4 - Notice before covering work			
F:..... V:..... T:.....	Item		
Clause 9.5 - Disturbance			
F:..... V:..... T:.....	Item		
Clause 9.6 - Environmental disturbance			
F:..... V:..... T:.....	Item		
Clause 9.7 - Works cleaning and clearing			
F:..... V:..... T:.....	Item		
Clause 9.8 - Vermin			
F:..... V:..... T:.....	Item		
<b>Carried Forward</b>			R
Section No. 1			
PRELIMINARIES & GENERAL			
Bill No. 1			
Preliminaries & General			

<b>Brought Forward</b>			<b>R</b>
Clause 9.9 - Overhand work			
F:..... V:..... T:.....	Item		
<u>Schedule of variables (B10)</u>			
This schedule contains all variables referred to in this document and is divided into pre-tender and post-tender categories. The pre-tender category must be completed in full and included in the tender documents. Both the pre-tender and post-tender categories form part of these Preliminaries			
<b>PRE-TENDER INFORMATION</b>			
<i>Refer to Contract Data</i>			
<b>POST-TENDER INFORMATION</b>			
<i>Refer to Contract Data</i>			
F:..... V:..... T:.....	Item		
<b><u>SECTION C - SPECIFIC PRELIMINARIES</u></b>			
Section C contains specific preliminary items which apply to this contract except where N/A (Not Applicable) appears against an item			
<u>Contract Drawings</u>			
The drawings issued with the tender documents do not comprise the complete set but serve as a guide only for tendering purposes and for indicating the scope of the work to enable the tenderer to acquaint himself with the nature and extent of the works and the manner in which they are to be executed			
Should any part of the drawings not be clearly understood by the tenderer he shall, before submitting his tender, obtain clarification in writing from the principal agent			
F:..... V:..... T:.....	Item		
<b>Carried Forward</b>		<b>R</b>	
Section No. 1 PRELIMINARIES & GENERAL Bill No. 1 Preliminaries & General			

<b>Brought Forward</b>			<b>R</b>
<p><u>Preambles</u></p> <p>The Specifications shall be read in conjunction with the bills of quantities / lump sum document and be referred to for the full descriptions of work to be done and materials to be used</p> <p>The specifications are issued and shall be read in conjunction with the drawings and the bills of quantities / lump sum document</p> <p>F:..... V:..... T:.....</p> <p><u>Trade Names</u></p> <p>Wherever a trade name for any product has been described in the bills of quantities / lump sum document, the tenderer's attention is drawn to the fact that any other product of equal quality may be used subject to the written approval of the principal agent being obtained prior to the closing date for submission of tenders</p> <p>If prior written approval for an alternative product is not obtained, the product described shall be deemed to have been tendered for</p> <p>F:..... V:..... T:.....</p> <p><u>Imported Materials &amp; Equipment</u></p> <p>The drawings issued with the tender documents do not comprise the complete set but serve as a guide only for tendering purposes and for indicating the scope of the work to enable the tenderer to acquaint himself with the nature and extent of the works and the manner in which they are to be executed</p> <p>Should any part of the drawings not be clearly understood by the tenderer he shall, before submitting his tender, obtain clarification in writing from the principal agent</p> <p>F:..... V:..... T:.....</p>	Item		
	Item		
	Item		
<b>Carried Forward</b>			<b>R</b>
<p>Section No. 1 PRELIMINARIES &amp; GENERAL Bill No. 1 Preliminaries &amp; General</p>			

<b>Brought Forward</b>			R
<p><u>Occupational Health and Safety Specification</u></p> <p>The contractor shall comply with all the requirements set out in the Construction Regulations 2003 issued under the Occupational Health and Safety Act. 1993 (Act No 85 of 1993)</p> <p>It is required of the contractor to thoroughly study the Health and Safety Specification that must be read together with and is deemed to be incorporated under this Section of the bills if quantities/ lump sum document.</p> <p>The contractor must take note that compliance with the Occupational Health and Safety Act, Construction Regulations and Health and Safety Specification is compulsory. In the event of partial or total non-compliance, the principal agent, notwithstanding the provisions of clause A31.0 of Section A or any other clause to the contrary, reserves the right to delay issuing any progress payment certificate until the contractor provides satisfactory proof of compliance. The contractor shall not be entitled to any compensation of whatsoever nature, including extension of time or interest, due to such delay of payment.</p> <p>Provisions for pricing of the Occupational Health and Safety Act, Construction Regulations and Health and Safety Specification is made under this clause and it is explicitly pointed out that all requirements of the aforementioned are deemed to be priced hereunder and no additional claims in this regard shall be entertained.</p> <p>F:..... V:..... T:.....</p> <p>Preparation of Health and Safety Plan. Implementation and maintenance of Health and Safety Plan</p> <p>F:..... V:..... T:.....</p> <p>Health and Safety Training. Implementation and maintenance of Training</p> <p>F:..... V:..... T:.....</p>		Item	
		Item	
		Item	
<b>Carried Forward</b>			R
<p>Section No. 1 PRELIMINARIES &amp; GENERAL Bill No. 1 Preliminaries &amp; General</p>			

<b>Brought Forward</b>			<b>R</b>	
Personal Protective Clothing and equipment. Maintenance of Personal Protective Clothing and Equipment  F:..... V:..... T:.....		Item		
Fences, Signs and Barricades. Maintenance of Fence, Signs and Barricades  F:..... V:..... T:.....		Item		
Establishment of Safety Administration. Implementation and maintenance of Safety Administration  F:..... V:..... T:.....		Item		
Other Health and Safety Fixed-charge Obligations. Other Health and Safety Time-Related Obligations  F:..... V:..... T:.....		Item		
<b>Carried to Final Summary</b>			<b>R</b>	
Section No. 1 PRELIMINARIES & GENERAL Bill No. 1 Preliminaries & General				

Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 2 - MAIN HOUSE</u></b>				
	<b><u>BILL NO. 1</u></b>				
	<b><u>ALTERATIONS</u></b>				
	<u>Standard Preambles</u>				
	The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
	<u>View site</u>				
	Before submitting his tender the tenderer shall visit the site and satisfy himself as to the nature and extent of the work to be done and the value of the materials salvageable from the alterations. No claim for any variations of the contract sum in respect of the nature and extent of the work or of inferior or damaged materials will be entertained				
	<u>General</u>				
	The contractor shall carry out the whole of the works with as little mess and noise as possible and with a minimum of disturbance to tenants in the building and to adjoining premises and their tenants. He shall provide proper protection and provide, erect and remove when directed, any temporary tarpaulins that may be necessary during the progress of the works, all to the satisfaction of the principal agent				
	The Contractor will be held solely responsible for checking all floor levels and dimensions in the existing building in order that the new extensions may be correctly lined up. Should any discrepancies be found in the Architect's drawings he should be asked for a decision before continuing with the work				
	<b>Carried Forward</b>			R	
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 1 Alterations				

<p style="text-align: right;"><b>Brought Forward</b></p> <p>The Contractor will be held solely responsible for any damage to persons and property, for the safety of the new and existing structure throughout the whole of the contract and must make good, at his own expense, any damage that may occur</p> <p>The Contractor shall not remove or interfere with any furniture, fittings or similar articles unless specially mentioned in the following items and shall give adequate notice to the Representative/Agent if the removal of any such articles from parts of the buildings are to be altered becomes necessary so that the Employer may have same removed before the Contractor commences work in such parts</p> <p>All demolitions and works on site must be carried out carefully and in the safest possible manner and the Contractor is to make a thorough examination and take all necessary precautions before proceeding with the work. The utmost care is to be observed to avoid any structural or other damage in the remaining portions of the existing building</p> <p>Special care is to be exercised not to interfere with any electrical installation, and notice is to be given to the Representative/Agent when any disconnections, removal of wire, etc., are necessary and the Contractor is to afford every facility to the workmen carrying out his work</p> <p>Allow for giving notice to local or other authorities for disconnecting electric light, water and drainage mains and removing telephone wires, etc., and pay all fees in connection therewith and afford every facility to the workmen carrying out this work</p> <p>The Contractor shall immediately notify the Representative/Agent and the Authorities concerned and shall at his own cost make all necessary arrangements for disconnection and repairs with the relevant Authorities and shall pay all fees and charges levied</p> <p>Doors, fanlights, windows, fittings, frames, linings, etc which are to remain the property of the employer shall be carefully taken out, temporarily stored, transported over a distance of approximately 50km to store and handed over to the employer</p>			R	
<p style="text-align: right;"><b>Carried Forward</b></p> <p>Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 1 Alterations</p>			R	



<p style="text-align: right;"><b>Brought Forward</b></p> <p>Doors, fanlights, windows, fittings, frames, linings, etc which are to be re-used shall be thoroughly overhauled before refixing including taking off, easing and rehanging, cramping up, re-wedging as required and making good cramps, dowels, etc, and oiling, adjusting and repairing ironmongery as necessary, replacing any glass damaged in removal or subsequently and stopping up all nail and screw holes with tinted plastic wood to match timber, unless otherwise described. Re-painting or re-varnishing is given separately</p> <p>Prices for taking out of doors, windows, etc shall include for removal of all beads, architraves, ironmongery, etc</p> <p>Prices for taking out and removing doors and frames shall include for removing door stops, cabin hooks, etc</p> <p>Existing sheets and rainwater goods, eaves and verges must be comprehensively protected against damage. No walking directly on the roof sheets will be allowed and rates for all work are to include for protective timber board gangways or similar approved</p> <p>With regard to building up of openings in existing walls, cement screeds and pavings, granolithic, tops of walls, etc, shall be levelled and prepared for raising of brickwork</p> <p>Making good of finishes shall include making good of the brick and concrete surfaces onto which the new finishes are applied, where necessary</p> <p>Erect a safety net to stop spillage from falling onto the ground when cleaning the roof sheets</p> <p>All residue from cleaning the roofs to be collected in drums/skips and be disposed of as builders rubble</p> <p>Fix an impact resistant transparent hood over high pressure spray</p> <p>The contractor will be required to take all dimensions affecting the existing buildings on the site and he will be held solely responsible for the accuracy of all such dimensions where used in the manufacture of new items (doors, windows, fittings, etc)</p>			<p style="text-align: right;">R</p>	
<p style="text-align: right;"><b>Carried Forward</b></p> <p>Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 1 Alterations</p>			<p style="text-align: right;">R</p>	

Brought Forward			R
<p>Should the Contractor damage any services which are to remain in operation or any services which have not yet been disconnected prior to removal, then the Contractor will be held solely responsible for such damage and any further resultant damage</p> <p>Allow for keeping area of the works, where the roof has been removed, weatherproof by means of tarpaulins, etc. for the entire period that the area is without a permanent weatherproof roof covering. The cost of all repairs consequential upon the contractor failing to comply with the requirement will be for the contractor's sole account</p> <p><b><u>REMOVAL OF ASBESTOS</u></b></p> <p><u>Asbestos removal and disposal</u></p> <p>Asbestos removal and disposal must be done by an registered Asbestos Contractor with the Department of Labour</p> <p>The removal and disposal of asbestos must be done strictly in accordance with the Occupational Health and Safety Act, 1003, Draft Asbestos Abatement Regulations</p> <p>Erect a safety net to stop spillage from falling onto the ground when cleaning the roof sheets.</p> <p>Prices for taking out and removing asbestos shall include for safe removal of asbestos products contaminated debris and the safe transporting and dumping of asbestos material to an approved dumping site including any statutory charges therein</p>			
1	Gutters or downpipe not exceeding 500mm girth	m	45
<p><b><u>REMOVAL OF EXISTING WORK</u></b></p> <p><u>Breaking down and removing brickwork etc</u></p>			
2	Various widths of brick walls (converted to cubic metres)	m3	12
Carried Forward			R
<p>Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 1 Alterations</p>			

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Brought Forward			R
	<u>Taking out and removing doors, windows, etc from brickwork to be demolished</u>		
3	Timber or steel single or double door or roller shutter door including frames not exceeding 2,5m <sup>2</sup>	No	1
4	Glazed timber, steel or aluminium window not exceeding 2,5m <sup>2</sup>	No	1
	<u>Taking out and removing doors, windows, etc, including thresholds, sills, etc from brickwork (closing up openings and making good finishes elsewhere)</u>		
5	Timber or steel single or double door or roller shutter door including frames not exceeding 2,5m <sup>2</sup>	No	6
6	Glazed timber, steel or aluminium window not exceeding 2,5m <sup>2</sup>	No	3
7	Ditto, exceeding 2,5m <sup>2</sup> and not exceeding 5m <sup>2</sup>	No	1
	<u>Cut out steel window sections only leaving the external frame and prepare for new aluminium window to be fitted into existing opening (new window and making good plaster and paintwork to reveals elsewhere)</u>		
8	Window opening not exceeding 1m <sup>2</sup>	No	4
9	Ditto, exceeding 1m <sup>2</sup> and not exceeding 2m <sup>2</sup>	No	4
	<u>Taking down and removing roofs, floors, panelling, ceilings, partitions, etc</u>		
10	Concrete or clay tiles and including battens	m2	28
11	Profiled or profiled concealed fix fibre cement, metal or translucent sheet roof covering or side cladding only	m2	27
12	Fascias and barge boards not exceeding 300mm high overall	m	20
13	Tongued and grooved, plasterboard or fibre cement ceilings, including insulation, timber brandering and cornices	m2	12
Carried Forward			R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 1 Alterations			

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Brought Forward			R
	<u>Taking up and removing wood block floor coverings, vinyl floor coverings, carpets, etc and preparing screeds for new floor coverings</u>		
14	Vinyl tile floor covering	m2	7
	<u>Taking out and removing ironmongery</u>		
15	Pressed steel pelmets, including single or double curtain track or single or double curtain track including brackets, etc from wall	m	8
16	Door ironmongery, hinge, barrel bolts, flush bolts, mortice locks, rebated mortice locks, door handles, signage, push or kick plates and coat hangers from timber door	No	2
17	Bathroom cabinet from wall	No	1
18	Roll-up/ roman/ venetian or vertical blinds from wall not exceeding 2,5m <sup>2</sup> overall	No	8
	<u>Taking out and removing ironmongery, setting aside for re-use and later refixing in similar new position (rate should include for refixing)</u>		
19	Door ironmongery, hinge, barrel bolts, door handles, signage, push or kick plates and coat hangers from timber door	No	2
	<u>Hacking up/off and removing granolithic, screeds, plaster, etc from concrete or brickwork and preparing surfaces for new screed, plaster, tile finishes, etc</u>		
20	Internal or external plaster from walls and columns	m2	94
	<u>Hacking up/off and removing ceramic tiles including removing mortar bed or adhesive from concrete or brickwork and preparing surfaces for new screed, plaster, tile finish, etc</u>		
21	Tiles and tile adhesive including plaster to walls average not exceeding 40mm thick and prepare for new	m2	18
Carried Forward			R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 1 Alterations			

Brought Forward			R
	<u>Taking out and removing sanitary fittings, tanks, geysers, etc, including disconnecting from pipes, traps, etc and making good floor and wall finishes (making good tiling and paintwork elsewhere)</u>		
22	Vitreous china wash hand basin, taps, waste and trap	No	1
23	Acrylic or cast iron bath, taps, waste and trap	No	1
	<u>Taking out/off and removing glass and mirrors</u>		
24	Mirror not exceeding 0,5m² from wall	No	1
<b><u>CUTTING THROUGH FLOORS AND CEILINGS</u></b>			
	<u>Cutting through</u>		
25	Not exceeding 150mm thick concrete surface bed for exceeding 500mm not exceeding 800mm wide concrete wall footings and making good concrete on both sides of not exceeding 280mm brick walls (making good floor finishes elsewhere)	m	5
<b><u>BUILDING UP OR ADJUSTING EXISTING OPENINGS OR FORMING NEW OPENINGS THROUGH EXISTING WALLS ETC</u></b>			
	<u>Breaking down and removing brickwork etc to form new opening or adjust existing opening</u>		
26	One brick walls	m2	4
27	270mm Hollow walls of two half brick skins	m2	2
28	Cut brick wall not exceeding 100mm deep with angle grinder before demolishing brickwork to form new opening or adjusting existing opening	m	10
<b><u>MASONRY</u></b>			
	<u>Brickwork in NFP bricks in class II mortar in building up openings or adjusting opening size</u>		
29	One brick walls	m2	4
30	280mm Hollow walls of two half brick skins	m2	4
Carried Forward			R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 1 Alterations			

Brought Forward			R
	<u>Sundries</u>		
31	Cutting toothing and bonding new brickwork to existing	m2	6
	<b><u>ROOF COVERING, ETC</u></b>		
	<u>Service and make good existing roof covering and accessories, inspect, service, replace broken tiles or sheeting in isolated areas with matching new, fix all loose screws and replace all missing screws, etc. all to match existing, and leave roof watertight and in fully functional state (new tiles and sheeting elsewhere)</u>		
32	Concrete or clay tiles in roof covering	m2	282
	<b><u>CARPENTRY &amp; JOINERY</u></b>		
	<u>Replace sawn softwood grade S5, including taking old</u>		
33	50 x 76mm Purlin	m	11
	<b><u>CEILINGS, PARTITIONS &amp; ACCESS FLOORING</u></b>		
	<u>Making good 6,4mm gypsum plasterboard ceilings and timber brandering</u>		
34	Ceilings in patches, including taking out existing	m2	10
	<b><u>FLOOR COVERINGS, WALL LININGS, ETC</u></b>		
	<b>Preparatory work to surfaces of existing floors all in accordance with the manufacturer's specifications</b>		
	<u>Making good defect in existing screeded floor with "Floorworx Pavelite" or equal approved system after existing surface has been primed with "Floorworx Pavelite Bond" all as per the manufacturers instructions to receive new carpet or vinyl tiling or sheeting (carpets, vinyl tiles or sheeting elsewhere)</u>		
35	On floors (2,5mm)	m2	7
	<b><u>PLASTERING</u></b>		
	<b>Carried Forward</b>		R
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 1 Alterations		

	Brought Forward			R
	<u>Making good internal cement plaster</u>			
36	On walls in patches including hacking off and removing existing plaster	m	50	
37	On narrow widths not exceeding 300mm wide	m2	24	
	<u>External cement plaster wood floated, on brickwork</u>			
38	On walls in patches including hacking off and removing existing plaster	m2	15	
39	On narrow widths not exceeding 300mm wide	m2	16	
40	On sloping top, front edge and projecting soffits of sills 250mm girth	m	11	
	<b><u>CLEAN DOWN SURFACES</u></b>			
	<b><u>ROOF COVERING, ETC.</u></b>			
	<u>Water-jetting existing roof surfaces, etc with high pressure low-volume water jetting lance to remove all dirt, brush down and wash to remove surface contamination, brush down areas of mould, fungus and damp and treat with two coats of anti fungal wash and leave perfectly clean on completion</u>			
41	Concrete or clay tiles in roof covering	m2	282	
	<b><u>SERVICING WINDOWS, DOORS, PLUMBING, ETC</u></b>			
	<u>Clean, adjust and replace damaged or missing screws for timber door and frame hardware</u>			
42	Steel, brass or aluminium door handle	No	5	
	<u>Clean, lubricate, service, adjust and replace damaged or missing screws for timber door and frame hardware</u>			
43	Steel, brass or aluminium butt hinges	No	6	
44	Mortice lockset with handles with roses or back plate, escutcheon plates, striking plate and including supplying two keys	No	4	
	<b>Carried Forward</b>			R
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 1 Alterations			

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	Brought Forward			R
45	Cylinder rebated lockset with handles with roses or back plate, escutcheon plates, striking plate and including supplying two keys	No	2	
	<u>Minor servicing, thoroughly cleaning down of all dirt, scale and general contamination from all surfaces, repairing and re-aligning as necessary existing sanitary fittings, etc and leaving in complete working order including flushing trap, fit new plug and chains, replace tap washers, fixing all leaks, replacing defective parts and seal with silicone sealant all around on completion sanitary fittings, etc</u>			
46	Stainless steel double bowl sink, double compartment washtrough, four taps or mixer, two wastes and combination trap or two traps	No	1	
47	Vitreous china wash hand basin, two taps or basin mixer, waste and trap	No	1	
48	Vitreous china WC pan with cistern and flush pipe	No	2	
49	Shower rose including arm	No	1	
50	Under tile shower mixer	No	1	
	<u>Sundries</u>			
51	Service, clean and replace washer to pillar tap, bib tap or stopcock.	No	1	
<b>Carried Forward to Summary of Section No. 2</b>				R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 1 Alterations				



Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 2 - MAIN HOUSE</u></b>				
	<b><u>BILL NO. 2</u></b>				
	<b><u>EARTHWORKS</u></b>				
	<u>Standard Preambles</u>				
	The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
	<u>Nature of ground</u>				
	The nature of the ground is unknown and the contractor is to make his own assessment and due allowance for same				
	<u>Subterranean water</u>				
	The nature of the ground is unknown and the contractor is to make his own assessment and due allowance for same				
	<u>Carting away of excavated material</u>				
	Descriptions of carting away of excavated material shall be deemed to include loading excavated material onto trucks directly from the excavations or, alternatively, from stock piles situated on the building site				
	<u>Filling and layer work materials</u>				
	References such as "G1", "G2", etc and "C1", "C2", etc in descriptions of filling and layer work materials refer to corresponding references in the document "Guidelines for Road Construction Materials. TRH 14 : 1985" compiled by the Committee of State Road Authorities and the properties set out therein for each kind shall be applicable to the respective materials described hereinafter				
	<b>Carried Forward</b>			R	
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 2 Earthworks				

Brought Forward				R
<u>Testing</u>				
Prices for filling are to include for all necessary density and other tests				
<u>Formwork</u>				
Formwork to sides of footings, bases, pile caps, ground beams, etc. will only be measured where it is prescribed by the engineer for design reasons. Formwork necessitated by irregularity or collapse of excavated faces will not be measured and the cost thereof shall be deemed to be included in the allowance for taking the risk of collapse of the sides of the excavations				
<b><u>SITE CLEARANCE</u></b>				
<u>Site clearance</u>				
1	Digging up and removing rubbish, debris, vegetation, hedges, shrubs, bush, etc and trees not exceeding 200mm girth	m2	177	
<b><u>EXCAVATION, FILLING, ETC OTHER THAN BULK</u></b>				
<b><u>EXCAVATIONS ETC</u></b>				
<u>Excavation in earth not exceeding 2m deep</u>				
2	Reduced levels under floors	m3	10	
3	Trenches	m3	26	
4	Thickening under surface beds etc	m3	6	
<u>Extra over trench and hole excavations in earth for excavation in</u>				
5	Soft rock	m3	3	
6	Hard rock	m3	2	
<u>Extra over trench and hole excavations in earth for breaking up and removing</u>				
7	Brickwork	m3	3	
Carried Forward				R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 2 Earthworks				

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	Brought Forward		R
8	Unreinforced concrete	m3	2
	<u>Extra over all excavations for carting away</u>		
9	Surplus material from excavations and/or stock piles on site to a dumping site situated not exceeding 5km from the building site	m3	18
	<u>Risk of collapse of excavations</u>		
10	Sides of trench and hole excavations not exceeding 1,5m deep	m2	66
	<u>Keeping excavations free of water</u>		
11	Keeping excavations free of all water other than subterranean water	Item	
	<b><u>FILLING ETC</u></b>		
	<u>Selected earth filling obtained from the excavations and/or prescribed stock piles on site, compacted to 95% Mod AASHTO density</u>		
12	Under floors, steps, pavings, etc	m3	10
13	Backfilling to trenches, holes, etc	m3	12
	<u>Filling of coarse river sand supplied by the contractor, consolidated</u>		
14	Under floors etc	m3	3
	<u>Filling of natural gravel material (G5) supplied by the contractor, compacted to 98% Mod AASHTO density</u>		
15	Under floors, steps, pavings, etc	m3	10
	<u>Compaction of ground surfaces</u>		
16	Compaction of natural or excavated ground surface under floors etc, including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 98% Mod AASHTO density	m2	115
	<b><u>WEED KILLERS, INSECTICIDES, ETC</u></b>		
	<b>Carried Forward</b>		R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 2 Earthworks			

Brought Forward			R
<u>Soil insecticide in accordance with SANS 5859</u>			
17	Under floors etc, including forming and poisoning shallow furrows against foundation walls etc, filling in furrows and ramming	m2	143
18	To bottoms and sides of trenches etc	m2	95
<b><u>TESTS</u></b>			
<u>Prescribed tests to determine degree of compaction or other properties of ground or filling (the following test should include travelling cost from laboratory to site within 10km in one direction to the site)</u>			
19	"Modified AASHTO Density" test	No	3
<b>Carried Forward to Summary of Section No. 2</b>			R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 2 Earthworks			

Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 2 - MAIN HOUSE</u></b>				
	<b><u>BILL NO. 3</u></b>				
	<b><u>CONCRETE, FORMWORK AND REINFORCEMENT</u></b>				
	<u>Standard Preambles</u>				
	The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
	<u>Cost of tests</u>				
	The costs of making, storing and testing of concrete test cubes as required under clause 7 "Tests" of SABS 1200 G shall include the cost of providing cube moulds necessary for the purpose, for testing costs and for submitting reports on the tests for approval. The testing shall be undertaken by an approved independent firm or institution nominated by the contractor (test cubes are measured separately)				
	<u>No-Fines concrete</u>				
	No-Fines concrete shall consist of 6 part aggregate to one part cement (1:6)				
	<u>Striking off and curing</u>				
	Concrete prices are to include for striking off and curing.				
	<u>Formwork</u>				
	Descriptions of formwork shall be deemed to include use and waste only (except where described as "left in" or "permanent"), for fitting together in the required forms, wedging, plumbing and fixing to true angles and surfaces as necessary to ensure easy release during stripping and for reconditioning as necessary before re-use				
	<b>Carried Forward</b>			R	
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 3 Concrete, Formwork & Reinforcement				

Brought Forward			R
<p>The vertical strutting shall be carried down to such construction as is sufficiently strong to afford the required support without damage and shall remain in position until the newly constructed work is able to support itself</p> <p>Formwork to soffits of solid slabs etc shall be deemed to be to slabs not exceeding 250mm thick unless otherwise described</p> <p>Formwork to soffits of slabs, beams, etc shall be deemed to be propped up exceeding 1,5m and not exceeding 3,5m high unless otherwise described</p> <p>Formwork to sides of bases, pile caps, ground beams, etc will only be measured where it is prescribed by the engineer for design reasons. Formwork necessitated by irregularity or collapse of excavated faces will not be measured and the cost thereof shall be deemed to be included in the allowance for taking the risk of collapse of the sides of the excavations, provision for which is made in "Earthworks"</p> <p><b><u>UNREINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES</u></b></p> <p><u>20MPa/19mm concrete</u></p>			
1	Strip footings	m3	7
<p><b><u>UNREINFORCED CONCRETE</u></b></p> <p><u>15MPa/19mm concrete</u></p>			
2	Surface beds on waterproofing	m3	5
3	Filling to cavity of hollow brick wall	m3	2
<b><u>TEST CUBES</u></b>			
4	Making and testing 150 x 150 x 150mm concrete strength test cube (Provisional)	No	6
<b><u>CONCRETE SUNDRIES</u></b>			
Carried Forward			R
<p>Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 3 Concrete, Formwork &amp; Reinforcement</p>			

Brought Forward				R
	<u>Finishing top surfaces of concrete smooth with a wood float</u>			
5	Surface beds, slabs, etc	m2	46	
	<b><u>MOVEMENT JOINTS ETC</u></b>			
	<u>Expansion joints with 10mm closed cell expanded polyethylene between vertical concrete and brick surfaces</u>			
6	Not exceeding 300mm high to edges of surface beds	m	13	
<b>Carried Forward to Summary of Section No. 2</b>				R
Section No. 2				
MAIN HOUSE BUILDING WORKS				
Bill No. 3				
Concrete, Formwork & Reinforcement				

Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 2 - MAIN HOUSE</u></b>				
	<b><u>BILL NO. 4</u></b>				
	<b><u>MASONRY</u></b>				
	<u>Standard Preambles</u>				
	The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
	<u>Sizes in descriptions</u>				
	Where sizes in descriptions are given in brick units, "one brick" shall represent the length and "half brick" the width of a brick				
	<u>Hollow walls</u>				
	Descriptions of hollow walls shall be deemed to include leaving every fifth perpend of the bottom course of the external skin open as a weep hole				
	<u>Bagged and sealed walls</u>				
	Walls in two skins described as "bagged and sealed" shall be deemed to include having the outer face of the inner skin bagged with 1:6 cement and sand mixture and sealed with two coats bitumen emulsion waterproofing coating				
	<b><u>BRICKWORK</u></b>				
	<b><u>FOUNDATIONS</u></b>				
	<u>Brickwork of NFX bricks (14 MPa nominal compressive strength) in class II mortar</u>				
1	280mm Hollow walls of two half brick skins, including wire ties	m2	27		
	<b><u>SUPERSTRUCTURE</u></b>				
	<b>Carried Forward</b>			R	
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 4 Masonry				



Brought Forward			R
<u>Brickwork of NFP bricks in class II mortar</u>			
2	Half brick walls	m2	36
3	Half brick walls in beamfilling	m2	9
4	280mm Hollow walls of two half brick skins, including wire ties	m2	109
<b><u>BRICKWORK SUNDRIES</u></b>			
5	Splayed mortar fillets one course high in 60mm cavities	m	52
6	Closing 60mm cavities of hollow walls vertically with brickwork half brick wide	m	11
7	Closing 60mm cavities of hollow walls horizontally with one course of brickwork	m	6
8	Brick on edge cill, 220mm deep set sloping and slightly projecting	m	4
<u>2,5mm Galvanised brick reinforcement</u>			
9	75mm Wide reinforcement built in horizontally	m	1,226
<u>Prestressed fabricated concrete lintels including necessary temporary supports</u>			
10	110 x 75mm Lintels in lengths not exceeding 3m	m	6
11	150 x 75mm Lintels in lengths not exceeding 3m	m	6
<u>Galvanised hoop iron cramps, ties, etc</u>			
12	32 x 1,6mm Roof tie 1,5m long with one end built into brickwork and other end fixed to timber	No	52
<u>Air bricks etc</u>			
13	229 x 152mm Clay vermin proof air brick	No	6
<b><u>FIBRE-CEMENT WINDOW SILLS</u></b>			
Carried Forward			R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 4 Masonry			

Brought Forward			R
	<p><u>Natural grey sills in single lengths bedded in class II mortar including metal fixing lugs etc</u></p>		
14	15 x 150mm Wide sills set flat and slightly projecting	m	15
<p><b><u>PAVING ETC</u></b></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Quarry tiles, cement, terrazzo and similar tiles, precast concrete bricks, blocks, etc</u></p> <p>Tiles shall be of approved manufacture, well burnt or cured, and uniform and true in size, shape and colour</p> <p><u>Preparation of concrete floor beds, slabs, etc for pavings</u></p> <p>Concrete surfaces shall be hacked (preferably by mechanical means) until all laitance, dirt, oil, etc is dislodged and swept clean of all loose matter. Surfaces shall then be wetted and kept damp for at least six hours before slushing with 1:2 cement/sand and while still wet, pavings, etc shall be laid on a 1:4 cement mortar bed not exceeding 25mm thick and jointed and pointed with hollowed joints. Sand shall be clean, sharp river sand</p> <p><u>Allow a PC amount of R300/m2 for paving (supplied and delivered to site) to be installed with butt joints on and including 50mm thick river sand bed with sand and cement mixture swept into joints and hosed down including preparation of ground or filling</u></p>			
15	Paving in stretcher, herringbone or basket weave pattern to falls	m2	69
16	220mm Wide brick-on-flat header course edgings on 100mm thick mortar bed, including necessary excavation	m	25
<p><b>Carried Forward to Summary of Section No. 2</b></p> <p>Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 4 Masonry</p>			R

Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 2 - MAIN HOUSE</u></b>				
	<b><u>BILL NO. 5</u></b>				
	<b><u>WATERPROOFING</u></b>				
	<u>Standard Preambles</u>				
	The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
	<u>Waterproofing</u>				
	Waterproofing of roofs, basements, etc shall be laid under a ten year guarantee. Waterproofing to roofs shall be laid to even falls to outlets etc with necessary ridges, hips and valleys. Descriptions of sheet or membrane waterproofing shall be deemed to include additional labour to turn-ups and turn-downs				
	<b><u>DAMPROOFING OF WALLS AND FLOORS</u></b>				
	<u>One layer 375 micron embossed polyethylene dampproof course (SANS 952-1985 type B)</u>				
1	In walls	m2	17		
	<u>One layer 250 micron green polyethylene waterproof sheeting (SANS 952-1985 type C) sealed at laps with PVC self-adhesive tape</u>				
2	Under surface beds	m2	143		
	<u>Two coats "ABE dura.proof hydrokote" or similar approved flexible hydraulic micro-mortar waterproofing and protection membrane, applied in accordance with the manufacturers instruction</u>				
3	On shower walls	m2	11		
4	On shower floors	m2	2		
	<b>Carried Forward</b>			R	
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 5 Waterproofing				

Brought Forward				R
<b><u>WATERPROOFING BASEMENTS, ROOFS, BALCONIES, ETC.</u></b>				
<u>Apply base coat with membrane and three coats "Duram Flexikote" or similar approved waterproof membrane in accordance with the manufacturers instruction</u>				
5	On concrete roof tiles in patches	m2	28	
<b><u>WATERSTOPS, SEALING STRIPS, JOINT SEALANTS, ETC</u></b>				
<u>Two-part grey polysulphide sealing compound including backing cord, bond breaker, primer, etc</u>				
6	10 x 15mm In expansion joints in floors including raking out expansion joint filler as necessary	m	13	
<b>Carried Forward to Summary of Section No. 2</b>				R
Section No. 2				
MAIN HOUSE BUILDING WORKS				
Bill No. 5				
Waterproofing				

Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 2 - MAIN HOUSE</u></b>				
	<b><u>BILL NO. 6</u></b>				
	<b><u>ROOF COVERINGS, CLADDINGS, ETC</u></b>				
	<u>Standard Preambles</u>				
	The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
	<u>Guarantee</u>				
	The contractor will be required to provide an Engineer and a written guarantee, stating that :				
	1. The roof sheeting is of the specified thickness.				
	2. The client is indemnified against any defects, including colour deterioration for a minimum period of 15 years.				
	3. All roof coverings and side cladding are to be installed to comply with SANS Code of Practice 0237 where applicable. All roof sheeting shall be laid under a 15 year guarantee for site workmanship and water tightness.				
	<b><u>TILES</u></b>				
	<u>420 x 332mm "Marley Homestead" or similar and approved concrete tiles nailed with 63mm corrosion-resistant tile fixing nails as required to and including 38 x 38mm sawn softwood battens at 320mm centres</u>				
1	Roof covering with a 30 degree pitch	m2	81		
2	Open valleys including raking cutting on both sides and necessary additional battens (valley gutters elsewhere)	m	18		
3	Extra on roof covering for 38 x 50mm sawn softwood tilting fillets	m	24		
	<b>Carried Forward</b>			R	
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 6 Roof Covering				

	Brought Forward			R
4	Ridges of tiles to match roofing tiles, bedded and pointed in 1:3 tinted cement mortar, including 300mm wide strip of 375 micron embossed damp proof course in accordance with SANS 952 Type B underlay and necessary additional battens	m	12	
5	Hips of tiles to match roofing tiles, bedded and pointed in 1:3 tinted cement mortar, including 300mm wide strip of 375 micron embossed damp proof course in accordance with SANS 952 Type B underlay, raking cutting to tiles on both sides and necessary additional battens	m	6	
6	Verges of capping tiles to match roofing tiles, fixed with non-corrosive fixing accessories	m	16	
	<b><u>PROFILED METAL SHEETING AND ACCESSORIES</u></b>			
	<u>0.53mm AZ150 Zinalume corrugated steel with a clean Colorbond™ finish in approved standard colour on one side and a standard backing coat to reverse side, fixed to timber purlins or rails</u>			
7	Roof covering with pitches not exceeding 25 degrees	m2	30	
8	Side wall flashings 308mm girth including sealed with 12 x 25mm closed cell bitumen impregnated polyurethane foam strips	m	4	
9	Head wall flashings 308mm girths serrated closers and poly-closers	m	5	
	<u>1.0mm Corrugated clear 90% light transmission translucent polycarbonate sheeting with 80mm side laps and 300mm end laps, fixed to timber purlins or rails</u>			
10	Roof covering with pitches not exceeding 25 degrees	m2	10	
	<b><u>UNDERLAY TO TILED ROOFS</u></b>			
	<u>"Marley Supreme" or similar and approved Single Sided Radiant Barrier with an R - Value of 1.0 m2K/W, fixed over trusses and under tiling battens with and including galvanised clout nails</u>			
11	To roofs with a 30 degree pitch	m2	81	
	<b>Carried Forward</b>			R
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 6 Roof Covering			

	Brought Forward	R
<b><u>UNDERLAY TO PROFILED METAL SHEETING</u></b>		
<u>"Marley Supreme" or similar and approved Single Sided Radiant Barrier with an R - Value of 1.0 m<sup>2</sup>K/W, fixed over trusses and under purlins with and including galvanised clout nails</u>		
12 To roofs with a pitch not exceeding 25 degrees	m2	30
		R
<b>Carried Forward to Summary of Section No. 2</b>		R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 6 Roof Covering		

Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 2 - MAIN HOUSE</u></b>				
	<b><u>BILL NO. 7</u></b>				
	<b><u>CARPENTRY AND JOINERY</u></b>				
	<u>Standard Preambles</u>				
	The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
	<u>Fixing</u>				
	Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins, or to be shot-pinned, to brickwork or concrete				
	Items described as "plugged" shall be deemed to include screwing to fibre, plastic or metal plugs at not exceeding 500mm centres, and where described as "bolted", the bolts have been given elsewhere				
	All sections of timber to be built into brickwork of concrete to be wrapped in Gunplast and the cost is deemed to be included in the relevant item.				
	Tenderers should include silicone sealant between skirting and finished surfaces of walls and floors in their price				
	<u>Joinery</u>				
	Descriptions of frames shall be deemed to include frames, transoms, rails, etc				
	Descriptions of hardwood joinery shall be deemed to include sinking and pelleting heads and nuts of bolts				
	All exposed timber to be treated with preservative to combat fungus as prescribed by the Forestry Act 1968 (Act 72 of 1968).				
	<b>Carried Forward</b>			R	
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 7 Carpentry & Joinery				



Brought Forward			R
<u>Decorative thermosetting plastic laminate covering</u>			
Laminate covering shall be glued under pressure and edge strips of same shall be butt jointed at junctions with adjacent similar finish			
<b><u>ROOFS, ETC</u></b>			
<u>Sawn softwood grade S5</u>			
1	38 x 114mm Plate	m	41
2	38 x 114mm Rafter in lengths not exceeding 2.4m	m	15
3	50 x 76mm Purlin	m	23
<u>Prefabricated roof trusses hoisted and fixed in position 2,650m high extreme above ground level</u>			
4	Sloping roof with fall exceeding 25 degrees, including purlins, rafters, trusses, permanent bracing, etc. and setting out into position complete including temporary bracing, hurricane straps, fixing to wall plates, etc. complete and tying into existing roof structure (measured on flat) (Bedroom 3,4 & bathroom 3).	m2	44
5	Sloping roof with fall exceeding 25 degrees, including purlins, rafters, trusses, permanent bracing, etc. and setting out into position complete including temporary bracing, hurricane straps, fixing to wall plates, etc. complete and tying into existing roof structure (measured on flat) (lounge & kitchen extension).	m2	10
<b><u>EAVES, VERGES, ETC</u></b>			
<u>Medium density plain fibre-cement flat sheets</u>			
6	6mm Eaves soffit covering including 38 x 38mm sawn softwood branders along edges, along centre and at 450mm centres across sheets	m2	39
<u>Medium density plain fibre-cement fascias and barge boards</u>			
7	12 x 225mm Fascias and barge boards, including galvanised steel H-profile jointing strips	m	79
Carried Forward			R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 7 Carpentry & Joinery			

	Brought Forward			R	
	FLOORS AND SKIRTING				
	SKIRTING				
	Wrought meranti				
8	20 x 70mm Skirting, plugged	m	51		
	TIMBER DOORS, WINDOWS, ETC				
	SUPPLEMENTARY PREAMBLES				
	Fire doors				
	Fire doors are to be in accordance with SANS 1253				
	DOORS ETC				
	Semi-solid flush doors with 3.2mm plain hardboard covering on both sides, hung to steel or timber frames				
9	40mm Door 813 x 2032mm high	No	3		
	"Bitcon" fire doors with commercial veneer				
10	Class A fire door 813 x 2032mm high including pressed steel frame for one brick wall and preparing frame for door closer and lock	No	1		
	FRAMES ETC				
	FRAMED FRAMES, MULLIONS, TRANSOMS, ETC				
	Wrought meranti				
11	44 x 69mm Frames	m	3		
	BEDROOM & KITCHEN CUPBOARDS				
12	Allow the Provisional Sum of R70,000.00 (Seventy Thousand Rand) for joinery, i.e. bedroom and kitchen cupboards.		Item		70,000.00
13	Allowance for profit and attendance			%	
	Carried Forward			R	
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 7 Carpentry & Joinery				

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[illegible]

Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 2 - MAIN HOUSE</u></b>				
	<b><u>BILL NO. 8</u></b>				
	<b><u>CEILINGS, PARTITIONS AND ACCESS FLOORING</u></b>				
	<u>Standard Preambles</u>				
	The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
	<u>Fixing</u>				
	Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins, or to be shot-pinned, to brickwork or concrete				
	Items described as "plugged" shall be deemed to include screwing to fibre, plastic or metal plugs at not exceeding 500mm centres, and where described as "bolted", the bolts have been given elsewhere				
	<u>Ceilings</u>				
	Unless otherwise described ceilings shall be deemed to be horizontal				
	<u>Bulkheads</u>				
	Bulkheads are defined as those portions of ceilings which are stepped down from the general ceiling level in a particular room or area and which generally occur along the perimeter. Their purpose is either to conceal services or to create architectural features				
	Bulkheads have only been described as such where they conform to the above definition and where the horizontal or vertical dimensions do not exceed 900mm. Where these dimensions are more than 900mm such portions of ceilings have been included in the appropriate general items of ceilings				
	<b>Carried Forward</b>			R	
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 8 Ceilings				

Brought Forward			R
Unless otherwise described bulkheads shall be deemed to be horizontal along the length			
<u>Steel components</u>			
All steel components for ceilings, partitions, etc are to be galvanised in accordance with SANS 121			
<b><u>CEILING TIMBERS, BEADS, INSULATION, ETC</u></b>			
<u>Insulation laid on top of ceilings between roof timbers, etc</u>			
1	135mm Thick / 11.5kg/m <sup>3</sup> Isotherm blanket type polyester thermal insulation	m2	135
<b><u>NAILED UP CEILINGS</u></b>			
<b><u>SUPPLEMENTARY PREAMBLES</u></b>			
<u>Openings</u>			
Prices for openings for light fittings, ventilation grilles, air conditioning diffusers, etc are to include for any necessary additional support, trimming around, etc			
<u>6,4mm Taper-edge gypsum plasterboard with taped and skimmed flush joints</u>			
2	Ceilings nailed to 38 x 38mm sawn softwood brandering (brandering elsewhere measured) at 400mm centres generally in both direction at joints and edges of boards	m2	51
3	Extra over ceiling for 610 x 610mm trap door of 38 x 50mm wrought softwood rebated framing with one cross brander, covered with ceiling board and fitted flush in opening, including necessary trimmers around	No	2
<u>Gypsum plasterboard cornices</u>			
4	70mm Coved cornices	m	68
<b>Carried Forward to Summary of Section No. 2</b>			R
Section No. 2			
MAIN HOUSE BUILDING WORKS			
Bill No. 8			
Ceilings			

Item No	Unit	Quantity	Rate	Amount
<b><u>SECTION NO. 2 - MAIN HOUSE</u></b>				
<b><u>BILL NO. 9</u></b>				
<b><u>FLOOR COVERINGS, WALL LININGS, ETC</u></b>				
<u>Standard Preambles</u>				
The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
<u>Fixing</u>				
Floor coverings, wall linings, etc shall, where applicable, be fixed with adhesive as recommended by the manufacturers of the flooring, linings, etc				
<u>Surface preparation, priming, curing, cleaning etc</u>				
Descriptions of the items below are deemed to include all necessary preparation, priming, mixing, curing, cleaning etc as prescribed by the manufacturers of the various products				
<u>Prime Cost (PC) Sums</u>				
Prime Cost (PC) Sums means an amount of money provided in the bills of quantities for material and goods to be obtained from a supplier nominated by the architect and to be fixed by the contractor				
The prime cost amount shall be omitted from the contract sum and the amounts actually paid by the contractor in respect of the purchase of the nett quantity of such items including delivery to site shall be added to the contract sum				
The contractor has to allow for labour, profit and waste in his rate over and above the PC amount				
<b><u>FLOOR COVERINGS</u></b>				
			R	
Carried Forward				
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 9 Floor Covering				

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Brought Forward			R
1	<u>Laminated timber flooring including underlay (Allow prime cost Of R 450,00/m² for the supply and deliver to site) laid to screeded floors (screeds elsewhere measured) including fitting, cutting and circular cutting all in accordance with the manufacturers specification</u>  On floors	m2	18
<b>Carried Forward to Summary of Section No. 2</b>			R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 9 Floor Covering			

Item No	Unit	Quantity	Rate	Amount
<b><u>SECTION NO. 2 - MAIN HOUSE</u></b>				
<b><u>BILL NO. 10</u></b>				
<b><u>IRONMONGERY</u></b>				
<u>Standard Preambles</u>				
The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
<u>Proprietary items</u>				
Where applicable the manufacturers' names or product catalogue titles are given in sub-headings preceding the items				
Prices are to be based on the specific products/articles specified. If tenderers wish to offer alternative products/articles for certain items, these items are to be clearly marked and the alternative specification given with supporting brochures etc clarifying the features of the products/articles offered				
On request returnable samples are to be provided to the principal agent for consideration				
<b>Carried Forward</b>				R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 10 Ironmongery				



Brought Forward			R
<u>Finishes to ironmongery</u>			
Where applicable finishes to ironmongery are indicated by suffixes in accordance with the following list:			
BS Satin bronze lacquered			
CH Chromium plated			
SC Satin chromium plated			
SE Silver enamelled			
Sn Satin Nichol			
GE Grey enamelled			
AN Anodised natural			
AA Anodised Aluminium			
AS Anodised silver			
AB Anodised bronze			
AG Anodised gold			
ABL Anodised black			
PB Polished brass			
PL Polished and lacquered			
PT Epoxy coated			
SD Sanded			
S Sil			
<b><u>HINGES, BOLTS, ETC</u></b>			
<u>"Union" or similar approved</u>			
1	100mm "8352-100SN" AA sinkless hinge	Pairs	2
<b><u>CATCHES, CABIN HOOKS, ETC</u></b>			
<u>"Halcast" or similar approved</u>			
2	200mm"H165-200" SC cabin hook and eye	No	2
<b><u>LOCKS</u></b>			
<u>"Union" or similar approved</u>			
3	Union 3 lever sashlock - code 2277/78SS MKD	No	1
<b><u>HANDLES</u></b>			
<u>"Union" or similar approved</u>			
4	Gower 2 Lever Lockset "CZ6822495SC" with and including Solid cast zinc handle and zinc backplate	No	4
Carried Forward			R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 10 Ironmongery			

	Brought Forward			R
5	CB612-24SC Lever handle on 165x50x8mm backplate. Fixed with thief proof one way screws	No	1	
	<b><u>DOOR CLOSER</u></b>			
	<u>"Union" or similar approved</u>			
6	Union CE Marked Fixed size 3 Rack & Pinion door closer (Code:J-CE3F-SIL)	No	1	
	<b><u>SUNDRIES</u></b>			
	<u>Coir door mats laid loose in mat surround</u>			
7	1000 x 1500 x 38mm Door mat	No	1	
	<b><u>BATHROOM FITTINGS</u></b>			
	<u>"Solid" or similar approved</u>			
8	19mm Diameter 600mm long chromium plated towel rail with chromium plated towel rail bracket plugged	No	2	
	<u>'Steiner' or similar approved:</u>			
9	Big roll white powder coated toilet roll holder plugged	No	2	
<b>Carried Forward to Summary of Section No. 2</b>				R
Section No. 2				
MAIN HOUSE BUILDING WORKS				
Bill No. 10				
Ironmongery				

Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 2 - MAIN HOUSE</u></b>				
	<b><u>BILL NO. 11</u></b>				
	<b><u>METALWORK</u></b>				
	<u>Standard Preambles</u>				
	The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
	<u>Descriptions of bolts, anchors, etc</u>				
	Descriptions of bolts shall be deemed to include nuts and washers				
	Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork or concrete				
	Items described as "holed for bolt(s)" shall be deemed to exclude the bolts unless otherwise described				
	Items described as "plugged" shall be deemed to include screwing to fibre, plastic or metal plugs at not exceeding 600mm centres				
	<u>Aluminium doors, windows, etc</u>				
	Doors and windows shall comply with AAAMSA design criteria				
	Glazing shall comply with SAGGA regulations. Glass shall be as described in the headings to window descriptions. Glass thickness shall comply with SAGGA regulations irrespective of thicknesses shown on the schedules/drawings				
	Doors and windows shall be supplied with protective tape and plastic and shall be removed only once surrounding trades have been completed				
	<b>Carried Forward</b>			R	
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 11 Metalwork				

<b>Brought Forward</b>				R
The following certificates shall be provided prior to commencement of site work:				
<ol style="list-style-type: none"> <li>1. A copy of the relevant AAAMSA Performance Test Certificate from the manufacturer/contractor supplying the architectural aluminium product</li> <li>2. A Certificate of Conformance confirming that anodising or powder coating has been processed in accordance with SANS 999 and SANS 1796 respectively</li> <li>3. A powder guarantee of not less than 15 years issued by the powder manufacturer. The specific conditions contained in this guarantee shall form part of the powder coating process</li> <li>4. A Certificate of Conformance confirming that glazing has been installed in accordance with SANS 0137, ensuring that safety glazing materials have been installed in the mandatory areas and that each individual pane of safety glazing materials has been permanently marked</li> <li>5. A warranty from the manufacturer of the laminated safety glass and/or hermetically sealed glazing units guaranteeing the products against delamination and colour degradation for a period of not less than five years</li> </ol>				
<b><u>GATES, SCREENS, ETC</u></b>				
<u>Galvanised steel powder coated security gates, fixed to brickwork or concrete</u>				
1	"Trellidoor" or similar approved single gate with and including slamlock, for opening size 1000 x 2100mm high	No	2	
2	"Trellidoor" or similar approved single gate with and including slamlock, for opening size 2000 x 2100mm high	No	1	
<b><u>POWDER COATED ALUMINIUM WINDOWS, DOORS, ETC BY AAAMSA MEMBERS ONLY AND PROVIDE AAAMSA PERFORMANCE TEST CERTIFICATE</u></b>				
<b>Carried Forward</b>				R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 11 Metalwork				

Brought Forward			R
	<u>Casement pre-glazed aluminium windows complete with ironmongery and including setting up, building in, filling back of frame with cement mortar, sealing around with silicone, etc</u>		
3	600mm Wide x 900mm high overall, with one full height side hung sash glazed with 4mm Pacific obscure glass	No	1
4	1200mm wide x 900mm high overall, comprising one fixed light approximate size 600mm x 900 and two top hung sashes of equal size on the other side glazed with 4mm Clear float glass.	No	1
5	440mm Wide x 1200mm high overall, with one fixed light glazed with 4mm Clear float glass.	No	1
6	1500mm wide x 1200mm high overall, comprising one centre fixed light approximate size 500mm x 1200mm high and three top hung sashes of equal size on either side of the fixed light glazed with 4mm Clear float glass.	No	3
	<u>Casement pre-glazed aluminium windows fitted into existing opening over steel external frame (steel sections removed, elsewhere measured) complete with ironmongery and including setting up, building in, filling back of frame with cement mortar, sealing around with silicone, etc</u>		
7	1520mm wide x 600mm high overall, comprising one centre fixed light approximate size 565mm x 600mm high and two full height side hung sashes of equal size on either side of the fixed light glazed with 4mm Clear float glass.	No	1
8	530mm Wide x 900mm high overall, comprising one fixed light approximate size 530mm x 450mm high and one top hung sash glazed with 4mm Pacific obscure glass	No	1
9	950mm Wide x 900mm high overall, comprising two equal full height side hung sashes glazed with 4mm Clear float glass.	No	1
10	1460mm Wide x 900mm high overall, comprising two equal full height side hung sashes glazed with 4mm Clear float glass.	No	1
Carried Forward			R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 11 Metalwork			

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	Brought Forward			R
11	440mm wide x 1170mm high overall, comprising one fixed light approximate size 440mm x 780mm high and one top hung sash approximate size 440mm x 390mm high glazed with 4mm Clear float glass.	No	1	
12	970mm Wide x 1200mm high overall, comprising two equal full height side hung sashes glazed with 4mm Clear float glass.	No	1	
13	Ditto, but 980mm Wide x 1200mm high overall.	No	1	
14	Ditto, but 1460mm Wide x 1200mm high overall	No	1	
	<u>Pre-glazed aluminium sliding doors, sidelights, etc complete with ironmongery and including setting up, building in, filling back of frame with cement mortar, sealing around same with silicone, etc</u>			
15	Single door, 900mm wide x 2100mm high overall, hung to and including aluminium door frame	No	1	
16	Sliding door in two equal leaves, 1800mm wide x 2100mm high overall.	No	1	
17	Double door in two equal leaves, 1800mm wide x 2100mm high overall, hung to and including aluminium door frame	No	1	
	<b><u>BURGLAR BARS AND SCREENS</u></b>			
	<u>6mm Thick x 30mm wide "View protect" or similar and approved transparent polycarbonate "Safety Bars" fixed to window frames all in accordance with the manufacturer's instructions, to:</u>			
18	Secure window size 1520mm wide x 600mm high overall.	No	1	
19	Ditto, but 530mm wide x 900mm high overall	No	1	
20	Ditto, but 600mm wide x 900mm high overall.	No	1	
21	Ditto, but 950mm wide x 900mm high overall.	No	1	
22	Ditto, but 1200mm wide x 900mm high overall.	No	1	
23	Ditto, but 1460mm wide x 900mm high overall.	No	1	
	<b>Carried Forward</b>			R
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 11 Metalwork			

	Brought Forward			R
24	Ditto, but 440mm wide x 1170mm high overall.	No	1	
25	Ditto, but 440mm wide x 1200mm high overall.	No	1	
26	Ditto, but 970mm wide x 1200mm high overall.	No	1	
27	Ditto, but 980mm wide x 1200mm high overall.	No	1	
28	Ditto, but 1460mm wide x 1200mm high overall.	No	1	
29	Ditto, but 1500mm wide x 1200mm high overall.	No	3	
<b><u>SHOWER CUBICLE PANELS AND DOORS</u></b>				
<b><u>Powder coated aluminium shower cubicle panels and doors with frames, sliding gear, pivot hinges, cleats, stops, etc. and 6mm toughened clear safety glass, plugged to tiled walls and sealed with silicone sealant (sizes to be verified on site):</u></b>				
30	Fixed panel approximate size 950 x 1 800mm high	No	1	
31	Framed pivot door approximate size 950 x 1800mm high	No	1	
32	Ditto, but approximate size 1140 x 1800mm high	No	1	
<b><u>FIREPLACE</u></b>				
<b><u>Jetmaster 7-50 Mynx or similar approved</u></b>				
33	Jetmaster 7-50 Free standing Mynx COMBO comprising approximate unit size 530mm long x 396mm wide x 335mm high including 3.6m flue, grate and pan, storm cowl and ceiling plate complete.	No	1	
<b>Carried Forward to Summary of Section No. 2</b>				R
Section No. 2				
MAIN HOUSE BUILDING WORKS				
Bill No. 11				
Metalwork				

Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 2 - MAIN HOUSE</u></b>				
	<b><u>BILL NO. 12</u></b>				
	<b><u>PLASTERING</u></b>				
	<u>Standard Preambles</u>				
	The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
	<b><u>GRANOLITHIC</u></b>				
	<u>Method</u>				
	The method to be used shall be either the monolithic method or the bonded method				
	<u>Preparation</u>				
	For granolithic applied monolithically, the concrete floor shall be swept clean after bleeding of the concrete has ceased and the slab has begun to stiffen; any remaining bleed water shall be removed and the granolithic applied immediately thereafter. For granolithic to be bonded to the floor slab after it has hardened, the slab surface shall be hacked (preferably by mechanical means) until all laitance, dirt, oil, etc is dislodged and swept clean of all loose matter. The slab shall then be wetted and kept damp for at least six hours before applying the granolithic				
	<u>Mix</u>				
	Granolithic shall attain a compressive strength of at least 41MPa. The coarse aggregate shall comply with SANS 1083 and shall generally be capable of passing a 10mm mesh sieve. Where the thickness of the granolithic exceeds 25mm, the size of the coarse aggregate shall be increased to the maximum size compatible with the thickness of the granolithic				
	<b>Carried Forward</b>			R	
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 12 Plastering				



	Brought Forward			R
	<p><u>Panels</u></p> <p>Granolithic shall be laid in panels not exceeding 14m<sup>2</sup> for monolithic finishes, not exceeding 9,5m<sup>2</sup> for bonded finishes and not exceeding 6m<sup>2</sup> for all external granolithic. Wherever possible, panels shall be square but at no time should the length of the panel exceed 1,5 times its width</p> <p>Where possible joints between panels shall be positioned over joints in the floor slab and shall be at least 3mm wide through the full thickness of the finish, separated by strips of wood or fibreboard and finished with V-joints</p> <p><u>Laying</u></p> <p>Monolithic granolithic shall be applied to the partially set slab and thoroughly compacted and lightly wood floated to the required levels</p> <p>Bonded granolithic shall be applied to the slab after applying a 1:1 sand-and-cement slurry brushed over the surface and allowed to partially set before applying the granolithic. The granolithic shall be thoroughly compacted and lightly wood floated to the required levels</p> <p>After wood floating, the monolithic and bonded granolithic shall remain undisturbed until bleeding has ceased and the surface has stiffened. Any remaining bleed water and laitance shall then be removed and the surface steel trowelled or power floated</p> <p><u>Curing, seasoning and protection</u></p> <p>Granolithic shall be covered with clean hessian with waterproof building foil over and kept wet for at least seven days after laying</p> <p><b><u>SCREEDS</u></b></p> <p><u>Screeds wood floated, on concrete</u></p>			
1	30mm Thick on floors and landings	m2	37	
	<p><b><u>INTERNAL PLASTER</u></b></p>			
	Carried Forward			R
	<p>Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 12 Plastering</p>			

Brought Forward			R
	<u>Cement plaster wood floated for tiles, on brickwork</u>		
2	On walls	m2	20
3	On narrow widths not exceeding 300mm wide	m2	3
	<u>Cement plaster steel trowelled, on brickwork</u>		
4	On walls	m2	111
5	On narrow widths not exceeding 300mm wide	m2	17
	<b><u>EXTERNAL PLASTER</u></b>		
	<u>Cement plaster wood floated, on brickwork</u>		
6	On walls	m2	38
7	On narrow widths not exceeding 300mm wide	m2	4
8	On sloping top, front edge and projecting soffit of sills 300mm girth	m	4
	<b><u>AIR GRATINGS</u></b>		
9	235 x 157mm Cast plaster or white plastic plain pattern air grating fixed flush with plaster face	No	3
Carried Forward to Summary of Section No. 2			R
Section No. 2			
MAIN HOUSE BUILDING WORKS			
Bill No. 12			
Plastering			

Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 2 - MAIN HOUSE</u></b>				
	<b><u>BILL NO. 13</u></b>				
	<b><u>TILING</u></b>				
	<u>Standard Preambles</u>				
	The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
	<u>Patterns</u>				
	Unless otherwise described, tiles shall be laid with continuous joints in both directions				
	<u>Fixing</u>				
	Unless described as "fixed with adhesive to plaster (plaster elsewhere)" descriptions of tiling on brick or concrete walls, columns, etc shall be deemed to include 1:4 cement plaster backing and descriptions of tiling on concrete floors etc shall be deemed to include 1:3 plaster bedding				
	Tiling described as "fixed with adhesive on power floated concrete" shall be deemed to include for approved tiling key-coat				
	Ceramic, porcelain, marble and granite tiles are to be fixed and grouted with suitable adhesives and grouts as recommended by the manufacturer of the tiles				
	<u>Repairs</u>				
	Repairs to damaged areas in the existing concrete surface bed or slab is to be done using "TAL Superscreed"				
	<u>Grouting joints</u>				
	Joints to be 3 to 5mm maximum width				
	<b>Carried Forward</b>			R	
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 13 Tiling				

Brought Forward			R
<u>Prime Cost (PC) Sums</u>			
<p>Prime Cost (PC) Sums means an amount of money provided in the bills of quantities for material and goods to be obtained from a supplier nominated by the architect and to be fixed by the contractor</p> <p>The prime cost amount shall be omitted from the contract sum and the amounts actually paid by the contractor in respect of the purchase of the nett quantity of such items including delivery to site shall be added to the contract sum</p> <p>The contractor has to allow for labour, profit and waste in his rate over and above the PC amount</p>			
<b><u>WALL TILING</u></b>			
<u>Allow the prime cost amount of R 350/m2 (Three Hundred and Fifty Rand) for porcelain tiles not exceeding 300 x 300mm for the supply and delivery to site), fixed with adhesive to plaster (plaster elsewhere) and flush pointed with tinted grout</u>			
1	On walls	m2	38
2	On narrow widths not exceeding 300mm	m2	1
<b><u>FLOOR TILING</u></b>			
<u>Allow the prime cost amount of R 400/m2 (Four hundred Rand) for porcelain tiles not exceeding 600 x 600mm the supply and delivery to site), fixed with adhesive to screed (screed elsewhere) and flush pointed with grout</u>			
3	On floors and landings	m2	72
4	On narrow widths not exceeding 300mm wide	m2	4
<b><u>SUNDRIES</u></b>			
<u>"M-Trim" or similar approved aluminium dividing strips</u>			
5	8mm Straight edge trim (code ASE080)	m	32
<b>Carried Forward to Summary of Section No. 2</b>			R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 13 Tiling			

Item No	Unit	Quantity	Rate	Amount
<b><u>SECTION NO. 2 - MAIN HOUSE</u></b>				
<b><u>BILL NO. 14</u></b>				
<b><u>PLUMBING AND DRAINAGE</u></b>				
<u>Standard Preambles</u>				
The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
<u>Wire gratings</u>				
Descriptions of gutter outlets etc shall be deemed to include wire balloon gratings				
<u>Stormwater channels</u>				
Descriptions of channels shall be deemed to include necessary excavation, surface preparation, compaction, etc, and disposal of surplus material on site				
<u>Exposed concrete surfaces</u>				
Exposed surfaces of concrete stormwater channels, cover slabs, inspection eye marker slabs, gulley tops, cleaning eye tops, catchpits, inspection chambers, etc. shall be finished smooth with plaster				
<u>Sealing of edges</u>				
Outer edges of sinks, basins, baths, urinals, etc are to be sealed against adjacent surfaces with approved silicone				
<b>Carried Forward</b>			R	
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 14 Plumbing & Drainage				

<b>Brought Forward</b>	R
<p><u>Reducing fittings</u></p> <p>Where fittings have reducing ends or branches they are described as "reducing" and only the largest end or branch size is given. Should the contractor wish to use other fittings and bushes or reducers he may do so on the understanding that no claim in this regard will be entertained</p> <p><u>uPVC pipes and fittings</u></p> <p>Sewer and drainage pipes and fittings shall be jointed and sealed with butyl rubber rings</p> <p>Soil, waste and vent pipes and fittings shall be solvent weld jointed or sealed with butyl rubber rings</p> <p><u>uPVC pressure pipes and fittings</u></p> <p>Pipes of 50mm diameter and smaller shall be plain ended with solvent welded uPVC loose sockets and fittings</p> <p>Pipes of 63mm diameter and greater shall have sockets and spigots with push-in type integral rubber ring joints. Bends shall be uPVC and all other fittings shall be cast iron, all with similar push-in type joints</p> <p><u>High density polyethylene (HDPE) pipes and fittings</u></p> <p>Pipes shall be type IV and of the class specified with "Plasson" or "Alprene" compression fittings</p> <p><u>"Polycop" polypropylene pipes</u></p> <p>Polypropylene pipes 54mm diameter and smaller shall be seamless copper coloured Class 16 pipes jointed with "Fast-fuse" heat welded thermoplastic or where so described "Polylock" compression fittings</p> <p>Pipes shall be firmly fixed to walls, etc with coloured nylon snap-in pipe clips with provision for accommodating thermal movement and jointed and fixed strictly in accordance with the manufacturer's instructions</p>	
<b>Carried Forward</b>	R
<p>Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 14 Plumbing &amp; Drainage</p>	

## Brought Forward

R

## Copper pipes

Pipes shall be hard drawn and half-hard "Maksal" pipes of the class described. Class 0 (thin walled hard drawn) pipes shall not be bent. Class 1 (thin walled half-hard), Class 2 (half-hard) and Class 3 (heavy walled half-hard) pipes shall only be bent with benders with inner and outer formers. Fittings to copper waste, vent and anti-siphon pipes, capillary solder fittings and compression fittings shall be "Cobra Watertech" type. Capillary solder fittings shall comply with ISO 2016

Copper pipes are to be installed in accordance with the latest revision of the Code of Practice for Copper Plumbing soldering techniques. Flux, solder, etc to be strictly in accordance with the manufacturer's requirements with special attention to copper flux composition

## Fixing of pipes

Unless specifically otherwise stated, descriptions of pipes shall be deemed to include fixing to walls, etc, casting in, building in or suspending not exceeding 1m below suspension level

Stainless steel basins, sinks, wash troughs, urinals, etc

Stainless steel for economy basins, domestic sinks and worktops shall be Type 430 (17/0)

Stainless steel for urinals, basins, quality sinks, wash troughs, institutional equipment, etc shall be Type 304 (18/8)

Stainless steel for laboratory sinks, photographic equipment, etc shall be Type 316 (18/8)

Units shall have standard aprons on all exposed edges and tiling keys against walls where applicable

## Paper wrapping to pipes

Pipes chased into brickwork must be wrapped with two layers of stout brown paper tied with wire. Rates are to include for wrapping around joints and fittings

**Carried Forward**

R

Section No. 2  
MAIN HOUSE BUILDING WORKS  
Bill No. 14  
Plumbing & Drainage

<p style="text-align: right;"><b>Brought Forward</b></p> <p><u>Laying, backfilling, bedding, etc of pipes</u></p> <p>Pipes shall be laid and bedded in accordance with manufacturers' instructions and trenches shall be carefully backfilled</p> <p><u>Filling and bedding material</u></p> <p>Selected Fill Material: Selected material shall be material that has a P.I not greater than 6, is free from vegetation and from lumps and stones of diameter &gt; 30mm. This material shall be used for the selected fill blanket</p> <p>Selected Granular Material: Selected granular material shall be of a granular, non-cohesive nature that is singularly graded between .6mm and 19mm, free draining, has a compact ability factor not exceeding .4 or such similar value as is laid down in project specification. For PVC and uPVC the factor is not to exceed the following; 1) 0.1 - Material suitable for all ground conditions 2) 0.3 - Material suitable provided extra care is taken during compaction operation</p> <p>Joints:</p> <p>To ensure that each pipe will be fully supported throughout the length of its barrel on the bedding cradle, joint pockets/ holes shall be formed in the bedding cradle for pipe sockets</p> <p>All work below ground shall be carried out in accordance with SANS 1200DB, SANS 1200LB, SANS 1200LD and SANS 1200LE</p> <p><u>General</u></p> <p>Descriptions of service pipes and flexible connecting pipes shall be deemed to include connections to taps, cisterns, etc and to steel pipes (adaptors for connections to copper pipes, etc are given separately)</p> <p>Descriptions of WC pans, slop hoppers, etc shall be deemed to include for joints to soil pipes (pan connectors are separately measured)</p> <p><b><u>RAINWATER DISPOSAL</u></b></p>			R	
<p style="text-align: right;"><b>Carried Forward</b></p> <p>Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 14 Plumbing &amp; Drainage</p>			R	



Brought Forward			R
<u>"Marley Vynadeep" or similar and approved gutters and rainwater pipes</u>			
1	146 x 93mm Gutter including brackets fixed to fibre cement fascias	m	51
2	Extra over gutter for stopped end	No	6
3	Extra over gutter for outlet for 80mm downpipe.	No	8
4	Extra over gutter for angle	No	4
5	Extra over rainwater pipe for bend or plinth bend	No	8
6	Extra over for shoe	No	8
7	80mm Diameter Rainwater downpipes fixed to wall with brackets, including sealing joints	m	21
<b><u>EARTHWORKS (STORMWATER, SUBSOIL DRAINAGE, STORMWATER DRAINAGE, SLEEVES FOR ELECTRICAL AND TELEPHONE CABLES ETC, SOIL DRAINAGE AND WATER SUPPLIES)</u></b>			
<u>Excavation in earth</u>			
8	Excavation in earth not exceeding 1m deep for pipe or cable trenches or chambers including risk of collapse of excavations	m3	6
9	Extra over excavation in earth for pipe and cable trenches or chambers for excavation in soft rock	m3	0.5
10	Extra over excavation in earth for pipe and cable trenches or chambers for excavation in hard rock	m3	0.2
Carried Forward			R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 14 Plumbing & Drainage			

	Brought Forward			R
11	Extra over excavation for pipe and cable trenches or chambers for carting away surplus material to a dumping site located by the contractor (This rate of carting away of excavated material shall be deemed to include loading excavated material onto trucks directly from the excavations or, alternatively, from stock piles situated on the building site, and spoiled at a site located by the contractor not exceeding 10km in one direction from the site. Rate should not allow for the spoiling costs paid at the dump site and this will be measured as an separate item in each work package)	m3	4	
12	Backfilling to pipe or cable trenches or chambers	m3	1	
13	Sand filling in bedding under and filling around pipes	m3	3	
	<b><u>STORMWATER DRAINAGE</u></b>			
	<u>Lay new precast concrete channels (laid on a concrete bedding):</u>			
14	260 x 140mm Channel with 150 x 75mm deep segmental channel	m	17	
	<b><u>JUNCTION BOXES, CATCHPITS, INSPECTION CHAMBERS AND HEADWALLS</u></b> <b><u>(STORMWATER, SUBSOIL DRAINAGE, STORMWATER DRAINAGE, SLEEVES FOR ELECTRICAL AND TELEPHONE CABLES ETC, SOIL DRAINAGE AND WATER SUPPLIES)</u></b>			
	<b><u>SOIL DRAINAGE</u></b>			
	<u>Heavy duty (Class 34) PVC-U sewer and drain pipes</u>			
15	110mm Pipes vertically or ramped to cleaning eyes etc (no excavation)	m	1	
16	110mm Pipes laid in trenches (trenches elsewhere)	m	18	
	<u>Extra over heavy duty (Class 34) PVC-U sewer and drain pipes for fittings</u>			
17	110mm Bend	No	2	
18	110mm Junction	No	3	
	<b>Carried Forward</b>			R
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 14 Plumbing & Drainage			

	Brought Forward			R
19	110mm Rodding eye  <u>uPVC gulleys</u>	No	3	
20	110mm Gulley exceeding 500mm and not exceeding 750mm deep  <b><u>SANITARY FITTINGS</u></b>  <u>White glazed vitreous china fittings including assembling and fixing in position, expanding bolts and mortices in brick or concrete walls, connecting up, etc.</u>	No	2	
21	510 x 400mm, "Daisy" white vitreous china basin (code 700803WH) with one taphole, including integrated overflow and chainstay	No	1	
22	510 x 405mm, "Hibiscus" white vitreous china basin (code 702303WH) with one taphole, including integrated overflow  <u>"Libra" or similar approved:</u>	No	1	
23	1 000 x 1 000 x 150mm "Cola 90°" white acrylic shower tray, set in cement mortar bedding and pointed all around with mildew resistant silicon sealant	No	2	
24	Vaal Hibiscus Elite code 772401WH close coupled W.C. suite comprising washdown pan, Vaal Buxton Sta-Tite white plastic seat code 8515Z100, matching 9 litre dual flush cistern with lid and fitments and fixed complete to wall and floor.  <b><u>WASTE UNIONS ETC</u></b>  <u>"Cobra" Watertech</u>	No	1	
25	32mm "308" CP Basin waste union, unslotted	No	2	
26	50mm Brass shower waste with 75mm diameter chrome plated shower grating (VA3.334-4)  <b><u>TRAPS ETC</u></b>  <u>PVC</u>	No	2	
27	40mm Basin plain P-trap	No	2	
	Carried Forward			R
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 14 Plumbing & Drainage			

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Brought Forward			R
	<u>Class 12 HDPe type V pipes</u>		
42	20mm Pipes	m	60
43	20mm Pipes chased into walls	m	20
44	20mm Pipes laid in and including trenches not exceeding 1m deep	m	16
	<u>Extra over Class 12 HDPe type V pipes for "Compression Type" fittings</u>		
45	20mm Fittings	No	28
	<u>Pex-Al-Pex or equal approved multilayer pipe for hot water &amp; heating with press fittings</u>		
46	15mm Pipe and fixing to walls, floors, in roofs, soffit of concrete slab, in chases (including chases), in concrete, etc.	m	45
	<u>Extra over press fittings</u>		
47	16mm Fittings	No	14
	<b><u>ELECTRIC WATER HEATERS</u></b>		
	<u>Hot Water Cylinders, Heat Pumps, Etc</u>		
48	Budgetary allowance for the servicing of existing 150l Geyser and Solar Panel		Item 5,000.00
49	Insulation Blanket for 150l HWC	No	1
50	Allow the Provisional Sum of R20,000.00 (Twenty Thousand Rand) for the installation of a 5kw Heat Pump		Item 20,000.00
51	Allowance for profit and attendance		%
	<b><u>SUNDRIES</u></b>		
52	Budgetary allowance for builders work in connection with Plumbing and Drainage		Item 3,500.00
	<b>Carried Forward</b>		R
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 14 Plumbing & Drainage		

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Brought Forward		R
<b><u>REPAIRS TO SEPTIC TANK</u></b>		
53	Allow the Provisional Sum of R5 000.00 (Five Thousand Rand) for repairs to septic tank.	5,000.00
54	Allowance for profit and attendance	%
<p><b>Carried Forward to Summary of Section No. 2</b></p> <p>Section No. 2  MAIN HOUSE BUILDING WORKS  Bill No. 14  Plumbing &amp; Drainage</p>		



Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 2 - MAIN HOUSE</u></b>				
	<b><u>BILL NO. 16</u></b>				
	<b><u>PAINTWORK</u></b>				
	<u>Standard Preambles</u>				
	The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
	<b><u>SUPPLEMENTARY PREAMBLES</u></b>				
	<b><u>PREPARATORY WORK TO EXISTING WORK</u></b>				
	<u>Previously painted plastered surfaces</u>				
	Surfaces shall be thoroughly washed down and allowed to dry completely before any paint is applied. Blistered or peeling paint shall be completely removed and cracks shall be opened, apply bonding liquid and one coat approved alkali resistant primer to opened cracks before filling with a suitable filler and finished smooth.				
	Apply bonding liquid and one coat approved alkali resistant primer to all bare substrate and filled areas				
	<u>Previously painted metal surfaces</u>				
	Surfaces shall be thoroughly rubbed and cleaned down. Blistered or peeling paint shall be completely removed down to bare metal				
	<u>Previously painted wood surfaces</u>				
	Surfaces shall be thoroughly cleaned down. Blistered or peeling paint shall be completely removed and cracks and crevices shall be primed, filled with suitable filler and finished smooth				
	<b>Carried Forward</b>			R	
	Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 16 Paintwork				



Brought Forward				R
<b><u>COLOURS</u></b>				
Unless otherwise described paintwork on ceilings shall be deemed to be in the "White" colour group and paintwork on all other components shall be deemed to be in the "Pastel" colour group in accordance with the Natural Colour System (NCS) adopted by the SA National Standards				
<b><u>PAINTWORK ETC TO NEW WORK</u></b>				
<b><u>ON INTERNAL FLOATED PLASTER SURFACES</u></b>				
<u>One coat alkali resistant primer and two coats superior quality acrylic emulsion paint for interior and exterior use</u>				
1	Walls	m2	131	
<b><u>ON EXTERNAL FLOATED PLASTER SURFACES</u></b>				
<u>One coat alkali resistant primer and two coats extremely durable, premium quality highly washable and stain resistant pure acrylic emulsion sheen paint for interior and exterior use</u>				
2	Walls	m2	28	
<b><u>ON PLASTERBOARD SURFACES</u></b>				
<u>One coat alkali resistant primer and two coats superior quality acrylic emulsion paint for interior and exterior use</u>				
3	Ceilings and cornices	m2	49	
<b><u>ON FIBRE-CEMENT BOARD SURFACES</u></b>				
<u>Two coats extremely durable UV-resistant, washable pure acrylic emulsion sheen paint</u>				
4	Fascias and barge boards, including priming metal jointing strips	m2	38	
<b><u>ON METAL SURFACES</u></b>				
Carried Forward				R
Section No. 2 MAIN HOUSE BUILDING WORKS Bill No. 16 Paintwork				

Brought Forward			R
	<u>One coat alkyd based zinc phosphate primer, one coat alkyd based universal undercoat and two coats superior quality universal enamel paint, on steel</u>		
5	Door frames	m2	1
	<b><u>ON WOOD SURFACES</u></b>		
	<u>Two coats oil wood primer</u>		
6	Backs of frames, linings, etc not exceeding 300mm wide	m	15
	<u>One coat primer, one coat alkyd based universal undercoat and two coats superior quality universal enamel paint</u>		
7	Doors	m2	10
8	Door frames etc	m2	3
9	Skirting, rails, etc not exceeding 300mm girth	m	51
	<b><u>PAINTWORK, ETC TO PREVIOUSLY PAINTED WORK</u></b>		
	<b><u>ON INTERNAL FLOATED PLASTER SURFACES</u></b>		
	<u>Two coats low odour premium quality highly washable and stain resistant acrylic emulsion paint</u>		
10	Walls	m2	498
	<b><u>ON EXTERNAL FLOATED PLASTER SURFACES</u></b>		
	<u>One coats alkyd based universal undercoat and two coats extremely durable, premium quality highly washable and stain resistant pure acrylic emulsion sheen paint for interior and exterior use</u>		
11	Walls	m2	114
	<b><u>ON PLASTERBOARD SURFACES</u></b>		
			</

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Brought Forward			R
	<u>One coats alkyd based universal undercoat and two coats extremely durable, premium quality highly washable and stain resistant pure acrylic emulsion sheen paint for interior and exterior use</u>		
12	Ceilings and cornices	m2	98
	<b><u>ON WOOD SURFACES</u></b>		
	<u>One coat alkyd based universal undercoat and one coat superior quality universal enamel paint</u>		
13	Doors	m2	33
14	Door frames etc	m2	10
15	Skirting, rails, etc not exceeding 300mm girth	m	170
	<u>Two coats alkyd superior quality matt/clear gloss vanish</u>		
16	Roof timbers at eaves and verges	m2	9
Carried Forward to Summary of Section No. 2			R
Section No. 2			
MAIN HOUSE BUILDING WORKS			
Bill No. 16			
Paintwork			

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SECTION SUMMARY - MAIN HOUSE BUILDING WORKS		Page No	Amount
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Carried to Final Summary			R
Section No. 2 MAIN HOUSE BUILDING WORKS			

Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 3 - COMMUNAL ABLUTIONS</u></b>				
	<b><u>BILL NO. 1</u></b>				
	<b><u>ALTERATIONS</u></b>				
	<u>Standard Preambles</u>				
	The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
	<u>View site</u>				
	Before submitting his tender the tenderer shall visit the site and satisfy himself as to the nature and extent of the work to be done and the value of the materials salvageable from the alterations. No claim for any variations of the contract sum in respect of the nature and extent of the work or of inferior or damaged materials will be entertained				
	<u>Explosives</u>				
	No explosives whatsoever may be used for alteration purposes unless otherwise stated				
	<u>General</u>				
	The contractor shall carry out the whole of the works with as little mess and noise as possible and with a minimum of disturbance to tenants in the building and to adjoining premises and their tenants. He shall provide proper protection and provide, erect and remove when directed, any temporary tarpaulins that may be necessary during the progress of the works, all to the satisfaction of the principal agent				
	<b>Carried Forward</b>			R	
	Section No. 3 COMMUNAL ABLUTIONS BUILDING WORKS Bill No. 1 Alterations				

<p style="text-align: right;"><b>Brought Forward</b></p> <p>The Contractor will be held solely responsible for checking all floor levels and dimensions in the existing building in order that the new extensions may be correctly lined up. Should any discrepancies be found in the Architect's drawings he should be asked for a decision before continuing with the work</p> <p>The Contractor will be held solely responsible for any damage to persons and property, for the safety of the new and existing structure throughout the whole of the contract and must make good, at his own expense, any damage that may occur</p> <p>The Contractor shall not remove or interfere with any furniture, fittings or similar articles unless specially mentioned in the following items and shall give adequate notice to the Representative/Agent if the removal of any such articles from parts of the buildings are to be altered becomes necessary so that the Employer may have same removed before the Contractor commences work in such parts</p> <p>All demolitions and works on site must be carried out carefully and in the safest possible manner and the Contractor is to make a thorough examination and take all necessary precautions before proceeding with the work. The utmost care is to be observed to avoid any structural or other damage in the remaining portions of the existing building</p> <p>Special care is to be exercised not to interfere with any electrical installation, and notice is to be given to the Representative/Agent when any disconnections, removal of wire, etc., are necessary and the Contractor is to afford every facility to the workmen carrying out his work</p> <p>Allow for giving notice to local or other authorities for disconnecting electric light, water and drainage mains and removing telephone wires, etc., and pay all fees in connection therewith and afford every facility to the workmen carrying out this work</p>					<p style="text-align: center;">R</p>
<p style="text-align: right;"><b>Carried Forward</b></p> <p>Section No. 3 COMMUNAL ABLUTIONS BUILDING WORKS Bill No. 1 Alterations</p>					<p style="text-align: center;">R</p>

<p style="text-align: right;"><b>Brought Forward</b></p> <p>The Contractor shall immediately notify the Representative/Agent and the Authorities concerned and shall at his own cost make all necessary arrangements for disconnection and repairs with the relevant Authorities and shall pay all fees and charges levied</p> <p>Doors, fanlights, windows, fittings, frames, linings, etc which are to remain the property of the employer shall be carefully taken out, temporarily stored, transported over a distance of approximately 50km to store and handed over to the employer</p> <p>Doors, fanlights, windows, fittings, frames, linings, etc which are to be re-used shall be thoroughly overhauled before refixing including taking off, easing and rehanging, cramping up, re-wedging as required and making good cramps, dowels, etc, and oiling, adjusting and repairing ironmongery as necessary, replacing any glass damaged in removal or subsequently and stopping up all nail and screw holes with tinted plastic wood to match timber, unless otherwise described. Re-painting or re-varnishing is given separately</p> <p>Prices for taking out of doors, windows, etc shall include for removal of all beads, architraves, ironmongery, etc</p> <p>Prices for taking out and removing doors and frames shall include for removing door stops, cabin hooks, etc</p> <p>Existing sheets and rainwater goods, eaves and verges must be comprehensively protected against damage. No walking directly on the roof sheets will be allowed and rates for all work are to include for protective timber board gangways or similar approved</p> <p>With regard to building up of openings in existing walls, cement screeds and pavings, granolithic, tops of walls, etc, shall be levelled and prepared for raising of brickwork</p> <p>Making good of finishes shall include making good of the brick and concrete surfaces onto which the new finishes are applied, where necessary</p> <p>Erect a safety net to stop spillage from falling onto the ground when cleaning the roof sheets</p>			R	
<p style="text-align: right;"><b>Carried Forward</b></p> <p>Section No. 3 COMMUNAL ABLUTIONS BUILDING WORKS Bill No. 1 Alterations</p>			R	

Brought Forward		R
<p>All residue from cleaning the roofs to be collected in drums/skips and be disposed of as builders rubble</p> <p>Fix an impact resistant transparent hood over high pressure spray</p> <p>The contractor will be required to take all dimensions affecting the existing buildings on the site and he will be held solely responsible for the accuracy of all such dimensions where used in the manufacture of new items (doors, windows, fittings, etc)</p> <p>Should the Contractor damage any services which are to remain in operation or any services which have not yet been disconnected prior to removal, then the Contractor will be held solely responsible for such damage and any further resultant damage</p> <p>Allow for keeping area of the works, where the roof has been removed, weatherproof by means of tarpaulins, etc. for the entire period that the area is without a permanent weatherproof roof covering. The cost of all repairs consequential upon the contractor failing to comply with the requirement will be for the contractor's sole account</p> <p><b><u>REMOVAL OF EXISTING WORK</u></b></p> <p><u>Taking out and removing sanitary fittings, tanks, geysers, etc, including disconnecting from pipes, traps, etc and making good floor and wall finishes (making good tiling and paintwork elsewhere)</u></p> <p>(FM3.402 Flushmaster Junior) toilet flush valve</p> <p>38 x 50mm Deep seal combination "P" or "S" trap</p> <p><u>Taking out and removing ironmongery</u></p> <p>Door handle from timber door</p> <p><b><u>SERVICING PLUMBING</u></b></p>		
Carried Forward		R
<p>Section No. 3 COMMUNAL ABLUTIONS BUILDING WORKS Bill No. 1 Alterations</p>		



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Brought Forward			R
	<u>Minor servicing, thoroughly cleaning, repairing and re-aligning as necessary existing sanitary fittings, etc and leaving in complete working order including flushing trap, fit new plug and chains, replace tap washers, fixing all leaks, replacing defective parts and seal with silicone sealant all around on completion sanitary fittings, etc</u>		
4	Vitreous china wash hand basin, taps and waste	No	10
5	Replace existing W.C. seat with new heavy duty double flap white plastic seat and fixing in position	No	8
Carried Forward to Summary of Section No. 3			R
Section No. 3 COMMUNAL ABLUTIONS BUILDING WORKS Bill No. 1 Alterations			

Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 3 - COMMUNAL ABLUTIONS</u></b>				
	<b><u>BILL NO. 2</u></b>				
	<b><u>WATERPROOFING</u></b>				
	<u>Standard Preambles</u>				
	The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
	<b><u>WATERPROOFING BASEMENTS, ROOFS, BALCONIES, ETC.</u></b>				
	<u>4mm Thick "Derbigum SP4" or similar approved waterproofing membrane including laps, turn-ups, turn-downs, etc and preparing and priming concrete or screeded surfaces laid in accordance with the manufacturers instruction</u>				
1	On tops and sides of inverted beams	m2	7		
	<b><u>WATERSTOPS, SEALING STRIPS, JOINT SEALANTS, ETC</u></b>				
	<u>Approved silicone sealing compound applied with a pressure caulking gun</u>				
2	Between aluminium door or window frames and plaster	m	80		
	<b>Carried Forward to Summary of Section No. 3</b>				R
	Section No. 3				
	COMMUNAL ABLUTIONS BUILDING WORKS				
	Bill No. 2				
	Waterproofing				

Item No	Unit	Quantity	Rate	Amount
<b><u>SECTION NO. 3 - COMMUNAL ABLUTIONS</u></b>				
<b><u>BILL NO. 3</u></b>				
<b><u>IRONMONGERY</u></b>				
<u>Standard Preambles</u>				
The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
<u>Proprietary items</u>				
Where applicable the manufacturers' names or product catalogue titles are given in sub-headings preceding the items				
Prices are to be based on the specific products/articles specified. If tenderers wish to offer alternative products/articles for certain items, these items are to be clearly marked and the alternative specification given with supporting brochures etc clarifying the features of the products/articles offered				
On request returnable samples are to be provided to the principal agent for consideration				
<b>Carried Forward</b>				R
Section No. 3 COMMUNAL ABLUTIONS BUILDING WORKS Bill No. 3 Ironmongery				

Brought Forward				R
<u>Finishes to ironmongery</u>				
Where applicable finishes to ironmongery are indicated by suffixes in accordance with the following list:				
BS Satin bronze lacquered				
CH Chromium plated				
SC Satin chromium plated				
SE Silver enamelled				
Sn Satin Nichol				
GE Grey enamelled				
AN Anodised natural				
AA Anodised Aluminium				
AS Anodised silver				
AB Anodised bronze				
AG Anodised gold				
ABL Anodised black				
PB Polished brass				
PL Polished and lacquered				
PT Epoxy coated				
SD Sanded				
S Sil				
<b><u>HANDLES</u></b>				
<u>"Union" or similar approved</u>				
1	22mm diameter "PHD-CF-300-22SS" tubular pull handle fixed flange	No	2	
<b>Carried Forward to Summary of Section No. 3</b>				R
Section No. 3				
COMMUNAL ABLUTIONS BUILDING WORKS				
Bill No. 3				
Ironmongery				

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Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 3 - COMMUNAL ABLUTIONS</u></b>				
	<b><u>BILL NO. 5</u></b>				
	<b><u>PLUMBING AND DRAINAGE</u></b>				
	<u>Standard Preambles</u>				
	The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
	<b><u>SANITARY FITTINGS</u></b>				
	<u>"Cobra" or similar approved</u>				
1	(FM3.402 Flushmaster Junior) toilet flush valve	No	8		
	<b>Carried Forward to Summary of Section No. 3</b>				
	Section No. 3 COMMUNAL ABLUTIONS BUILDING WORKS Bill No. 5 Plumbing & Drianage				
				R	

Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 3 - COMMUNAL ABLUTIONS</u></b>				
	<b><u>BILL NO. 6</u></b>				
	<b><u>PAINTWORK</u></b>				
	<u>Standard Preambles</u>				
	The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained				
	<b><u>SUPPLEMENTARY PREAMBLES</u></b>				
	<b><u>PREPARATORY WORK TO EXISTING WORK</u></b>				
	<u>Previously painted plastered surfaces</u>				
	Surfaces shall be thoroughly washed down and allowed to dry completely before any paint is applied. Blistered or peeling paint shall be completely removed and cracks shall be opened, apply bonding liquid and one coat approved alkali resistant primer to opened cracks before filling with a suitable filler and finished smooth.				
	Apply bonding liquid and one coat approved alkali resistant primer to all bare substrate and filled areas				
	<u>Previously painted metal surfaces</u>				
	Surfaces shall be thoroughly rubbed and cleaned down. Blistered or peeling paint shall be completely removed down to bare metal				
	<u>Previously painted wood surfaces</u>				
	Surfaces shall be thoroughly cleaned down. Blistered or peeling paint shall be completely removed and cracks and crevices shall be primed, filled with suitable filler and finished smooth				
	<b>Carried Forward</b>			R	
	Section No. 3 COMMUNAL ABLUTIONS BUILDING WORKS Bill No. 6 Paintwork				

Brought Forward				R
<b><u>COLOURS</u></b>				
Unless otherwise described paintwork on ceilings shall be deemed to be in the "White" colour group and paintwork on all other components shall be deemed to be in the "Pastel" colour group in accordance with the Natural Colour System (NCS) adopted by the SA National Standards				
<b><u>PAINTWORK, ETC TO PREVIOUSLY PAINTED WORK</u></b>				
<b><u>ON INTERNAL FLOATED PLASTER SURFACES</u></b>				
<u>Two coats low odour premium quality highly washable and stain resistant acrylic emulsion paint</u>				
1	Walls	m2	250	
<b>Carried Forward to Summary of Section No. 3</b>				R
Section No. 3 COMMUNAL ABLUTIONS BUILDING WORKS Bill No. 6 Paintwork				



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Item No		Unit	Quantity	Rate	Amount
	<b><u>SECTION NO. 4 - ELECTRICAL WORKS</u></b>				
	<b><u>BILL NO. 1</u></b>				
	<b><u>ELECTRICAL REPAIR WORK</u></b>				
	<b><u>DISTRIBUTION BOARD</u></b>				
	<b><u>'Distribution boards complete with sheet metal tray, frames, sub-frames, busbars, provision for two TP future circuit breakers, legend card, circuit breakers, fuses, switches, relays, earth leakage units, time switches, etc:</u></b>				
	<u>Supply and install Flush mounted SDB complete with Schneider / CBI circuit breakers- 16 Way</u>				
1	Remove	No	1		
2	Supply	No	1		
3	Install	No	1		
	<u>10-20 Amp 6KA Single Pole MCB</u>				
4	Remove	No	2		
5	Supply	No	3		
6	Install	No	3		
	<u>30-60 Amp 6KA Single Pole MCB</u>				
7	Remove	No	1		
8	Supply	No	1		
9	Install	No	1		
	<u>30-60 Amp 6KA Earth Leakage MCB</u>				
10	Remove	No	2		
11	Supply	No	2		
	<b>Carried Forward</b>			R	
	Section No. 4 ELECTRICAL WORKS Bill No. 1 Electrical Repair Work				

	Brought Forward			R
12	Install	No	2	
	<u>60-70 Amp 6KA Double Pole MCB</u>			
13	Remove	No	1	
14	Supply	No	1	
15	Install	No	1	
	<u>Supply and Install new legend</u>			
16	Remove	No	1	
17	Supply	No	1	
18	Install	No	1	
	<b><u>ISOLATOR</u></b>			
	<u>60A 2-Pole 100x50 type (IP65) Isolator</u>			
19	Remove	No	2	
20	Supply	No	2	
21	Install	No	2	
	<b><u>CERTIFICATE OF COMPLIANCE</u></b>			
	<u>Allow for Certificate of Compliance (COC) in terms of the Occupational and Health Safety Act, OHS ACT of 1993. Allow for testing , earthing and balancing of Phases as well as commissioning of the whole electrical lighting and power installation.</u>			
22	Distribution Board - Up to 30 Circuits	No	1	
	<b><u>CABLES, WIRING AND EARTH WIRE</u></b>			
	<b><u>CABLES</u></b>			
	<u>16mm<sup>2</sup> x 3 Core Cu SWA cable</u>			
23	Remove	m	10	
	Carried Forward			R
	Section No. 4 ELECTRICAL WORKS Bill No. 1 Electrical Repair Work			

		Brought Forward			R	
24	Supply	m	10			
25	Install	m	10			
	<b><u>CABLE TERMINATIONS</u></b>					
	<b><u>Including cable gland, screw type earth tag, gland bracket, earth tail and fixing. Refer to General Technical Specification</u></b>					
	<u>2,5mm² x 3 house wire</u>					
26	Remove	m	100			
27	Supply	m	100			
28	Install	m	100			
	<b><u>EARTHING CONDUCTORS</u></b>					
	<b><u>Supply &amp; install the following Bare Copper earth conductors running with and strapped to power cables (Power cable measured elsewhere):</u></b>					
	<u>4mm² BCE conductor</u>					
29	Supply	m	75			
30	Install	m	75			
	<b><u>EARTHING AND BONDING OF THE INSTALLATIONS</u></b>					
	<b><u>Supply and install connections to fixed appliances</u></b>					
	<u>2,5mm² BCE conductor</u>					
31	Remove	No	1			
32	Supply	No	1			
33	Install	No	1			
		Carried Forward			R	
	Section No. 4					
	ELECTRICAL WORKS					
	Bill No. 1					
	Electrical Repair Work					

Brought Forward				R
<b><u>Neutral Earthing Bar</u></b>				
<u>300mm length of 70mm<sup>2</sup> copper busbar fitted with studs mounted off the wall</u>				
34	Remove	No	1	
35	Supply	No	1	
36	Install	No	1	
<b><u>WIRING</u></b>				
<b><u>Supply and install PVC insulated conductors in conduits or trunking: (colours Red = Phase conductor, Black = Neutral conductor, Green / Yellow = Earth, Line 1 =Pink, Line 2 = orange)</u></b>				
<u>2,5 mm<sup>2</sup> Red colour</u>				
37	Remove	m	100	
38	Supply	m	100	
39	Install	m	100	
<u>2,5 mm<sup>2</sup> Black colour</u>				
40	Remove	m	100	
41	Supply	m	100	
42	Install	m	100	
<u>2,5 mm<sup>2</sup> Yellow colour</u>				
43	Remove	m	100	
44	Supply	m	100	
45	Install	m	100	
<b><u>Draw-wires</u></b>				
Carried Forward				R
Section No. 4 ELECTRICAL WORKS Bill No. 1 Electrical Repair Work				

	Brought Forward			R
	<u>Galvanised steel draw-wires drawn into conduit</u>			
46	Supply	m	100	
47	Install	m	100	
	<b><u>LUMINARIES</u></b>			
	Luminaries shall comply with : Luminaries shall include for lamp sources, suspension, fixing and connecting. All fittings will be connected to an isolator or plugged into an 5A socket outlet.			
	<b><u>LED TUBE COMMERCIAL</u></b>			
	<b><u>Recessed and Surface Commercial Lighting</u></b>			
	<u>Surface Open Channel fluorescent with LED 2 x 18W - cool white lamps - equivalent to 2x 36W T8 fluorescent lamps - 1200mm</u>			
48	Remove	No	2	
49	Supply	No	4	
50	Install	No	4	
	<b><u>Chandelier</u></b>			
	<u>Drop Chandelier. Height: 220mm; Width 200mm; Cord Length 1060mm; Bulb Type G4 Bi-pin; Max Wattage 10W ; Globe Chandelier</u>			
51	Supply	No	2	
52	Install	No	2	
	<b><u>Decorative Lights</u></b>			
	<u>Supply and install similar and / or equal to light fitting ref No's as listed below. Many of these light fittings might not be available in it's current form, but a similar product will suffice. Most REF NO's are from Radiant / Eurolux catalogues</u>			
	<b><u>Bulkhead Lighting</u></b>			
	Carried Forward			R
	Section No. 4 ELECTRICAL WORKS Bill No. 1 Electrical Repair Work			

	Brought Forward			R
	<u>Bulkhead, Surface, 2 x 18W, LED Lascon Roma</u>			
53	Remove	No	8	
54	Supply	No	8	
55	Install	No	8	
	<b><u>CONDUITS AND ACCESSORIES</u></b>			
	<b><u>Galvanised steel conduit to SANS 606114-1 &amp; 60614-2-1 chased in walls, surface mount, open roof spaces or in drywall in the following size:</u></b>			
	<u>25mm Diameter galvanised steel conduit</u>			
56	Remove	m	50	
57	Supply	m	100	
58	Install	m	100	
	<u>60mm Round boxes:</u>			
59	Remove	No	10	
60	Supply	No	26	
61	Install	No	26	
	<u>60mm Round box Dome Cover</u>			
62	Remove	No	10	
63	Supply	No	26	
64	Install	No	26	
	<u>100mm x 100mm x 50mm galvanised steel Boxes:</u>			
65	Remove	No	10	
66	Supply	No	10	
67	Install	No	10	
	<b>Carried Forward</b>			R
	Section No. 4 ELECTRICAL WORKS Bill No. 1 Electrical Repair Work			

Brought Forward			R
<b><u>PVC conduit chased in walls, open roof spaces or in drywall in the following size:</u></b>			
<u>20mm Diameter PVC conduit</u>			
68	Remove	m	50
69	Supply	m	150
70	Install	m	150
<b><u>LIGHT SWITCH OUTLET</u></b>			
<b><u>Crabtree or equal approved:</u></b>			
<b><u>Light switches are to include for screwing to outlet boxes, connecting up and cover plates. Units mounted on outlet trunking to be manufactured and installed by manufacturer of outlet trunking</u></b>			
<u>16A One lever one-way switch unit</u>			
71	Remove	No	6
72	Supply	No	4
73	Install	No	4
<u>20A 2 lever (2 x 2 way) (100 x 10mm)</u>			
74	Remove	No	1
75	Supply	No	5
76	Install	No	5
<b><u>SWITCHED SOCKET OUTLETS</u></b>			
<b><u>Legrand Arteor / Mosaic or similar approved socket outlets including screwing to outlet boxes, cable termination and cover plates.</u></b>			
Carried Forward			R
Section No. 4 ELECTRICAL WORKS Bill No. 1 Electrical Repair Work			



		<b>Brought Forward</b>					R
	<u>Single 16A 3Pin RSA Socket Outlet</u>						
77	Remove	No	4				
78	Supply	No	1				
79	Install	No	1				
	<u>Double 16A 3Pin RSA Socket Outlet</u>						
80	Remove	No	9				
81	Supply	No	9				
82	Install	No	9				
<b><u>DSTV</u></b>							
<b><u>Supply and install DSTV compatible and components for domestic &amp; communal satellite TV distribution systems.</u></b>							
	<u>TV Wall Connector - 100 x 50 box</u>						
83	Remove	No	1				
84	Supply	No	1				
85	Install	No	1				
	<u>75 Ohm Co Axe TV cable - fitted in conduit or surface on wiring trunking / roof space</u>						
86	Remove	m	2				
87	Supply	m	10				
88	Install	m	10				
<b><u>INTRUDER ALARM SYSTEM</u></b>							
		<b>Carried Forward</b>					R
Section No. 4 ELECTRICAL WORKS Bill No. 1 Electrical Repair Work							

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	Brought Forward			R
	<u>Alarm - Domestic Control box with 12V Battery</u>			
89	Remove	No	1	
90	Supply	No	1	
91	Install	No	1	
	<u>Mini - UPS - Power Supply Unit incl termination</u>			
92	Remove	No	1	
93	Supply	No	1	
94	Install	No	1	
	<u>Surface Panic button on wall</u>			
95	Remove	No	3	
96	Supply	No	3	
97	Install	No	3	
	<u>Domestic Alarm Keypad with LCD display - 6 zone</u>			
98	Remove	No	1	
99	Supply	No	1	
100	Install	No	1	
	<u>Wall Mounted PIR sensor</u>			
101	Remove	No	6	
102	Supply	No	6	
103	Install	No	6	
	<u>Reed Switch - Timber Doors &amp; Windows</u>			
104	Remove	No	6	
	Carried Forward			R
	Section No. 4 ELECTRICAL WORKS Bill No. 1 Electrical Repair Work			

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NOV 2023**

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HAROLD PORTER GARDEN - ADDITIONS & ALTERATIONS  
NOV 2023**

[illegible]

**PART C: THE CONTRACT**  
**Part C3: Scope of Work**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
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**PART C: THE CONTRACT**  
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**C3.1. Description of the Works**

**C3.1.1 Employer's Objectives**

The employer's objective is to deliver improved infrastructure at Porter's Lodge which is the Garden Manager's official home and requires various upgrades and maintenance. The Garden Manager's home needs to be upgraded into more comfortable living space for her family's needs.

**C3.1.2 Overview of the Works**

**Porter Lodge 2801 Clode Street**

Upgrades and maintenance to the Garden Manager's official's house to ensure a more comfortable living space.

**Harold Porter Bathrooms**

Maintenance to the bathrooms.

**C3.1.3 Extent of the Works**

**Harold Porter house at 2801 Clode street**

**Structural and Building**

**Roof Structure / Covering:**

The roof will be inspected for any leaks and contractor will leave the roof in full functional state. The roof will then be pressure washed.

The damaged roof sheeting in the courtyard will be replaced with corrugated metal sheet to match existing.

**Ceilings:**

The ceiling in Bedroom 1 will need to be replaced as it is in a poor condition. All other ceilings will have to be painted.

The timber strip between the ceiling boards will need to be removed and the joints will be skimmed and painted.

**Fascia's:**

All fascia's will be removed, newly installed and to receive two coats of extremely durable UV-resistant washable pure acrylic paint, on work in poor condition. Existing gutters and 80 mm diameter will be removed and new rainwater goods will be installed.

Floors:

The bathroom and kitchen floor tiles will be hacked up, new screed to be laid and new porcelain full-body tiles will be installed.

The vinyl floor tiles in the storeroom will be lifted, floor to be screeded and new full-body porcelain tiles will be installed.

Wall Coverings:

All internal and external walls will be painted. The ponding of stormwater against the external walls will be addressed in the civil section of the report.

The missing patio partition boards will be replaced and need to be replaced and painted.

Windows:

All steel windows will be replaced with new aluminium windows. New lintels will be installed above all the window openings.

Doors:

All external doors will be replaced with aluminium doors, whereas the internal doors will be replaced as needed.

Fittings:

A new fireplace will be installed in the same position as the previously removed fireplace.

All door locksets will be serviced to ensure they are fully functional.

Carpentry and Ironmongery:

All kitchen cupboards will be removed and new cupboards to be installed. New cupboards will also be installed in all the bedrooms.

**Plumbing and Drainage**

Bathroom 1 will have to be renovated to accommodate the passageway needed to gain access to Bedrooms 3 and 4. The bathroom will be fitted with a new shower and wash hand basin. The floor and wall tiles will also be replaced.

The WC pans and cisterns for both bathrooms in the dwelling are operational and in a good condition. No work is required to these sanitary fixtures. There were no defects identified in the Bathroom next to the storeroom and therefore no work is recommended for this area.

The surface mounted water pipework will be chased into the wall prior to the new kitchen cupboards being installed. This will allow for reposition of the sink if need be.

A new toilet roll holder will be installed in bathroom 1.

All damaged pipework will be replaced.

Fire Fighting:

One 4.5 kg CO<sup>2</sup> fire extinguisher will be installed as well as the accompanying signage.

**Civil Works and Stormwater**

The following work will be executed:

- Paving will be installed around the building directing water away from the external dwelling walls.
- Stormwater from downpipes will discharge onto a paved area which will direct water away from the dwelling.

To address the damp wall in the lounge, a new cavity wall will be built 1200 mm away from the existing wall. The cavity wall will prevent rising damp from occurring and the existing damp wall will be demolished. In addition to the new cavity wall, paving will be installed in front of the new cavity wall to direct stormwater away from the new external wall.

An allowance has been made to repair damages to the septic tank on the South-West side of the property.

The blocked gully will be unblocked and if it is found to be damaged an allowance has been made repair the damaged line.

### **New Building Work**

The below to be read in-conjunction with the layout drawings.

The following changes will be made to the dwelling:

- Two additional bedrooms will be constructed.
- An en-suite bathroom will be added to Bedroom 4
- Bathroom one will be reduced to allow for a passageway leading to Bedrooms 3 and 4.
- The wall between Bathroom 1 and the WC will be demolished to create a new bathroom.
- The bathtub will be removed in Bathroom 1 and a shower and new wash hand basin installed.
- A new passageway will be constructed leading from the garage to the existing passageway.
- A sliding door will be installed in the new passageway to access the courtyard. The window in South-West window in the kitchen to be built closed and a new 900 x 900 mm window to be installed on the North wall of the kitchen.
- The North wall of the lounge will be demolished, and a new cavity wall will be constructed 1200 mm further away.

### **Building Electrical**

The building is supplied with 60A Supply connected to Eskom and the building has no standby power.

The main distribution board is installed in the kitchen and the electrical meter is installed.

Rewiring to all lighting circuits will be required and existing light fittings will be replaced with new CFL-type lighting and fluorescent light.

The following electrical work to be executed:

- The existing light fixtures will be evaluated to ensure adherence to minimum design standards and electrical use good practice.
- Replace the distribution board with a flush-mounted SBD and labelling and provide a legend card. Replacement of old circuit breakers rated lower than 6KA and provide neutral /earth bar 300 mm length of 70 mm<sup>2</sup>.
- Provide a Certificate of Compliance on the Electrical Installation.
- Install a new 60A Isolator for the electric stove and geyser with IP65 rating, provide earthing and bonding using a 2.5 mm<sup>2</sup> BCE conductor.
- All the current wireways will be removed, and new wireways will be installed in accordance with the electrical power drawing. And all the wire ways should be chased into walls.
- Replace the existing bulkhead lights in the dining room and lounge with chandeliers of warm white LED.
- Replace all the bulkhead lights installed in bathrooms with vapour-proof bulkheads with an IP65 Rating.
- Replace all the bedroom bulkhead lighting (Surface, 2x18W LED), with bulkhead LED lighting. Lux level in bedrooms should not be less than 215 Lux, not more than 538 Lux.
- Replace all the fluorescent tubes with 1200 mm Vapour proof LED tube.
- Install photocell in a dummy Bulkhead.



- Install additional bulkhead LED Lights at the external areas.
- Install additional intruder PIR sensors in the new rooms.
- Install a new alarm system that can add up to 12 zones and incorporate 19 reed switches for timber doors and windows.
- Supply a mini-UPS for the alarm system.
- All electrical joints shall be done in a connection box with IP65 rating.

Certificates of Compliances will be obtained for the distribution boards, whilst the earthing and bonding of all the buildings will be checked, tested and upgraded.

### **Harold Porter Botanical Garden Toilets**

The following work is planned under the repair/maintenance work for the toilets:

- Service all taps e.g. replacement of washers tightening of the taps to the WHB.
- Seal around all bathroom windows
- Paint concrete beams and walls
- Replace all bathroom P-traps.
- Extend support brackets beneath the wash had basin to prevent it from collapsing.
- All toilets seat to be replaced with a heavy-duty toilet seat and cover.
- All junior flushmasters will be replaced with similar.

The Contractor will be required to construct the works in conformity with design criteria specified in the Project Specification.

The project period will be **7 months**.

#### **C3.1.4 Location of the Works**

The area where the refurbishment of the bathroom will be executed is located at the Harold Porter's National Botanical Garden, c/o Clarence Drive and, Broadwith Rd, Betty's Bay.

The work to be executed at the Garden Manager's house is located at 2801 Clode Street, Betty's Bay.

#### **C3.1.5 Description of Site and Access**

This garden is situated in the centre of the coastal fynbos where the flora is at its richest. It encompasses mountain slopes with wind-clipped heathlands, deep gorges with relict forests, flats, and marshes with restios, sedges and bulbs, as well as dunes adjacent to the beach with specialised salt-adapted plants. The Garden is renowned for its waterfalls and amber pools.

The main fynbos families are present as well as other important families such as irises, daisies, and orchids. The Garden boasts red disa in its natural habitat as well as South Africa's national flower, the king protea.

This beautiful, secluded Garden is set between mountain and sea, in the heart of the Cape Fynbos region within the Kogelberg Biosphere Reserve. It consists of 10 hectares of cultivated fynbos garden and 190.5 hectares of pristine natural fynbos. The Garden Estate is the natural part of the garden with several kilometres of nature trails providing scenic views of forests, mountains, and coastline.

The garden is accessible via the R44 (Clarence Drive, whilst the Porter's house takes a right onto Waterfall Street and a left into Clode Street, Betty's Bay.

#### **C3.1.6 Temporary Works**

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

**PART C: THE CONTRACT**  
**Part C3: Scope of Work**

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**C3.2. Construction**

**C3.2.1 Construction Standards**

The "Model Preambles for Trades (2008 Edition)" recommended and published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in the Bills of Quantities, with amendments as follows: References to "Architect" in the Model Preambles are to be read as "Principal Agent" shall apply to this contract.

This publication is available from The Association of South African Quantity Surveyors, P.O. Box 3527, Halfway House, 1685 - telephone (011) 315-4140, before a Tender is submitted.

The SANS 1200 Standardised Specification for Civil Engineering Construction prepared by Standards South Africa and specific amendments and additions to the SANS 1200 Standardized Specifications shall apply to this contract.

The SANS 1200 Standardised Specification publications are available from Standard south Africa, Private Bag X 191, Pretoria, 0001.

**C3.2.2 Plant and Materials**

**C3.2.2.1 Plant and Materials Supplied by the Employer**

None

**C3.2.2.2 Materials, Samples and Shop Drawings**

All materials are to be tested by a commercial laboratory as directed by the Engineer.

**C3.2.3 Construction Equipment**

**C3.2.3.1 Requirements for Equipment**

The Contractor is required to use plant and equipment that is sufficient for the contract.

**C3.2.3.2 Equipment Provided by the Employer**

None

**C3.2.4 Existing Services**

**C3.2.4.1 Known Services**

As-built information is unavailable at the time of tender, the onus still lies with the main Contractor to ensure that no services are damaged during the construction phase.

**C3.2.4.2 Treatment of Existing Services**

Contractor to use caution.

**C3.2.4.3 Use of Detection Equipment for the Location of Underground Services**

At main Contractor's discretion.

**C3.2.4.4 Damage to Services**

It is the responsibility of the Contractor to ensure that no services are damaged during the construction process. In case the known services are damaged, the main Contractor shall be responsible for the repair off the services to the original state before it was damaged, as well as all cost associated with the damaged service.

**C3.2.5 Site Establishment**

**C3.2.5.1 Services and Facilities Provided by the Employer**

None.

**C3.2.5.2 Facilities Provided by the Contractor**

The onus lies with the main Contractor to find a suitable camp site, approved by the Employer.

**C3.2.5.3 Storage**

No requirements are specified.

**C3.2.5.4 Other Facilities and Services**

No requirements are specified.

**C3.2.5.5 Vehicles and Equipment**

No requirements are specified.

**C3.2.5.6 Advertising Rights**

It is the main Contractor's responsibility that no suppliers advertise on site. Any advertisement from suppliers shall be removed at the cost of the main Contractor.

**C3.2.5.7 Notice Boards**

The main Contractor is allowed to place a noticeboard on site. The maximum allowed size of this board should be 2 x 3 m.

**C3.2.6 Site Usage**

The Contractors are not allowed to work outside the allowed working hours, as agreed with the Engineer. The disturbance to the residence should be kept at a minimum.

**PART C: THE CONTRACT**  
**Part C3: Scope of Work**

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**C3.3. Management**

**C3.3.1 Planning and Programming**

**C3.3.1.1 General**

This clause describes the requirements for the preparation, submission, updating and revision of the programme for the works. The requirements are in addition to or in expansion of the JBCC PBA clause [15.6].

The programme shall be used by the contractor to plan and execute the works. The programme shall also be used by the Principal Agent to monitor progress and be the sole basis for the assessment of revisions of the date for Practical Completion.

The programme shall be produced by the contractor as follows:

- a) A programme for the totality of the works shall be submitted to the principal agent for acceptance. If the principal does not accept such programme, it shall be revised and amended until it is accepted by the principal agent. This programme will then be regarded as the baseline programme.
- b) This baseline programme shall be updated with actual progress monthly, or any more frequent basis as necessitated by construction events. The contractor may submit to the principal for acceptance revisions to the baseline programme.
- c) Acceptance by the Principal Agent of any programme submitted by the contractor does not make such programme a contract document, nor does it mandate that the works shall be constructed strictly in accordance therewith. The contractor always remains responsible for the construction of the works.

**C3.3.1.2 Submission of Programme**

Within 10 (ten) working days of been given possession of the site the Contractor shall submit to the Principal Agent for his review and acceptance a programme for the whole of the works showing the order in which the contractor proposes to execute the works. This programme becomes the baseline programme upon acceptance by the Principal Agent. The baseline programme shall have regard to the contract completion dates, any other milestones and any restraints set out in the contract. Thereafter, if the actual progress does not conform with the baseline programme, the Principal Agent is entitled to require the Contractor to submit a revised programme showing the order of activities necessary to ensure completion of the works by the contract completion dates.

The Contractor shall supply the Principal Agent with an electronic copy of each programme, together with a print-out bar chart or tabular report in a pre-agreed format. All programmes shall be prepared and submitted using Microsoft Project software.

Within 10 (ten) working days of the contractor submitting a programme complete with all the information required by this clause to the principal agent for acceptance, the principal agent will accept the programme or state reasons for not accepting the programme. If such reasons are given, the contractor shall take account of the reasons and resubmit the programme within 5 (five) working days.

If the Principal Agent fails to act the programme is deemed to be rejected.

#### **C3.3.1.3 Default in submission of programs**

Should the contractor fail to submit a programme for acceptance as the baseline programme or not update the programme as described above, the principal agent shall be entitled to withhold 25% of the amount due to the contractor in interim payment certificates until the contractor has complied with its obligations in this regard.

### **C3.3.2 Health and Safety**

#### **C3.3.2.1 Health and Safety specification**

In terms of the Occupational Health and Safety Act (Act 85 of 1993) (OHSA) and the Construction Regulation 2014, the Client must provide the Contractor with a Health and Safety Specification to which the Contractor must respond with a Health and Safety Plan for approval by the Client.

The purpose of this Specification is to ensure that Principal Contractors entering a contract with the Employer maintain an acceptable level of performance with regard to health and safety issues during the performance of the contract. In this regard the OHSA Specification form an integral part of the Contract and the Principal Contractor shall ensure that their contractors and/or suppliers comply with the requirements of this Specification.

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

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**PART C: THE CONTRACT**  
**Part C4: Site Information**

<b>PROJECT TITLE:</b>	<b>REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE RENOVATION AND RESTORATION WORK TO PORTER'S LODGE INCLUDING THE GARDEN VISITOR TOILETS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI) AT THE HAROLD PORTER NATIONAL BOTANICAL GARDEN, BETTY'S BAY</b>
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C4.1 SITE INFORMATION

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**PART C: THE CONTRACT**  
**Part C4: Site Information**

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**C4.1 Site Information****C4.1.1 Site Location**

The site is located at the Harold Porter's National Botanical Garden, c/o Clarence Drive and, Broadwith Rd, Betty's Bay.

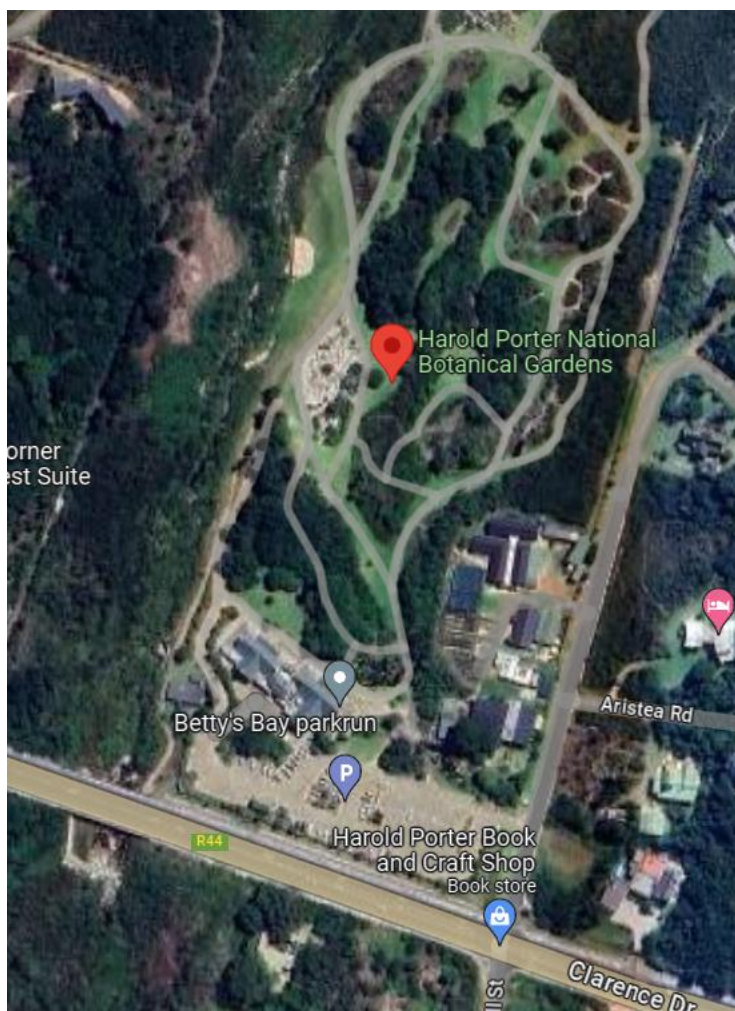
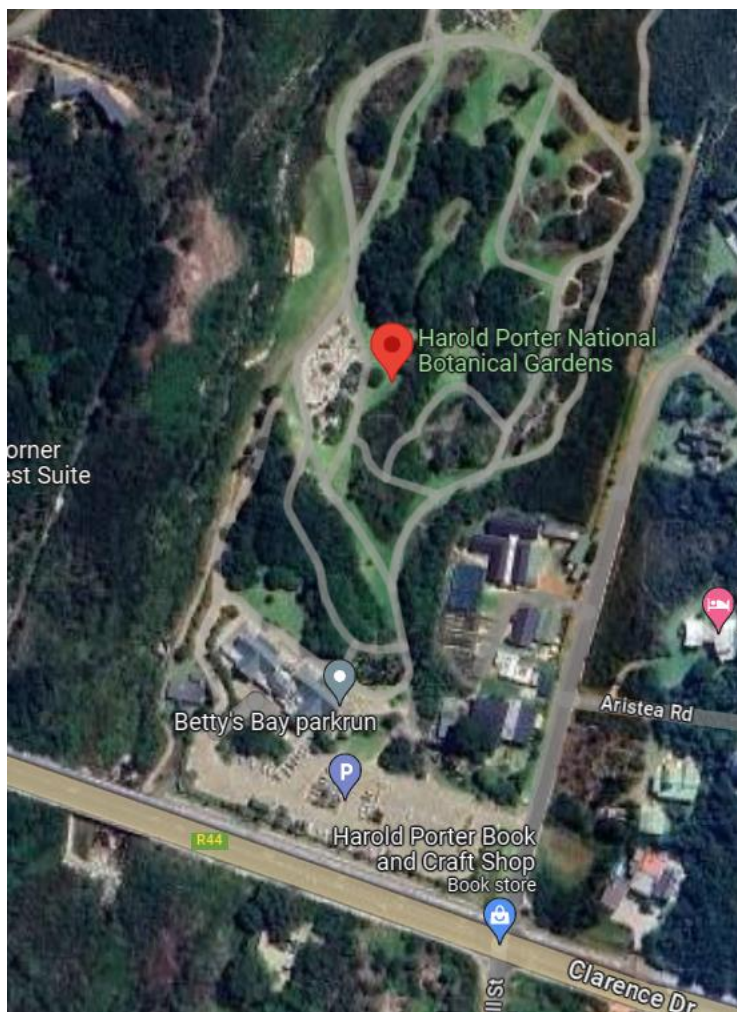


Figure 1: Location of site

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
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**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
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Figure 2: Location of site

**C4.1.2 Weather Information**

The weather measurements to be recorded for each calendar month are:

- The cumulative rainfall (mm)
- The number of days with rainfall more than 10 mm

If any one of these weather measurements recorded within a calendar month, before the Completion Date for the whole of the works and at the place stated in this Contract Data is shown to be more than the amount stated below, then the contractor may notify the consultant of an inclement weather claim.

Month	Number of days with rain more than 10 mm
January	1
February	1
March	1
April	2
May	3
June	4
July	5
August	5
September	5
October	4
November	2
December	2

**South African National Biodiversity Institute**

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Contract: **SANBI G497/2023**

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**ANNEXURE A: SPECIFICATIONS**

## **TECHNICAL SPECIFICATION**

### **AA PLUMBING AND DRAINAGE INSTALLATIONS**

#### **CONTENTS**

AA 01	SCOPE
AA 02	STANDARD SPECIFICATIONS
AA 03	VARIATIONS AND ADDITIONS TO STANDARD SPECIFICATIONS
AA 04	OPERATING AND MAINTENANCE MANUALS
AA 05	TESTS AND INSPECTIONS ON COMPLETION OF MAINTENANCE WORK
AA 06	QUALITY ASSURANCE SYSTEM
AA 07	OPERATING AND COMMISSIONING OF PLANT AND INSTALLATION
AA 08	GUARANTEE OF INSTALLATION AND EQUIPMENT

#### **AA 01 SCOPE**

This specification covers the general priority and breakdown maintenance of plumbing and drainage installations, which include the following:

- (a) Rainwater disposal systems
- (b) Soil and wastewater drainage systems
- (c) Domestic water distribution and reticulation systems
- (d) Sanitary and brassware equipment
- (e) Fire water piped reticulation networks.

This specification shall form an integral part of the priority and breakdown maintenance contract document, and shall be read in conjunction with the additional and particular specifications compiled as part of this document.

This 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.

#### **AA 02 STANDARD SPECIFICATIONS**

##### **AA 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:

##### **AA 02.01.01 SANS Specifications and codes**

SANS 10400	-	The application of the National Building Regulations
SANS 1200 DB	-	Earthworks (pipe trenches)
SANS 1200 LB	-	Bedding (pipes)
SANS 1200	-	Medium-pressure pipelines
SANS 1200 LD	-	Sewers
SANS 10252. Part 1	-	Water supply installations for buildings
SANS 10252. Part 2	-	Drainage installations for buildings
SANS Specifications listed on page 3 of the DPW Specification OW 371		

**AA 02.01.02    Department of Public Works Specifications**

OW 371 - Specification of materials and methods to be used. (Fourth revision, October 1993)  
Guide for architects concerning drainage, water supply and stormwater drainage  
PW 343 - Building specifications for regional offices  
FPO/G61/3E - Guide to architects  
Drainage details.

**AA 02.01.03    Occupational Health and Safety Act**

The Contractor shall be required to comply with the Occupational Health and Safety Act 85 of 1993, Construction Regulations 2014 and related regulations. Non-compliance with these regulations, in any way whatsoever, will be adequate reason for suspending the Works.

**AA 02.01.04    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.

**AA 02.01.05    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.

**AA 03                VARIATIONS AND ADDITIONS TO STANDARD SPECIFICATIONS**

The following additional general specifications and requirements shall be read in conjunction with this specification and shall be adhered to unless otherwise specified in the Particular Specification.

**AA 03.01           GENERAL REPAIR AND INSTALLATION REQUIREMENTS**

- (a) All materials and equipment supplied and installed shall be new, high quality and designed and manufactured to the relevant specifications and suitable for providing efficient, reliable and trouble-free service.
- (b) All work shall be executed in a first-class workman-like manner by qualified registered plumbers.
- (c) All equipment, component parts, fittings and materials supplied and/or installed, shall conform in respect of quality, manufacture, test and performance to the requirements of the applicable current SANS specifications and codes, except where otherwise specified or approved by the Engineer in writing.
- (d) All materials and workmanship which, in the opinion of the Engineer, are inferior to that specified for the work will be condemned. All condemned material and workmanship shall be replaced or rectified as directed and approved by the Engineer.
- (e) The Contractor shall submit a detailed list of the equipment and material to be used to the Engineer for approval before placing orders or commencing installation.

- (f) All new piping shall be installed and positioned such as to not impede on access routes, entrances and other services. The Contractor shall coordinate these new pipe routes taking other services and equipment into account.
- (g) All control equipment and serviceable items shall be installed and positioned such that they will be easily accessible and maintainable.
- (h) The Contractor shall make sure that all safety regulations and measures are applied and enforced during the repair and maintenance work to ensure the safety of the public and the User Client.
- (i) Repair and maintenance work shall be programmed in such a manner as to ensure the shortest possible downtime of any service and the least inconvenience to the User Client and the public. The Contractor shall make sure that the necessary notifications and notices are timeously put into place for these activities.

**AA 03.02****GENERAL REQUIREMENTS FOR REPAIR AND INSTALLATION OF DOMESTIC WATER INSTALLATIONS**

- (a) All pipes are to be carefully examined for defects and flaws before installation and shall be neatly fitted. They shall be installed in such manner as to prevent the formation of air locks. Automatic air vents shall be installed on all high points of the installation.
- (b) The ends of all the pipes are to be cleaned, free from burrs, and rough edges, and joined together tightly. Where applicable, an approved pipe joint compound may be sparingly used with best quality hemp. All surplus or exposed hemp is to be thoroughly cleaned off joints before the painting of pipes.
- (c) All vertical pipes must be securely fixed with brackets and supports of approved type, fixed securely into the wall and not more than 40 mm from the wall. These fixings must be strictly adhered to.
- (d) Pipes installed in service ducts and ceiling voids are to be perfectly plumbed and secured with approved brackets, fixed securely at distances not exceeding the specified distances and not more than 40 mm away from the face of the walls or soffits. Pipes inside buildings and where specified shall be chased into walls, wrapped with building paper and properly secured and covered. Pipes must be free to move in the brackets.
- (e) Pipes passing through the walls and concrete floors are to be provided with suitable pipe sleeves extending 10 mm beyond finished floor or wall surfaces. All pipe fixings and throughways shall be free to allow movement for expansion and contraction. Any pipe fitting feeding a pipe which is rigidly secured by a structural element shall be securely anchored to prevent any stress developing between the fitting and the structural element.
- (f) Chromium or nickel-plated metal covering plates are to be provided and fixed securely to pipes passing through the ceilings and walls. This requirement is not applicable to concrete floors and ceilings.
- (g) Pipes passing through the ceilings or floors shall be offset from the wall to the front of the cornice with sufficient clearance to allow for the clear fixing of a ceiling plate. Pipes installed directly through the cornice will not be allowed. In multi-storey buildings where wall thickness varies, the same shall apply.

- (h) All offsets are to be evenly and symmetrically set, the offsets being as high and as near the ceiling as possible.
- (i) Pipes shall be installed in such a manner to allow for contraction and expansion.
- (j) During construction all pipe ends shall be kept plugged to prevent any ingress of dirt, rubble, etc.
- (k) Damages, chases, holes, etc, in brickwork, concrete and other finishes resulting from repair, replacement and service work shall be made good to match the existing and shall include plaster, concrete work, brickwork, paint, tiling, ceilings and all required materials for the remedial action.
- (l) The work shall be of a high quality and executed by qualified tradesmen in accordance with the relevant specifications.

**AA 03.03      GENERAL REQUIREMENTS FOR REPAIR AND INSTALLATION OF SOIL AND WASTEWATER INSTALLATIONS**

The following requirements shall apply to this installation unless otherwise specified.

**AA 03.03.01      Underground sanitary drainage installations**

- (a) All manhole covers and frames shall be cast into the concrete cover slabs.
- (b) Manholes in trafficable areas shall be provided with type 1A heavy-duty cover and frame and surrounded by concrete slabs.
- (c) Fittings in the ground and below floor slabs shall be without access eyes.
- (d) Sewer pipes in the ground with a slope steeper than 1:5 and under surface beds shall be encased in concrete as detailed.
- (e) The sewer outside the boundary of the building complex shall be constructed strictly in accordance with the details and specifications of the local authorities.
- (f) Existing drainage invert levels and positions are to be checked against invert levels given on the drawings before commencing the work. The Contractor shall inform the Engineer immediately of any discrepancy.
- (g) All existing services are to be located and opened before commencing the proposed drainage work.
- (h) The drainage system shall be tested according to the specifications laid down by the NBRI. This shall be carried out in the presence and to the satisfaction and approval of the Engineer.
- (i) During construction all pipe ends are to be suitably plugged to prevent any ingress of dirt, rubble, etc.
- (j) Modern technology video surveying equipment and detection equipment shall be utilised to establish blockage problems and indicate the positions of such problems.
- (k) Any drainage pipe within the 45° range below building foundations shall be encased in concrete or soilcrete as specified.

**AA 03.03.02    Above ground sanitary drainage installations**

- (a) All accessible waste and soil fittings above ground level shall have inspection eyes. Inspection eyes shall not be underneath any fittings.
- (b) All single wash hand basins shall be connected to a 40 mm internal diameter waste pipe.
- (c) All groups of wash hand basins and sinks shall be connected to a 50 mm internal diameter waste pipe, unless otherwise indicated.
- (d) All traps up to and including 50 mm diameter shall be of the "deep reseal" (75 mm) type.
- (e) The maximum bend on any single fitting shall be 45°, with the exception of ventilation pipes where bends of up to 90° may be used.
- (f) Drainage pipes and fittings running below concrete slabs and along walls and columns shall be suspended by means of approved type hangers, holderbats, etc, and at appropriate intervals, to provide a rigid, proper suspended system and as required by the manufacturer.
- (g) All ventilation pipes shall be finished off with a suitable durable grating.
- (h) All S-trap WC pans shall have plugged anti-siphon horns fitted to provide for cleaning access.

**AA 03.04    PRESSURE TESTING OF PIPES**

- (a) All new pipe installations under the repair Contract shall be pressure tested before being taken into use. The Engineer shall witness this pressure test.
- (b) Completed sections of the pipe installation shall be filled with water after all branches have been plugged, sealed or closed.
- (c) The section of pipe shall be hydraulically pressure tested by means of a suitable manually operated or mechanically driven pressure pump.
- (d) A pressure of at least 1,5 times the working pressure of the class rating of pipes or fittings shall be applied for a period of time specified in the specifications or as recommended by the manufacturers. (Refer to SANS 1200 L for minimum and maximum test pressures.)
- (e) Tests shall not be performed against closed valves.
- (f) Leakage which occurs shall be measured and calculated and checked against the allowable losses, as specified in SANS 1200 L.
- (g) If the completed section of pipe complies with all specifications and passes the tests and inspection, it can be approved by the Engineer and the Contractor instructed to backfill the open sections of trench at the joints and connections, where applicable.
- (h) The Contractor shall then proceed to build all the valve chambers, inspection chambers, etc, for underground installations and close off pipes in walls, voids and ducts for above ground installations.

**AA 03.05****STERILISING OF WATER PIPES**

- (a) Before any repaired and new pipeline is taken into use, the pipeline shall be sterilised over its complete length, including the fittings. The pipe shall be filled with potable water chlorinated to a concentration of 15 mg of chlorine per litre of water, which shall remain in contact with the inner surface of the pipeline for a period of not less than 24 hours. The pipeline shall be filled for sterilising in such a manner that no chlorine shock is created or air is trapped in the pipeline.
- (b) The Contractor shall submit full details of the proposed method of sterilising the pipeline to the Engineer for approval at least fourteen days prior to the commencement of sterilising.
- (c) The cost of water for filling the pipeline for sterilising shall be borne by the Contractor.
- (d) The Contractor shall provide all necessary materials, tools, equipment and labour required for sterilising the pipeline. After sterilising the pipeline the Contractor shall, at no extra cost, empty the pipeline and dispose of the water in a manner approved by the Engineer.

The Contractor may use the following products as a source of chlorine:

- chloride of lime to SANS 295 yielding 33 % free chlorine by mass;
- calcium hypochlorite to SANS 295 yielding 70 % free chlorine by mass;
- chlorine gas applied by chlorinator.

After sterilisation, an approved water quality test shall be carried out to a minimum number of 10 % of the total water points, randomly selected, evenly spread and marked on drawings. These tests shall include a full bacteriological test as per SANS 241 and the results shall be submitted to the Engineer for approval. Each abortive test shall be for the Contractor's account.

**AA 03.05.01 Bacteriological requirements**

When tested the water shall comply with the limits given in table AA 03.05.01/1.

TABLE AA 03.05.01/1

PROPERTY	RECOMMENDED MAXIMUM LIMIT	MAXIMUM ALLOWABLE LIMIT
Total coliform bacteria count per 100 millilitre	Nil*	5
Faecal coliform bacteria count per 100 millilitre	Nil	Nil
Standard plate count per millilitre	100	Not specified

- \*(a) If any coliform bacteria are found in a sample, a second sample must be taken immediately after the tests on the first sample have been completed. This sample shall be free from coliform bacteria.
- (b) Not more than 5 % of the total number of water samples (from any one reticulation system) tested per year may contain coliform bacteria.

The Engineer shall witness the sterilising of the pipes.



The Contractor shall ensure that during the sterilising procedure the necessary safety precautions are instituted to prevent the intake of water by the user and/or public from the system. On completion the system shall be properly flushed out.

#### **AA 03.06      AIR TEST FOR SEWER AND DRAINS**

The following air test requirements as specified in the NBRI information sheet X/BOU 2-34 shall be applicable to all air tests on new sewers and drains installed under the repair work phase, and shall be executed by the Contractor and witnessed by the Engineer.

##### **AA 03.06.01      Method of air testing**

All openings in the pipeline are plugged by means of sewer testing plugs. The sewer plug at the lowest end of the pipeline is connected to an air supply hose, which is attached to a mechanically driven air blower, compressor or hand pump. Air is pumped into the pipeline at a pressure of approximately 375 mm water gauge. The pressure is held at this level for a period of two minutes to allow the air temperature to become constant. Subsequently the air supply is closed off and the time recorded for the air pressure to drop from 250 to 125 mm water gauge. If the recorded time is less than the value given in table AA 03.06.01/1 below, it means that the pipeline leaks and does not comply with the required standards of tightness. The apparatus required for the air test is commercially available.

The following requirements have to be taken into account when performing the air test:

- (a) Air-permeable pipelines such as vitrified clay or asbestos cement should preferably be tested when moist or wet.
- (b) The trench should be partially backfilled before the test is carried out. This is to stop possible temperature variations and to prevent damage to the pipeline during subsequent backfilling operations.
- (c) The testing equipment should be shielded from the direct rays of the sun.
- (d) Flexible joints are recommended for sewer and drain pipelines. Good quality flexible joints are superior to cement caulked joints and they also provide the pipeline with flexibility to prevent cracking due to subsequent soil movement.
- (e) The test method is very sensitive to flaws in the pipeline, such as cracks or leaking joints. The actual positions of flaws along the pipeline can be determined by using the special equipment.
- (f) If the pipeline is below the water table and subjected to external water pressure, the test method should be modified so that the final pressure value is higher than that of the external water pressure acting on the lowest part of the installation.

TABLE AA 03.06.01/1: MINIMUM TIMES FOR PRESSURE DROP OF 250 mm TO 125 mm WATER GAUGE

PIPE (DIAMETER (mm))	MINIMUM TIME (min - s)	CRITICAL LENGTH OF PIPELINE (m) (58 m <sup>2</sup> INTERNAL SURFACE AREA)	MINIMUM TIME (S) FOR LONGER LENGTH (L) OF PIPELINE
100	1 - 58	184,6	0,640 L
150	2 - 57	123,1	1,439 L
200	3 - 56	92,3	2,559 L
225	4 - 26	82,1	3,239 L
250	4 - 55	73,8	3,998 L
300	5 - 54	61,5	5,757 L
375	7 - 23	49,2	8,996 L
450	8 - 51	41,0	12,954 L
525	10 - 20	35,2	17,632 L
600	11 - 49	30,8	23,030 L

**AA 04 OPERATING AND MAINTENANCE MANUALS**

Not Applicable

**AA 05 TESTS AND INSPECTIONS ON COMPLETION OF REPAIR WORK**

Except where otherwise provided in the Contract, the Contractor shall provide all labour, materials, power, fuel, accessories and properly calibrated and certified instruments necessary for carrying out such tests. The Contractor shall make arrangements for such tests and he shall give at least 72 hours notice to the Engineer, in writing, prior to commencing test.

In the event of the plant or installation not passing the test, the Employer shall be at liberty to deduct from the Contract price all reasonable expenses incurred by the Employer or the Engineer attending the repeated test.

Whenever any installation or equipment is to be operated for testing or adjusting as provided for above, the Contractor shall operate the entire system for as long a period as may be required to prove satisfactory performance at all times in the occupied space served by that system for up to twenty-four hours a day continuously until the system is handed over.

The Contractor shall provide all labour and supervision required for such operation and the Department may assign operating personnel as observers, but such observation time shall not be counted as instruction time.

After completing the installation or system, all equipment shall be tested, adjusted and readjusted until it operates to the satisfaction and approval of the Engineer.

The Contractor shall submit certificates of tests carried out to prove the performance of all equipment and also certificates to be obtained from all relevant authorities and statutory bodies, etc.

**AA 06      QUALITY ASSURANCE SYSTEM**

The Contractor shall institute an approved quality assurance (QA) system which shall be submitted to the Engineer for approval. The records of this QA system shall be kept throughout the duration of the Contract and be submitted to the Engineer at regular intervals as required.

**AA 07      OPERATING AND COMMISSIONING OF PLANT AND INSTALLATION**

On completion of the repair work and/or the installation of new systems the plant and equipment shall be put into operation after all tests and adjustments have been carried out to the satisfaction of the Engineer. The Contractor shall run and operate the system for a period of time as specified by the Engineer and train the staff of the User Client to operate and maintain the system. This period of time shall not exceed one month.

Logging of the operation of the installations shall commence immediately upon start-up.

The Contractor shall submit a full commissioning report.

**AA 08      GUARANTEE OF INSTALLATION AND EQUIPMENT**

The Contractor shall provide and obtain guarantees from the manufacturer(s) and/or supplier(s) to the effect that each piece of new equipment, supplied and installed under the repair contract, shall comply with the required performance and will function as part of the complete system.

All new equipment, including the complete new installations and the systems as a whole shall be guaranteed for a period of 12 (twelve) months commencing on the day of issue of a certificate of completion for repair work of the installation.

**AA 09      REPAIR WORK TO INSTALLATIONS, SYSTEMS AND EQUIPMENT****AA 09.01      GENERAL**

During the repair and maintenance 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 specified Particular Specification details.

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.

The repair work items shall be listed in tabular form in the Particular Specification with all relevant details, such as capacity, size, manufacturer, model number, etc.

All repair work shall be executed within the specified durations listed in the Appendix to Tender. All new equipment, materials and systems shall be furnished with a written guarantee with a defects liability period of 12 months from date of issue of a certificate of completion for the 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 plumbing and drainage installations shall be categorised under the following headings:

- (a) Rainwater disposal systems
- (b) Soil and wastewater drainage systems
- (c) Domestic water distribution and reticulation networks
- (d) Sanitary and brassware equipment
- (e) Fire water piped reticulation networks.

## **AA 09.02      RAINWATER DISPOSAL SYSTEMS**

### **AA 09.02.01    General**

Repair work to the rainwater disposal system shall be detailed in the Particular Specification and shall include but not be limited to the following:

- (a) Replacement of damaged, broken, leaking, corroded pipework and fittings;
- (b) Replacement of damaged, broken and missing rainwater outlets, stormwater catch pit gratings, manhole covers and frames and floor drains;
- (c) Repair work to damaged manholes, catch pits, kerb inlets, channel drains and drain points including builder's work and benching;
- (d) Initial unblocking and clearing of all rainwater drainage pipes, manholes, catch pits, drain points, channel drains and gutters;
- (e) Repair and upgrading of drainage system where necessary;
- (f) Provision of additional rainwater drainage points where outlets are insufficient and ponding occurs;
- (g) Prevention of any unauthorised effluent into this drainage system;
- (h) Reinstatement and making good of walls, tiling, floors, concrete, road surfaces, etc, to approved acceptable levels where any repair, upgrade and/or service work have been executed;
- (i) Realign and fix gutters to correct falls where necessary, including additional brackets where required.

**AA 09.02.02    Material and equipment specification for rainwater disposal systems**

Materials and equipment to be used for repair items shall be suitable and/or adaptable to the existing installation and shall comply with the following:

**(a)    Vitrified clay pipe and fittings**

Vitrified clay pipes shall only be used for underground installations. The pipes and fitting shall strictly conform to SANS 559. The pipes and fittings shall have a minimum crushing strength of 45 kN/m.

The joining method to be used shall be polypropylene couplings with integral rubber seal similar or equal to Vitrosleeve in accordance with SANS 974 allowing up to 2,5° angular movement per joint and 5 mm line displacement per joint. The joint shall retain an effective water seal with regard to above conditions with a 6 m water head.

Pipes shall be cut using an approved pipe cutter and the ends shall then be trimmed by means of a pipe trimmer to remove any sharp edges.

The piping system shall be tested as indicated in this specification.

**(b)    Supercast cast-iron pipe and fittings**

Supercast cast-iron pipes can be used for underground and above ground installations. Plain-ended cast-iron pipes and fittings, manufactured from 150, grade A grey iron in accordance with SANS 1034 shall be used. Fittings and pipes shall be free of pinholes, blowholes, blemishes, flash and foundry sand and have a smooth bore. All pipes and fittings shall be sand-blasted and coated on the inside and outside by submersion in a corrosion inhibiting oxide primer or bitumen paint.

The pipes and fittings shall be joined by means of stainless steel neoprene couplings as supplied by the manufacturer of the pipe system. The coupling shall be installed according to the manufacturer's specification and tightened with a torque wrench to a torque of 6,8 Nm.

**(c)    uPVC pipe and fittings above ground**

uPVC pipes and fittings can be used for above ground installations.

For pipe sizes larger than 160 mm diameter uPVC class 6 pressure pipe to SANS 966 shall be used with prefabricated uPVC bends and junctions. Prefabrication shall be done by means of hot-air welding of fittings to be covered with three layers of fibreglass reinforced lining over welded sections. The resin to be used shall be as specified by the manufacturer for usage with PVC. Bends shall be manufactured out of 3 to 4 sections per bend. Pipe joints shall be done by means of couplings fixed with solvent cement for PVC piping. This joint shall be reinforced with a fibreglass lining of three layers.

Piping has to be supported and bracketed with properly sized and designed brackets consisting of two half sections clamped over the pipe and hanged with two hanger rods.

Pipes to be pressure tested in sections as specified in this specification.

(d) Prefabricated galvanized steel piping and fittings above ground

Prefabricated galvanized steel piping can be used for above ground rainwater drainage systems. The pipe to be used shall be plain ended medium gauge uncoated pipe to SANS 62 galvanized to SANS 763. All fittings are to be manufactured from the same material welded with flanged ends or rolled ends to fit clambon fittings. Fittings are only to be galvanized after manufacturing. All joints to be either flanged or equipped with clambon couplings. All fittings and junction to be 45° sections.

The pipe system shall be properly secured and bracketed at regular intervals with correctly sized and designed galvanized brackets.

Pipes are to be pressure tested in sections as specified in this specification.

(e) Geberit HDPe pipe and fittings

Geberit HDPe pipes and fittings can be used for underground and above ground installations where specified. Pipes shall be plain ended and only Geberit HDPe bends and fittings shall be used. Jointing of pipes and fittings shall be done by butt welding, electro-sleeve couplings and/or flanged joints. Pipes and fittings shall only be installed by Geberit approved installers and the Contractor shall furnish a certificate to this effect. Pipes and fittings shall be installed strictly according to the Geberit application technique.

Pipes to be pressure tested in sections as specified in this specification.

(f) Roof outlets

Where waterproofing is installed, as for roof slabs, an adjustable roof outlet/drainage point to be used consisting of a cast-iron unit with cast-iron ring clamp to fit over waterproofing edge and an adjustable height outlet to fit in with the screed level. For surfaces such as paving and walkways a flat grating of brass or cast iron shall be used with a catch basket. Within paving blocks a square top frame shall be used. For roof outlets a domed grating is to be used. Where roofs are to be covered with stones, a mesh shall be installed to prevent any stones from entering the rainwater system.

Two-way side outlets shall be used in cases where required.

Floor and roof outlets to be fitted to cast-iron pipe by means of SSN couplings.

**AA 09.03      SOIL AND WASTEWATER DRAINAGE SYSTEM****AA 09.03.01      General**

Repair work to the soil and wastewater drainage system shall be detailed in the Particular Specification and shall include but not be limited to the following:

- (a) Replacement of damaged, broken, leaking, corroded above and underground pipework and fittings;
- (b) Replacement of damaged, broken and missing gully gratings, manhole covers and frames, cleaning eye covers, screws and bolts, inspection eye covers, end caps and vent cowls;
- (c) Repair work to damaged manholes, gullies, cleaning eyes, floor drains, etc, including builder's work and benching;
- (d) Initial unblocking and cleaning of all drainage pipework, traps, floor drains, gullies and sanitary ware equipment;

- (e) Video surveying of all underground drainage pipework to establish root ingress, damaged pipework, fat build-up, blockages, incorrect falls, sagging and as-built information. This survey shall be utilised to establish the extent of repair and upgrade work to be executed;
- (f) Repair and upgrading of soil and wastewater drainage systems where necessary;
- (g) Repair work to bracketing systems including fixing and repair of existing brackets and the introduction of additional brackets where required;
- (h) Repair, re-fix and bracket sanitary ware equipment to walls, floors, etc, where required;
- (i) Repair, replace and clean out sanitary ware and equipment traps;
- (j) Test pipe system, traps and equipment for leakage;
- (k) Empty, clean out separators, clean out strainers, and test for leak tightness, repair and recommission oil and grease separators. Check the conformance of the capacities of the oil and grease separators in relation to the facilities they serve; where necessary these shall be upgraded and where no separators have been provided, new separators shall be provided;
- (l) Reinstatement of walls, tiling, floors, concrete finishes, holes, chases, surfaces, etc, to an approved acceptable level where any repair, upgrade and/or service work have been executed;
- (m) Prepare, paint and repaint pipework and equipment where necessary, in accordance with Technical Specification BH: Fittings.

#### **AA 09.03.02    Material and equipment specification for soil and wastewater drainage systems**

Materials and equipment to be used for repair items shall be suitable and/or adaptable to the existing installation and shall comply with the following:

##### **(a)    Vitrified clay pipe and fittings**

Vitrified clay pipes shall only be used for underground installations. The pipes and fittings shall strictly conform to SANS 559. The pipes and fittings shall have a minimum crushing strength of 45 kN/m.

The jointing method to be used shall be polypropylene couplings with integral rubber seal similar or equal to Vitrosleeve according to SANS 974 allowing up to 2,5 ° angular movement per joint and 5 mm line displacement per joint. The joint shall retain an effective water seal with regard to the above conditions with a 6 meter water head.

Pipes shall be cut using an approved pipe cutter and the ends shall then be trimmed by means of a pipe trimmer to remove any sharp edges.

The installation shall be tested according to the NBRI information sheet X/BOU 2-34.

##### **(b)    Supercast cast-iron pipe and fittings**

Supercast cast-iron pipes can be used for underground and above ground installations. Plain-ended spun cast-iron pipes and fittings manufactured from 150 grade A grey iron in accordance with SANS 1034 shall be used. Fittings and pipes shall be free of pinholes, blowholes, blemishes, flash and foundry sand and to have a smooth bore. All pipes and fittings are to be sand-blasted

and coated on the inside and outside by submersion in corrosion inhibited oxide primer or bitumen paint.

The pipes and fittings shall be joined by means of stainless steel neoprene couplings as supplied by the manufacturer of the pipe system. The coupling shall be installed according to the manufacturer's specification and be tightened with a torque wrench to a torque of 6,8 Nm.

Where cast-iron stub stack overflow gullies are used with pipe materials such as PVC a rubber O-ring shall be used to fit over the PVC pipe into the cast-iron fitting. The joint shall be grouted up afterwards.

Above ground piping shall be bracketed with properly sized and designed brackets according to the manufacturer's specification at correct intervals.

The piping system shall be tested in accordance with the NBRI information sheet X/BOU 2-34.

(c) uPVC soil and waste pipe and fittings

UPVC soil, vent and waste pipe systems can be used for underground and above ground drainage installations. This piping shall conform in all respects to SANS 971 for underground systems and to SANS 967 for above ground systems.

All underground pipes, as well as soil pipes above ground, shall be joined by means of rubber ring seal couplings and fittings in accordance with the manufacturer's specification. All waste and vent pipes shall be joined by means of solvent weld fittings and couplings. The solvent weld glue to be used shall be as specified by the pipe manufacturer, allowing for thermal contraction and expansion.

The piping system shall be pressure tested in accordance with the NBRI information sheet X/BOU 2-34.

(d) Structural wall uPVC pipes and fittings

Structural wall uPVC drainage pipe can be used for underground drainage systems. This piping system shall be used with standard underground uPVC pipe fittings, equipped with rubber ring joints. The pipe shall be equipped with z-lock type rubber ring joints.

The piping system shall be pressure tested in accordance with the NBRI information sheet X/BOU 2-34.

(e) Geberit HDPE pipes and fittings

Geberit HDPE pipes and fittings can be used for underground and above ground installations. Pipes shall be plain ended and only Geberit HDPE bends and fittings shall be used. Jointing of pipes and fittings shall be done by butt welding, electro-sleeve couplings and/or flanged joints. Pipes and fittings may only be installed by Geberit approved installers and the Contractor shall furnish a certificate to this effect. Pipes and fittings shall be installed strictly according to the Geberit application technique.

The complete system shall be pressure tested in accordance with the NBRI information sheet X/BOU 2-34.



(f) Stainless steel floor traps and floor channels

Stainless steel floor traps and channels shall be manufactured from 304 stainless steel with a load capacity of 1 500 kg. The floor traps shall have a flow capacity of 3 litre/second.

The units shall be fitted with a double water seal, large sludge box and shall be easily dismantlable for cleaning purposes. Tiling keys and waterproofing flanges shall be provided where required. Side inlets with diameter of 50 mm shall be provided for waste connections to other equipment where required.

(g) Cast-iron floor traps

Cast-iron floor traps shall be manufactured from cast iron and shall be fitted with a water seal and a large sludge box and lid to be easy removable for maintenance purposes. The unit shall be designed such as to provide access to the drainage system and to be used as a cleaning point.

**AA 09.04      DOMESTIC WATER DISTRIBUTION AND RETICULATION NETWORKS****AA 09.04.01      General**

Repair work to the domestic water distribution and reticulation networks shall be detailed in the Particular Specification and shall include, but not be limited to the following:

- (a) Replacement of damaged, broken, leaking, corroded above and underground pipe work, fittings and equipment;
- (b) Repair, replace and service valves, which shall include new gaskets, gland packings, seals, bolts and nuts, etc;
- (c) Where valves do not close properly, all these valves shall be refurbished, descaled and replaced where necessary;
- (d) Repair, clean and service all strainers, including the replacement of strainer elements where corroded and installation of new gaskets;
- (e) Repair, service, test and readjust pressure-reducing valves. Pressure gauges are to be recalibrated and checked. Up and downstream pressures are to be logged. Downstream pressure has to be adjusted to an acceptable level, taking into account the allowable working pressure of the system and its components;
- (f) Repair, service and check the proper functioning of all non-return valves;
- (g) Repair, service, readjust and calibrate all safety and expansion relief valves;
- (h) Repair, service and clean out all air release valves and vacuum breakers;
- (i) Repair work to bracketing systems including fixing and repair of existing brackets and provision of additional brackets where required;
- (j) Hot-water pipe lagging and cladding shall be inspected, repaired, sealed and replaced where required;
- (k) Repair, service and log readings of water meters including cleaning of integral strainers;

- (l) Water storage tanks are to be emptied, cleaned out, repaired, sealed and put back into operation. Ball float and/or filling valves to these tanks are to be serviced and repaired where required;
- (m) Water pipes are to be sampled for corrosion and scaling. The Engineer will evaluate the actions to be taken if the results of this sampling indicate that attention is required;
- (n) Water supply has to be sampled and chemically analysed for the suitability to the systems and materials it serves;
- (o) Domestic geysers are to be repaired and serviced in accordance with the manufacturer's specification and shall include descaling, replacement of elements, testing for any leaks, checking of safety valve operation (replace if required), testing of the thermostat operation and set point (replace if necessary);
- (p) Pressure test and sterilise repaired new installation and equipment;
- (q) Reinstatement and making good of walls, tiling, floors, concrete, finishes, holes, chases, surfaces, etc, to an acceptable level where repair, upgrade and/or service work have been executed.

**AA 09.04.02    Material and equipment specification for domestic water distribution and reticulation networks**

Materials and equipment to be used for repair items shall be suitable and/or adaptable to the existing installation and shall comply with the following requirements:

- (a) Copper pipe installation
  - (i) The installation of copper piping systems shall be done in accordance with the manufacturer's code of practice and all relevant codes, standards and regulations.
  - (ii) Copper pipes shall only be installed downstream of galvanized mild steel pipes when applicable.
  - (iii) Where dissimilar metals are joined, dielectric or isolating couplings shall be used. This is not required where copper and brass dezincified alloys join.
  - (iv) Copper pipes shall be of the hard drawn type Class 0 in accordance with SANS 460 and shall be joined by means of capillary soldered type fittings. No compression type fittings shall be allowed unless otherwise specified.
  - (v) Copper capillary soldered type fittings shall be used in accordance with ISO 2016, SANS 1067, DIN 2856 or BSS 864.
  - (vi) The soldering flux to be used shall be water based and easily flushed out, withstand temperatures above 240 °C and shall contain no ammonia. The flux shall be non-toxic when dissolved in water.
  - (vii) The solder to be used shall be in accordance with SANS 24 and shall consist of a material containing 97 % tin and 3 % copper. Solders containing lead, resin core and acid core shall not be used.
  - (viii) The heat source to be used shall be propane gas with induction air, at a temperature not higher than 240 °C. The pipe ends and fittings shall be cleaned and waxed with an approved solder flux, before soldering.

The pipe and fittings shall then be fitted together and heated to the correct temperature before the solder is applied. Care must be taken not to add too much or too little solder to the joint. Immediately after setting of the solder the joint shall be wiped clean with a wet cloth. Pipes shall be washed out as soon as possible after jointing and all traces of flux shall be removed.

- (ix) All bronze or brass equipment and fittings shall be of the dezincified type.
- (x) Copper pipes and fitting shall be installed strictly to the manufacturer's specification and include the following:
  - (1) No labour bends;
  - (2) Provision for thermal contraction and expansion of pipes;
  - (3) Pipe brackets shall be installed at appropriate positions where pipes are installed on surface level;
  - (4) Pipes chased or built into walls or floors shall be wrapped with two layers of building paper or similar approved material. Hot and cold water pipes running next to each other shall be at least 50 mm apart;
  - (5) Equipment fixed to copper pipe outlets, where the pipes are surface mounted or built into walls, shall be done by means of copper wall plate fittings on the copper pipes, properly secured to the structure to prevent structural damage to soldered joints.
- (xi) Pipe hangers and brackets shall be of copper, copper alloy or non-conductive materials. No piece of copper pipe shall touch any other conductive surface. Brackets shall be designed to structurally support and fix the pipe system, and shall allow enough clearance from walls, soffits, etc, to insulate hot-water pipes and maintain equipment.
- (xii) Pipe hangers and brackets shall be installed according to the manufacturer's specification on the following maximum spacings:

PIPE DIAMETER (mm)	HORIZONTAL (metre)	VERTICAL (metre)
15	1,3	1,9
22 and 28	1,9	2,5
35 and 42	2,5	2,8
54	2,5	3,9
67 – 108	2,8	3,9

- (xiii) All copper pipes open to structural damage, shall be protected by steel sleeves or structurally designed cover.
- (xiv) All pipework shall be pressure tested and sterilised as specified.
- (xv) Where flanged fittings are used, cadmium-plated bolts, nuts and spring washer shall be used to joint these flanges.
- (xvi) All hot-water pipes shall be lagged as specified.

- (xvii) Shut-off valves shall be installed on all branch pipes and ball-o-stop valves shall be installed on all connectors to basin pillar cocks, sink mixers, cistern type WCs and other fittings.
- (xviii) All types shall be marked in accordance with SANS 10140 or as specified by the Engineer.
- (xix) Approved type expansion bellows shall be installed where required for expansion and contraction to prevent excessive strain on fittings and soldered joints.

(b) Galvanized steel pipe installations

- (i) All galvanized steel pipes shall be medium gauge mild steel screwed and socketed pipes to SANS 62 and shall be normalised and marked as such by the manufacturer. Pipes shall be hot-dip galvanized to SANS 763.
- (ii) All fittings shall be malleable cast-iron fittings to SANS 509 and galvanized to SANS 763.
- (iii) All 80 mm diameter and larger pipes shall be joined with Class 16 flanged couplings to SANS 1123/1600. The bolts, nuts and spring washers to be used on these joints shall be cadmium-plated.
- (iv) In pipe ducts and elsewhere pipes shall be fixed onto walls, soffits, etc, with approved type of supports, holderbats, clamps, etc. Brackets shall be designed to structurally support and fix the pipe system and shall have enough clearance from walls, soffits, etc, to insulate hot-water pipes and maintain equipment.
- (v) Pipes shall be supported according to the manufacturer's specifications with approved brackets at the following maximum intervals:

PIPE DIAMETER (mm)	HORIZONTAL (metre)	VERTICAL (metre)
15 dia to 20 dia	1,200	1,830
32 dia to 40 dia	1,830	2,450
50 dia to 150 dia	2,450	3,050

- (vi) Pipes shall be installed in such a manner as to prevent air locks. A minimum rise of 1:250 shall be maintained to high points, which shall be fitted with suitable air release valves.
- (vii) All pipes shall be marked according to SANS 10140 or as specified by the Engineer. All surface pipes shall be painted.
- (viii) Pipes shall be installed flush unless otherwise instructed by the Engineer.
- (ix) Provision shall be made for thermal contraction and expansion.
- (x) The type of pipe joint compound shall be approved by the Engineer and used sparingly with good quality hemp. For pipes larger than 80 mm diameter a jointing compound such as Epidermix 32 shall be used.

- (xi) Any pipe buried shall have at least 900 mm cover and be coated and wrapped to SANS 1117 and tested in the presence of the Engineer.
- (xii) All exposed hot-water pipes shall be lagged as specified.
- (xiii) All pipework and fittings shall be pressure tested and sterilised as specified
- (xiv) Valves shall be installed on all branch pipes and ball-o-stop valves on all connectors to basin pillar cocks, sink mixers, cistern type WCs and other fittings.
- (xv) Approved type expansion bellows shall be installed where required for expansion and contraction to prevent excessive strain on fittings and pipe joints.

(c) uPVC underground pipe installations

- (i) uPVC piping shall conform to SANS 966 with rubber ring type joints.
- (ii) All bends shall be uPVC type fittings with rubber ring joints.
- (iii) All other fittings such as T-pieces, reducers, flanges, etc, shall be bitumen-dipped cast-iron rubber ring jointed fittings to SANS 546.
- (iv) No solvent weld type fittings will be allowed.
- (v) All cast-iron fittings shall be coated and wrapped to SANS 1117.
- (vi) All pipes shall be layed on a 100 mm sand-bedding cradle and covered with 300 mm sand before backfilling.
- (vii) All backfilling shall be in accordance with SANS 1200 DB and to the Engineer's and approval.
- (viii) Pipe trenching and bedding:

AREA	MINIMUM COVER	BEDDING TYPE	MAIN FILL
Vehicle traffic	1 100	Flexible pipe bedding as per SANS 1200 LB	Soilcrete
Under surface bed	600		Soilcrete
Other areas	900		90 % of modified AASHTO density

- (ix) All thrust blocks shall be cast between the pipe and the undisturbed trench material.
- (x) No concrete shall come into direct contact with the UPVC pipe. At the thrust blocks the bend shall be wrapped with a Densopol 80 HT Tape or similar approved.
- (xi) HDPe pipe connections to uPVC pipes up to 50 mm can be done by means of SG Iron manufactured saddles with the appropriate gaskets and cadmium-plated bolts and nuts.
- (xii) All pipe crossings under traffic areas shall be backfilled with soilcrete and compacted as specified.

- (xiii) All pipework shall be pressure tested with all joints uncovered, to the satisfaction of the Engineer.
- (xiv) Suitably sized air release valves built into valve chambers shall be installed at all high points of the pipeline.

(d) HDPE underground pipe installations

- (i) HDPE piping shall be Type 4 HDPE pipe to SANS 533.
- (ii) All fittings shall be of Plasson compression type and shall conform to ISO/DIS 3458.
- (iii) All pipes shall be laid on a 100 mm sand bedding cradle and covered with 300 mm of sand of selected material.
- (iv) All backfilling shall be in accordance with SANS 1200 DB and to the Engineer's and approval.
- (v) Pipe trenching and bedding:

AREA	MINIMUM COVER	BEDDING TYPE	MAIN FILL
Vehicle traffic	1 100	Flexible pipe bedding as per SANS 1200 LB	Soilcrete
Under surface bed	600		Soilcrete
Other areas	900		90 % of modified AASHTO density

- (vi) No concrete shall come into direct contact with the HDPE pipe. At these points the fittings shall be wrapped with Densopol 80 HT tape or similar approved.
- (vii) All pipe crossings under traffic areas shall be backfilled with soilcrete and compacted as specified.
- (viii) All pipework shall be pressure tested with all joints uncovered to the satisfaction of the Engineer.
- (ix) Suitably sized air release valves built into valve chambers shall be installed at all high points of the pipeline.

(e) Valves

- (i) Gate valves underground in valve chambers to connect to uPVC piping (65 mm NB and larger)

Gate valves are to be equipped with non-rising spindle, spherical graphite iron body to SANS 936 Grade 42, cast-iron nitrile butadiene rubber covered gate, stainless steel spindle, nitrile butadiene rubber O-rings and seals, cast-iron bonnet and gunmetal thrust collar to BS 1400 LG2.

The valves shall conform to SANS 664 and/or 665 and shall be capable of withstanding a working pressure of 1 600 kPa.

The valves shall be fitted with a square key spindle top to close the valves in clockwise direction and socket ends to SANS 665 to fit into uPVC Class 12 pipe and installed to detail.

(ii) Gate valves underground in valve chamber to connect to HDPe piping

The gate valves shall be of the dezincified brass type with brass gate, brass body, non-rising spindle and BSP threaded socket ends. The valves shall conform to SANS 776 Class 125. The valves shall be able to withstand a working pressure of 1 600 kPa. The valve shall be fitted with a hand wheel on an extended spindle shaft of 700 mm to close in a clockwise direction and installed to detail.

(iii) Gate valves above ground for temperatures up to 40 °C to connect to steel piping (65 mm NB and larger)

Gate valves are to be equipped with non-rising spindle, spherical graphite iron body to SANS 936 Grade 42, cast-iron nitrile butadiene rubber covered gate, stainless steel spindle, nitrile butadiene rubber O-rings and seals, cast-iron bonnet and gunmetal thrust collar to BS 1400 LG2.

The valves shall conform to SANS 664 and/or 665 and shall be capable of withstanding a working pressure of 1 600 kPa.

The valves shall be fitted with flanged ends to SANS 1123, table 16, hand wheel to close the valves in a clockwise direction and installed in an upright position or sideways to a maximum 90 ° from upright.

(iv) Gate valves above ground for temperatures above 40 °C to connect to steel piping (65 NB mm and larger)

Gate valves shall be equipped with non-rising spindle, spherical graphite iron body to SANS 963 Grade 42, cast-iron gate, gunmetal seat and gate rings, high-tensile bronze spindle, cast-iron bonnet and gunmetal thrust collar to BS 1400 LG2.

The valves shall conform to SANS 665 and shall be capable of withstanding a working pressure of 1 600 kPa and a temperature of 90 °C.

The valve shall be fitted with flanged ends to SANS 1123, table 16, hand wheel to close the valve in a clockwise direction and installed in an upright position or side ways to a maximum 90° from upright.

(v) Gate valves above ground to fit to copper pipes (65 mm NB and larger)

Gate valves shall be equipped with non-rising spindle, gunmetal bronze or dezincified brass body, gunmetal or dezincified brass gate and graphite asbestos packing in the gland.

The valve shall be fitted with a hand wheel to close in a clockwise direction and installed in an upright position or sideways to maximum 90° from upright.

The valve shall be equipped with flanges to SANS 1123, table 16, hand wheel to close the valve in a clockwise direction and installed in an upright position or sideways to a maximum 90° from upright.

(vi) Gate valves above ground for temperatures up to 100 °C (up to 50 mm NB)

The gate valves shall be of the dezincified brass type with brass gate, brass body, non-rising spindle and BSP threaded socket ends. The valve shall conform to SANS 776, Class 125.

The valves shall be able to withstand a working pressure of 1 600 kPa.

The valve shall be equipped with a hand wheel to close in a clockwise direction.

The valve shall be installed in an upright position or sideways to a maximum 90° from upright and shall be so placed with other fittings to be removable without cutting the pipework.

(vii) Ball-O-Stop valves (15 mm diameter - 25 mm diameter)

These valves shall be full-way ballcock type with BSP threaded ends. The valves shall conform to SANS 1056, Part 3, shall be rated for a test pressure of 2 000 kPa, and shall be chrome-finished when exposed.

(viii) Angle regulating valves

These valves shall be 15 mm chromium-plated angle regulating valves with a 350 mm chromium-plated copper tube and cap nuts where required.

(f) Strainers

(i) Strainers for connection to steel or UPVC pipes (65 mm NB and larger)

These strainers shall be of the Y-type with cast-iron body, stainless steel or bronze strainer element and shall be equipped with flanged ends to SANS 1123, table 16. The hole sizes of the strainer element shall be maximum 1 mm diameter and be removable without dismantling of pipework. The strainer shall be suitable for a temperature of up to 90 °C at a 1 000 kPa pressure rating and installed with the element facing downwards or a maximum of 45° sideways.

(ii) Strainers for connection to copper pipes (65 mm NB and larger)

These strainers shall be of the Y-type with bronze or dezincified brass body, stainless steel strainer element and must be equipped with flanged ends to SANS 1123, table 16. The hole sizes of the strainer element shall be maximum 1 mm diameter. The strainer element shall be removable without dismantling of pipework. The strainer shall be suitable for a temperature of up to 90 °C at a 1 000 kPa pressure rating and installed with the element facing downwards or a maximum of 45° sideways.

(iii) Strainers for connection to steel and copper pipes (up to 50 mm NB)

These strainers shall be of the Y-type with bronze or dezincified brass body, stainless steel strainer element and must be equipped with BSP threaded socket ends. The hole sizes of the strainer element shall be maximum 0,8 mm diameter. The strainer shall be suitable for a temperature of up to 90 °C at a pressure rating of 1 000 kPa and installed with the element facing downwards or a maximum of 45° sideways.



(g) Non-return valves(i) Non-return valves for cold water (65 mm NB and larger)

The non-return valve shall be of the spring-loaded dual flap plate type fitted between two flanges (wafer).

The non-return valve shall be equipped with a cast-iron body, aluminium bronze plates, stainless steel springs and neoprene seals on the plates. The valves shall be suitable for a working pressure of 1 000 kPa.

(ii) Non-return valves for hot water (up to 100 mm NB) and cold water (up to 50 mm NB)

These non-return valves shall be of the spring-loaded piston type, with bronze or dezincified brass body, stainless steel spring and bronze disc with neoprene seal fitted with BSP threaded socket ends. The valve shall be suitable for a working pressure of 1 000 kPa and a temperature of up to 90 °C. All valves shall be installed as to be removable without extensive pipework removal.

(h) Air release valves and vacuum breakers(i) Double orifice double-acting air release valves with sizes from 50 mm NB to 200 mm NB

This air release valve shall be fitted with small and large orifice. The air release valve shall be fitted with a cast-iron body, stainless steel or fibreglass balls, integral shut-off valve and flanged ends to SANS 1123, table 16.

The valve shall be suitable for maximum pressure of 1 600 kPa.

(ii) Single orifice air release valves for main water lines with sizes from 25 mm NB to 50 mm NB

This air release valve shall be fitted with a small orifice, cast-iron body, fibre glass or stainless steel ball float and BSP threaded inlet.

When the valve is installed a shut-off valve shall be installed on the inlet side.

The valve shall be suitable for maximum pressure of 1 600 kPa.

(iii) Single orifice double purpose air release valves for domestic water lines up to 15 mm NB

This air release valve shall be fitted with a stainless steel float, brass or cast steel body with an integral shut-off valve fitted.

The valve shall be capable to withstand a working pressure of 1 000 kPa at 110 °C.

(iv) Vacuum breaker up to 40 mm diameter

The vacuum breaker shall be fitted with neoprene seal, spring-loaded disc in a dezincified brass or bronze body. The valve shall seal watertight and shall be designed to withstand a working pressure of 1 000 kPa and a temperature of 90 °C.

(i) Pressure-reducing valves(i) Combination pressure-reducing stations

Where a high peak flow as well as a small flow can occur and the small flow is out of the range of the large pressure-reducing valve, a small pressure-reducing valve is installed in parallel with the large pressure-reducing valve. The two pressure-reducing valves in parallel shall be set according to the manufacturer's specification.

(ii) Large pressure-reducing valves (65 mm NB and larger)

This pressure-reducing valve shall be equipped with a cast-iron body, neoprene nylon-reinforced diaphragm, bronze seal disc washer, stainless steel shaft and flanged ends. The valve shall be pilot operated and shall be designed to handle high flows at a minimum head loss.

The valve must be adjustable to handle a wide range of incoming pressures at a constant downstream pressure.

The valve shall be equipped with flanged ends to SANS 1123, table 16.

(iii) Small pressure-reducing valves (15 mm NB to 50 mm NB)

This pressure-reducing valve shall be equipped with brass body, balanced single seat and integral strainer. The valve shall be able to handle a wide range of incoming pressures while the downstream pressure stays constant with maximum inlet pressure of 1 000 kPa and a maximum water temperature of 40 °C.

The valve shall be equipped with BSP male threaded brass union couplings.

(j) Water meters(i) Combination water meters

Where high peak flow, as well as a small flow, can occur and the small flow is out of the registration range of the large water meter, a small water meter shall be installed in parallel with the large water meter to cater for the small flows with integral automatic change-over valves. These valves shall be designed to have a minimum pressure drop at operating point.

(ii) Water meters (50 mm NB and larger)

These water meters shall be of the dry type with all gears and transmission and roller counters in a dry head, and shall be equipped with flanged ends to SANS 1123, cast-iron body with high quality corrosion-proof coating. The meter shall be protected from magnetic fields and sealed to prevent tampering with adjustments. The meter must be able to work up to a pressure of 1600 kPa under a maximum water temperature of 40 °C. The scale of meter must be in cubic metre (m<sup>3</sup>) and equipped with needle indicators reading in litres. Accuracy of meter shall be not less than 98 %.

The meters shall be installed with leading and trailing lengths of pipes to the manufacturer's specification.

(iii) Water meters (up to 50 mm NB)

The meter shall be of the volumetric rotary piston type with brass body equipped with union couplers. The meter reading must be in kilolitres. The meter shall have an accuracy of not less than 98 %. The meter must be able to operate up to a water pressure of 1000 kPa at a water temperature of 40 °C.

The meters shall be installed with leading and trailing lengths of pipes to the manufacturer's specification.

(k) Adjustable balancing valves

Adjustable balancing valves shall be supplied and installed as indicated on the applicable drawings. A portable differential pressure meter shall be used, with all the necessary pipes, shut-off valves and air release valves to set the balancing valves. A graph chart shall be supplied to indicate the flow units against the valve adjustment and as the pressure differential over the valve.

The pressure gauge shall be calibrated according to the current accepted SI units.

The calibrated adjustable balancing valves shall be of the angle valve type equipped with bronze valve body, bronze disc, internal seals with BSP threaded ends. The valve shall be fitted with stop-cock connection ends on inlet and outlet onto which the differential pressure gauge can be coupled. The valve shall be equipped with an indicator on the valve handle to show the position of the valve opening. The valve shall be suitable for operating at a temperature of 90 °C against a pressure of 1 000 kPa.

(l) Semi-conductive reheating tape for hot-water pipes

Semi-conductive reheating tape shall be strapped to the hot-water pipes under the thermal insulation. This reheating tape shall be installed strictly according to the manufacturer's specification.

The system shall be fitted with all the necessary end seals, tee splices, straps, etc, as required by the supplier.

The reheating tape shall be of the self-regulating type equipped with a parallel circuit, self-regulating conductive core, polyolefin jacket and tinned copper braid on the outside.

The reheating tape shall be sized to maintain an operating temperature of 60 °C of water inside the pipe.

(m) Expansion bellows(i) Expansion bellows for pipes (50 mm NB and larger)

Expansion bellows shall be of the rubber-lined type fitted between flanges. These bellows shall be suitable for an operating temperature of -10 °C to 110 °C at an operating pressure of 1 500 kPa. The bellows shall be installed strictly in accordance with the manufacturer's specifications.

(ii) Expansion bellows for copper pipes (up to 40 mm NB)

These expansion bellows shall have a copper body with corrugated stainless steel lining and soldered capillary type couplings. The bellows shall be capable to withstand a working pressure of 600 kPa

at a temperature of 140 °C. Installation shall be strictly in accordance with the manufacturer's specifications.

(n) Lagging of hot-water pipes

(i) Preformed closed cell flame retarded flexible insulation sections

Where pipes are installed in service ducts, ceiling voids and where specified the pipes shall be insulated with Thermaflex preformed pipe insulation sections. This insulation shall be used with pipe systems where the maximum temperature is 80 °C. For a temperature higher than 80 °C preformed fibreglass sections shall be used with galvanized sheet metal muffs.

All bends and T-pieces shall be cut in a 45° mitre box to form a neat joint. All joints shall be glued together with a contact adhesive supplied by the manufacturer. Pipe sizes larger than 50 mm diameter shall be insulated with preformed fibreglass sections with canvas covers glued together with cold wood glue.

Thermaflex thickness for various pipe sizes shall be as follows:

PIPE SIZE (STEEL)	PIPE SIZE (COPPER)	THERMAFLEX THICKNESS
50 mm dia	54 mm dia	20 mm
40 mm dia	42 mm dia	20 mm dia
32 mm dia	35 mm dia	15 mm dia
25 mm dia	28 mm dia	15 mm dia
20 mm dia	22 mm dia	15 mm dia
15 mm dia	15 mm dia	15 mm dia

(ii) Preformed fibreglass sections with galvanized sheet metal muffs

All hot-water pipes in service tunnels, service corridors and where exposed to damage and/or weather shall be insulated with preformed fibreglass sections covered with galvanized sheet metal muffs in a watertight manner. Sheet metal muffs shall be installed with the joints overlapping at least 50 mm and the longitudinal overlap pointing downwards to prevent ingress of water. The sheet metal muff shall be strapped with 10 mm galvanized straps by means of a strapping tool with a minimum of 2 straps/section. All pipe bends, T-pieces, etc, shall be insulated with 25 mm diameter fibreglass rope covered with a 12 mm thick layer of self-setting fibre cement. A reinforcing gauge shall be wrapped over the fibre cement while wet and painted with mastic paint when dry.

Fibreglass section thickness for the various pipe sizes shall be as follows:

PIPE SIZE (STEEL)	PIPE SIZE (COPPER)	FIBREGLASS THICKNESS
100 mm dia	108 mm dia	50 mm dia
80 mm dia	76 mm dia	40 mm dia
65 mm dia	67 mm dia	40 mm dia

PIPE SIZE (STEEL)	PIPE SIZE (COPPER)	FIRBREGGLASS THICKNESS
40 mm dia	54 mm dia	25 mm dia
40 mm dia	42 mm dia	25 mm dia
32 mm dia	35 mm dia	25 mm dia
25 mm dia	28 mm dia	20 mm dia
20 mm dia	22 mm dia	20 mm dia
15 mm dia	15 mm dia	20 mm dia

**AA 09.05****SANITARY AND BRASSWARE EQUIPMENT**

Repair work to the sanitary and brassware equipment is detailed in the Particular Specification and shall include but not be limited to the following:

- (a) Damaged and/or broken irreparable sanitary and brassware equipment shall be replaced with equal specification equipment or approved alternative. These shall be installed strictly to the manufacturer's specifications.
- (b) Sanitary and brassware equipment that are unsuitable for the purpose and application they serve are to be replaced with suitable equipment.
- (c) The quantity of sanitary and brassware equipment for the number of people and application they serve, shall be investigated in accordance with the current SANS 10400 application regulations. If found to be insufficient these facilities shall be upgraded only if approved by the Engineer.
- (d) Loose sanitary ware shall be re-fixed and bracketed to structures in accordance with the manufacturer's specifications.
- (e) Stained sanitary ware equipment shall be cleaned, where possible, with approved cleaning agent in accordance with the manufacturer's specification.
- (f) All cisterns are to be cleaned out and filling and flushing mechanisms shall be serviced and repaired. Where beyond repair status these items shall be replaced with equal specification or approved alternatives.
- (g) All worn-out and leaking flush valves are to be repaired by utilising the manufacturer's replacement kits. Where flush valves are damaged beyond repair these shall be replaced with equal specification or approved alternatives.
- (h) All pillar taps, mixers, sink taps and other taps are to be serviced, utilising repair kits. Where equipment is beyond repair these items shall be replaced with equal specification or approved alternatives. Where equipment connections are loose these shall be properly secured to sanitary ware and other equipment.
- (i) Leaking, corroded or damaged chromium-plated flush pipes to water-closets and urinals are to be replaced where required.
- (j) Replace missing and/or damaged shower gratings with equal specification or approved alternatives.
- (k) Service and repair water metering taps by utilising manufacturer's replacement kits where necessary. Where damaged beyond repair the complete item shall be replaced with equal specification or approved alternative.

- (l) Replace missing or damaged tap handles with matching handles from the manufacturer of the tap.
- (m) Readjust all timing mechanisms on flush valves and metering taps in accordance with repairs and services to the correct flushing and flow times.
- (n) Replace damaged or missing basin and/or sink mixer swivel arms with equal specification or approved alternative.
- (o) Replace missing or damaged toilet seats and covers with equal specification or approved alternatives.
- (p) Repair and service urinal syphonic valves with replacement kits from manufacturer. Where no spares are available or equipment is damaged beyond repair, these items are to be replaced with equal specification or approved alternatives.
- (q) Repair and clean out all bottle traps. Bottle traps that are damaged beyond repair are to be replaced with equal specification or approved alternatives.
- (r) Repair and service bath taps and mixers by utilising manufacturer's replacement kits. Where damaged beyond repair, the taps and mixers shall be replaced with equal specification or approved alternatives.

## **AA 09.06      FIRE WATER PIPED RETICULATION NETWORKS**

### **AA 09.06.01      General**

Repair work to the fire water piped reticulation networks is detailed in the Particular Specification and shall include but not be limited to the work described below. This specification only covers the water piped reticulation for the fire water protection system, while the equipment to this installation, such as fire hydrants, hose reels and extinguishers, are covered and detailed in Technical Specification JC: Conventional Fire Fighting Equipment. This specification has to be read in conjunction with the afore-mentioned specification.

- (a) Replace damaged, broken, leaking, corroded above and underground pipework, fittings and equipment.
- (b) Repair, replace and service valves which shall include new gaskets, gland packings, seals, bolt and nuts, etc.
- (c) Where valves do not close properly, all these valves are to be refurbished, descaled and if necessary replaced.
- (d) Repair, service and check the proper functioning of all non-return valves and backflow preventers.
- (e) Repair, service, readjust and calibrate all pressure gauges.
- (f) Repair bracketing systems including fixing and repair of existing brackets and the provision of additional brackets where required.
- (g) Report all problems related to fire fighting equipment to the Engineer.
- (h) Water storage tanks are to be emptied, cleaned out, repaired, sealed and put back into operation. Ball float and/or filling valves to these tanks are to be serviced and repaired where required.
- (i) Pressure test and sterilise repaired new installation and equipment.

- (j) Reinstall and make good walls, tiling, floors, concrete, finishes, holes, chases, surfaces, etc, to an acceptable level where any repair, upgrade and/or service work have been executed.
- (k) Record pressure readings on supply to installation.

#### **AA 09.06.02 Material and equipment specification for fire water piped reticulation networks**

Materials and equipment to be used for repair items shall be suitable and/or adaptable to the existing installation and shall comply with the following:

##### **(a) Galvanized steel pipe installation**

- (i) All galvanized steel pipes shall be medium gauge mild steel screwed and socketed pipes to SANS 62 and shall be normalised and marked as such by the manufacturer. Pipes shall be hot-dip galvanized to SANS 763.
- (ii) All fittings shall be malleable cast-iron fittings to SANS 509 and galvanized to SANS 763.
- (iii) All 80 mm diameter and larger pipes shall be joined with Class 16 flanged couplings to SANS 1123/1600. The bolts, nuts and spring washers to be used on these joints shall be cadmium-plated.
- (iv) In pipe ducts and elsewhere pipes shall be fixed onto walls, soffits, etc, with approved type of supports, holderbats, clamps, etc. Brackets shall be designed to structurally support and fix the pipe system and shall have enough clearance from walls, soffits, etc, to maintain equipment.
- (v) Pipes shall be supported according to the manufacturer's specifications at the following maximum intervals:

NORMAL SIZE (mm)	HORIZONTAL (mm)	VERTICAL (mm)
15 dia to 20 dia	1 200	1 830
32 dia to 40 dia	1 830	2450
50 dia to 150 dia	2 450	3 050

- (vi) All pipes shall be marked according to SANS 10140 or as specified by the Engineer. All surface pipes shall be painted.
- (vii) Pipes shall be installed on the surface, unless otherwise specified.
- (viii) Provision shall be made for thermal contraction and expansion.
- (ix) The type of pipe joint compound shall be approved by the Engineer and used sparingly with good quality hemp. For pipes larger than 80 mm diameter a jointing compound such as Epidermix 32 shall be used.
- (x) Any buried pipe shall have at least 900 mm cover and be coated and wrapped to SANS 1117 and tested in the presence of the Engineer.
- (xi) All pipework and fittings shall be pressure tested as specified.

(b) uPVC underground pipe installations

- (i) uPVC piping shall conform to SANS 966 with rubber ring type joints.
- (ii) All bends shall be uPVC type fittings with rubber ring joints.
- (iii) All other fittings such as T-pieces, reducers, flanges, etc, shall be bitumen-dipped cast-iron rubber ring jointed fittings to SANS 546.
- (iv) No solvent weld type fittings will be allowed.
- (v) All cast-iron fittings shall be coated and wrapped to SANS 1117.
- (vi) All pipes shall be laid on a 100 mm sand bedding cradle and covered with 300 mm sand before backfilling.
- (vii) Pipe trenching and bedding:

AREA	MINIMUM COVER	BEDDING TYPE	MAIN FILL
Vehicle traffic	1 100	Flexible pipe bedding as per SANS 1200 LB	Soilcrete
Under surface bed	600		Soilcrete
Other areas	900		90 % of modified AASHTO density

- (viii) All thrust blocks shall be cast between the pipe and the undisturbed trench material.
- (ix) No concrete shall come into direct contact with the uPVC pipe. At the thrust blocks the bend shall be wrapped with Densopol 80 HT tape or similar approved.
- (x) HDPE pipe connections to uPVC pipes up to 40 mm diameter can be done by means of SG Iron manufactured saddles with the appropriate gaskets and cadmium-plated bolts and nuts.
- (xi) All pipe crossings under traffic areas shall be backfilled with soilcrete and compacted as specified.
- (xii) All pipework shall be pressure tested with all joints uncovered to the satisfaction of the Engineer.
- (xiii) Suitably sized air release valves built into valve chambers shall be installed at all high points of the pipeline.
- (xiv) Duckfoot bends shall be used to all fire hydrants at the foot of fire hydrants. This to be cast into thrust blocks.

(c) HDPE underground pipe installations

- (i) All HDPE piping shall be Type 4 HDPE pipe to SANS 533.
- (ii) All fittings shall be of Plasson compression type and shall conform to ISO/DIS 3458.



- (iii) All pipes shall be laid on a 100 mm sand bedding cradle and covered with 300 mm of sand or selected material.
- (iv) All backfilling shall be to the SANS 1200 DB and to the Engineer's approval.
- (v) Pipe trenching and bedding:

AREA	MINIMUM COVER	BEDDING TYPE	MAIN FILL
Vehicle traffic	1 100	Flexible pipe bedding as per SANS 1200 LB	Soilcrete
Under surface bed	600		Soilcrete
Other areas	900		90 % of modified AASHTO density

- (vi) No concrete shall come into direct contact with the HDPE pipe. At these points the fittings shall be wrapped with Densopol 80 HT tape or similar approved.
- (vii) All pipe crossings under traffic areas shall be backfilled with soilcrete and compacted as specified.
- (viii) All pipework shall be pressure tested with all joints uncovered to the satisfaction of the Engineer.
- (ix) Suitably sized air release valves built into valve chambers shall be installed at all high points of the pipeline.

(d) Valves

- (i) Gate valves underground in valve chambers to connect to uPVC piping (65 mm NB and larger)

Gate valves are to be equipped with non-rising spindle, spherical graphite iron body to SANS 936 Grade 42, cast-iron nitrile butadiene rubber covered gate, stainless steel spindle, nitrile butadiene rubber O-rings and seals, cast-iron bonnet and gunmetal thrust collar to BS 1400 LG2.

The valves shall conform to SANS 664 and/or 665 and shall be capable of withstanding a working pressure of 1 600 kPa.

The valves shall be fitted with a square key spindle top to close the valves in clockwise direction and socket ends to SANS 665 to fit into uPVC.

Valves are to be provided with locking devices to lock valves in open position.

- (ii) Gate valves underground in valve chambers to connect to uPVC piping

The gate valves shall be of the dezincified brass type with brass gate, brass body, non-rising spindle and BSP threaded socket ends. The valves shall conform to SANS 776 Class 125. The valves shall be able to withstand a working pressure of 1 600 kPa. The valve shall be fitted with a hand wheel on an extended spindle shaft of 700 mm to close in a clockwise direction and installed to detail.

(iii) Gate valves above ground to connect to steel (65 NB and larger)

Gate valves are to be equipped with non-rising spindle, spherical graphite iron body to SANS 936 Grade 42, cast-iron nitrile butadiene rubber covered gate, stainless steel spindle, nitrile butadiene rubber O-rings and seals, cast-iron bonnet and gunmetal thrust collar to BS 1400 LG2.

The valves shall conform to SANS 664 and/or 665, and shall be capable of withstanding a working pressure of 1 600 kPa.

The valves shall be fitted with flanged ends to SANS 1123/1600, hand wheel to close the valves in a clockwise direction and installed in an upright position or sideways to maximum 90° from upright.

These valves shall be equipped with locking devices to lock valves in open position.

(iv) Gate valves above ground (up to 50 mm NB)

The gate valves shall be of the dezincified brass type with brass gate, brass body, non-rising spindle and BSP threaded socket ends. The valves shall conform to SANS 776 Class 125.

The valves shall be able to withstand a working pressure of 1 600 kPa.

The valve shall be equipped with a hand wheel to close in a clockwise direction.

The valves shall be installed in an upright position or sideways to maximum 90° from upright and shall be so placed with other fittings as to be removed without cutting the pipework.

The valves shall be equipped with locking devices to lock valves in open position.

## **TECHNICAL SPECIFICATION**

### **AB      BUILDING ELECTRICAL INSTALLATIONS**

#### **CONTENTS**

<b>AB 01</b>	<b>SCOPE</b>
<b>AB 02</b>	<b>STANDARD SPECIFICATIONS, REGULATIONS AND CODES</b>
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<b>AB 04</b>	<b>TESTS AND INSPECTIONS PRIOR TO PRACTICAL COMPLETION</b>
<b>AB 05</b>	<b>LOGGING AND RECORDING PROCEDURES</b>
<b>AB 06</b>	<b>MAINTENANCE TOOLS AND SPARES</b>
<b>AB 07</b>	<b>QUALITY ASSURANCE SYSTEM</b>
<b>AB 08</b>	<b>RE-COMMISSIONING OF INSTALLATION</b>
<b>AB 09</b>	<b>REPAIR WORK TO LIGHTING INSTALLATIONS</b>
<b>AB 10</b>	<b>INSTALLATION TECHNICAL DETAILS</b>
<b>AB 11</b>	<b>MAINTENANCE OF THE INSTALLATION</b>

#### **AB 01      SCOPE**

**AB 01.01** This specification comprises all aspects regarding the repair and maintenance of building electrical systems. Building electrical systems comprise:

- (i) Distribution boards and low voltage cable
- (ii) Interior and exterior lighting of buildings
- (iii) Small power and fixed appliances
- (iv) Earthing and lightning protection system.

**AB 01.02** This specification shall form an integral part of the repair and maintenance contract document and shall be read in conjunction with portion 3, the Additional Specifications included with this document.

#### **AB 02      STANDARD SPECIFICATIONS, REGULATIONS AND CODES**

**AB 02.01** The latest edition, including all amendments up to date of tender of the following specifications, publication and codes of practice shall be read in conjunction with this specification and shall be deemed to form part thereof.

**AB 02.02 SANS Specifications**

General	Distribution and meter boards	LV cables and conductors	Lighting system	Earthing and lightning protection system	Small power installation	
					Power outlets	Conduits, powerskirting, cable trays and ducting
SANS 10142	SANS 152		SANS 10114	SANS 03	SANS 152	SANS 950
SANS 10160	SANS 156	SANS 10198	SANS 163	SANS 10199	SANS 164	SANS 1065
SANS 10400	SANS 172	SANS 1411	SANS 1012		SANS 1084	SANS 1085
SANS 1222		SANS 1507	SANS 1084		SANS 1239	
			SANS 1250			
			SANS 1279			
			SANS 1777			
			SANS 10114			

**AB 02.03 Department of Public Works Specifications PW 774 and PW 343.****AB 02.04 Occupational Health and Safety Act of 1993: Construction Regulations, 2003 as promulgated in Government Gazette No 25207 and Regulation Gazette No 7721 of 18 July 2003.****AB 02.05 Manufacturer's specifications and installation instructions.****AB 02.06 Additional requirements**

Equipment and material installed shall be new and unused.

Luminaires, control gear, isolators and power outlets shall bear the SANS stamp. The Contractor shall ensure that all safety regulations and measures are applied and enforced during repair and maintenance work on cabling, wiring, distribution boards, luminaires, power points and fixed appliances.

**AB 03 OPERATING AND MAINTENANCE MANUALS**

**AB 03.01** No operating and maintenance manuals shall be developed for this section.

The contractor shall use the maintenance control plan to schedule preventative maintenance actions.

**AB 04 TESTS AND INSPECTIONS PRIOR TO PRACTICAL COMPLETION**

**AB 04.01** All systems are to be re-checked by the Contractor prior to re-commissioning. Copies of all checks for each installation shall be presented to the Engineer for approval before re-commissioning takes place.

**AB 04.02** It is the responsibility of the Contractor to provide all labour, accessories and properly calibrated and certified measuring instruments necessary to record the following parameters:

**AB 04.02.01** Continuity of ring final circuit conductors

**AB 04.02.02** Continuity of protective conductors, including main and supplementary equipotential bonding

**AB 04.02.03** Earth electrode resistance

**AB 04.02.04** Insulation resistance

**AB 04.02.05** Polarity

**AB 04.02.06** Earth fault loop impedance

**AB 04.02.07** Operation of residual current devices

**AB 04.02.08** Phase voltage

**AB 04.02.09** Current per phase

**AB 04.02.10** Illumination levels in lux

**AB 04.03** The Contractor is responsible for the arrangement of such tests. He shall give at least 72 hours notice to the Engineer prior to the test date.

## **AB 05** **LOGGING AND RECORDING PROCEDURES**

**AB 05.01** The Contractor shall as part of this Contract institute a Recording system as part of his Maintenance Control Plan as defined in the Additional Specification SA – General Maintenance. This shall consist of a Record book which shall be utilised to log and record all faults, system checks, breakdowns, maintenance visits, inspections etc.

**AB 05.02** The logbook shall be stored in a safe place and shall only be utilised by the Contractor and Engineer. A copy of the monthly entries and recordings into this logbook shall be submitted by the Contractor together with his monthly report to the Engineer.

This logbook shall be structured to at least include the following:

**AB 05.02.01** Bi-annual inspection and testing of all systems.

**AB 05.02.02** Monthly lamp inspection and maintenance actions.

**AB 05.02.0** Annual earthing test report.

**AB 05.02.04** Bi-annual inspection and testing of distribution boards.

## **AB 06** **MAINTENANCE TOOLS AND SPARES**

**AB 06.01** On commencement of the Repair and Maintenance Contract, the Contractor shall supply and deliver certain Tools and Spares to the User Client. These tools and spares will be the property of the Department of Public Works. Any deficiencies or short fall or damaged Tools and Spares during the contract shall be replaced with new equipment/material.

**AB 06.02** The Tools and Spares shall be kept safe in a lockable store room on site. The Contractor shall provide his own lock for the designated store room. The inventory of the Tools and Spares shall be verified on a monthly basis. Any short fall shall be replaced by the Contractor as part of his responsibility under this contract.

**AB 06.03** The Tools and Spares shall at least include the following:

10 off 100W GLS lamps  
 20 off PL 9W lamps  
 20 off 36W fluorescent lamps  
 40 off 58W fluorescent lamps  
 10 off 250W HPS lamps  
 5 off 80W MV lamps  
 Distribution kiosk key  
 DB face plate square key  
 DB face plate triangular key.

**AB 06.04** Tools and Spares: Measurement and payment

<u>Item</u>	<u>Unit</u>
(a) <b><u>Supply of Tools and Spares</u></b>	No

The unit of measurement shall be the number of Tools and Spares supplied.

The tendered rate shall include full compensation for the supply and delivery of the Tools and Spares as specified.

## **AB 07** **QUALITY ASSURANCE SYSTEM**

**AB 07.01** Following formal approval of his Quality Assurance system by Engineer, the Contractor shall implement the approved QA system.

**AB 07.02** Records of this QA system shall be kept throughout the duration of the contract and shall be submitted to the Engineer as required by the Department.

## **AB 08** **RE-COMMISSIONING OF INSTALLATION**

**AB 08.01** On practical completion of the repair work, the contractor shall re-check and put all systems into operation.

**AB 08.02** All commissioning shall be performed by the Contractor, to the satisfaction of the Engineer. The Contractor shall confirm in writing that all systems have been repaired according to specification and are fully operational.

**AB 08.03** All installations shall be energised for a minimum continuous period of 96 hours immediately prior to the Engineer's Practical Completion inspection to verify lamp stability and reliability of power reticulation

**AB 09**      **REPAIR WORK TO LIGHTING INSTALLATIONS**

**AB 09.01** The various electrical systems shall be repaired during the first phase of the repair and maintenance contract.

**AB 09.02** The scope of the repair work shall include, but shall not be limited to the activities listed below.

**AB 09.03** The Contractor shall record the repair actions in tabular format before the Contractor's responsibility for maintenance commences.

**AB 09.04** Repair work shall be executed within the approved period for repairs.

**AB 10**      **INSTALLATION TECHNICAL DETAILS**

**AB 10.01**    **Installation description**

Repair and maintenance work of the building electrical systems shall be in the following areas:

- Reception Office
- Library
- Recreational Area
- Creche unit with 2 x rooms and ablution for kiddies
- 1 x Storeroom
- Disabled Bathroom
- 4 x Offices
- Male and Female ablutions
- Kitchen
- Caretakers flat with bathroom and kitchen
- 2 x Activity Areas
- Braai Area

**AB 10.02**                      **Scope of repair work**

**AB 10.02.01**   **Distribution boards and cabling**

- (a) Service distribution boards: inspect and clean the distribution boards, treat the enclosure for moisture ingress and corrosion
- (b) Check for rigidity and fastening of equipment trays, panels, doors and handling devices
- (c) Check locking mechanism and fit padlock. All padlocks shall be of local manufacture with brass bodies and 75 mm chrome shackles. Three keys (with PVC labels) shall be provided for each lock
- (d) Replace damaged or missing faceplates, doors, mounting frames, handles, thumb catches, etc.
- (e) Check operation of distribution board equipment and meters, replace if faulty or damaged with an approved type
- (f) Remove all obsolete equipment and meters
- (g) Check and fasten wiring and cable terminations
- (h) Re-arrange wiring and equipment to give a neat installation
- (i) Trace outgoing circuits
- (j) Fit labelling and blank face plate covers
- (k) Replace the distribution boards if required and replacement is approved by Engineer. Check earth bar and earth continuity, record
- (l) Label all wiring and cabling with Grafoplast Trasp PVC markers
- (m) Replace all circuit breakers that are rated below 5 kA.

**AB 10.02.02**   **Lighting system**

- (a) Indoor luminaires
  - (i) Operational and complete luminaires
    - Remove lamps and wash luminaire body with detergent. Clean polycarbonate diffusors with detergent. Clean polished pure aluminium diffusors / reflectors with benzene



- Check condition of luminaire seal, entrance gland, lampholder and internal wiring
- Ensure that earth stud and earth connection is sound
- Replace missing screws, catches, bolts and plugs
- Check condition of suspension cords of pendant luminaires
- Re-lamp.

(ii) Damaged or incomplete luminaires

- Remove luminaire
- Replace luminaire and reconnect
- Fit new lamps.

(b) Light switches

Note: All light switches shall have steel faceplates with permanent glued Traffolite labels.

- Remove switch cover
- Check continuity of earth connection
- Check operation of switch and replace if suspect
- Replace switch cover, fit new csk stainless steel screws if required.

(c) Photocells

- Wash translucent body with detergent
- Cover photocell and verify operation
- Check bypass manual switching circuit
- Enclose all exposed wiring in 16 mm ø Sprague.
- Install photocell in a dummy bulkhead.

(d) Floodlight and bulkhead luminaires

- Remove lens and lamp. Wash lens thoroughly

- Wash luminaire body with detergent
- Clean polished pure aluminium reflectors with benzene
- Check condition of internal wiring, capacitor, ballasts and starters
- Check condition of neoprene seal and replace if worn or damaged
- Check condition of lampholder
- Seal conduit and wiring entry with silicone to eliminate water ingress
- Fit new lamp
- Check condition of earth stud and luminaire earth connection
- Replace all missing screws, lens catches, bolts
- Close cover securely, check stirrup bolts.

#### SCHEDULE OF LUMINAIRES

TYPE	DESCRIPTION
A	2 x 58W SABS OPEN CHANNEL FLUORESCENT LUMINAIRE - LASCON TYPE : R1-258 SS
B	2 x 36W SABS OPEN CHANNEL FLUORESCENT LUMINAIRE - LASCON TYPE : R1-236 SS
C	1 x 58W SABS OPEN CHANNEL FLUORESCENT LUMINAIRE - LASCON TYPE : R1-158 SS
D	1 x 36W SABS OPEN CHANNEL FLUORESCENT LUMINAIRE - LASCON TYPE : R1-136 SS
E	2 x 58W SABS IP 55 FLUORESCENT LUMINAIRE - LASCON TYPE : C2-258SS WITH WATERTIGHT DIFFUSER
F	2 x 58W SABS FLUORESCENT LUMINAIRE - LASCON TYPE : WITH PRISMATIC DIFFUSER
G	2X 58W SURFACE MOUNTED FLUORESCENT LUMINAIRE WITH SINGLE PARABOLIC REFLECTOR
H	70W HPS B40 BRITELITE WALL MOUNTED BULKHEAD LUMINAIRE : LASCON TYPE B40-70W HPS
I	80W MV B40 BRITELITE WALL MOUNTED BULKHEAD LUMINAIRE : LASCON TYPE B40-80W MV
J	80W MV WALL MOUNTED LUMINAIRE BEKA TYPE: AZIMUTH 80W MV ACRYLIC
K	BULKHEAD LUMINAIRE - LASCON TYPE: B10 WITH 2XPL9 LAMPS
L	BULKHEAD LUMINAIRE - LASCON TYPE: B10 WITH 21 W DULUX EL ECO LAMP
M	BULKHEAD LUMINAIRE - LASCON TYPE: B20 WITH 2XPL9 LAMPS
N	DÉCORATIVE ROUND BULKHEAD WITH GRID – ILM TYPE: BHD/CMO/MO/GR

O	DÉCORATIVE OVAL BULKHEAD WITH EYELID – ILM TYPE: BHD/CMO/OVL/EL
P	125W MV FLOODLIGHT LUMINAIRE WITH GRP BODY: ILM TYPE: GAL/GRP/125/MV
Q	400W HPS FLOODLIGHT LUMINAIRE : LASCON TYPE : L14ST-400 HPS
R	250W HPS FLOODLIGHT LUMINAIRE : LASCON TYPE : L14ST-250 HPS
S	400W MV SABS APPROVED HIGH BAY LUMINAIRE WITH AUTO LIGHT SIMILAR OR EQUAL TO BEKA BAY
T	BOWL TYPE IP55 BATHROOM FITTING WITH CERAMIC LAMP HOLDER WITH DULUX EL ECO 21W/E27 LAMP
U	DÉCOR ROUND CHEESE BULKHEAD 250 MM GLASS BOWL-ILM TYPE: DEC/RND/CHS/250 WITH 21 W DULUX EL ECO LAMP
V	WALL MOUNTED DÉCOR SPOT LIGHT ILM TYPE : ACC/SPT/100
W	CEILING MOUNTED 3 LIGHT DECORATIVE LUMINAIRE WITH GLASS CUPS AND DULUX EL ECO 21W/E27 LAMPS
X	CEILING MOUNTED 2 LIGHT DECORATIVE LUMINAIRE WITH GLASS CUPS AND DULUX EL ECO 21W/E27 LAMPS
Y	CEILING MOUNTED SINGLE LIGHT DECORATIVE LUMINAIRE WITH GLASS CUPS AND DULUX EL ECO 21W/E27 LAMPS
Z	BULKHEAD LUMINAIRE - BEKA TYPE SERIES 30: WITH 2XPL9W CFL LAMPS
AA	CEILING MOUNTED LUMINAIRE WITH STEEL DOME REFLECTOR AND 21W DULUX EL ECO LAMP
AB	CEILING FAN WITH 1 X GLASS CUPS AND 100W GLS LAMPS
AC	400W MV HIGHBAY LIGHT BEKA TYPE: BEKA 400W MV
AD	250W MV LOWBAY DOWNLIGHTER BEKA TYPE: BEKATEC 250W HPS

### **AB 10.02.03** Power outlets and fixed appliances

Note: All power outlets shall have steel faceplates with permanent glued Traffolite labels.

- (a) Inspect all power outlets and verify earthing
- (b) Check contact points and tighten screws
- (c) Replace missing screws and covers for outlet and draw boxes
- (d) Replace missing, faulty or damaged socket outlets and plugs
- (e) Check conditions and operation of local isolators and control switches for fixed equipment and replace if faulty, damaged or missing
- (f) Check earthing of fixed appliances and test for earth continuity
- (g) Inspect cable and wireways

- (h) Check for rigidity and fastening of the cable ducts, ladders, ducting, powerskirting and surface conduiting, fasten or replace if loose or damaged, check earthing and test for earth continuity.

**AB 10.02.04 Earthing, bonding and lightning protection**

- (a) Check earthing and bonding of outlet points, equipment, cable and wireways, fixed appliances, water and gas pipes, etc.
- (b) Check installation and termination of protective conductors and earth electrodes
- (c) Test for earth continuity
- (d) Provide 6 mm<sup>2</sup> copper earth wire jumper between roof cladding and all gutter downpipes. Fasten with lugs and galvanized zinc bolts. Typically ten downpipes per housing unit. Earth at least two gutter downpipes by means of 16 mm<sup>2</sup> green insulated earth wire connected to 1,2 m earth electrode by means of cadwelding. Typically two downpipes per 25 m long housing unit
- (e) Installation of 50 mm<sup>2</sup> aluminium roof conductor in galvanised conduit from the roof cladding against the building to the earth electrode.

**AB 10.03 Repair work: Measurement and payment**

**AB.01 Distribution boards and cabling**

<u>Item</u>	<u>Unit</u>
<b>AB.01.01 <u>Service distribution board</u></b>	No

The unit of measurement shall be the number of distribution kiosks or boards opened and serviced as specified in Clause AB 10.02.

The tendered rate shall include full compensation for the opening of the distribution board or kiosk, internal cleaning of the enclosure, cleaning of equipment and meters, removal of obsolete distribution board equipment, re-arrangement of equipment and wiring, treatment of the enclosure for moisture ingress and corrosion, vermin protection, fastening and / or replacement of wiring, tracing of outgoing circuits, labelling of outgoing wiring and mcb's and cable terminations and earth testing.

The tendered sum shall further include for replacement of damaged, missing or faulty distribution board switchgear, meters, face plates, mounting frames,

handling devices, doors, labelling with engraved Traffolite labels, neutral bars, earth bars etc. All downstream circuit breakers shall be rated at 6 kA fault level.

Item

Unit

**AB.01.02 Replace distribution board**

No

The unit of measurement shall be the number of distribution boards removed and replaced if replacement is approved by Engineer.

The tendered rate shall include full compensation for the dismantling of the DB equipment, removal of the dilapidated enclosure, supply and installation of an epoxy painted new enclosure, mounting frames, plates, equipment, meters, tracing of outgoing circuits, labelling etc.

The tendered sum shall further include for re-wiring of the board, cable termination, cable labelling, remedial builders work and earth testing.

Item

Unit

**AB.01.03 Replace cabling**

m

The unit of measurement shall be the linear length of cable supplied and installed.

The tendered rate shall include full compensation for the removal of the existing cabling; supply, handling, installation and termination of the specified type of cable.

This rate shall further include for the supply of all cable ties, clamps and other material necessary to ensure that the installation conforms to the specification.

Item

Unit

**AB.01.04 Replace wiring**

m

The unit of measurement shall be the linear length of conductors supplied and installed.

The tendered rate shall include full compensation for the removal of the existing conductors, the supply, handling, installation, pulling in conduit and termination of the specified type of conductor.

This rate shall further include for the supply of all cable ties, labelling, and other material necessary to ensure that the wiring conforms to the specification.

Item

Unit

**AB.01.05 Jointing and termination of cables**

No

The unit of measurement shall be number of cable joints or terminations.

The tendered rate shall include full compensation for the cost for providing the kits, complete with compound, ferrules and cable lugs, the cost for cutting the cable, handling and fitting kits and the cost of testing the joints and terminations. Position of joints shall be indicated on as-built drawings

ItemUnit**AB.01.06 Supply and install padlocks**

No

The unit of measurement shall be number of padlocks supplied and installed.

The tendered rate shall include full compensation for the ordering, supply and installation of the 75 m locally manufactured padlocks and locking devices as well as fitting each of the three keys with purpose-made pvc labels.

ItemUnit**AB.01.07 Excavate in all materials for trenches, backfill, compact and dispose of surplus material**m<sup>3</sup>

The unit of measurement shall be the cubic meter of material excavated in trenches.

The tendered rate shall include full compensation for clearing and grubbing the trench areas, for excavating the trench, preparing the bottom of the trench, separating material unsuitable for backfill and dealing with any surface or subsurface water.

The tendered rate shall furthermore cover the cost of installing the sand bed and sand cover, backfilling, compacting and disposing of the surplus material.

ItemUnit**AB.01.08 Supply and install cable sleeves**

m

The unit of measurement shall be the linear length in meter of the cable sleeve supplied and installed.

The tendered rate shall include full compensation for the supply, delivery, handling and installing the specified sleeves including the all the required, couplings, steel draw wires and plugs.

ItemUnit

**AB.01.09 Supply and install plastic warning tape** m

The unit of measurement shall be the linear length in meter of the plastic warning tape supplied and installed.

The tendered rate shall include full compensation for the supply, handling and laying of the plastic warning tape.

Item	Unit
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<b>AB.01.10</b>	<b>Termination of the low voltage cable</b>	No
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The unit of measurement shall be the number of low voltage cable terminations.

The tendered rate shall include full compensation for providing the cable glands and shrouds, the cost for handling, fitting and cutting the cable.

Item	Unit
------	------

**AB.01.11 Supply and install earth continuity conductor** m

The unit of measurement shall be the linear length in meter of the earth continuity conductor supplied and installed.

The tendered rate shall include full compensation for procuring, furnishing and laying the specified earth continuity conductor.

Item	Unit
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<b>AB.01.12</b>	<b>Termination and connect earth continuity conductor</b>	No
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The unit of measurement shall be the number of earth continuity conductors terminated and connected.

The tendered rate shall include full compensation for supplying all the material required to terminate and connect the earth continuity conductors and the connecting thereof to the earth bars, including label tags.

Item	Unit
------	------

<b>AB.01.13</b>	<b>Supply and installation of circuit breakers</b>	No
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The unit of measurement shall be the number of circuit breakers supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type and size of circuit breaker, including printed PVC labelling.

Item

Unit

**AB.01.14 Supply and installation of isolators**

No

The unit of measurement shall be the number of isolators supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified isolator, including printed PVC labelling.

Item

Unit

**AB.01.15 Supply and install contactors**

No

The unit of measurement shall be the number of contactors supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type of contactor, including engraved labelling on rear tray.

Item Unit

**AB.01.16 Supply and install switching timers**

No

The unit of measurement shall be the number of switching timers supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type of switching timer, including labelling.

Item

Unit

**AB.01.17 Supply and install earth leakage units**

No

The unit of measurement shall be the number of earth leakage units supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type of earth leakage units, including labelling.

Item

Unit

**AB.01.18 Supply and install fuses**

No

The unit of measurement shall be the number of fuses supplied and installed.



The tendered rate shall include full compensation for the supply and installation of the specified type of fuse, including engraved label indicating fuse rating.

<u>Item</u>	<u>Unit</u>
<b>AB.01.19 Supply and install surge arrestors</b>	No

The unit of measurement shall be the number of surge arrestors supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type of surge arrestors, with visual indication.

<u>Item</u>	<u>Unit</u>
<b>AB.01.20 Supply wire marker kit</b>	No

The unit of measurement shall be the number of specified wire marker kits supplied.

The tendered rate shall include full compensation for the procurement and delivery of the cable marker kit as specified.

AB.02	<u>Lighting system</u>	
		<div> <div>Item</div> <div>Unit</div> </div>
AB.02.01	Re-lamp luminaire	No

The unit of measurement shall be the number of lamps replaced.

The tendered rate shall include full compensation for the supply and installation of the specified lamp according to the manufacturer's instructions. Replacement date must be written on lamp.

<u>Item</u>	<u>Unit</u>	
<b>AB.02.02 Service luminaire</b>		No

The unit of measurement shall be the number of luminaires opened and serviced  
In accordance with Clause AB 10.02.

The tendered rate shall include full compensation for the servicing of the luminaire, including washing, checking of seals, glands, lamp holders, cleaning of diffusers, tightening of fixing screws and bolts, corrosion protection and the checking of earthing continuity and aiming angle if applicable. All external

luminaire conduit entries are to be sealed with silicone, which cost is included in this payment item.

The tendered rate shall further include for replacement of the luminaires internal wiring where applicable and the tightening of all connections

<u>Item</u>	<u>Unit</u>
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<b>AB.02.03</b>	<b><u>Replace luminaire</u></b>	No
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The unit of measurement shall be the number of luminaires replaced.

The tendered rate shall include full compensation for the removal of the existing luminaire and for the supply and installation of the specified type of light fitting complete with lamp and control gear, according to manufacturer's instructions.

<u>Item</u>	<u>Unit</u>
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<b>AB.02.04</b>	<b><u>Replace light switch</u></b>	No
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The unit of measurement shall be the number of light switches replaced.

The tendered rate shall include full compensation for the removal of the existing light switch and for the supply and installation of the specified type of light switch to manufacturer's instructions. Light switch face plate shall be fitted with an engraved Traffolite label as per Nosa-standard, cost of, which is included in rate.

<u>Item</u>	<u>Unit</u>
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<b>AB.02.05</b>	<b><u>Replace photo-electric switch</u></b>	No
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The unit of measurement shall be number of photocell units replaced.

The tendered rate shall include full compensation for the supply, connecting and testing of the switch.

The rate shall further include full compensation for the cost of providing and installing all hardware, screws, wall plugs, 16 mm ø sprague and other material required to install the photo electric light switch in accordance with the manufacturer's specification.

The tendered rate shall further compensate for the supply and installation of the photocell inside a dummy B10 bulkhead.

<u>Item</u>	<u>Unit</u>
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<b>AB.02.06</b>	<b><u>Replace luminaire diffuser</u></b>	No
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The unit of measurement shall be number of luminaire diffusers replaced.

The tendered rate shall include full compensation for the supply and installation of the specified type of diffuser, including fixing screws and clips.

<u>Item</u>	Unit
<b>AB.02.07    <u>Service light switch</u></b>	No

The unit of measurement shall be the number of light switches opened and serviced.

The tendered rate shall include full compensation for the servicing of the light switch, internal cleaning of the enclosure, spray painting, inspection of the contact points, switching mechanism, earthing, etc.

The tendered sum shall further include for replacement of any missing outlet covers and fixing screw and earth testing. Light switch face plate shall be fitted with an engraved Traffolite label as per Nosa-standard, cost of, which is included in rate.

<u>Item</u>	Unit
<b>AB.02.08    <u>Remove, clean, store and reinstallation of luminaire</u></b>	No

The unit of measurement shall be the number of light fittings removed, cleaned, stored and reinstalled.

The tendered rate shall include full compensation for the removal, disconnect, cleaning, storage (4 weeks) reinstallation, reconnection and testing of the luminaire.

The rate shall further include full compensation for the installation of 2 x 700 mm supporting timber members above the ceiling (114 x 38 Par SA Pine) and the mounting of 63 mm ø round conduit outlet box complete with 2 x 4 x 60 mm galvanised screws.

<u>Item</u>	<u>Unit</u>
<b>AB.02.09    <u>Replace Lamp Holder</u></b>	No

The unit of measurement shall be the number of lamp holders replaced.

The tendered rate shall include full compensation for the removal of the existing lamp holder and for the supply and installation of the specified type (ceramic) of lamp holder to the manufacturer's instructions.

<u>Item</u>	<u>Unit</u>
<b>AB.02.10    <u>Replace Luminaire internal components</u></b>	No
<p>The unit of measurement shall be the number of SANS approved internal luminaire components replaced.</p> <p>The tendered rate shall include full compensation for the removal of the defective component and for the supply, installation and testing of the specified type of component to the manufacturer's instructions.</p>	

**AB.03        Small power and fixed appliances**

<u>Item</u>	<u>Unit</u>
<b>AB.03.01    <u>Replace socket outlet</u></b>	No
<p>The unit of measurement shall be the number of socket outlets replaced.</p> <p>The tendered rate shall include full compensation for the removal of the existing socket outlet and the supply and installation of the specified type of socket outlet.</p> <p>All socket outlets shall be supplied complete with cover plates and boxes where required. The tendered rate shall therefore include for the supply of the cover plates and fixing screws where applicable. Outlet face plate shall be fitted with an engraved, Traffolite label as per Nosa-standard, cost of, which is included in the rate.</p>	

<u>Item</u>	<u>Unit</u>
<b>AB.03.02    <u>Replace isolator</u></b>	No
<p>The unit of measurement shall be the number of isolators supplied.</p> <p>The tendered rate shall include full compensation for the supply and installation of the specified type of isolator or control unit.</p> <p>The tendered sum shall further include for the provision of 4 wire, 3 phase connections to the fixed appliance. Isolator face plate shall be fitted with an engraved Traffolite label as per Nosa-standard, cost of, which is included in the rate.</p>	

<u>Item</u>	<u>Unit</u>
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**AB.03.03 Replace plug tops**

No

The unit of measurement shall be the number of plug tops replaced.

The tendered rate shall include full compensation for the supply and installation of the required type of plug top.

ItemUnit**AB.03.04 Replace conduit**

m

The unit of measurement shall be the linear meter of conduit supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type and size of conduit, including all fixing accessories.

ItemUnit**AB.03.05 Replace wiring channel**

m

The unit of measurement shall be number of linear meter of wiring channel replaced.

The tendered rate shall include full compensation for the supply and installation of the specified type of wiring channel with 6 x 60 mm fasteners, including the cover and all the necessary accessories.

ItemUnit**AB.03.06 Supply and install connections to fixed appliances**

No

The unit of measurement shall be number of connections made.

The tendered rate shall include full compensation for the supply and installing of the connections to the fixed appliances.

ItemUnit**AB.03.07 Service socket outlet**

No

The unit of measurement shall be the number of socket outlets opened and serviced.

The tendered rate shall include full compensation for the servicing of the socket outlet, internal cleaning of the enclosure, inspection of the contact points, switching mechanism, if applicable, earthing, etc. Outlet face plate shall be fitted

with an engraved, Traffolite label as per Nosa-standard, cost of, which is included in the rate.

The tendered sum shall further include for replacement of any missing outlet covers and fixing screw and earth testing.

Item

Unit

**AB.03.08 Service isolator**

No

The unit of measurement shall be the number of isolators opened and serviced.

The tendered rate shall include full compensation for the servicing of the isolator , internal cleaning of the enclosure, inspection of the contact points, switching mechanism, earthing and connections to the fixed appliance. Isolator face plate shall be fitted with an engraved Traffolite label as per Nosa-standard, cost of, which is included in the rate.

The tendered sum shall further include for replacement of any damaged or missing outlet covers and fixing screw, connections to appliances including earth continuity testing.

Item

Unit

**AB.03.09 Replace power skirting**

m

The unit of measurement shall be the linear metre of power skirting supplied and installed.

The tendered rate shall include full compensation for the removal of the existing power skirting, the supply and installation of the specified type and size of powerskirting including all accessories.

Item

Unit

**AB.03.10 Supply and install Pratley boxes**

No

The unit of measurement shall be the number of Pratley boxes supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type of Pratley box.

Item

Unit

**AB.03.11 Supply and install draw boxes**

No

The unit of measurement shall be the number of draw boxes supplied and installed.

The tendered rate shall include full compensation for supplying and installing the draw boxes including cover plates where no equipment is installed in the box.

ItemUnit**AB.03.12 Supply and install draw box cover plates**

No

The unit of measurement shall be the number of draw box cover plates supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type and size of cover plates for draw boxes including the fixing screws.

ItemUnit**AB.03.13 Replace “stop-start” local control panel**

No

The unit of measurement shall be the number of “stop-start” local control panels supplied and replaced.

The tendered rate shall include full compensation for the supply and installation of “stop/start” local control panel including emergency stop button and 32A 3 pole contactor in an IP55 polycarbonate enclosure. The rate shall include an engraved Traffolite label indicating load and supply DB.

ItemUnit**AB.03.14 Test and service ceiling mounted fan**

No

The unit of measurement shall be the number of ceiling fans tested.

The tendered rate shall include full compensation for the servicing of the fan, disconnection, testing, inspection of the contact points, switching mechanism, earthing and re-connection of the ceiling fan.

ItemUnit

**AB.03.15 Replace ceiling mounted fan**

No

The unit of measurement shall be the number of ceiling fans supplied and installed.

The tendered rate shall include full compensation for the disconnection of the damaged ceiling fan and for the supply, installation and connection of the new ceiling fan.

ItemUnit**AB.03.16 Service ceiling mounted fan control switch**

No

The unit of measurement shall be the number of control switches opened and serviced.

The tendered rate shall include full compensation for the servicing of the control switch, inspection of the contact points, switching mechanism, if applicable, earthing etc.

ItemUnit**AB.03.17 Replace ceiling mounted fan control switch**

No

The unit of measurement shall be the number of control switches replaced.

The tendered rate shall include full compensation for the supply and installation of the control switch.

The tendered sum shall further include for the provision of connection to the ceiling fan.

ItemUnit**AB.03.18 Replace domestic stove components**

No

The unit of measurement shall be the number of stove components.

The tendered rate shall include full compensation for the supply and installation of the specified component.

The rate shall further include the disconnection and removal of the faulty component and the installation and testing of the new component.

ItemUnit



**AB.03.19 Replace geyser components**

No

The unit of measurement shall be the number of geyser components.

The tendered rate shall include full compensation for the supply and installation of the specified component.

The rate shall further include the disconnection and removal of the faulty component and the installation and testing of the new component.

The rate shall also include the draining of the water from the geyser and refilling before testing.

ItemUnit**AB.03.20 Supply and Install Stove**

No

The unit of measurement shall be the number of electrical four plate stoves with oven and warm drawer supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the stove including connection and testing after approval of the Engineer.

ItemUnit**AB.03.21 Provide Certificate of Compliance**

sum

The unit of measurement shall be a sum for all Certificate of Compliance obtained from local authorities and issued to the Engineer for all the buildings under the installation.

The tendered rate shall include full compensation for the testing and all associated equipment to complete the Certificate of Compliance and certification thereof.

**AB.04 Earthing and bonding**ItemUnit**AB.04.01 Supply and install earthing and bonding for the installation Lump sum**

The tendered lump sum shall include full compensation for the provision of all material required for the earthing and bonding of the installation in accordance with the specification.

ItemUnit

**AB.04.02    Testing of the earth installation by a specialist contractor    Lump sum**

The tendered lump sum shall include full compensation for the testing of the earth installation by a specialist contractor approved by the Engineer.

Item

Unit

**AB.04.03    Supply and install earth electrodes**

No

The unit of measurement shall be the number of earth electrodes supplied and installed.

The tendered sum shall include full compensation for the supply and installation of the specified type and size of earth electrodes including termination by means of approved clamps.

Item

Unit

**AB.04.04    Provide cadweld joint**

No

The unit of measurement shall be the number of cadweld joints provided.

The tendered sum shall include full compensation for the supply and installation of the specified type and size of cadweld pyro joints.

Item

Unit

**AB.04.05    Earth building roof structure**

No

The unit of measurement shall be the number of roof structures earthed.

The tendered sum shall include full compensation for the supply and installation of the specified type and size of earthwire and the termination there off onto a 1,2 m Cu earth electrode driven into the soil 1,8 m deep.

**AB.05    Inspection of Electrical Installation**

Item

Unit

**AB.05.01    Inspection of building general electrical installation**

sum

The unit of measurement shall be the sum for the building inspected prior to commencement of the repair work phase.

The tendered sum shall include the visual and functional inspection and testing of all lights, switches, small power points and fixed appliances, to determine the extent of repairs or replacements required.

The rate shall further include the preparation of a schedule of items (report) requiring repairs or replacement, for approval by the engineer.

## **AB 11      MAINTENANCE OF THE INSTALLATION**

**AB 11.01** Monthly maintenance responsibilities for each installation including all units and components as specified, shall commence with access to the site. A difference shall be made in payment for the maintenance prior to and after practical completion of repair work. The installations at Kopfontein Gate has just been repaired and maintained under an existing contract. The contractor will as part of his maintenance obligations service all the equipment as part of his maintenance obligations at the start of the contract.

Maintenance responsibilities of the completed installation shall commence upon the issue of a certificate of practical completion for repair work, and shall continue for the remainder of the 36-month contract period.

**AB 11.02** The following maintenance actions will be required under this contract::

**AB 11.02.01** Routine preventative maintenance

**AB 11.02.02** Corrective maintenance

**AB 11.02.03** Breakdown maintenance

These actions are defined in the Additional Specification SA – General Maintenance.

**AB 11.03** The maintenance schedules and frequency of maintenance activities shall be developed under the maintenance control plan which will be instituted by the Contractor. The Contractor's responsibility in this regard is specified in the Additional Specification SA – General Maintenance.

### **AB 11.04    Scope of routine preventive maintenance**

The routine maintenance work to be performed and executed shall include, but not be limited to the items listed below. These actions and findings shall be logged and reported on the relevant approved schedules and reports.

#### **AB 11.04.01    Monthly maintenance**

- (a)            Check operation of protective and monitoring devices
- (b)            Verify operation of switching elements and meters
- (c)            Check lamp operation

(d) Measure phase voltages and currents in distribution boards and record values in Record book

(e) Inspect and repair the following:

- (i) any visible damage to the installation
- (ii) setting of protective and monitoring devices
- (iii) ensure presence of diagrams, instructions and similar information
- (iii) ensure upkeep of the labelling of the distribution board, equipment, cabling and wiring
- (iv) ensure presence of Nosa-type engraved labelling on face plates or bodies of light switches, socket outlets and isolators.

**AB 11.04.02** Annual maintenance

- (a) Service all luminaires, distribution boards, socket outlets, isolators, light switches, etc.
- (b) Carry out all tests listed under section AB 04.02 above and record values in the Record book
- (c) Witnessed testing of all earth leakage protection units on all socket outlet units
- (d) Visually inspect the following and repair if required:
  - (i) connection of cables and conductors including earthing and bonding
  - (ii) presence of appropriate devices for isolation and switching
  - (iii) correct connection of socket outlets, light switches, isolators, lampholders, etc.

**AB 11.05** **Maintenance work: Measurement and payment**

Refer to clause SA 06 of the ADDITIONAL SPECIFICATION: SA GENERAL MAINTENANCE

## **TECHNICAL SPECIFICATION**

### **BA            ROOF COVERINGS**

#### **CONTENTS**

BA 01	SCOPE
BA 02	STANDARD SPECIFICATIONS
BA 03	MEASUREMENT AND PAYMENT

#### **BA 01            SCOPE**

This specification covers the removal of existing roof coverings and waterproofing and the supply, delivery and installation of new roof coverings and water-proofing to various types of roofing, including:

- Iron sheeting of various types;
- Translucent sheeting

Roof coverings shall mean the scope of work related to the removal of existing roof coverings, water-proofing and ancillary items, the supply and installation of new roof sheeting, roofing screws, purlins, flashings, rainwater goods, water-proofing, fascias and barge boards. This specification also includes minor work related to trusses, purlins and paintwork.

#### **BA 02            STANDARD SPECIFICATIONS**

##### **BA 02.01        GENERAL STANDARD SPECIFICATIONS**

The latest edition, including all amendments 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:

OW 371	-	Specification of Materials and Methods to be used
SANS 1200HB	-	Cladding and Sheeting
SANS 1783-4	-	Softwood brandering and battens
SANS 935	-	Hot-dip (galvanised) zinc coatings
SANS 1273	-	Fasteners for sheet roof and wall coverings
SANS 10407	-	Thatched roof construction

##### **BA 02.02.01    ADDITIONAL SPECIFICATIONS**

Technical Specification BB: Carpentry and Joinery for Roofs and Ceilings  
 Technical Specification BC: Waterproofing of Concrete Roofs

##### **BA 02.02.02    OCCUPATIONAL HEALTH AND SAFETY ACT**

The Contractor shall be required to comply with the Occupational Health and Safety Act 85 of 1993, Construction Regulations 2014 and related regulations. Non-compliance with these regulations, in any way whatsoever, will be adequate reason for suspending the Works.

**BA 02.03      ADDITIONAL REQUIREMENTS FOR REPAIR OF PROFILED ROOF SHEETING  
(NON-CONCEALED FIXING AND CONCEALED FIXING)**

**BA 02.03.01      Roof sheeting**

Existing roof sheeting shall either be replaced or to a small extent be repaired according to the Schedule of Quantities and as instructed by the Engineer. Where new sheeting is specified, the existing roof sheeting must be removed. Each day's removed sheeting shall be fully covered with new roof sheeting at the end of the day. Plastic sheeting or equivalent approved protection to minimize damage possibilities due to rain, etc. and to protect the personnel and occupied buildings. The new roof sheeting shall be 0,6 mm thick galvanised (or Chromadek) IBR or equivalent approved for roof slopes exceeding 15°. Concealed fixed type Chromadek roof sheeting will in general be used to cover roofs with slopes not exceeding 15°. The sheeting must be laid in long lengths without end overlaps. The broad flutes must be turned up at the apex to form a dam, and turned down at the eaves to form a drip. Metal closers 0,8 mm thick galvanised (or Chromadek), complete with polyclosers set in one run of silicone sealant, are required at apexes, ridges, side and head walls, etc. The Contractor shall take all necessary dimensions and measurements on site prior to manufacturing and installation. Z275 galvanising spelter shall be used and the Contractor shall provide SANS certificates of compliance to the Engineer. Various standard dark colours will be used for Chromadek finished roof sheeting, flashings, gutters and down pipes. In all cases the roofing must be laid strictly in accordance with the manufacturer's specifications.

In certain cases, existing roof sheeting that is removed from buildings, will be re-used to repair similar types of structures.

The following paragraphs in specification OW 371 must be specifically read in conjunction with this technical specification:

Paragraph 7.6, excluding 7.6.1(i), 7.6.2(a) and 7.6.2(e)  
Paragraph 7.7, excluding 7.7.1, 7.7.5 and 7.19.1(a).

**BA 02.03.02      Main fasteners to timber purlins: Galvanised/Chromadek IBR or equivalent approved sheeting**

90 mm x no. 14 hexagon head (H/H) carbon steel (C/S) cadmium plated Posidriv or equivalent approved roofing screws with 29 mm diameter x 1,0 mm thick galvanised conical washers and poly-isobutyl grommet assembly must be used. Main fasteners for steel purlins are to be 65 mm long. Fasteners to be provided at alternating ribs and all side laps.

**BA 02.03.03      Side lap fasteners: Galvanised/Chromadek IBR or equivalent approved sheeting**

Stitching will be done with 25 mm x no. 14 H/H C/S Posidriv or equivalent approved roofing screws @ 600 c/c maximum with 29 mm diameter x 1,0 mm thick galvanised conical washers and poly-isobutyl grommet assembly. Provide 10 x 1,6 mm thick butyl rubber sealer strip between sheets.

**BA 02.03.04      Flashings**

0,8 mm thick Chromadek/galvanised flashings at ridge caps, side and head walls, drips, corners, etc, as described elsewhere. The minimum length of an overlap between flashings is 150 mm. Apply two runs of silicone sealant between flashings. Flashings to be stitched together with 25 mm x no. 14 H/H C/S Posidriv or equivalent approved roofing

screws with 29 mm diameter x 1,0 mm thick galvanised conical washers at end laps and longitudinally @ 400 c/c maximum at ribs, etc. The Contractor shall take all necessary dimensions and measurements on site prior to manufacturing and installation.

**BA 02.03.05    Sealant**

Silicone sealant with an amine cure system with primer shall be used to waterproof all flashings and rainwater goods, viz. gutters and down pipes. Two runs of silicone shall be provided at end overlaps.

**BA 02.03.06    Pipe flashings**

Dektite or equivalent approved pipe flashings shall be used to waterproof pipe protrusions through the roof sheeting. Installation shall be done strictly in accordance with the manufacturer's specification and shall include the application of Dektite silicone sealant and fastening of flashing to surface with TEKS or equivalent approved self-drilling fasteners.

**BA 02.03.07    Insulation**

No insulation repairs are required. In certain cases insulation may be necessary to reduce heat load or to comply with hygiene requirements as in abattoirs. Refer to section 7 part 7.6.3 of OW 371.

Specification for non-visible roof insulation material:

Super Sisalation 420 RSA or equivalent approved reinforced reflective aluminium foil (heavy grade) laid on 1,6 mm diameter galvanised straining wires at 300 mm centres to the manufacturer's specification. The insulation shall be laid longitudinally over the purlins and lapped 150 mm at joints.

Specification for visible roof insulation material:

White Alucushion (code 2906) or equivalent approved white bubble foil on Aluminium foil backing laid on 1,6 mm diameter white plastic (PVC) coated straining wires at 383 mm centres to the manufacturer's specification. The insulation shall be laid longitudinally over the purlins and lapped at joints.

**BA 02.04        ADDITIONAL REQUIREMENTS FOR REPAIR OF PROFILED SIDE WALL CLADDING (NON-CONCEALED FIXING AND CONCEALED FIXING)**

**BA 02.04.01    Side wall cladding**

Existing side wall cladding shall either be repaired or replaced in accordance with the Schedule of Quantities. Where new cladding is specified, the existing side wall cladding must be removed. Each day's removed cladding shall be fully covered with new cladding at the end of the day. The new side wall cladding shall be 0,6 mm thick galvanised (or Chromadek) IBR or equivalent approved. The cladding must be laid in long lengths without end overlaps. Metal closers 0,8 mm thick galvanised (or Chromadek), complete with polyclosers set in one run of silicone sealant, are required at gables, ridges, side and head walls, etc. The Contractor shall take all necessary dimensions and measurements on site prior to manufacturing and installation. Z275 galvanising spelter shall be used and the Contractor shall provide SANS certificates of compliance to the Engineer. Heavy duty profiled polycarbonate sheets shall be used for translucent sheeting. Various standard dark colours for Chromadek finished side wall cladding, flashings, gutters and down pipes will be used. In all cases the cladding must be laid strictly in accordance with the manufacturer's specifications.



**BA 02.04.02    Main fasteners to timber girts: Galvanised/Chromadek IBR (or equivalent approved) and profiled translucent sheeting**

90 mm x no. 14 hexagon head (H/H) carbon steel (C/S) cadmium plated Posidriv or equivalent approved roofing screws with 29 mm diameter x 1,0 mm thick galvanised conical washers and poly-isobutyl grommet assembly must be used. Main fasteners for steel girts are to be 65 mm long. Fasteners to be provided at alternating ribs.

**BA 02.04.03    Side lap fasteners: Galvanised/Chromadek IBR (or equivalent approved) sheeting**

Stitching will be done with 25 mm x no. 14 H/H C/S Posidriv or equivalent approved roofing screws @ 600 c/c with 29 mm diameter x 1,0 mm thick galvanised conical washers and poly-isobutyl grommet assembly. Provide 10 x 1,6 mm butyl rubber sealer strip between sheets.

**BA 02.04.04    End overlaps**

If unavoidable, the end overlap shall be 300 mm minimum between sheeting and sealed with two rows of silicone sealant between the sheets. Bolt the ribs in the overlap region with the profiled (polycarbonate) translucent sheeting with galvanised no. 14 gutter bolts, bonded washers and nuts through every alternative rib.

**BA 02.04.05    Side overlaps: Vertical profiled translucent sheeting**

Stitching will be done with 6 mm cadmium-plated cladding bolts and nuts x 25 mm long @ ± 300 c/c with 19 mm diameter x 1,0 mm thick galvanised conical washers and poly-isobutyl grommet assembly.

**BA 02.05        ADDITIONAL REQUIREMENTS FOR THE REPAIR OF THATCHED ROOFS**

**BA 02.05.01    Preparation (Refer to Thatch Guide, CSIR 1998)**

Cleaning and bundling

After the grass has been cut and loosely bundled, each bundle is shaken vigorously to dislodge all loose material. The bundles are then cleaned by passing a sickle through them, working from top to bottom. This removes the remaining leaf growth from the lower two thirds of the stalks. The grass is then regrouped into bundles about 1,0 - 1,5 m long and between 75 and 100 mm in diameter. These bundles are each tied with a thong of twisted grass or with twine and packed in heaps (pyramid shape) about 2 m high and 2.5 to 3 m in diameter at the base.

Combing

When the thatch is to be used for the “spray layer” (or what is commonly referred to as the *spreilaag*), immediately above the thatching battens, where the underside will often be exposed in a room, the material should be combed to ensure that the stalks are perfectly clean. A comb is made by driving a few 75 mm x 3.5 mm round wire nails into a horizontal pole, about 300 mm long. The nails are spaced about 12 mm apart, in a straight line. The bundles of grass are placed across the top of the comb and pressed down so that the stalks are separated by the nails. The bundle is then pulled through the comb from the top to the bottom end.

Storing

After combing, the bundles should be stacked clear of the ground and under cover. Bundles are normally baled for transport, in batches of 10 to 20 bundles for manual handling and 500 bundles for mechanical handling.

**BA 02.05.02    Chicken mesh protection**

To protect thatch roofing against damages caused by baboons, monkeys, birds, etc. a single layer of chicken mesh shall be placed over the finished thatch. Where the ridge has been removed, the chicken mesh shall be placed before the new ridge is placed. Otherwise, chicken mesh shall be laid over the ridge.

Sheets of mesh shall be placed vertically. Edges shall be tied together using binding wire. Chicken mesh shall be laid to cover the lower thatch edges and shall be tensioned using binding wire nailed to trusses underneath the roofing edge.

**BA 02.06        ADDITIONAL REQUIREMENTS FOR THE REPAIR OF SLATE TILE ROOFS****BA 02.06.01    General**

Slate tile roofs shall be handled according to the specifications in OW 371: Specification of Materials and Methods to be used, together with these additional requirements. It is a specific requirement that the slate roofing be performed by a slate roofing specialist. When required, slate tiles shall be carefully removed and stored for re-use. Care shall be taken to not damage tiles during the process. Additional tiles required shall be matched to the existing tiles as closely as possible and approved by the Engineer before being placed.

**BA 02.06.02    Waterproofing**

The waterproofing membrane used under slate tiles shall be a three-layer laminate, consisting of a waterproof upper layer, a polypropylene interlayer and an anthracite bottom layer. The waterproofing shall be nailed to the rafters. Battens shall be placed on top of the waterproofing membrane.

Waterproofing shall be covered by tiles as soon as possible after being laid to prevent damage from exposure to the elements.

**BA 02.06.03    Tile laying**

Slates are to be laid in double thickness, with a headlap of 75 mm. Firstly an under-eave slate is nailed to the first (or tilting) batten, with the head of the slate resting on the second batten, and with a 50 mm overhang into the gutter. Full slates are then centre-nailed to the second batten, and thereafter proceed upwards to the ridge. Slates are to be laid to straight lines horizontally and vertically, in broken bond.

**BA 02.06.04    Tile nailing**

Tile nailing shall be performed as specified in OW 371, with the additional requirement that nailing holes shall be drilled, not punched.

**BA 02.07        RAINWATER GOODS****BA 02.07.01    Gutters**

Standard size for houses:

100 x 75 x 0,8 thick standard Chromadek/galvanised non-supporting beaded gutter. Galvanised brackets are to be provided at every truss. Brackets are to be painted to specification in the Schedule of Quantities.

Alternatively standard 140 x 127 x 83 x 0,6 mm thick Brownbuilt or equivalent approved Chromadek/galvanised fascia gutter with galvanised gutter clips can be used.

Typical size for other buildings:

125 x 100 x 0,8 thick standard Chromadek self-supporting beaded gutter.

Dark colours to Consultant's specification.

The following paragraphs in specification OW 371 must be read in conjunction with this technical specification:

7.15, 16.12 and 16.13.

The Contractor shall take all necessary dimensions and measurements on site prior to manufacturing and installation.

**BA 02.07.02     Joints in gutters, valleys, etc**

150 mm overlap sealed with an approved silicone and riveted together with 2 rows of sealed pop rivets. Linings to valleys and secret gutters, etc, shall have an overlap of 225 mm.

**BA 02.07.03     Gutter accessories and ancillary items**

End stops:         0,8 mm thick Chromadek/galvanised finished end stops joined to gutter on site and sealed as for joints in gutters.

Outlets:             0,8 mm thick Chromadek/galvanised finished outlets fixed to gutter with pop rivets and sealed with an approved silicone. Outlet to slip into down pipe.

Fascia straps:     25 mm wide x 1,0 mm thick galvanised straps at +/- 686 mm c/c.

Corner joints:      Corner joints to be neatly mitred, pop riveted together and sealed with an approved silicone.

Sealant:             Clear silicone sealant with amine cured system and primer shall be used to waterproof gutters and down pipes.

**BA 02.07.04     Down pipes**

Standard sizes:

100 x 75 x 0,6 thick Chromadek/galvanised down pipes

100 x 100 x 0,8 thick Chromadek/galvanised down pipes

Dark colours to Consultant's specifications.

Down pipes to have double-seamed joints. Down pipes, shoes, offsets, etc, shall be joined together by means of 100 mm slip joints and pop riveted together.

The Contractor shall take all necessary dimensions and measurements on site prior to manufacturing and installation.

**BA 02.07.05     Down pipe accessories**

Brackets:             Standard galvanised brackets shall be spaced at centres not exceeding 2,4 metres.

Brackets to be primed and painted with 2 coats of high gloss enamel.

Shoes, offsets and spreaders: Manufactured from 0,8 mm thick Chromadek/galvanised material, cut and mitred to suit. All joints to be sealed with an approved silicone sealant.

#### **BA.02.07.06    General**

The Contractor will be responsible for the stability of the supporting structure during and after removal of existing roof cladding and sheeting.

SANS 1200 HB "Cladding and Sheeting" will be applicable for the erection of all new roofs.

The Contractor must give a minimum 3 year guarantee for the watertight roof and workmanship. **The manufacturer must carry out inspections at regular intervals during the construction period. He must issue a certificate of acceptance and compliance on completion to the client.**

### **BA 03                    MEASUREMENT AND PAYMENT**

#### **BA.03.01            DETAILS OF MATERIAL TO BE USED**

For detail descriptions of materials, thicknesses, dimensions and ancillary items to be used, as specified in the various payment items of roof sheeting, cladding, flashings, etc; refer to the scheduled list below:

<b>Flashings: Refer to Technical Specifications BA</b>	
<b>Roof:</b>	
0,8 mm thick Chromadek Ridge Flashing	462 mm girth (231 + 231), 3 x bends (2 are shallow bends). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone; 2 rows of broad flute polyclosers bedded in silicone, 2 rows x 0,6 mm thick Chromadek broad flute metal closers. Bend up trough to form a dam.
0,8 mm thick Galvanised Ridge Flashing	462 mm girth (231 + 231), 3 x bends (2 are shallow bends). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone; 2 rows of broad flute polyclosers bedded in silicone, 2 rows x 0,6 mm thick Galvanised broad flute metal closers. Bend up trough to form a dam.
0,6 mm thick Chromadek Eaves Closer	Fix standard serrated narrow flute eaves closer to timber purlin. Patch plaster and touch up paint work.
0,8 mm thick Chromadek Apex Trim	462 mm girth (231 + 231 vertical), 3 x bends (2 are shallow bends). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row of broad flute polycloser bedded in silicone, 2 rows x 0,6 mm thick Chromadek broad flute metal closers. Bend up trough to form a dam.
0,8 mm thick Galvanised Apex Trim	462 mm girth (231 + 231 vertical), 3 x bends (2 are shallow bends). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row of broad flute polycloser bedded in silicone, 2 rows x 0,6 mm thick galvanised broad flute metal closers. Bend up trough to form a dam.
0,8 mm thick Chromadek Headwall Flashing	385 mm girth (231 + 154 vertical) headwall flashing, 2 x bends (1 is a shallow bend). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row of broad flute polycloser bedded in silicone, 1 row x 0,6 mm thick Chromadek broad flute metal closer. Bend up trough to form a dam. 154 mm girth (114 + 25 + 15 lip @ 15°) Chromadek counter flashing, 3 x bends (1 is a shallow bend). Counter

	flashing to overlap with headwall flashing with at least 75 mm. Cut 6 mm wide groove into brick wall for counter flashing. Prime joint and seal with an approved 6 x 6 mm poly-urethane sealant.
0,8 mm thick Galvanised Headwall Flashing	385 mm girth (231 + 154 vertical) headwall flashing, 2 x bends (1 is a shallow bend). Fix flashing to roof sheeting with Posidriv and washers. 150 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row of broad flute polycloser bedded in silicone, 1 row x 0,6 mm thick Galvanised broad flute metal closer. Bend up trough to form a dam. 154 mm girth (114 + 25 + 15 lip @ 15°) galvanised counter flashing, 3 x bends (1 is a shallow bend). Counter flashing to overlap with headwall flashing with at least 75 mm. Cut 6 mm wide groove into brick wall for counter flashing. Prime joint and seal with an approved 6 x 6 mm poly-urethane sealant.
Extra over for cutting into brick wall	6 mm wide groove x 30 mm deep into brick wall. Clean groove from dust and prime groove.
0,8 mm thick Chromadek Hip Flashing	462 mm girth (231 + 231), 3 x bends (2 are shallow bends). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone. 2 rows of broad flute polyclosers bedded in silicone, 2 rows x 0,6 mm thick Chromadek broad flute metal closers on rake. Bend up trough to form a dam.
0,8 mm thick Galvanised Hip Flashing	462 mm girth (231 + 231), 3 x bends (2 are shallow bends). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone. 2 rows of broad flute polyclosers bedded in silicone, 2 rows x 0,6 mm thick Chromadek broad flute metal closers on rake. Bend up trough to form a dam.
0,8 mm thick Chromadek Apron Flashing	462* mm girth (308 + 154* vertical, girt position determines final upstand length on site), 3 x bends (2 are shallow bends). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone. 2 rows of broad flute polyclosers bedded in silicone, 1 row x 0,6 mm thick Chromadek broad flute metal closer. Bend up trough to form a dam.
0,8 mm thick Galvanised Apron Flashing	462* mm girth (308 + 154* vertical, girt position determines final upstand length on site), 3 x bends (2 are shallow bends). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone. 2 rows of broad flute polyclosers bedded in silicone, 1 row x 0,6 mm thick Galvanised broad flute metal closer. Bend up trough to form a dam.
0,8 mm thick Chromadek Eaves Flashing	462* mm girth (154 vertical + 308*, girt position determines final upstand length), 3 x bends (2 are shallow bends). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row each of broad and narrow flute polyclosers bedded in silicone, 1 row each x 0,6 mm thick Chromadek broad and narrow flute metal closers. Turn down trough to form a drip. Overhang length of roof sheeting to be determined on site.
0,8 mm thick Galvanised Eaves Flashing	462* mm girth (154 vertical + 308*, girt position determines final upstand length), 3 x bends (2 are shallow bends). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row each of broad and narrow flute polyclosers bedded in silicone, 1 row each x 0,6 mm thick galvanised broad and narrow flute metal closers. Turn down trough to form a drip. Overhang length of roof sheeting to be determined on site.
0,8 mm thick Chromadek Gable Flashing (residential type)	308 mm girth (262 + 46 vertical), 3 x bends (2 are shallow bends). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone. Flashing to be fitted tightly over gable fascia board. Provide one row of continuous silicone on rib.
0,8 mm thick	308 mm girth (262 + 46 vertical), 3 x bends (2 are shallow bends). Fix flashing to

Galvanised Gable Flashing (residential type)	roof sheeting with Posidriv screws and washers. 150 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone. Flashing to be fitted tightly over gable fascia board. Provide one row of continuous silicone on rib.
0,8 mm thick Chromadek Gable Flashing (industrial type)	462 mm girth (262 + 200 vertical), 3 x bends (2 are shallow bends). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row x 0,6 mm thick Chromadek broad flute metal closer on side wall cladding. Provide one row of continuous silicone on rib.
0,8 mm thick Galvanised Gable Flashing (industrial type)	462 mm girth (262 + 200 vertical), 3 x bends (2 are shallow bends). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row x 0,6 mm thick galvanised broad flute metal closer on side wall cladding. Provide one row of continuous silicone on rib.
0,8 mm thick Chromadek Side Wall Flashing	385 mm girth (231 + 154 vertical) side wall flashing, 2 x bends (1 is a shallow bend). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row of broad flute polycloser bedded in silicone (only for vertical side wall cladding). 154 mm girth (114 + 25 + 15 lip @ 15°) Chromadek counter flashing, 3 x bends (1 is a shallow bend). Counter flashing (side wall is a brick wall) to overlap with side wall flashing with at least 75 mm. Cut 6 mm wide groove into brick wall parallel to roof sheeting for counter flashing. Prime joint and seal with an approved 6 x 6 mm poly-urethane sealant.
0,8 mm thick Galvanised Side Wall Flashing	385 mm girth (231 + 154 vertical) side wall flashing, 2 x bends (1 is a shallow bend). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row of broad flute polycloser bedded in silicone (only for vertical side wall cladding). 154 mm girth (114 + 25 + 15 lip @ 15°) galvanised counter flashing, 3 x bends (1 is a shallow bend). Counter flashing (side wall is a brick wall) to overlap with side wall flashing with at least 75 mm. Cut 6 mm wide groove into brick wall parallel to roof sheeting for counter flashing. Prime joint and seal with an approved 6 x 6 mm poly-urethane sealant.
0,8 mm thick Galvanized Roof Overhang Barge Flashing	616 mm girth (286 + 300 vertical + 20 + 10 vertical) standard Craft-Lock barge flashing, 4 x bends (1 is a shallow bend). Fix flashing to roof sheeting with Posidriv screws and washers, and to 250 x 25 wide x 2,5 thick with 25 mm lip galvanised bracket. The galvanised bracket to be screwed to rafter ends with 2 countersunk brass screws. 150 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row of broad flute polycloser bedded in silicone, 1 row x Chromadek broad flute metal closer bedded in a row of silicone. Bend up trough to form a dam.
0,8 mm thick Chromadek Roof Overhang Barge Flashing	616 mm girth (286 + 300 vertical + 20 + 10 vertical) standard Craft-Lock barge flashing, 4 x bends (1 is a shallow bend). Fix flashing to roof sheeting with Posidriv screws and washers, and to 250 x 25 wide x 2,5 thick with 25 mm lip galvanised bracket. The galvanised bracket to be screwed to rafter ends with 2 countersunk brass screws. 150 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row of broad flute polycloser bedded in silicone, 1 row x Galvanised broad flute metal closer bedded in a row of silicone. Bend up trough to form a dam.
0,8 mm thick Chromadek Side Roof Overhang Flashing (carports)	616 mm girth (286 + 300 vertical + 20 + 10 vertical), 4 x bends (1 is a shallow bend). Fix flashing to roof sheeting with Posidriv screws and washers, and to 250 x 25 wide x 2,5 thick with 25 mm lip galvanised bracket. The galvanised bracket to be screwed to timber rafter ends with 2 countersunk brass screws or to be site welded to steel purlins. 150 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone.
0,8 mm thick Galvanised Side	616 mm girth (286 + 300 vertical + 20 + 10 vertical), 4 x bends (1 is a shallow bend). Fix flashing to roof sheeting with Posidriv screws and washers, and to

Roof Overhang Flashing (carports)	250 x 25 wide x 2,5 thick with 25 mm lip galvanised bracket. The galvanised bracket to be screwed to timber rafter ends with 2 countersunk brass screws or to be site welded to steel purlins. 150 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone.
0,8 mm thick Galvanised Valley Flashing	770 mm girth (308 + 27 vertical + 100 wide gutter + 27 vertical + 308), 6 x bends (2 x shallow bends). Fix valley gutter to top of valley rafters with Posidriv screws and washers (seal with silicone). Cut and bend valley gutter at main gutter with 25 mm down lip. 225 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone. 2 rows of narrow flute polyclosers in ribs bedded in silicone.
0,8 mm thick Galvanised Valley Side Wall Flashing	616 mm girth (308 + 27 vertical + 140 wide gutter + 141 vertical), 4 x bends (1 is a shallow bend). Fix valley gutter to top of valley rafter with Posidriv screws and washers (seal with silicone) and impact nails (6 mm dia x 60 long @ 200 c/c) to brick wall. Cut and bend valley gutter at main gutter with 25 mm down lip. 225 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row of narrow flute polyclosers in ribs bedded in silicone. 154 mm girth (114 + 25 + 15 lip @ 15°) galvanised counter flashing, 3 x bends (1 is a shallow bend). Counter flashing (side wall is a brick wall) to overlap with side wall flashing with at least 75 mm. Cut 6 mm wide groove into brick wall parallel to roof sheeting for counter flashing. Prime joint and seal with an approved 6 x 6 mm poly-urethane sealant.
0,8 mm thick Chromadek Flat Back Flashing	1200* mm wide (25 mm lips on sides bend down to angle of rib) x 925 mm girth, * width of roof monitors determine the final width of flat back flashing. Flat back flashing for full length between monitor and ridge. Fix flashing to roof sheeting with Posidriv screws or sealed type Aluminium blind pop rivets. 150 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row of broad flute polycloser bedded in silicone at bottom end of flat back flashing.
0,8 mm thick Galvanised Flat Back Flashing	1200* mm wide (25 mm lips on sides bend down to angle of rib) x 925 mm girth, * width of roof monitors determine the final width of flat back flashing. Flat back flashing for full length between monitor and ridge. Fix flashing to roof sheeting with Posidriv screws or sealed type Aluminium blind pop rivets. 150 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row of broad flute polycloser bedded in silicone at bottom end of flat back flashing.
0,8 mm thick Chromadek Wall Gutter	616 mm girth (154 vertical x 462 at slope), 1 x bend. Fix boundary/side valley gutter to top of valley rafter with Posidriv screws and washers (seal with silicone) and impact nails (6 mm dia. x 60 long @ 200 c/c) to brick wall. 225 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row x 0,6 mm thick galvanised narrow flute closers in ribs fixed to purlins with Posidriv screws and washers; seal with silicone. 154 mm girth (114 + 25 + 15 lip @ 15°) Chromadek counter flashing, 3 x bends (1 is a shallow bend). Counter flashing (side wall is a brick wall) to overlap with side wall flashing with at least 75 mm. Cut 6 mm wide groove into brick wall for counter flashing. Prime joint and seal with an approved 6 x 6 mm poly-urethane sealant.
0,8 mm thick Galvanised Wall Gutter	616 mm girth (154 vertical x 462 at slope), 1 x bend. Fix boundary/side valley gutter to top of valley rafter with Posidriv screws and washers (seal with silicone) and impact nails (6 mm dia. x 60 long @ 200 c/c) to brick wall. 225 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row x 0,6 mm thick galvanised narrow flute closers in ribs fixed to purlins with Posidriv screws and washers; seal with silicone. 154 mm girth (114 + 25 + 15 lip @ 15°) galvanised counter flashing, 3 x bends (1 is a shallow bend). Counter flashing (side wall is a brick wall) to overlap with side wall flashing with at least 75 mm. Cut 6 mm wide groove into brick wall for counter flashing. Prime joint and seal with an approved 6 x 6 mm poly-urethane sealant.
0,8 mm thick Chromadek Corner Piece Flashing (for monitors)	231 wide x 77 vertical x 462 long, shallow bend for horizontal portion. Fix flashing to roof sheeting with Posidriv screws or sealed type Aluminium blind pop rivets. Seal overlap with 2 rows of pop rivets and 2 rows of silicone. Provide broad flute polyclosers bedded in silicone in troughs.

0,8 mm thick Galvanised Corner Piece Flashing (for monitors)	231 wide x 77 vertical x 462 long, shallow bend for horizontal portion. Fix flashing to roof sheeting with Posidriv screws or sealed type Aluminium blind pop rivets. Seal overlap with 2 rows of pop rivets and 2 rows of silicone. Provide broad flute polyclosers bedded in silicone in troughs.
<b>Walls: (m)</b>	
0,8 mm thick Chromadek External Vertical Flashing	462 mm girth (231 + 231), 3 x bends (2 x shallow bends). Fix flashing to roof sheeting with Posidriv screws and washers. 150 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone.
0,8 mm thick Galvanised External Vertical Flashing	462 mm girth (231 + 231), 3 x bends (2 x shallow bends). Fix flashing to roof sheeting with Posidriv screws with washers. 150 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone.
0,8 mm thick Chromadek Internal Vertical Flashing	462 mm girth (231 + 231), 3 x bends (2 x shallow bends). Fix flashing to roof sheeting with Posidriv screws with washers. 150 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone.
0,8 mm thick Galvanised Internal Vertical Flashing	462 mm girth (231 + 231), 3 x bends (2 x shallow bends), fix flashing to roof sheeting with Posidriv screws with washers. 150 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone.
0,8 mm thick Chromadek Drip Flashing	154 mm girth (64 vertical + 50 + 20 vertical + 20) standard drip flashing to suit roof sheet, 3 x bends. Fix flashing to girts or roof sheeting with sealed type Aluminium blind pop rivets or Posidriv screws with washers. 50 mm overlap sealed with one row of silicone and stitched together with sealed Aluminium blind type pop rivets.
0,8 mm thick Galvanised Drip Flashing	154 mm girth (64 vertical + 50 + 20 vertical + 20) standard drip flashing, 3 x bends. Fix flashing to girts or roof sheeting with sealed type Aluminium blind pop rivets or Posidriv screws with washers. 50 mm overlap sealed with one row of silicone and stitched together with sealed blind type pop rivets.
0,8 mm thick Chromadek Window Flashings	154 mm girth 3 x bends. Different flashing details for sill, jamb and top of window. Contractor to provide details to Engineer for approval. One row of narrow flute polyclosers bedded in silicone above and below window frame. Fix flashings to girts or roof sheeting with Posidriv screws and washers or sealed type Aluminium blind pop rivets. 100 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone. Seal around window frame with silicone to waterproof flashings. 1 row x 0,6 mm thick Chromadek broad flute metal closer for sill flashing.
0,8 mm thick Galvanised Window Flashings	154 mm girth 3 x bends. Different flashing details for sill, jamb and top of window. Contractor to provide details to Engineer for approval. One row of narrow flute polyclosers bedded in silicone above and below window frame. Fix flashings to girts or roof sheeting with Posidriv screws and washers or sealed type Aluminium blind pop rivets. 100 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone. Seal around window frame with silicone to waterproof flashings. 1 row x 0,6 mm thick galvanised broad flute metal closer for sill flashing.
0,8 mm thick Chromadek Door Flashings	154 mm girth 3 x bends. Different flashing details for sill, jamb and top of window. Contractor to provide details to Engineer for approval. One row of narrow flute polyclosers bedded in silicone above and below window frame. Fix flashings to girts or roof sheeting with Posidriv screws and washers or sealed type Aluminium blind pop rivets. 100 mm overlap sealed with 2 rows of pop rivets and 2 rows of silicone. Seal around window frame with silicone to waterproof flashings. 1 row x 0,6 mm thick chromadek broad flute metal closer for sill flashing
0,8 mm thick Galvanised Door Flashings	154 mm girth 3 x bends. Different flashing details for sill, jamb and top of window. Contractor to provide details to Engineer for approval. One row of narrow flute polyclosers bedded in silicone above and below window frame. Fix flashings to girts or roof sheeting with Posidriv screws and washers or sealed type Aluminium blind pop rivets. 100 mm overlap sealed with 2 rows of pop rivets and 2 rows of



	silicone. Seal around window frame with silicone to waterproof flashings. 1 row x 0,6 mm thick galvanised broad flute metal closer for sill flashing
0,8 mm thick Chromadek Bull Nose Flashing	462 mm girth (262 + 200 vertical), 3 x bends excluding curving (2 are shallow bends), Fix flashing to roof sheeting with Posidriv screws and washers. 300 mm max. overlaps (run outs) sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row x 0,6 mm thick Chromadek broad flute metal closer on side wall cladding. Provide one row of continuous silicone on rib. Contractor to measure radius on site prior manufacturing.
0,8 mm thick Galvanised Bull Nose Flashing	462 mm girth (262 + 200 vertical), 3 x bends excluding curving (2 are shallow bends). Fix flashing to roof sheeting with Posidriv screws and washers. 300 mm max. overlaps (run outs) sealed with 2 rows of pop rivets and 2 rows of silicone. 1 row x 0,6 mm thick Galvanised broad flute metal closer on side wall cladding. Provide one row of continuous silicone on rib. Contractor to measure radius on site prior manufacturing.
<b>Roof Insulation: (m²)</b>	
White Bubble Foil on white straining wires (abattoirs only)	Lay insulation strictly to manufacturer's specifications. Use 1,6 mm diameter white PVC coated straining wires @ 300 mm c/c max. Refer to clause 2.3.7 of Technical Specification BA: Roof Coverings.
420 RSA heavy duty reinforced reflective Aluminium foil	Lay insulation strictly to manufacturer's specifications. Refer to clause 2.3.7 of Technical Specification BA: Roof Coverings.
<b>Rainwater Goods:(m)</b>	
100 x 75 x 0,8 mm thick Chromadek beaded non-supporting box gutter	Provide 25 x 1 mm thick galvanised fascia straps @ 686 c/c to support fascia of gutters; fix with 6 mm galvanised gutter bolts, nuts and washers. All accessories and ancillary items included. Roof sheeting troughs to be have drip bend.
100 x 75 x 0,6 mm thick Chromadek down pipes; height < 3 m	Provide one down pipe for every 6 m of gutter length. For gutter length of 3 to 6 m, provide two down pipes. All accessories and ancillary items included.
100 x 75 x 0,6 mm thick Chromadek down pipes; 3 m < height < 5 m	Provide one down pipe for every 6 m of gutter length. For gutter length of 3 to 6 m, provide two down pipes. All accessories and ancillary items included.
125 x 100 x 0,8 mm thick Chromadek self-supporting box gutter	Gutter to be braced back to the roof sheeting with a 25 x 1 mm thick galvanised fascia straps @ 686 c/c. The detail can only be applied to sheeting with a max. cantilever of 450 mm from first purlin. Roof sheeting troughs to be have drip bend.
125 x 100 x 0,8 mm thick Chromadek down pipes	Provide one down pipe for every 6 m of gutter length. For gutter length of 4,5 to 6 m, provide two down pipes. All accessories and ancillary items included.
100 x 100 x 0,8 mm thick Chromadek down pipes	Provide one down pipe for every 6 m of gutter length. For gutter length of 4,5 to 6 m, provide two down pipes. All accessories and ancillary items included.
<b>Pipe Flashings: (No. and Dia.)</b>	
Dektite pipe flashings to diameter	For all residential type of buildings, pipe protrusions through roof sheeting will be eliminated by re-routing existing pipe work. For all other pipe protrusions: Use Dektite no. 2 for pipe diameters 40 - 80 mm and Dektite no. 4 for pipe diameters

	80 - 150 mm. Dektite flashings are made of E.P.D.M. rubber compound of a carbon black colour.
0,8 mm thick Chromadek Cravat and Cowl Flashing to diameter	Refer to roof and wall details no 1 and 2. (Bound into the back of this document).
<b>Pipework: (No.)</b>	
Re-route existing pipes; diameter and number	<p><u>Re-routing of roof void geyser pipework:</u> Disconnect and remove existing overflow pipe from Latco - and or Safety Valve, supply and connect new 15-28mm dia polycop pipe to existing Latco - and or Safety Valve including all necessary fittings, adaptors, brackets, etc. and re-route pipework in ceiling or roof void to protrude through external wall, including making good of external wall, irrespective of finish. Allow approximately 7m horizontal and 3m vertical pipework to ground level per geyser, complete with standard primer, one undercoat and two coats of super acrylic paint to exposed pipework to match existing paint system and colour.</p> <p><u>Ventilation pipework:</u> Remove existing 100mm dia ventilation pipe section protruding through roof covering. Install 90° bend below roof level and re-route ventilation pipe to clear overhang. Install 90° reducing 100 x 50 bend and rise with 50mm dia pipe to 600mm. Install standard sewer pipe ventilation cowl on top of ventilation pipework. Pipe material must adapt to existing material of ventilation pipework. The bracketing and supports of the ventilation pipework shall be as per manufacturers specifications. Standard primer, one coat undercoat and two coats of super acrylic paint to exposed pipework to match existing paint system and colour.</p>

#### **BA.03.02      SPECIFICATION FOR PAINTING OF PREVIOUSLY PAINTED GALVANIZED ROOFS OR GALVANIZED IRON ROOFS**

Specification of paint shall be equal or similar approved to Plascon paint for Galvanised iron roofs or previously painted galvanised iron roofs.

A two coat system shall be used of one coat Plascothane over Plascon Epiwash Strontium Chromate Primer offering good durability and protection.

Contractor must ensure that the work is done by a competent person and must be approved by the Engineer before work may commence

#### **PRODUCTS TO BE USED**

Plascon Aquasolv Degreaser (GR1)  
Plascon Epiwash Strontium Chromate Primer (AW255)  
Plascothane '421' Industrial Dual Pack Polyurethane Enamel

#### **SURFACE PREPARATION – PREVIOUSLY PAINTED**

Remove all peeling paint by sanding, scraping or water cooled grinders (BOCSH GNS14) fitted with reversible knotted wire brush available from TVL Brush Code Z037 (Werner Group of Companies). Care must be taken not to remove any sound galvanizing. Any unsound paint will fail at a later stage. Wash roof with Aquasolv degreaser, scotch brite pads and rinse thoroughly with clean water. Ensure that all Aquasolv Degreaser is properly washed off.

#### SURFACE PREPARATION - UNPAINTED GALVANISED

Wash roof with Aquasolv Degreaser, scotch brite pads and rinse thoroughly with clean water. Ensure that all Aquasolv Degreaser is properly washed off.

#### APPLICATION

Apply one coat of Epiwash Strontium Chromate Primer using airless spray. For conventional spraying, thin with Epiwash Thinner (TH128). Allow 4 hours drying time. Apply a second coat if necessary to achieve the specified DFT of 25 – 35 microns.

Apply one coat Plascothane by airless spray to achieve complete obliteration. Ensure that a single coat of wet film application of 88 – 135 microns is achieved. This will give a DFT of 50 – 75 microns. Application in high humidity environments (75% RH) may cause surface bloom.

#### GUARANTEE

The Contractor must give a written 5 year guarantee for the quality and workmanship of the paint work (fair wear and tear excepted). The Contract shall be liable for any peeling or flaking paint applied by the Contractor and shall execute all such work of repair, rectification and making good of painted surfaces as may be ordered in writing by the Engineer. The manufacturer must carry out inspections at regular intervals during the construction period. He must issue a certificate of acceptance and compliance on completion to the client.

### **BA.03.02**

#### **BASF SPECIFICATION FOR OVER COATING OF CHROMADEK ROOFS**

##### RECOMMENDED COATING SYSTEM

A two-coat system of high build BASF Polyurethane over BASF Primer giving excellent corrosion protection.

Proprietary Degreaser (BASF Approved)  
BASF Primer  
BASF Polyurethane Top Coat

The Technical Data Sheets for these products must be complied with fully.

##### SURFACE PREPARATION

- All existing paint coatings to be removed by means of water assisted mechanical brushing using "Scotchbrite stitched abrasive discs Cut and Polish Medium Grade".
- Degrease using bristle brushes and BASF approved degreaser. Rinse with clean potable water and allow to dry.
- The use of emery pads/paper is not permitted as this will result in scouring of the galvanizing.

Note: the Contractor may propose alternative methods for preparing the surface which must be approved by the paint supplier.

##### GALVANIZING THICKNESS DETERMINATION

Prior to the application of the primer, the thickness of the galvanizing (Zinc Coat) is to be measured and the measurements recorded. The number of readings shall amount to not

less than 5% of the total roof surface area, i.e. if the area of the roof is 1000m<sup>2</sup>, then 50 readings are to be taken, distributed evenly across the surface. In the event that greater than 10% of the test have less than 15 micron of galvanizing then two coats of primer must be used.

#### APPLICATION OF COATINGS

The surface temperature of the roof shall not exceed 60°C at the time of the application of the coating. Should a suitable thermometer not be readily available, as a good rule of thumb, 60°C is generally accepted as the temperature at which the bare hand cannot be held comfortably on the hot surface.

Should the temperature be considered to be in excess of 60°C, then unless approved by BASF, painting must be delayed.

- One or two full coats of BASF Primer which will be dependant on the thickness of the Zinc coating from measurements taken prior to commencement of the coating application.
- One full coat of BASF Polyurethane topcoat.

#### Primer Coat/s

As soon as the surfaces are dry, apply by airless spray, one (1) full coat of BASF Primer, at a dry film thickness of 10-15 micron. Allow a minimum of 1 hour but no more than 48 hours at 22°C before over coating.

#### Top Coat

Apply by airless spray, one (1) full coat of BASF Polyurethane to a dry film thickness of 40-45 micron. Colour as per ISCOR colour standard.

- All the above-mentioned products must be applied strictly in accordance with the relevant Product Data Sheet and applied as per the code of practice.
- The paint as supplied has been formulated to attain the correct DFT as specified. Thinners are therefore not normally required however if necessary only BASF approved thinners should be used as this can effect application and result in poor quality coating.

#### TEST AREA

On each separate roof (for a large contract) then a minimum test area of 1m<sup>2</sup> must be provided for testing by the BASF Coatings representative. This area must be easily accessed and representative of the specific contract. Normally this will be undertaken at least 7 days after roof completion to ensure thorough curing of the paint. Variations in application due to the environment will require additional test areas.

The BASF Coatings representative will perform tests on this area and successful testing will result in the signing off the particular contract.

### **BA 03.03 SCHEDULED ITEMS**

**BA.01      Supply and install cladding and roofing:.....Unit: m<sup>2</sup>**

The area measured will be that of the exposed surface of the finished building as specified in, Subclause 8.1.1 of SANS 1200 HB.

Separate items will be scheduled for roofing materials and side cladding, subdivided for each type of roofing, cladding and finish.

The rate shall cover the cost of supplying, delivering, storing on site, handling, moving, installing and fixing the roofing or cladding (finished or prepainted as scheduled) complete with all necessary fasteners (all roofing and cladding materials and accessories are to be supplied by a South African-based manufacturer and are subject to a three year written guarantee for water tightness and workmanship). The rate shall also cover the cost of cutting, notching, waste, all scaffolding, temporary supports, hoisting facilities and safety precautions (see Subclause 8.1.1 of SANS 1200HB).

**BA.02      Forming cranks, bullnoses, etc: ..... Unit: m**

Cranks, bullnoses, etc. will be measured by length, with bullnoses to a maximum of 600mm radius and bend to maximum of 90°.

Separate items for cranks, bullnoses, etc, will be scheduled for each different type of sheeting, profile and finish.

The rate shall cover the cost of supplying, delivery, storing on site, handling, moving, installing and fixing of cranks, bullnoses, etc. and shall be measured as an extra over the specified roof sheeting. The rate shall also cover the cost of cutting, notching, waste, all necessary scaffolding, temporary supports, hoisting facilities and safety precautions (see Subclause 8.1.2 of SANS 1200 HB).

**BA.03      Carefully remove existing cladding and roofing: ..... Unit: m<sup>2</sup>**

The area measured will be that of the exposed surface of finished building (see Subclause 8.1.1 of SANS 1200 HB).

Separate items will be scheduled for roof covering and side cladding, without differentiating amongst different profiles, materials, etc.

The rate shall cover the cost of removing of existing roofing or side cladding, inclusive of flashings and sundry items, from timber or steel purlins, and the removal from site of all such material. The rate shall also cover the cost of any scaffolding, temporary supports, hoisting facilities etc. as well as credit for the redundant material becoming the property of the Contractor.

The rate shall also cover all temporary necessary dust screens, sheets, plastic linings, etc. laid horizontal or vertical inside existing roof spaces or voids on top of ceilings, trusses, etc. to protect all contents inside the buildings while replacing or repairing the roof coverings.

**BA.04      Carefully remove and store existing cladding and roofing:.....Unit: m<sup>2</sup>**

The area measured will be that of the exposed surface of finished building (see Subclause 8.1.1 of SANS 1200 HB).

Separate items will be scheduled for roof covering and side cladding without differentiating amongst different profiles etc.

The rate shall cover the cost of removing of existing roof sheeting or side cladding inclusive of flashings and sundry items from timber or steel purlins, the temporary storage of the removed sheeting or cladding at a store area (position of store area to be indicated on site). The rate shall also cover the cost of any scaffolding, temporary supports, hoisting facilities etc.

The rate shall also cover all temporary necessary dust screens, sheets, plastic linings, etc. laid horizontal or vertical inside existing roof spaces or voids on top of ceilings, trusses, etc. to protect all contents inside the buildings while replacing or repairing the roof coverings.

**BA.05      Re-erect stockpiled cladding and roofing:.....Unit: m<sup>2</sup>**

The area measured will be that of the exposed surface off the finished building (see Subclause 8.1.1 of SANS 1200 HB).

Separate items will be scheduled for roof covering and side cladding without differentiating amongst different profiles, materials, etc.

The rate shall cover the cost of preparing, re-erecting, handling, moving, installing existing stockpiled roofing and cladding, including new fixing fasteners, etc. complete. The rate shall also cover the cost of cutting, notching, waste, all scaffolding, temporary supports, hoisting facilities and safety precautions (see Subclause 8.1.1 of SANS 1200HB).

**BA.06      Supply and install sundry items, etc:.....Unit: m**

Flashing, ridging, etc. will be measured by length.

Separate items will be scheduled for each type, finish and shape of sundry item.

The rate shall cover the cost of supplying, delivery, storing on site, handling, moving, installing and fixing the relevant item complete with all fasteners and sundry items as stipulated in BA.02.3.4.

The rate shall also cover the cost of cutting, notching, waste and of all scaffolding, temporary supports, hoisting facilities and safety precautions (see Subclause 8.1.1 of SANS 1200 HB).

**BA.07      Supply and install roof insulation:.....Unit: m<sup>2</sup>**

The area measured will be that of the exposed surface, no deductions being made for openings left or cut for protrusions such as those specified in Subclause 5.7 of SANS 1200 HB, or for ventilators and the like. Deductions will be made for windows and other openings of similar dimensions.

The rate shall cover the costs of supplying, delivery, storing on site, handling, moving, installing and fixing complete with all necessary fasteners as specified in BA.02.3.7, and shall also cover the cost of cutting, notching, waste and of all scaffolding, temporary supports, hoisting facilities and safety precautions (see Subclause 8.1.1 of SANS 1200 HB).

**BA.08      Supply and install waterproofing: ..... Unit: m<sup>2</sup>**

The area measured will be that of the exposed surface, no deductions being made for openings left or cut for protrusions such as those specified in Subclause 5.7 of SANS 1200 HB, or for ventilators and the like. Deductions will be made for windows and other openings of similar dimensions.

The rate shall cover the costs of supplying, delivery, storing on site, handling, moving, installing and fixing complete with all necessary fasteners as specified, and shall also cover the cost of cutting, notching, waste and of all scaffolding, temporary supports, hoisting facilities and safety precautions (see Subclause 8.1.1 of SANS 1200 HB).

**BA.09      Supply and install rainwater goods: ..... Unit: m**

Rainwater goods and similar lengths of constant profile will be measured by length.

Sundry items such as stop-ends, bends, shoes, etc. are deemed to be included in the tendered rate per metre.

Separate items will be scheduled for each type, finish, shape and when relevant, profile of rainwater goods. The rate shall cover the cost of supplying, delivery, storing on Site, handling, moving installing and fixing the relevant goods complete with all necessary fasteners, etc. as specified in BA.02.6 (all complete and subject to a three year written guarantee on water tightness and workmanship). The rate shall also cover the cost of cutting, notching and waste, and of all scaffolding, temporary supports, hoisting facilities and safety precautions (see Subclause 8.1.1 of SANS 1200 HB).

**BA.10      Carefully remove existing rainwater goods: ..... Unit: m**

The length measured will be that of the exposed length of finished building.

No separate items will be scheduled for size, thickness, material, profile, galvanized or chromadek finished items.

The rate shall cover the cost of removing of existing rainwater goods inclusive of brackets and sundry items from timber or steel purlins and trusses, the cost of any scaffolding, temporary supports, hoisting facilities etc. and the allowance of credit for material to become the property of the Contractor and to be removed from the site.

**BA.11      Miscellaneous items:**

(a) Measured by number:

(i) (Description of item) ..... Unit: No

(ii) Etc.

(b) Measured by linear metre:

(i) (Description of item).....Unit: m

(ii) Etc.

The unit of measurement shall be the number or metre as applicable to each item.

The tendered rates shall include full compensation for manufacturing or providing and installing each item complete as per BA.03.1.

**BA.12** Roof rehabilitation:.....Unit: m<sup>2</sup>

The area measured will be that of the exposed surface of building as specified in Subclause 8.1.1 of SANS 1200 HB. Separate items will be scheduled for roofing and side cladding, without differentiating between different profiles, finishings, fixing methods, etc.

The rate shall cover the cost for inspecting, removing existing and supplying and fixing new Leak King or posidriv screws or nails and mechanisms, sealants, sealer strips, etc. complete.

The rate shall also cover the cost of cutting, waste, all scaffolding, temporary supports, etc. all to the approval of the Engineer.

**BA.13** Supply and install additional fixing screws, etc:.....Unit: No.

The unit of measurement will be the number of additional screws installed.

The rate shall cover the cost for removing defective fixing screws as indicated by the Engineer, and replacing aforesaid with new Leak King or equivalent approved fixing screws in similar previous positions.

No separate items will be scheduled for roof sheeting, side cladding or different profiles. Payment under this item shall not include the screws to be replaced under the roof rehabilitation item above.

**BA.14** Carefully remove and re-erect ventilation units:.....Unit: No.

The unit of measurement will be number of ventilation units removed, temporarily stored and resized to similar positions.

The rate shall cover the cost for carefully removing existing ventilation units approximately 2,5m<sup>2</sup> in area from existing roof structures, temporary storage, servicing of existing ventilation units, cleaning, re-erecting later onto new roof sheeting (irrespective of type or profile of sheeting), new ventilation flashings and counter flashings, sealants, fixing screws, fasteners, etc. complete. The rate shall also cover the cost for cutting openings into new sheeting for ventilation units, waste, all necessary scaffolding, temporary supports, hoisting facilities and safety precautions (see Subclause 8.1.1 of SANS 1200 HB).

**BA.15** Carefully remove and re-erect birdproofing:.....Unit: m<sup>2</sup>

The area measured will be that of the exposed surface to be covered with bird-proofing.

The rate shall cover the cost for carefully removing chicken wire bird-proofing stapled to each roof truss tie beam at roof overhang between beam-filling and fascia board, temporary storage, cleaning of bird-proofing, re-erecting later into similar previous



position. The rate shall also cover the cost for cutting, fixing staples, waste, scaffolding, etc.

**BA.16      Prepare existing roof sheeting and repaint: .....Unit: m<sup>2</sup>**

The area measured will be that of the exposed surface of roof sheeting painted (measured on flat area as for roof coverings.)

The rate shall cover the cost for removing existing paint and cleaning surfaces with an approved degreaser and scotch brite pads and rinsing thoroughly by means of pressure washing to receive one new coat "Epiwash Strontium Chromate Primer" or equivalent approved primer coat and one coat "Plascothane Twin pack Polyurethane Paint" or equivalent approved polyurethane roof paint, supplying, delivery and applying new primer and finishing coat, etc., without distinguishing between roof sheeting, side cladding, profile, finish, etc. See also BA 03.02

The rate shall also cover the cost of waste, all necessary scaffolding, etc.

**BA.17      Replacement of existing roof tiles in patchwork: .....Unit: number**

The unit of measurement will be number of roof tiles removed, installation of new roof tiles similar to existing roof tiles.

The rate shall cover the cost for carefully removing existing roof tiles approximately 350mm x 350mm in area from existing roof structures, installation of new roof tiles and ridge flashings, sealants, fixing screws, fasteners, etc. complete. The rate shall also cover the cost, waste, all necessary scaffolding, temporary supports, hoisting facilities and safety precautions.

**BA.18      Install wire chicken mesh over thatch roofs: .....Unit: m<sup>2</sup>**

The unit of measurement will be square metre of wire chicken mesh installed over thatch roofing.

The rate shall cover the cost of supplying, cutting and placing of the wire mesh, all labour, necessary scaffolding and safety precautions. The rate shall also include the provision of all tools and the supply and fixing of binding wire and fixing-nails.

**BA.19      Pressure Clean existing roof tiles: .....Unit: m<sup>2</sup>**

The area measured will be that of the exposed surface of roof tiles pressure cleaned (measured on flat area as for roof coverings.)

The rate shall cover the cost for removing existing dirt and cleaning surfaces by means of pressure washing with an approved degreaser and rinsing thereof.

The rate shall also cover the cost of water connection, all necessary scaffolding, etc.

## **TECHNICAL SPECIFICATION**

### **BB CARPENTRY AND JOINERY FOR ROOFS AND CEILINGS**

#### **CONTENTS**

BB 01	SCOPE
BB 02	STANDARD SPECIFICATIONS
BB 03	VARIATIONS AND ADDITIONS TO STANDARD SPECIFICATIONS
BB 04	DETAIL OF WORK
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BB 06	MEASUREMENT AND PAYMENT

#### **BB 01 SCOPE**

Carpentry and joinery shall mean the repair of materials and components such as removal of existing timber roof trusses, purlins, ceilings, etc, and the installation of new timber trusses and other timber roof members, structural beams, purlins, battens and ceilings. This specification does not include work related to roof coverings and paintwork, which are specified elsewhere.

This specification covers the repair of existing timber members in roof trusses, the removal and replacement of existing timber members from roof trusses and associated timber roof members and ceilings. This specification also covers the supply, delivery and installation of new timber trusses, purlins, battens and beams for various types of timber related structures and ceilings.

The complete scope of repair work shall be as described in BB 04: Detail of repair work.

#### **BB 02 STANDARD SPECIFICATIONS**

##### **BB 02.01 GENERAL STANDARD SPECIFICATIONS**

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:

OW 371	-	Specification of Materials and Methods to be used (Fourth revision, October 1993)
SANS 10243	-	The design, manufacture and erection of timber trusses
SANS 266	-	Gypsum plasterboard
SANS 1783 - 2	-	Stress-graded softwood: general structural timber
SANS 1783 - 4	-	Softwood bracing and battens
SANS 803	-	Fibre-cement boards

##### **BB 02.02 ADDITIONAL SPECIFICATIONS**

Technical Specification BA: Roof coverings  
 Technical Specification BD: Walls  
 Technical Specification BJ: Paintwork

**BA 02.03      OCCUPATIONAL HEALTH AND SAFETY ACT**

The Contractor shall be required to comply with the Occupational Health and Safety Act 85 of 1993, Construction Regulations 2014 and related regulations. Non-compliance with these regulations, in any way whatsoever, will be adequate reason for suspending the Works.

**BB 03      VARIATIONS AND ADDITIONS TO STANDARD SPECIFICATIONS****BB 03.01      ADDITIONAL REQUIREMENTS FOR REPAIR OF TIMBER ROOF STRUCTURES****BB 03.01.01      Timber trusses****(a)      Replacing timber trusses**

The Engineer shall inspect timber trusses for defects and establish which timber trusses must be replaced.

Reasons for replacing trusses will include but not be limited to the following:

- (i) Deflection exceeding acceptable limits;
- (ii) Inadequacy in design, e.g. structural strength, structural instability, load conditions;
- (iii) Decay of large portions of truss members (defective timber);
- (iv) Large portions of truss members having so many defects e.g. cracked timber, corroded connector nail plates, etc, that it will be uneconomical to repair the defects.

**(b)      Repair of timber trusses**

Repair work shall include but not be limited to the following:

- (i) Strengthening of truss members, connections, splices and anchorage at supports;
- (ii) Strengthening of truss members due to unforeseen loads, notching and cutting for services by other contractors;
- (iii) Repair of truss members where large knots and waness occur;
- (iv) Replacing metal plate connectors in cases of corrosion, incorrect application of connector plates, incorrect size of connector plates, unsymmetrically fitted connector plates, connector plates with teeth flattened, minimum bite of less than 65 mm of a connector plate on a truss member;
- (v) Replacing of decayed timber, particularly rafter ends at roof overhangs and at roofing screws. Timber subjected to insect attack and fungal decay should be treated with an appropriate preservative. Where there is a low risk of decay or insect attack, two coats of Creosote may be applied to the timber. Refer to clauses 8.1 and 8.2 in OW 371 for the preservation of wood in high-risk regions;
- (vi) Replacing and/or repair of cracked timber members. Galvanised connector plates and metal straps may be considered;
- (vii) Maximum slenderness ratio must be less than 180 for compression members that carry forces resulting from dead and live loads. Compression members 36 mm thick and longer than 1,8 m must have a continuous longitudinal runner centrally placed (or T-bracing) and properly connected and braced. For members that resist loads caused by wind, the slenderness ratio must be less than 250;
- (viii) Plumb of trusses should not exceed 100 mm or total span/20 whichever is the least;
- (ix) Exposed portions of the trusses shall be painted to match existing appearance.

The roof trusses shall be fully braced. The Engineer shall give instructions regarding the provision of bracing members to the roof system.

**BB 03.01.02    Purlins (for sheeted roofs, battens for tiled roofs)****(a)    Replacing timber purlins**

The Engineer shall inspect timber purlins for defects and possible reuse. The Engineer shall establish which timber purlins need to be replaced.

Reasons for replacing purlins will include but not be limited to the following:

- (i)    Decayed timber, particularly at gable overhangs;
- (ii)   Broken, warped and brittle timber;
- (iii)   Worn-out roof screw holes;
- (iv)   Inadequacy in design, e.g. structural strength and excessive deflection due to large spans;
- (v)   Inappropriate spacing of purlins for the specific roof covering.

**(b)    Repair of timber purlins**

Repair work shall include but not be limited to the following:

- (i)    For roof pitches under 45° the purlins shall be erected on edge (narrow edge).
- (ii)   All purlins shall be secured to rafters at each intersection in addition to nails. In roof voids a single 3,2 mm diameter galvanised wire tie bound twice with twisted ends or a galvanised bent plate connector shall be used for securing purlins to rafters. On roof overhangs only galvanised bent plate connectors shall be used for securing purlins to rafters.
- (iii)   Splices shall be staggered. Splices that do not conform to the requirements of clause 8.8 of OW 371, or clauses 8.5.1 and 8.5.2 of SANS 10234, must be repaired. Nailed galvanised plate connectors on either side of purlins are also acceptable.
- (iv)   Exposed portions of the purlins shall be painted to match existing appearance.

Skew nailing of purlins to trusses shall not be closer than 30 mm from the edge of the member.

**BB 03.01.03    Structural timber****(a)    Replacing structural timber**

The Engineer shall inspect members of structural timber, i.e. beams and columns, for defects and shall establish which of these members must be replaced. Reasons for replacement will include but not be limited to the following:

- (i)    Deflection exceeding acceptable limits;
- (ii)   Inadequacy in design, e.g. structural strength, structural instability, load conditions;
- (iii)   Decay of a large portion of the member (defective timber);
- (iv)   Replacing of decayed timber, particularly at ends of beams.

**(b)    Repair of structural timber**

Repair work shall include but not be limited to the following:

- (i)    Strengthening of members, connections, splices and anchorage at supports;
- (ii)   Strengthening of members due to unforeseen loads, notching and cutting for services by other contractors;
- (iii)   Exposed portions of structural timber shall be painted to match existing appearance;
- (iv)   Bolt connections shall be in accordance with the requirements of SANS 10163.

**BB 03.01.04    Ceilings**

New ceilings shall be installed in accordance with section 9 of OW 371.

**(a)    Branderling to ceilings**

Branderling to ceilings shall be replaced where:

- (i)    Ceiling boards are replaced;
- (ii)    Branderling is broken, rotten and beyond any further use.

New branderling shall be provided in accordance with clause 9.4 of OW 371. The branderling shall continue over at least three bays and shall be staggered to ensure that splices do not all occur in one line. Branderling must be provided for light fitting support.

**(b)    Gypsum ceiling boards**

Repairs to existing ceilings shall include the installation of new 6,4 mm thick gypsum ceiling boards with metal H-section jointing strips. The new ceiling boards shall be nailed to branderling with galvanised or cadmium-plated clout-headed nails.

Gypsum ceiling boards shall not be used in wet areas such as in ablutions, abattoirs, kitchens and bathrooms.

Ceiling boards shall be in long lengths, symmetrically arranged with smaller panels, closely butted and secured at 150 mm centres to branderling as specified.

Where it is necessary to replace ceiling boards onto existing branderling, new boards shall be installed by first drilling through and then securing with cadmium-plated flat headed wood screws, or alternatively by shot nailing to suit, to avoid unnecessary vibration or impact damage to adjacent elements.

Gypsum cove cornices 76 mm wide shall be provided where existing cornices are to be replaced.

Existing trap doors in ceilings shall be reused. If required, new 650 x 650 mm trap doors shall be installed.

No ceiling insulation must be provided unless specified.

Painting of the ceiling shall be done in accordance with Technical Specification BJ: Paintwork.

**(c)    Fibre cement ceiling boards**

Fibre cement ceiling boards shall be installed in wet areas such as in ablutions, abattoirs, kitchens and bathrooms.

Fibre cement ceiling boards shall be 6 mm thick, complying with the requirements of SANS 803 and of the flat pressed type.

The boards shall be nailed to the branderling with 2 mm diameter galvanised or cadmium-plated clout-headed nails, spaced at 100 mm centres at edges of boards and 150 mm centres along the intermediate branderling. Ceiling boards shall be in long lengths, symmetrically arranged with smaller panels as required and closely butted.

Replacement of new ceiling boards onto existing branderling shall be done as described in BB 03.01.04(b) above.

Fibrous plasterboard cove cornices to ceilings shall be of 100 mm girth, provided by an approved manufacturer. Gypsum cove cornices 76 mm wide can be used in kitchens and bathrooms of houses. Powder-coated wall angles 25 mm wide shall be used for cornices in abattoirs.

Existing trap doors in ceilings shall be reused. If required, new 650 x 650 mm trap doors shall be installed.

Painting of the ceiling shall be done in accordance with Technical Specification BJ: Paintwork.

(d) Exposed T-system suspended ceilings

Repairs to existing suspended ceilings will include but not be limited to the following:

- (i) Replace damaged panels with new ceiling boards;
- (ii) Replace sections of damaged T-strips or H-strips;
- (iii) Replace cornices;
- (iv) Tension, fix and realign existing hangers;
- (v) Install new hangers as required;
- (vi) Clean ceiling boards, including washing of the ceiling boards with a mixture of water and sugar soap and wiping dry, or painting the ceiling boards.

(e) External gable fibre cement boards for side cladding

External tongued and grooved boarding shall be removed and replaced with 6 mm thick flat pressed fibre cement boarding. The boarding shall be fixed to new branding as specified in this section. Provide painted 25 x 25 mm meranti quarter rounds at edges as required.

The boarding shall be painted in accordance with Technical Specification BJ: Paintwork.

**BB 03.01.05 Fascia and barge boards**

Repairs to fascia and barge boards shall include but not be limited to the following:

- (a) Replace damaged and broken fibre cement fascia and barge boards.
- (b) Replace missing, corroded and damaged H-profile jointing strips.
- (c) Replace all nails with suitable length and diameter brass screws. Provide nylon plugs to timber where necessary.
- (d) Align and fix existing fascia and barge boards.
- (e) Paint fascia and barge boards in accordance with Technical Specification BJ: Paintwork. All sides including the edges must be painted.
- (f) The roof covering shall cover the top edge of the fascia on gables.

**BB 03.01.06 Timber trusses, purlins and battens**

(a) Existing timber trusses and roof structure

(i) General

- (1) The Contractor shall establish proper access and install adequate lighting to the roof voids to enable detailed inspections of structural deficiencies by the Engineer. Temporary scaffold planks shall be laid across bottom chords to allow access to all critical areas. After inspection, the extent of repairs is to be agreed with the Engineer.

- (2) All completed work shall be inspected and approved by the Engineer.
- (3) All new timber work shall comply with SANS 10163.
- (4) Timber grade shall be S5 and replacement sizes are to match existing unless otherwise agreed.
- (5) Repair details on attached sheets R1 to R3 shall form the basis for repairs. Any deviations from or variations to these details are to be approved by the Engineer. Any types of failure not covered by these details shall be discussed with the Engineer who will then issue the necessary repair instructions.

(ii) Procedures (watermarked and slightly rotten members)

- (1) Watermarked and slightly rotten members need not be replaced or repaired if the following test indicate these members to be satisfactorily:

Using a 3,5 mm nail, make scratch marks in all these members to expose good unaffected timber. If scratch depth is 2 mm or less, it is acceptable and these members need only to be treated as described in (2) below.

- (2) The members shall be wire-brush cleaned, free of any loose or deleterious material, then treated with 1 coat of creosote, or similar approved. Apply by brush to affected areas and 200 mm beyond, all to the manufacturer's specifications. Safety precautions shall be taken against possible health or fire hazards as specified by manufacturer.

(iii) Procedures (cracked and failed members)

- (1) All members that are cracked right through will be regarded as failed members. Members with minor longitudinal cracks shall be repaired, following procedure 5 on sheet R3.
- (2) The Contractor must allow for propping and/or bracing at failed members to ensure complete structural stability during repairs.
- (3) Failed members as indicated in details 1 to 4 on sheets R1 to R3 shall be realigned by means of clamping with temporary backing pieces, after which repairs can proceed.
- (4) Members that are damaged too badly to effect repairs will have to be replaced or doubled up to suit the circumstances.
- (5) Once all repair work has been completed the Contractor must clean out the ceiling void, free of all rubbish, excess building material and all other foreign matter and make good any damage caused to ceilings, etc.
- (6) Any alternative repair proposal shall be submitted in writing to the Engineer.

**BB 04            DETAIL OF REPAIR WORK**

The detail of the work is described in the Schedule of Quantities.

**BB 05            MAINTENANCE**

**Note:** There will be no maintenance work required for carpentry and joinery for roofs and ceilings in this contract.

**BB 06            MEASUREMENT AND PAYMENT****BB 06.01        MEASUREMENT AND RATES****BB 06.01.01    General inclusion of costs****Notes:**

All material scheduled to be removed shall be deemed to be existing damaged materials in small or large sections. All such redundant material shall become the property of the Contractor and must be removed from site immediately.

All new material used for repair work shall be of approved equal quality, colours, profiles, thickness, etc and shall in all cases match the existing materials and shall be fixed (internally or externally) to existing material or surfaces.

All replacement, removal and repair work shall be done carefully as to not damage any adjacent or other material or work. Any damage to other or adjacent materials or areas caused by the negligence of the Contractor shall be repaired by him free of charge.

All work scheduled to be removed or taken out shall be deemed to include the cleaning and preparation of the remaining sections, areas, or work to receive the new material or work specified.

Repair work shall also include all cutting, grinding, cutting into, welding, bending, strengthening, drilling, etc to repair or to improve the items or areas as new and to match the existing.

Work scheduled to be realigned and refixed shall be deemed to include all necessary new additional materials, brackets, connector plates, bolts, pip rivets, nails, screws, spacer blocks, clamps, timber, and labour, etc to leave the items as new and totally functional.

All new work are measured net and shall include all cutting, lapping, waste, bending, fixing, corners, mitres, fixing screws, pip rivets, nails, adhesive, grout, putty, etc, as well as cleaning and preparation of surfaces not already prepared as part of removed items, etc.

Unless scheduled otherwise, new ceilings and ceilings in patchwork shall be fixed to existing brander and the Contractor must take special care not to damage the existing brander when removing damaged ceiling boards.



**BB 06.02.      SCHEDULED ITEMS****NEW WORK****BB.01      Structural timber:**

- (a) Plates (sizes indicated) ..... Unit: m
- (b) Beams (sizes indicated) ..... Unit: m
- (c) Joists (sizes indicated) ..... Unit: m
- (d) Rafters (sizes indicated) ..... Unit: m
- (e) Purlins (sizes indicated) ..... Unit: m
- (f) Roof trusses complete (drawing number indicated) ..... Unit: number
- (g) Etc

The unit of measurement shall be the metre of individual types of timber elements or number of complete trusses installed.

The tendered rates shall include full compensation for the supply of all materials, manufacture, cutting, waste, jointing, scaffolding, temporary supports, hoisting facilities and installation of the timber as specified, scheduled or shown on the Drawings.

**BB.02      Ceilings:**

- (a) Ceiling boards, trapdoors, cornices, cover strips, etc  
(type and/or thickness indicated):
  - (i) Thickness, shape and description of applications ..... Unit: m<sup>2</sup>, m, number
  - (ii) Etc for other thicknesses, shapes, etc

The unit of measurement shall be the number, metre or square metre of ceiling boards, trapdoors, cornices, etc installed complete as specified and scheduled.

The tendered rates shall also include full compensation for the construction of the ceilings, trapdoors, cornices, cover strips, etc including jointing strips, insulation blankets and banderling as specified.

**BB.03****Joinery:**(a) Items measured by number:

- (i) Doors, etc (type and size indicated) ..... Unit: number
- (ii) Etc for other items measured by number

(b) Items measured by linear metre:

- (i) Skirtings, rails, cover strips, quadrant beads, etc (size indicated) ..... Unit: m
- (ii) Etc for other items measured by length

(c) Items measured by area:

- (i) Eaves covering, etc (type and thickness indicated) ..... Unit: m<sup>2</sup>
- (ii) Etc, for other items measured by area

The units of measurement shall be the number, metre or square metre of each type and/or size of joinery item specified and installed complete.

The tendered rates shall include full compensation for the supply of all materials, manufacture, cutting, waste, fixing, scaffolding, temporary supports, hoisting facilities and installation of the joinery items.

New joinery, will except where otherwise specified, be fixed or hung to existing material or surfaces.

**ALTERATION WORK****BB.04****Alterations and repairs to existing structures:**(a) Indicate if repairs, alterations, removal or sealing, etc:

- (i) Description of individual items to be repaired, replaced, altered, removed, sealed, etc ..... Unit: m<sup>3</sup>, m<sup>2</sup>, m, number

The unit of measurement for items repaired, replaced, altered, removed, sealed, etc shall be cubic metre, square metre, metre or number as scheduled. No distinction between sizes or profiles will be made for the removal of structural timber elements.

The tendered rates shall include full compensation for all costs to repair, refix, remove, cutting into, re-align, taking off, handling, temporary store, scaffolding, temporary supports, hoisting facilities and preparing existing remaining material or surfaces where applicable to receive new items as well as for credit for the redundant material becoming the property of the Contractor, etc as specified in the Standard and Technical Specifications and shall allow for all necessary labour, plant and new material needed for the repairs, replacement or alterations, etc to leave the scheduled items as new and to the approval of the Engineer. Refer also to the general inclusion of costs in BB.06.01.01."

**BB.05****Repairs to watermarked and slightly rotten timber roof members:**

..... Unit: m

The unit of measurement shall be the linear metre of timber roof members repaired as specified. No distinction will be made for size, type of member or position.

The tendered rate shall include full compensation for the complete repair work, wire brushing, creosote, etc as specified by the Engineer.

**BB.06      Repairs to damaged masonry, plastering and surface finishes:**

(a)    Items measured by number:

(i)    Description of item..... Unit: No

(ii)   Etc..... Unit: m

(b)    Items measured by linear metre:

(i)    Description of item..... Unit: No

(ii)   Etc..... Unit: m

The unit of measurement shall be the number or metre as applicable to each item.

The tendered rates shall include full compensation for the making good of masonry (stock or face bricks), beam-filling, plastering, painting, closing ends to troughs of sheet metal roof sheeting, repairs to structure at ends of rafters and purlins, protruding through brick walls, etc.

The tendered rate shall also cover the cost of cutting, notching and waste and of all scaffolding, temporary supports, etc.

**BB.07      Painting to top cords of timber trusses  
in roof voids:..... Unit: m**

The unit of measurement shall be the metre.

The tendered rate shall include full compensation to prepare existing top cords (where applicable) to receive one coat creosote. No distinction will be made for size, type, new or existing members. The rate shall also cover the cost for waste, all scaffolding, etc.

**BB.08      Painting of existing members in overhangs:..... Unit: m**

The unit of measurement shall be the metre.

Separate items will be listed for paint and/or creosote as specified.

The tendered rate shall include full compensation to prepare existing overhangs to receive paint or creosote as specified. No distinction will be made for size of existing members. The rate shall also cover the cost for waste, all scaffolding, etc.

## **TECHNICAL SPECIFICATION**

### **BD            WALLS**

#### **CONTENTS**

BD 01	SCOPE
BD 02	STANDARD SPECIFICATIONS
BD 03	VARIATIONS AND ADDITIONS TO STANDARD SPECIFICATIONS
BD 04	DETAIL OF REPAIR WORK
BD 05	MAINTENANCE
BD 06	MEASUREMENT AND PAYMENT

#### **BD 01            SCOPE**

This specification covers the repair of existing interior and exterior walls including all related building elements such as plastering, partitioning, wall tiling, windows, doors, etc, which form an integral part of an installation.

In determining the remedy for any repair work, the Engineer must take the climatic conditions in which all building elements have to function into consideration. Allowance should be made accordingly for the strength and durability of all components in relation to their purpose and application.

This specification does not include any work related to paintwork as this is specified elsewhere.

The complete scope of repair work shall be in accordance with the section: Detail of repair work.

#### **BD 02            STANDARD SPECIFICATIONS**

##### **BD 02.01            GENERAL STANDARD SPECIFICATIONS**

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. All other relevant and applicable SANS regulations are also to be considered as minimum requirements, and in particular SANS 10400: The Application of the National Building Regulations.

OW 371	-	Specification of materials and methods to be used (Fourth revision, October 1993)
SANS 22	-	Glazed ceramic wall tiles and fittings
SANS 227	-	Burnt clay masonry units
SANS 545	-	Wooden doors
SANS 622	-	Gypsum cove cornice
SANC 680	-	Glazing putty for wood and steel sashes
SANS 727	-	Windows and doors made from rolled mill steel sections
SANS 10107	-	The fixing of glazed wall tiles
SANS 1236	-	Silvered glass mirrors for general use
SANS 1263	-	Safety and security glazing materials for buildings

##### **BD 02.02            ADDITIONAL SPECIFICATIONS**

Technical Specification BG: Metalwork  
 Technical Specification BH: Fittings  
 Technical Specification BJ: Paintwork

**BD 02.03      OCCUPATIONAL HEALTH AND SAFETY ACT**

The Contractor shall be required to comply with the Occupational Health and Safety Act 85 of 1993, Construction Regulations 2014 and related regulations. Non-compliance with these regulations, in any way whatsoever, will be adequate reason for suspending the Works.

**BD 03      VARIATIONS AND ADDITIONS TO STANDARD SPECIFICATIONS****BD 03.01      ADDITIONAL REQUIREMENTS FOR REPAIR OF PLASTERED AND UNPLASTERED WALL SURFACES****BD 03.01.01      Introduction**

A detailed survey of all existing building elements may reveal the necessity for remedial work of varying degree. The Engineer shall make an assessment of all aspects that need to be addressed.

**BD 03.01.02      Plastering: General**

All plaster shall comply with the requirements of SANS Standard Specification 523 and section 14 of OW 371. All plastering shall be painted in accordance with Technical Specification BJ: Paintwork, or tiled according to this specification BD.

The Engineer shall inspect the plaster surfaces and establish which wall plastering must be repaired. Reasons for replacing existing plastering will include, but not limited to the following:

- (a) Excessive plaster cracking
- (b) Loose (delaminated) and spalling plaster
- (c) Dusting
- (d) Scaling and flaking
- (e) Defective plaster mix.

All chases shall be marked out in straight lines and neatly cut on either side of the recess for the pipe/conduit with an angle grinder. The width of the removed plastering must extend at least 30 mm beyond the edge of the chasing. Pipes or conduits shall be fixed before commencing grouting and plastering.

After the pipe has been put in place, the void shall be filled with a non-shrink cement grout of 60 MPa compressive strength at 28 days. The chases shall then be covered by fixing with shot-fired nails a weld mesh strip (30 mm longway x 10 mm shortway x 0,5 mm thick expanded metal lath) before applying the final plaster.

**BD 03.01.03      Plastering: Walls of wet areas**

Where necessary, hack off and remove existing internal plaster to walls. The substrates must be prepared to be sound, free from cement, grout, laitance, loose or segregated materials, voids or flaws and substances that could interfere with bonding of the new plaster. This preparation work can be done by means of clipping away with a chisel, steel-wire brush and angle grinders to the satisfaction of the Engineer. Smooth concrete must be chipped mechanically to prepare for bonding of new plaster. Before plastering commences, the substrates must be well wetted with clean water.

Only approved ready-mixed or pre-mixed bagged plaster mortar with 10 MPa compressive strength or equivalent may be used for plastering. Mix a liquid waterproofing admixture in a dilution of one part by volume with ten parts by volume of clean water. The diluted admixture is added to the appropriate dry cement/sand mixture. The mortar shall be produced in such quantities that will be used within one hour after mixing. The finished plasterwork shall be of an even and smooth trowel surface finish.

When dry, apply two coats of an approved water dispersed epoxy resin coating to the plastered surfaces of the walls that are to be painted.

#### **BD 03.01.04    External plastering**

The Engineer shall mark out areas that need to be renovated. The Contractor shall neatly cut with an angle grinder in straight lines the edges of the poor patches of plaster that must be removed.

The substrate of the brick walls must be prepared to be sound, free from cement grout, laitance, loose or segregated material, voids or flaws and substances that might interfere with the bonding of the new plaster.

The surface must not be powdery or crumbly, and must exhibit adequate tensile strength. The preparation work can be done by means of chipping away with a chisel, steel-wire brush and angle grinders to the satisfaction of the Engineer.

Smooth surfaces must be chipped to provide mechanical bonding for new plaster. Before plastering commences the substrate must be well wetted with clean water.

Only approved ready-mixed or pre-mixed bagged plaster mortar with 5 MPa compressive strength or approved equivalent may be used for plastering. The Contractor shall submit the design mix with the volume of water to be added to the mortar mix for approval by the Engineer. An approved bonding agent must be added to the mortar mix.

The mortar shall be produced in quantities that will be used within one hour after mixing. Care shall be taken not to mix old mortar into any new batch.

The finished plasterwork shall be of an even and smooth wooden trowel (surface finish with rounded edges at sharp corners) to the satisfaction of the Engineer. The plasterwork shall be cured for seven days by any approved method to prevent loss of moisture.

Three (3) test cubes per sampling shall be taken at a frequency for every 15 m<sup>2</sup> plaster area. Cube moulds for nominal size 100 mm complying with the requirements of SANS Method 863 must be used. Final instructions for sampling, moulding, cutting and testing will be issued to the Contractor on site.

#### **BD 03.01.05    Rough-cast plaster**

Rough-cast plaster shall be applied in two coats. The undercoat shall be composed of one part cement and five parts sand finished with a wooden float. The finishing coat shall be composed of one part cement and three parts stone aggregate that will pass through a 4 mm sieve. The finishing coat shall be flicked on with a machine before the undercoat has set to obtain an even texture to match the existing rough-cast plaster.

Where the undercoat has already been plastered, the undercoat shall be prepared to receive the finishing coat. The surface of the undercoat plaster shall be chipped adequately to form a key and wetted before the finishing coat is applied.

**BD 03.01.06    Fine rough-cast plaster**

Fine rough-cast plaster shall be as for rough-cast plaster but the finishing coat shall be composed of one part cement and three parts coarse sand.

**BD 03.01.07    Internal plastering**

The surface of internal plaster shall be steel trowelled to a smooth, even and true finish. External plaster shall be finished to a true and even surface with a wood float. All plaster surfaces shall be free from blemishes, cracks, blisters or other defects. Plaster shall return into reveals and soffits of openings, and all angles shall be true and straight with salient angles slightly rounded.

Plastering of a surface shall be executed in one operation, as no joint marks will be allowed. Plaster on walls shall not be less than 12 mm or more than 20 mm thick and plaster on concrete shall be not less than 10 mm or more than 15 mm thick, except where specifically specified otherwise.

Only approved ready-mixed or pre-mixed bagged plaster mortar with 5 MPa compressive strength or approved equivalent may be used for plastering. The Contractor must submit the design mix with the volume of water that will be added to the mortar mix to the Engineer for approval.

**BD 03.02    PARTITIONS**

All internal non-load-bearing walls shall be inspected and the Engineer shall determine whether partitioning such as laminated plastic particleboard, polyester painted steel, vinyl clad gypsum panels or any other demountable partitioning should be replaced.

Where partitioning must be relocated or replaced, such new partitioning shall be non-combustible, provide acoustical privacy and comply with SANS 10400.

All new partitions shall assemble into a rigid structure and all units shall be readily removable from either side without disturbing adjacent units.

All exposed trims for doorframes, glazing and skirting are to be of aluminium, or alternatively be painted in accordance with Technical Specification BJ: Paintwork.

The type of boarding and jointing or cover strips shall be in accordance with the Schedule of Quantities.

**BD 03.03    WALL CRACKS**

Wall cracks shall be evaluated to determine the nature and severity of the occurrence of the cracks. The Engineer shall inspect all plastered and unplastered walls and identify the underlying factors causing cracks. Repairs shall be carried out in accordance with the Particular Specifications.

**BD 03.04    FACE BRICKS**

Face bricks shall be inspected for dirt, efflorescence, staining, oil, paint, lichens and mosses, water, smoke and soot, rust, or damage caused by chemical reaction.

Where efflorescence appears, light brushing and hosing down with clean water is recommended for most cases. The brickwork must be saturated with clean water before applying any chemical and washed down with clean water afterwards. Cleaning can also be achieved with scrubbing, water jetting with cleaning agents and soaps, etc. Staining caused by non-water-soluble salts, such as vanadium, manganese and iron, shall be treated as follows:

- (a) Remove vanadium staining by washing the wall with a solution of 100 g to 1 litre of water using caustic soda. (Use the corresponding secondary potassium salts where available, as these will be less likely to cause visible secondary efflorescence.) If secondary efflorescence occurs, wash it off with clean water.
- (b) Manganese stains must be removed using proprietary brand chemical compounds based on hydrochloric acid with modifiers and sodium fluoride. These solutions should be applied using full strength as recommended by the manufacturer.
- (c) Where rust/iron stains occur, wash the affected area with a solution of 50 g oxalic acid, 20 g sodium fluoride, 15 g citric acid in 1 litre of fresh, clean water. Apply the solution to a dry wall and leave it on the wall until the stain has dissolved. Wash down using a solution of 50 g bicarbonate of soda in one litre of water.

External environmental stains and smears caused by soot, smoke, industrial pollution and spillage of oil, paint and other compounds, including micro-organic growths such as fungi, lichens and mosses on brickwork, must be identified and dealt with in an appropriate and approved way.

Care shall be taken to test the effect of some of the chemicals and compounds for possible harmful effects on the colours of the brickwork and on adjacent materials, as well as for possible toxicity to human, animal and plant life. All cleaning procedures shall be carried out with full knowledge of all the potential dangers to human and animal health, and the appropriate safeguarding and precautionary measures shall be put in place.

#### **BD03.04.01     APPLICATION     OF     SILANE     /     SILOXANE     BASED     WATER REPELLENT/IMPREGNATION**

The surface to be treated shall be clean, sound and dry. It should be free from dust, dirt, loose particles and oily or greasy deposits.

The surface shall be dry to allow maximum penetration. No application shall be made for at least four days after rain.

In order to remove any loose particles, the walls shall be pressure-cleaned with water before application of the silane / siloxane based water repellent. After pressure cleaning of the walls, the walls shall be left to dry in sunny conditions for at least 4 days, and where dagha (cement) has come loose in the joints and left a void, dagha (cement) joint filling shall be prepared to match the existing colour and shall be replaced to match the existing. The Contractor shall submit a mix design of the dagha (cement) joint filling for approval before application.

The contractor shall arrange for walls to be inspected by the Engineer's Representative before application of the water repellent, but after pressure cleaning of the walls.

The water repellent should be applied by brush or through a low pressure knapsack sprayer. Application should commence from the highest point of the surface and work down the surface. Some run-down of the coating is permissible but should not exceed 250-300 mm. A second coat may be given but only after at least two hours drying time between coats.

Avoid working in full sunshine to achieve maximum penetration. Confine activities to the shadow side of the structures.

Application temperature shall be +/- 5o to +30o, and shall not be applied if rain is imminent.



The penetrating silane / siloxane based water repellent shall be applied to cover 3 – 5 m<sup>2</sup> per litre per coat. The water repellent shall be applied in two coats.

The penetrating silane / siloxane based water repellent shall be applied in accordance with the instructions of the supplier.

## **BD 03.05      WALL TILING**

### **BD 03.05.01      General**

Tiling shall comply with the requirements of SANS Standard Specification 22 and section 15 of OW 371. The code of practice for the fixing of glazed wall tiles, SANS 10107 and the recommendations of the South African Ceramic Tile Manufacturer's Association (SACTMA) must be adhered to.

All tiled areas must be checked for damaged surfaces or to determine where tile adhesion to subsurface proves to be of non-satisfactory standard. In cases where tiled surfaces need to be redone, proper care shall be taken in removing all damaged tiles, as well as any adhesive remains on the subsurface.

Matching of existing size and colour should be pursued wherever possible.

### **BD 03.05.02      Glazed wall tiling**

White glazed tiles 150 x 150 x 5 mm thick, first grade, must be laid in a cement-based powder adhesive, strictly in accordance with the manufacturer's specification. Drying periods for backgrounds and substrates must be strictly adhered to. All tiles must be correctly bedded. This can be achieved by using a 6 mm square notched wall trowel to spread the fixative to the required thickness of 6 mm. Bed the tiles dry and move them firmly into position, ensuring that they are in proper overall contact with the bed and form an even surface.

A minimum of 2 mm grouting joints shall be allowed between tiles. Under no circumstances should the tiles be butt-jointed. Do not fill joints between tiles until at least 24 hours after the tiles have been bedded. Ensure that the joints are free of tile adhesive residue and any foreign matter. Fill joints with waterproofed white cement. Existing joints must be cleaned and refilled with new white cement.

### **BD 03.05.03      Ceramic wall tiling**

Glazed ceramic wall tiles 230 x 115 x 11, 5 mm thick, with grade 1 acid resisting quality finish are to be used. Apply an approved epoxy grout into the tile joints and finish off with a wetted nosing tool to a smooth glazed finish. Ceramic tiles include special tiles, such as bull nose and corner tiles. Repairs include replacing damaged tiles and pointing between tiles with an approved epoxy grout.

### **BD 03.05.04      Corner protectors**

Install 75 x 75 x 5 mm thick aluminium angle corner protectors to external vertical wall corners for protection with 8 mm diameter impact nails x 80 mm long @ 300 mm c/c to a maximum height of 1,6 m. Seal the interface gap with approved silicone.

Install for abattoirs and dairies 75 x 75 x 3 mm thick stainless steel grade 304 angle corner protectors, polished to a No 2B finish with a grit 180, to external vertical wall corners. Fix the corner protectors with 8 mm diameter impact nails x 80 mm long @ 300 mm c/c to a height of 1,8 m. The interface gap must be sealed with an approved polyurethane sealant.

### **BD 03.05.05      Expansion joints**

Expansion joints for glazed wall tiling shall be provided at 3,5 m centres maximum (vertically and horizontally). The joints shall be 5 mm wide. Prepare the joints by

cleaning them thoroughly. The joints shall be primed and sealed with an approved one component 5 x 5 mm white polyurethane joint sealant.

Expansion joints for ceramic wall tiling shall be provided at 4 m centres maximum (vertically and horizontally). The joints shall be 10 mm wide maximum. Prepare the joints by cleaning them thoroughly. The joints shall be primed and sealed with approved one component 10 x 10 mm white polyurethane joint sealant.

## **BD 03.06      WINDOWS**

### **BD 03.06.01    General**

All windows shall be inspected to assess the level of workability, paying special attention to hinges, handles, stays, catches, etc. Should any window be found unsuitable due to damage to the frame, opening section or any other part thereof, such window shall be replaced.

The Engineer shall take great care to make sure that the appropriate waterproofing details are applied strictly to ensure adequate protection against any water penetration.

### **BD 03.06.02    Steel windows**

The Engineer shall inspect for any deficiencies in residential and industrial type steel windows and cell windows. Where necessary, windows shall be serviced and repainted in accordance with Technical Specification BJ: Paintwork.

### **BD 03.06.03    Burglar bars to steel windows**

Where manganese bars are incorporated in the fixed mullions of the windows, this shall be done in such a way that the bars are not wider apart than 15 cm/centre. The bars shall have at least a section of 30 x 16 mm, penetrating at least 100 mm in the lintels and sills. Heavy duty burglar bars shall be 15 mm diameter or 12 mm square. Loose burglar bars shall be site welded to the window frames.

### **BD 03.06.04    Timber windows**

All wooden windows are to be inspected and treated according to the condition of the timber as stipulated in Technical Specification BJ: Paintwork.

### **BD 03.06.05    Aluminium windows**

When working with mortar or plaster great care shall be taken to protect all aluminium sections from staining by applying a film protector or motor oil on the aluminium surface.

## **BD 03.07      GLAZING**

### **BD 03.07.01    Glass**

Cracked and broken glazing shall be replaced. The glazing and fixing of glass in buildings shall be carried out strictly in accordance with SANS Code of Practice 0137.

### **BD 03.07.02    Putty**

Care shall be taken to remove all chipped, flaked or damaged putty. The Engineer shall indicate on site which putty must be replaced.

All new putty shall comply with the requirements of the SANS Standard Specification 680. The putty shall be delivered on the site in sealed containers marked with the SANS mark.

Type I putty as specified shall only be used for glazing in wood sashes and Type II only in steel sashes.

Paintwork on putty shall not commence until putty has properly dried out, which may necessitate the addition of an accelerating agent. The Contractor shall therefore take programming of trades in Port of Entry areas into consideration.

**BD 03.08**      **DOORS**

**BD 03.08.01**   **General**

All existing doors shall be inspected for the general condition and integrity of hinges, locking mechanisms, etc.

All steel doors shall comply with the requirements of SANS Standard Specifications 727 and 1129 and section 13 of OW 371.

All new external doors are to be fitted with 1½ pair heavy duty hinges.

Door signage, such as door numbers, etc, shall be in accordance with Technical Specification BH: Fittings, and the Schedule of Quantities.

Special attention shall be given to the condition of striker plates and hinges that need to be replaced, or properly secured where possible. Doors shall be painted to the requirements of Technical Specification BJ: Paintwork.

**BD 03.08.02**   **Doors, sidelights and fanlights**

All wooden stock doors shall comply with the requirements of SANS Standard Specification 545 and section 8, clauses 8.33 and 8.34 of OW 371.

**BD 03.08.03**   **Flush doors**

The Contractor shall inspect all doors, internal and external. Where any door needs to be replaced, such door shall be a 40 mm thick solid laminated door as specified for interior or exterior use and shall be capable of withstanding the raking, deflection, puncture and moisture resistance tests for the desired application.

Unless otherwise specified, face veneer shall be rotary cut, and shall be of the timber specified, or where doors are to be painted, shall be of timber suitable for painting. Painting shall be done in accordance with Technical Specification BJ: Paintwork, and the Schedule of Quantities.

Edge strips for concealing the vertical edges of doors shall be of the same timber as the face veneer and for single doors and hinge edges of double doors not be less than 10 mm thick, and for rebated meeting edges of double doors not less than 20 mm thick. The top and bottom edges of doors showing end grain shall be sealed with lacquer or other suitable material if the edges were disturbed in any way.

**BD 03.08.04**   **Toilet doors in ablutions**

Doors showing signs of erosion due to water penetration shall be either replaced or cut short 150 mm from finished floor level. If the existing semi-solid door panel is to be retained, it should be cut short 150 mm from the floor level. A 38 x 50 mm SAP insert must be glued and nailed in at the bottom edge. The steel frame must also be cut short and filled in with grout at the cut edges and fixed to the wall with 2 x 8 mm diameter heavy duty impact nails.

**BD 03.09      IRONMONGERY****BD 03.09.01      General**

All ironmongery shall comply with the requirements of section 11 of OW 371. All ironmongery shall be approved by the agent/representative before fixing. Articles shall be fixed with screws of similar metal and shall be eased, oiled, adjusted and left in perfect working order on completion.

All ironmongery shall be inspected to assess the level of workability, paying special attention to door handles, locks, door closers, door stops, door catches, fixing of these fittings, etc. Should any of these fittings be found unsuitable due to damage, corrosion, etc, they shall be replaced. Where existing holes in wood are worn out, these holes must be plugged with wood to receive the screws.

Toilet doors in ablutions must be fitted with approved D-type natural anodised aluminium pull handles and 150 x 150 mm plate. Install 15 mm diameter concealed steel roller ball catch with chromium-plated striker plate with circular hole for roller ball catch. Fix this plate to door frame with two aluminium pop rivets.

**BD 03.09.02      Door locks**

Each lock shall be provided with two keys and no key shall pass a second lock. All mortice locks, mortice latches and night latches, rim and cylinder rim night latches, and escutcheon for locks shall comply with the requirements of the SANS. The Contractor shall supply all screws, etc, required for completion of the work.

**BD 03.09.03      Cupboard doors**

Where required according to the Schedule of Quantities, built-in cupboard doors in sleeping quarters are to be provided with 2 x angle iron sections of 35 x 80 x 3 mm thick x 10 mm diameter hole for a padlock that must be fixed to the inside of the cupboard door.

Locker doors shall be provided with a 50 x 50 x 5 mm thick mild steel angle x 10 mm diameter hole for a padlock site welded to the locker.

**BD 04              DETAIL OF REPAIR WORK**

The detail of the work is described in the Schedule of Quantities.

**BD 05              MAINTENANCE**

No maintenance will be required for walls under this contract.

**BD 06              MEASUREMENT AND PAYMENT****BD 06.01      MEASUREMENT AND RATES****BD 06.01.01      General inclusion of costs and specific specifications****Notes:**

Where applicable, standard SANS 1200 measurement and payment items shall be used for Earthworks (Small Works) (1200 DA), Site Clearance (1200 C) and Concrete (Structural) (1200 G).

All material scheduled to be removed shall be deemed to be existing damaged materials in small or large sections. All such redundant material shall become the property of the Contractor and must be removed from site immediately.

All new material shall be deemed to be in patchwork and shall be of approved equal quality, colours, profiles, thickness, etc and shall in all cases match the existing materials and shall be fixed (internally or externally) to existing material, frames or surfaces.

All replacement, removal and repair work shall be done carefully as to not damage any adjacent or other material or work. Any damage to other or adjacent materials or areas caused by the negligence of the Contractor shall be repaired by him free of charge.

All work scheduled to be replaced shall be deemed to include for the careful removal of the damaged existing material as a whole or partly, as specified, for the cleaning and preparation of the remaining surface(s), frames, etc as well as for the new material scheduled or specified to replace the damaged material.

All work scheduled to be removed, hacked off, or taken out shall be deemed to include the cleaning and preparation of the remaining surfaces, areas where material were removed, or remaining work to receive new material or work specified.

Repair and service work shall also include all removing, cutting, grinding, cutting into, welding, bending, strengthening, drilling, tightening, fastening, oiling, greasing, adjusting and providing missing or damaged screws or bolts, etc to repair and service or to improve the items or areas as new and to match the existing. The servicing of windows will be measured in number irrespective of the type of window or the amount of opening sashes present in the overall window size. The rates tendered for servicing of windows or similar items shall be deemed to include for servicing all opening sashes and the total overall frame. The rates tendered for servicing of doors or gates shall include the service of all locks, handles etc.

Work scheduled to be realigned and refixed shall be deemed to include all necessary new additional materials, brackets, connector plates, bolts, pip rivets, nails, screws, spacer blocks, clamps, timber, and labour, etc to leave the items as new and totally functional.

All new work are measured net and shall include all cutting, lapping, waste, bending, fixing, corners, mitres, fixing screws, pip rivets, nails, adhesive, grout, putty, etc, as well as cleaning and preparation of surfaces not already prepared as part of removed items, etc. The supply and installation of new window handles, pegs, stays, etc as well as the service of windows shall include for sealing all bolts and screws of handles, stays, etc with epoxy after fixing or tightening into positions. The rates tendered for installation or replacement of burglar bars on window frames shall be deemed to include for installation or replacement of burglar bars on all opening windows on the total overall frame.

The removal of doors, gates or windows shall include for the removal of all existing locks, handles, striking plates, etc but exclude the hinges, etc, which shall be used for the new replaced items. All repair work (excluding paintwork) around and in the thresholds of new door frames, gates or windows build into existing brickwork in new or existing positions shall be deemed to be included in either the rates tendered for the new replacement item or the removal payment item of the frame, window, etc.

The new doors to toilets and wet areas as specified shall be fitted with rubber door stops, D-profiled pull handle and backplate sets, 15 mm roller ball catches with striking plates and all other ironmongery needed to install the doors complete. All new ironmongery shall be measured and paid for separately.

The new doors to offices, etc, as specified shall be fitted with rubber door stops, 4 lever mortice locksets with handle sets to match existing, striking plates and all other ironmongery needed to install the doors complete. All new ironmongery shall be measured and paid for separately.

All ironmongery installed on the project shall bear the SANS approved trademark and codes. Samples of all ironmongery scheduled must be according to the samples of the Department of Public Works and samples must be handed to the engineer for approval before ordering the material.

All brickwork shall include for damp proofing membranes, galvanized brickwork reinforcement to every third course, wire ties and wall anchors as needed.

Tile work to walls shall include all cutting, spacers, waste, jointing, mitres, corners, epoxy grout and joint filler.

Ordering of certain specified material i.e. NCI industrial type wall tiles needs special and urgent attendance and should be ordered timeously as to prevent any construction delays.

All new glass mirrors shall be silvered float glass copper backed mirrors with polished edges all round and shall, unless otherwise scheduled, be fixed to walls with chromium plated dome capped mirror screws with rubber buffers.

#### **Specific specification : Repairs to galvanised IBR roofs**

Repairs to the workshops and store room roofs will include the following work and all work must be carried out in accordance with the Technical Specification BA: Roof Coverings.

- (a) Inspect the roof for defects.
- (b) Fasten loose nuts on hook bolts.
- (c) Replace damaged and/or severely corroded washers (allow for  $\pm 30\%$  of all washers to be replaced). The remainder of the existing washers must be painted with an approved rust converter and a grey colour pure acrylic paint system.
- (d) Insert sealer strips on all loose side laps.
- (e) Stitch side laps together with Leak Plugs for IBR roof cladding (2 between every hook bolt; purlins are spaced at approximately 1,86 m c/c).
- (f) Install new 0,8 mm thick apex trim at the workshops for the length of each bay size 616 mm girth (286 + 300 vertical + 20 + 10 vertical) with Craft-Lock type apex trim fixing brackets. The apex trim 4 x bend (1 is a shallow bend) and fixed to roof sheeting with stitching screws and washers, and to 260 mm vertical x 140 mm (at slope) x 25 mm wide x 2,5 mm thick with 25 mm lip galvanised bracket. The galvanised bracket to be screwed and fixed to roof cladding in trough with 2 galvanised gutter bolts. The spacing of the brackets is 1029 mm. 150 mm overlap fixed and sealed with 2 rows of pop rivets and 2 rows of silicone. Bend up trough to form dam.
- (g) Side wall flashings: Inspect existing flashings. All loose flashings must be sealed with two rows of silicone and stitched together with no.10 stitching screws. Counter flashing to be sealed with silicone in brick wall. Existing sealant to be removed. Prepare groove to manufacturer's specifications to receive new joint sealant.
- (h) Ridge flashings: Inspect existing flashings. All loose flashings must be sealed with two rows of silicone and stitched together with no.10 stitching screws.
- (i) Holes (small diameter) in cladding to be sealed with Leak King plugs.

- (j) Replace existing galvanised gutters and down pipes with new 125 x 100 x 0,8 mm thick Chromadek gutters with 100 x 100 x 0,8 mm thick Chromadek rainwater down pipes spaced at approximately 6 to 7 m intervals.

**Specific specification : Repairs to concrete gutter at workshops**

- (a) The existing  $\pm 305$  mm x 400 mm deep concrete box gutters must be waterproofed with a fully bonded waterproofing system to Technical Specification BC: Waterproofing. Prepare the existing cement screed surface by cleaning it and replacing decayed cement screed with new screed. The waterproofing membrane must be dressed over the top ends of the concrete upstand beams of the gutters and down into down pipes. All sharp concrete corners must be chamfered adequately to suit waterproofing membrane requirements.
- (b) The existing expansion joints in the box gutter must be cleaned and prepared to receive joint sealant. The edges of the concrete must be chamfered to comply with waterproofing manufacturer's requirements. Insert 35 mm diameter "Cordex" or equivalent approved backing cord for 25 mm wide joint. Prime joint and seal joints with 25 mm wide x 15 mm thick approved poly-urethane joint sealant applied strictly according to manufacturer's specifications. The top surface of the joint sealant must be recessed adequately into joint to allow for a closed cell polyethylene foam strip that will accommodate movement of the waterproofing membrane.

Dressing to expansion joint will comprise of additional strips of reinforced waterproofing membranes that are lapped and sealed to manufacturer's specifications. The Contractor must submit detail for approval to the Engineer prior installation.

**Specific specification : Repairs to roller shutter doors**

- (a) Replace the whole bottom T-bar including the bottom  $\pm 17$  galvanised slats of the existing roller shutter doors with a new galvanised T-bar (bottom rail) with neoprene weather strip. The Contractor must measure the width of the door (approximately 3000 mm) and the opening width of the wicket door prior ordering the new bottom T-bar and new galvanised slats ( $\pm 76$  mm high x 1,2 mm thick). When the new bottom T-bar has arrived on site, the Contractor must remove the existing bottom T-bar and slats and slide in the new T-bar and slats.
- (b) Provide and insert end locks on the ends of door curtains.
- (c) Repairing shall include fixing of missing bracket bolts, screws and pins, brackets, fittings such as locks, loose ratchet and pawls, and brackets. Loose bracket bolts that have broken out of walls shall be replaced with 175 mm long x 12 mm diameter threaded rods that must be anchored to the walls with an approved epoxy grout.
- (d) Repairing bent and fixing of damaged steel plates of canopy covers.
- (e) Repairing gearbox, gear handle, drive shaft, pinions and bevel gears.

**Specific specification: Servicing and adjustments to roller shutter doors**

- (a) All other door components shall be serviced, adjusted, repaired and replaced, but not restricted to, for the full repair of the complete door installation to a smooth working condition. The door sizes is approximately 3000 mm wide x 3500 mm high. The existing interlocking slats are 76 mm wide.

- (b) Servicing shall include cleaning and oiling of hinges, rollers, bearings, gears, channel guides and locks. Interlocking slats of the roller shutter curtains shall only be washed with a high-pressure water jet and detergent to remove all dirt, grease, etc.
- (c) Adjusting, fixing and realigning of door guides. The existing channel guides, approximately 76 mm wide shall be bent straight to allow free and smooth movement of the roller shutter door slats. The Engineer shall give the necessary instructions where severely damaged channel guides must be replaced.
- (d) Adjusting and balancing torsion springs, barrel collar and counter balance.

**Specific specification : Welding of thin steel plates**

Thin steel plates covering the external side of doors must be welded to the door frame members. The existing paint must be removed from the welding areas prior to site welding. A coded or experienced welder must submit the proposed welding procedure to the Engineer for approval. The aim of the site welding is two fold, viz to fix the steel plate to the frame and secondly, to prevent water ingress into the inside of the door. The perimeter of the individual plate sections of the door must be sealed with continuous impervious welds.

**BD 06.02      SCHEDULED ITEMS**

**NEW WORK**

**BD.01      Doors and windows:**

- (a) (Type of doors, windows, locks, etc and material indicated):

- (i) Description of item..... Unit : number

The unit of measurement shall be the number of doors, windows, locks, etc installed complete as specified.

The tendered rates shall include full compensation for the manufacturing and installation of the steel doors, windows, locks, frames, etc complete with hinges, handles, locks, barrel bolts, retaining devices, door stops, stays and any other work necessary to complete the work as specified, scheduled or as shown on the Drawings. The tendered rates for windows shall also include full compensation for glazing, window sills and damp-proof sheeting as specified or to match existing.

**BD.02      Wall & Floor panelling:**

- (a) Description of material to be used:

- (i) Description of item and/or position to  
be fixed ..... Unit m, m<sup>2</sup>, number

The unit of measurement shall be the number, metre, etc for each item as scheduled.

The tendered rates shall include full compensation for all costs of material, waste, labour, plant, transport, delivery, access, scaffolding, fuel, etc to install the material as specified and to match the existing to the Engineer's approval.

**BD.03      Joinery:**

- (a) Items measured by number:



- (i) Doors, etc (type and size indicated) .....Unit: number
- (ii) Etc for other items measured by number
- (b) Items measured by linear metre:
  - (i) Skirting, etc (type and size indicated)..... Unit: m
  - (ii) Etc for other items measured by length
- (c) Items measured by area:
  - (i) Eaves covering, etc (type and thickness indicated) .....Unit: m<sup>2</sup>
  - (ii) Etc, for other items measured by area

The units of measurement shall be the number, metre or square metre of each type and/or size of joinery item specified.

The tendered rates shall include full compensation for the supply of all materials, manufacture, cutting, waste, fixing and installation of the joinery items.

#### **BD.04**

##### **Ironmongery, steelwork, glass, wall finishings, etc:**

- (a) Measured by number:
  - (i) (Description of item) .....Unit: number
  - (ii) Etc
- (b) Measured by linear metre:
  - (i) (Description of item) ..... Unit: m
  - (ii) Etc
- (c) Measured by area:
  - (i) (Description of item) ..... Unit: m<sup>2</sup>
  - (ii) Etc

The unit of measurement shall be the number, metre or square metre as applicable to each item.

The tendered rates shall include full compensation for manufacturing, providing and installing each item to new or existing steel, wood or plaster complete as per specifications, drawings, descriptions as scheduled or as the existing and shall include for all labour, material, waste, plant, transport, delivery, access, scaffolding, fuel, etc to the Engineer's approval.

##### **ALTERATION WORK**

#### **BD.05**

##### **Corrective work to existing structures:**

- (a) Indicate if repairs, replace, alterations, removal or sealing, etc:
  - (i) Description of individual items to be repaired, altered, removed, sealed, etc ..... Unit: m<sup>3</sup>, m<sup>2</sup>, m, number

The unit of measurement for items repaired, replaced, altered, removed, sealed, etc shall be the cubic metre, square metre, metre or number for each item as scheduled.

The tendered rates shall include full compensation for all costs to repair, replace, refix, remove, build, cutting into, re-align, taking off, temporary store, etc as specified in the Standard and Technical Specifications and shall allow for all necessary labour, plant and new material needed to do the specified work and to leave the scheduled items as new and to the approval of the Engineer. Refer also to the general inclusion of costs in BD 06.01.01.

## **TECHNICAL SPECIFICATION**

### **BE FLOORS**

#### **CONTENTS**

BE 01	SCOPE
BE 02	STANDARD SPECIFICATIONS
BE 03	VARIATIONS AND ADDITIONS TO STANDARD SPECIFICATIONS
BE 04	DETAIL OF REPAIR WORK
BE 05	MAINTENANCE
BE 06	MEASUREMENT AND PAYMENT

#### **BE 01 SCOPE**

Floors shall mean the scope of work to repair materials and components such as removal of existing floors and installation of new floor coverings, skirting, screeds, concrete floors and paving. This specification does not include work related to metalwork and paintwork, which are specified elsewhere.

This specification covers the removal of existing floor coverings, screeds and concrete surface beds, the repair of existing floor coverings, screeds and concrete surface beds. This specification also covers the supply, delivery and installation of new floor coverings, screeds and concrete surface beds for various types of buildings.

The complete scope of repair work shall as described in BE 04: Detail of repair work.

#### **BE 02 STANDARD SPECIFICATIONS**

##### **BE 02.01 GENERAL STANDARD SPECIFICATIONS**

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:

OW 371	-	Specification of Materials and Methods to be used (Fourth edition, October 1993)
SANS 281	-	Hardwood block and strip flooring
SANS 581	-	Semi-flexible vinyl floor tiles
SANS 786	-	Flexible vinyl flooring
SANS 978	-	Wood mosaic flooring
SANS 10070	-	The laying of thermoplastic and similar types of flooring
SANS 10043	-	The laying of wood floors
SANS 10186	-	The laying of textile floor coverings
SANS 1449	-	Ceramic wall and floor tiles

##### **BE 02.02 ADDITIONAL SPECIFICATIONS**

Technical Specification BF: Structural concrete  
Technical Specification BG: Metalwork

**BE 02.03      OCCUPATIONAL HEALTH AND SAFETY ACT**

The Contractor shall be required to comply with the Occupational Health and Safety Act 85 of 1993, Construction Regulations 2014 and related regulations. Non-compliance with these regulations, in any way whatsoever, will be adequate reason for suspending the Works.

**BE 03      VARIATIONS AND ADDITIONS TO STANDARD SPECIFICATIONS****BE 03.01      ADDITIONAL REQUIREMENTS FOR REPAIR OF FLOORS****BE 03.01.01      Floor coverings**

Existing floors shall be inspected to determine the extent of any damaged floor areas. The existing floors and other building elements shall be protected from damage during the progress of any repair work and on completion shall be cleaned and handed over in a perfect condition. Only skilled workmen experienced in laying any type of floor finishes shall carry out the work.

**BE 03.01.02      Preparation of floor slab and surface beds for new floor screeds**

The existing concrete screed shall be removed in patches designated by the Engineer.

All laitance on the surface of the existing surface bed must be removed completely. Mechanised plant such as scabblers or abrasive blasters must be used. The Contractor shall take all necessary precautions to keep dust pollution to a minimum inside the building during the breaking out and removing of existing concrete screeds, as well as during the preparation of the existing concrete surface bed.

After the mechanical cleaning of the slab surface to expose the coarse aggregate, all dust and debris must be removed, and the surface must be thoroughly wetted and kept wet for at least 12 hours before application of the new concrete screed.

**BE 03.01.03      Surface preparation of existing floor screeds for new floor coverings**

The following procedure is suggested where vinyl tiles were laid with bitumen adhesive:

- (a) The Engineer will specify the where existing vinyl tiles are to be removed.
- (b) The bitumen must be removed mechanically and/or chemically. Remove as much bitumen and other contamination as possible by scraping. Bitumen can be heated to soften it.
- (c) Sweep or vacuum sub-floor thoroughly to remove dust and grit.
- (d) An approved solvent based degreasing and cleaning compound can be used to remove the bitumen chemically. The Contractor shall ensure the safety of the workers and the building against possible fire.
- (e) The concrete surface must be smoothened. Even the surface with Pavelite or approved equivalent before laying the new vinyl tiles. The Pavelite must be applied in accordance with the manufacturer's specifications.
- (f) Vacuum clean the floor surface again before the adhesive is applied to lay the vinyl tiles.

**BE 03.01.04    Cement screed**

Cement screed shall be carried out in accordance with clause 14.18 of OW 371. The Engineer shall determine which existing cement screeds are to be replaced. The cement screed shall have a maximum thickness of 30 mm. Where required the cement screed shall be modified with an approved alkali compatible acrylic emulsion by preparing the cement screed with a mixture of the latex and water in the required ratio.

Before the new screed is applied, remove all surface water from the slab. Apply a bond coat to the slab/surface bed, consisting of a 1:1 mix of cement and clean fine sand with just enough water to provide the consistency of slurry. Mix in equal parts an approved alkali compatible acrylic emulsion specially modified for use in cement mortars with water, and add Portland cement to form the slurry. Spread the bond coat evenly using a stiff fibre brush. Do not leave standing pools. Place screed in good time (before the bond coat dries out). The screed must be laid and compacted in one layer.

Curing should commence as soon as the finishing operations have been completed and should be continued for at least 7 days. The Engineer must approve the method of curing.

Joints must be formed in the screed at all existing contraction and expansion positions, as well as at intermediate positions at 3 m spacing maximum.

**BE 03.01.05    Concrete screeds****(a)    General**

Concrete screeds shall have a minimum thickness of at least 50 mm. The Engineer shall determine the areas of which the concrete screeds need to be replaced.

Only ordinary Portland cement, CEM 1 42,5 in accordance with SANS ENV 197-1, shall be used.

Coarse aggregate maximum size:	10 mm
28-day cube strength:	35 MPa.

The use of an approved plasticizer is recommended to reduce the water content of the mix to the absolute workable minimum.

The mix design must be submitted to the Engineer in advance for approval.

Four sets of six test cube samples shall be taken for every factory for the testing of the compressive strength of the concrete.

**(b)    Concrete floor hardener**

Concrete natural non-ferrous aggregate floor hardeners shall strictly be applied in accordance with the manufacturer's specification and under his supervision.

Note: The Contractor shall furnish a certificate of compliance, together with a written guarantee after completion.

**(c)    Compressive strength**

At 7 days:	50 MPa
At 28 days:	70 MPa

All other aspects of the construction of new concrete screeds shall be adhered to as specified in Technical Specification BF: Structural concrete.

**BE 03.01.06 Laying of material (ceramic excluded)**

The laying of vinyl and similar flooring material in tile and sheet form and the fixing of plastic skirting, nosing, etc, shall be carried out in accordance with SANS 1043 and section 10, clause 10.3 of OW 371.

The laying of wood block and wood mosaic flooring shall be carried out in accordance with SANS 1043 and section 10, clause 10.2 of OW 371.

The laying of textile floor coverings shall be done in accordance with SANS 10186.

Vinyl floor tiles shall be laid with continuous joints in both directions. Tiles shall be cut with a "jointer" at saw and expansion joints. Tiles laid over these types of joints will not be permitted. Only latex-resin type adhesive shall be allowed to glue tiles to the concrete screed or surface bed.

**BE 03.01.07 Granolithic screed finish**

Granolithic screed finish to floors, treads of steps, thresholds and similar surfaces, unless otherwise specified, shall not be less than 25 mm thick. The granolithic screed shall be composed of three parts granite, or other approved hard stone chips, or approved hard, coarse sharp washed granite or quartzite sand, half part clean sand and one part of cement, hand or mechanically trowelled to a true and smooth surface. No dry cement powder, grout or wet slurry mix shall be applied to the surface.

New granolithic screed shall be laid before the concrete surface bed or floor matures in order to allow for proper binding. If this is not possible, then the top of the surface bed or floor shall be hammered, chipped and then cleaned with a wire brush and a coat of neat cement grout applied immediately before the granolithic is laid.

The granolithic shall be laid in panels not exceeding 6 m<sup>2</sup> in area and jointed to lines of panels with V-joints. The joints between the panels shall coincide with joints in the concrete surface bed or floor.

Granolithic finish to stair risers, sides of curbs and other vertical surfaces shall, unless otherwise specified, not be less than 12 mm thick.

All granolithic work shall be done by experienced workmen only and shall be protected from damage caused by rain or other extreme weather for 12 hours after being laid. Protection shall be provided against too rapid drying whilst hardening by means of covering with wet sacks or other suitable material. The screed shall also be protected from damage and discoloration during the progress of the remaining work.

Edges of granolithic floor butting against different floor finishes and edges of margins, etc, shall be true and sharp, and shall be protected by fixing temporary wood strips which shall remain in position until the laying of the adjoining floor has commenced.

Where a non-slip granolithic floor finish is required, the granolithic shall be laid as specified above. Alundum grit shall then be sprinkled over the surface at the rate of 1 kilogram per square meter, lightly tamped in and allowed to set.

**BE 03.01.08 Vinyl floor finishes**

Existing floors should be inspected and where vinyl tiles need to be replaced, such tiles shall comply with the requirements of SANS 786, and be 300 x 300 x 2 mm thick unless otherwise specified. The flooring shall be of marbled pattern and of an approved colour (to be specified by the Engineer).

Vinyl floor tiles or sheets shall be laid with an adhesive recommended by the manufacturer. All the preparation and work in connection with the laying and fixing of the specified flooring and vinyl skirting shall be done in accordance with SANS 1070 and to the satisfaction of the Engineer.

The flooring shall, where necessary, be cut and neatly fitted against adjoining floors, thresholds, etc. Where required the Contractor shall carefully remove existing timber floor skirting and/or quarter rounds for re-use where vinyl tiles are laid against walls. Reinstall skirting and/or quarter rounds.

Vinyl floor tiles shall, unless otherwise specified, be laid with continuous joints in both directions and vinyl floors shall, unless otherwise specified, be in standard widths with cut sheets at sides of floors as necessary, all to the entire satisfaction of the Engineer.

The vinyl flooring and skirting shall be covered up and protected from damage during the progress of remaining work and on completion be cleaned and, unless otherwise specified, polished with the type of polish recommended by the manufacturer of the vinyl flooring.

#### **BE 03.01.09 Skirting**

Loosened hardwood skirting must be cleaned and where necessary removed and/or replaced by 76 x 19 (or 25 mm) mm thick hardwood skirting with one rounded top edge plugged to the wall. Painting shall be in accordance with Technical Specification BJ: Painting.

In selected areas skirting shall be 100 mm high x 6 mm thick unglazed ceramic tiles glued to walls with an approved cement grout. The Engineer shall specify these areas.

Vinyl cove skirting shall be of approved manufacture and colour and, unless otherwise specified, be 70 mm high.

#### **BE 03.01.10 Sealing of vinyl flooring**

The newly laid tiles shall, after four days, be scrubbed with a diluted neutral detergent/stripper complying with SANS 825 and rinsed thoroughly. After the floor has dried, apply two coats polymer/acrylic sealer combination containing a minimum of 22 % solids using an applicator pad. Ensure that the surface has set hard before allowing traffic on the floors.

#### **BE 03.01.11 Wood block floors**

##### **(a) Replacement of wood block floors**

Where required, wood blocks that must be replaced shall, unless otherwise specified, be Clear Grade, Class H with nominal sizes of 75 mm wide, 225 mm long and 20 mm thick, and shall comply with the requirements of SANS 281. Wood blocks that are loose must be re-laid using an approved hot or cold adhesive after the old bitumen has been removed and the surface prepared.

The moisture content of the blocks shall be as specified in the above-mentioned specification, and the blocks shall be treated with timber preservative as specified. The blocks shall, unless otherwise specified, be laid to a basket pattern with an approved hot or cold adhesive and shall be sanded on completion all in accordance with the SANS Code of Practice, SANS 1043 and to the satisfaction of the Engineer

Wood block floors shall be covered up and protected from damage during the progress of the remaining work, and unless otherwise specified, a sealer shall be applied to the final sanded surface and then polished all in accordance with the above-mentioned Code of Practice.

(b) Partial repairs to parquet floors

Only severely loose wood blocks identified by the Engineer shall be repaired. The Contractor shall carefully remove the wood blocks for re-use. Scraping and any other suitable means shall be used to remove the old bitumen. The concrete surface bed or cement screed shall be cleaned from dust and bitumen residue as specified in BE 03.01.02. If the concrete or cement screed is in a poor condition, the poor patches shall be removed according to BE 03.01.04. The Contractor will be allowed to use rapid hardening cement grouts to reduce drying time of concrete and cement screeds in order to suit the working programme. The screeds must be laid at such a level as to enable the workmen to lay the cleaned wood blocks at the same level as the surrounding wood flooring blocks. The cleaned blocks shall be laid in a basket pattern (or the same existing pattern) with approved hot or cold bitumen at the same level as the surrounding blocks. Missing blocks must be replaced.

**BE 03.01.12    Sealing of timber floors**

Existing timber floors must be mechanically belt-sanded to remove all traces of existing sealer in strict compliance with SANS 1043. Where necessary, existing flooring, skirting and quarter rounds should be temporarily removed. Before applying the new wooden floor sealer, ensure that the surfaces are dry, sanded smooth and free from varnish or oil. Vacuum the dust from the prepared floor surfaces.

Apply three coats of clear, lead free wooden floor sealer with preservative and anti-fungicidal properties according to the manufacturer's specification.

Apply the first coat until an even glossy, wet surface is achieved. Leave to dry thoroughly. Apply at least two other coats in the same way, and finally a fourth and final coat. It is proposed that the Contractor first do a trial section to satisfy himself that he can handle this procedure. The final appearance of the wooden floor must be smooth and have a uniform non-gloss finish.

Reinstate skirting and quarter rounds.

**BE 03.01.13    Tiling (general)**

Tiles shall be solidly bedded and jointed in cement mortar and, unless otherwise specified, joints shall be 6 mm wide.

The joints in all tiling are to be continuous in both directions. The pointing is to be carried out by well pressing in half-dry cement mortar. Under no circumstances may liquid cement grout be used for pointing.

All tiling shall be properly covered and shall be protected against any possibility of staining, discolouring or any other damage.

At completion, all tiling is to be exposed, checked for damage, repaired where necessary and cleaned off with soft soap and cold water and left in a perfect condition. The application of oil on tiling is not allowed.

**BE 03.01.14    Ceramic and quarry floor tiles**(a) General requirements

The Engineer shall determine which tiles need replacement. The existing floor screed and floor tiles must be removed in patches and/or areas as determined by the Engineer.

Ensure that the base for floor tiling is rigid, stable and level unless required to have a fall in one or more direction(s). The surface preparation and cement screed (if required) are described in BE 03.01.03 and BE 03.01.04 respectively.



When proprietary brand adhesives are being used for fixing ceramic floor tiles it is essential that the surface to which the tiles are to be fixed is clean, dry, flat and true.

Lay approved unglazed ceramic split floor tiles (230 x 115 x 11,5 mm thick and of a selected or matching colour) in professional floor grouting with 8 - 10 mm wide joints. The floor grout must be applied with a 10 mm square notched floor trowel evenly over an area not exceeding 1 metre at a time. Coved skirting tiles including external and internal skirting corners must be laid against walls in abattoirs. Setting out must be done correctly. The finished installation must be level plumb and true unless specified otherwise. In abattoirs the floor tiles must be laid to specified falls.

Mortar beds for dust-pressed tiles and quarry tiles shall be formed with a slurry of 1:1 cement and clean fine sand to a thickness of about 3 mm on an area not exceeding 1 metre at a time. The joints will be 6 - 8 mm wide depending on the size of the tile.

The tiles must be laid in professional cement-based powder adhesive, strictly in accordance with the manufacturer's specifications. The Code of Practice for the fixing of tiles in accordance with SANS 1449 and the recommendations of the South African Ceramic Tile Manufacturer's Association (SACTMA) shall be followed. Important points to be taken into consideration is are summarised below:

- (i) Sufficient time must be allowed between building operations.
- (ii) Drying periods for backgrounds and substrates must be strictly adhered to.
- (iii) No tiling may commence prior to the prescribed time.
- (iv) All tiles must be correctly bedded. The tiles must be properly bedded into a fixative that is spread evenly to the required thickness using a square notched rubber mallet (10 mm for ceramic tiles). Bed the tiles dry and move firmly into position, ensuring that they are in proper overall contact with the bed, and form an even surface.
- (v) A minimum of 6 - 10 mm grouting joints must be allowed between extruded and split tiles (3 mm minimum for pressed tiles). Ensure that the joints are free of tile adhesive and any foreign matter.
- (vi) Tiling installation: Setting out and finished installation must be done correctly.

(b) Filling of joints

Do not fill joints between tiles until at least 24 hours after the tiles have been bedded. Before applying the joint epoxy grout ensure that the joints are free of tile adhesive residue and any foreign matter. Apply the approved epoxy grout into the tile joints. The finishing-off must be completed with a wetted nosing tool or spatula so that a smooth glazed surface finish can be achieved. Application of the epoxy grout must be done strictly in accordance with the manufacturer's specifications. Finally, the tiles must be thoroughly cleaned.

**BE 03.01.15    Movement joints in tiling**

(a) General requirements

Movement joints are to be provided in tile work due to moisture expansion, thermal expansion and contraction, and crack control at existing expansion joints in the surface bed.

- (i) Provide movement joints in the tile work, screed and bedding down to the concrete surface bed or slab. The spacing of these joints depends on the position of existing joints, column and wall layouts and slab thickness. The maximum spacing of joints should be limited to 30 times the slab (surface bed) thickness or 4,5 m, whichever is the lesser. The length-to-width ratio of tile panels should be limited to between 1,0 and 1,5.
- (ii) Provide isolation joints around the perimeter of the floor, around columns, walls and other fixed structural elements.
- (iii) Joints shall be aligned with no offsets. Irregular shape tile panels must be avoided. Where included angles are unavoidable, it should be less than 60 degrees.
- (iv) The width of the joint shall be 6 mm minimum and 10 mm maximum. Provide an approved closed-cell expanded polyethylene foam joint filler with a hinged temporary blocking piece in the movement joints. The size of the blocking piece must be the same as the joint width.

(b) Joint sealing

The joints shall be prepared and primed prior the application of the joint sealant.

The liquid sealant in joints shall be an approved one part grey polyurethane sealant with a shore hardness of A45 and an elongation of 400 %. The manufacturer's specifications must be strictly followed.

(c) In abattoirs

Clean and dry all tile surfaces. All loose material must be removed by means of a wire brush or by water while all tile adhesives are cleaned from the edges of the tiles.

Ensure that all traces of release agents, curing compounds and existing joint sealant compounds are removed. Install a suitable closed-cell expanded polyethylene bond breaker cord in the expansion and isolation joints after which the complete substrate is primed with a component solvent free primer which penetrate into the tile and pull all dust particles with it. Proceed with the final application of an approved one part grey polyurethane sealant with a shore hardness of A45 and an elongation of 400 %. The manufacturer's specifications must be strictly followed.

## **BE 02.02      PAVING**

Repairs to paving shall include the improvement of existing paving, drainage channels and the replacement of paving that can not be repaired. Different paving types exist, e.g. concrete, precast paving segmental and regular blocks, bricks and slasto. This specification only covers pedestrian paving around buildings.

The Engineer shall identify the paving areas that are to be repaired. Defects to paving will include but not be limited to the following aspects:

- (a) Failure of subbase material and subsidence of sub-soil due to excessive water erosion;
- (b) Broken and severely damaged paving;
- (c) Distorted and disturbed paving;
- (d) Drainage problems, e.g. ponding of water on the paving and in drainage channels, incorrect falls, etc;
- (e) The omission of edge restraint;
- (f) Intrusion of weed or hostile root penetration.

**BE 03.02.01     Preparing foundation**

If the subbase and/or subgrade have failed, this soft and unstable material shall be replaced. Existing paving must be carefully removed and stack for re-use. The new earth filling shall be of inert material, having a maximum plasticity of 10, free from large stones, etc, spread, leveled, watered and compacted in layers not exceeding 150 mm thick to a density of 95% of modified AASHTO density. Cement stabilization to improve the existing subgrade may be considered to improve the characteristics of the material. The blocks shall be laid true to line, levels and grade on a 25 mm thick layer of approved bedding sand. The bedding sand must not be used to fill hollows in an uneven subgrade or subbase surface. Where specified, plastic sheeting must be provided below the bedding sand layer. Refer also to BE 03.02.06.

The Contractor shall be responsible for carrying out all necessary process control tests on the density and moisture content of the completed subgrade, subbase, etc, to ensure that the required compaction is being attained.

**BE 03.02.02     Laying of segmental block paving**

The existing blocks shall be pre-selected for re-use. Broken and severely damaged paving blocks shall be replaced. New paving blocks shall comply with SANS 1058 Class 30 compressive strength. All blocks shall be laid true to line and level. Care shall be taken to ensure that joint lines are straight and square. The blocks shall have a minimum thickness of 80 mm.

After laying the blocks, the paving shall be compacted by means of vibrating plate compactor with joints between the blocks filled in, after compaction, by sweeping in fine sand. The jointing sand shall have a pass of 1,18 mm sieve and contain 10-50 % material passing the 75 micron sieve. The sand shall be free of all soluble salts or contaminants likely to cause efflorescence or staining.

Areas against curbs, manholes, etc, that require infilling and which exceed 25 % of a full block unit shall be filled with units cut to size using a mechanical or hydraulic guillotine, bolster or angle grinder. Infill areas constituting less than 25 % of a full block area and are of 25 mm minimum dimension shall be filled with 25 MPa concrete. Smaller areas shall be filled with 1:4 cement mortar.

**BE 03.02.03     Laying face brick pavers, precast concrete blocks and slasto**

The existing blocks shall be pre-selected for re-use. Broken and severely damaged paving blocks shall be replaced. All blocks shall be laid true to line and level. Care shall be taken that joint lines are straight and square. Slasto shall be laid in the same pattern to match existing.

After laying the blocks, the paving shall be compacted by means of vibrating plate compactor. Clean the top of the blocks before and after compaction. Thoroughly wet compacted area after compaction and leave 24 hours to dry. The joints between the blocks must be filled in, after compaction, with a 1:4 cement mortar. The joints shall be pointed with a steel tool to a smooth surface finish.

**BE 03.02.04     Laying of cast *in situ* concrete paving and drainage channels**

Severely cracked and/or damaged concrete paving and drainage channels shall be replaced. The Engineer shall indicate which panels and sections of drainage channels are to be removed. Cutting out will be done with an angle grinder or saw cutting machine. Concrete panels must be removed in sizes where the ratio of the sides does not exceed 1:1,5. The foundation material must be improved as specified in BE 03.02.01.

New concrete panels and drainage channels must be cast with a compressive strength of 25 MPa. Concrete paving to the specified thickness must be finished off with a smooth wood trowel surface finish or must match the existing surface finish.

Edges must be finished off with a steel nosing tool with a radius of 5 mm. Expansion joints must be provided where specified. Drainage channels must be cast in lengths not exceeding 1 metre. Channels must be finished off to have a smooth steel trowel finish.

**BE 03.02.05    Precast concrete edge beams, curbs and channels**

Edge restraints shall be installed before paving commences. Edge restraints may be cast *in situ*, or consist of precast units. Precast edge blocks shall have dimensions of 75 mm wide x 300 mm deep. Cast *in situ* beams with 25 MPa concrete shall have dimensions of 300 x 300 mm and cast in lengths on exceeding 1 metre.

Precast concrete curbs and channels shall comply with SANS 927, generally in 1 metre lengths and finished smooth from the mould on exposed surfaces. Curbs and channels shall be bedded on and jointed in 1:3 cement mortar and pointed with keyed joints. Bases to curbs shall be Class B prescribed mix of unreinforced concrete.

**BE 03.02.06    Weed control**

Two types of weed killing shall be carried out:

- (a) Mixing weed killer to subbase for rehabilitated paving;
- (b) Spraying existing paving excluding concrete paving.

After the base course has been approved and the curbing completed, the prepared base must be treated with a weed killer similar or equal to HYVAR X at a rate of 4 kg/m<sup>2</sup>. Plastic sheeting with a thickness of 375 micron shall be laid to prevent the penetration of grass underneath the segmental paving.

**BE 03.02.07    Site clearance**

Excess sand and all other debris shall be removed before the pavement is opened to traffic. The site shall be left in a tidy condition.

**BE 04            DETAIL OF REPAIR WORK**

The detail of the scope of work is described in the Schedule of Quantities.

**BE 04            MAINTENANCE**

No maintenance will be required for floors under this contract.

**BE 06            MEASUREMENT AND PAYMENT**

**BE 06.01        MEASUREMENT AND RATES**

**BE 06.01.01    General inclusion of costs and specific specifications**

**Notes:**

Where applicable, standard SANS 1200 measurement and payment items shall be used for Earthworks (Small Works) (1200 DA), Site Clearance (1200 C) and Concrete (Structural) (1200 G).

All material scheduled to be removed shall be deemed to be existing damaged materials in small or large sections. All such redundant material shall become the property of the Contractor and must be removed from site immediately.

All new material shall be deemed to be in patchwork and shall be of approved equal quality, colours, profiles, thickness, etc. and shall in all cases match the existing materials and shall be fixed (internally or externally) to existing material or surfaces.

All replacement, removal and repair work shall be done carefully as to not damage any adjacent or other material or work. Any damage to other or adjacent materials or areas caused by the negligence of the Contractor shall be repaired by him free of charge.

All work scheduled to be removed, hacked off or taken out shall be deemed to include the cleaning, removing of contact glue or bitumen and preparation of the remaining surfaces, areas where material were removed, or remaining work to receive new material or work specified.

Repair work shall also include all cutting, grinding, cutting into, welding, bending, strengthening, drilling, etc. to repair or to improve the items or areas as new and to match the existing.

Work scheduled to be realigned and refixed shall be deemed to include all necessary new additional materials, brackets, connector plates, bolts, pip rivets, nails, screws, spacer blocks, clamps, timber, and labour, etc. to leave the items as new and totally functional.

All floor surfaces scheduled to be cleaned and sealed shall include for stripping the floors from any fats, grime, dirt, oil and other deposits. Replacement of grout to ceramic and clay floor tiles shall also be included where necessary as per the tendered rate. Sealing of existing vinyl floor tiles shall be done in accordance with Technical Specification BE 03.01.10.

All new work are measured net and shall include all cutting, lapping, waste, bending, fixing, corners, mitres, fixing screws, pip rivets, nails, adhesive, grout, putty, etc, as well as cleaning and preparation of surfaces not already prepared as part of removed items, etc.

Tile work to floors shall include all cutting, spacers, waste, jointing, mitres, corners, epoxy grout and joint filler.

Ordering of certain specified materials i.e. NCI industrial type floor tiles needs special and urgent attendance and should be ordered timeously as to prevent any construction delays.

## **BE 06.02 SCHEDULED ITEMS**

### **NEW WORK**

### **BUILDING WORK**

#### **BE.01 Floor screeds:**

(a) (Thickness indicated) .....Unit: m<sup>2</sup>

(b) Etc. for other thicknesses

The unit of measurement shall be the square metre of floor screed laid, as specified, on floors, steps or areas shown on the Drawings or as designated by the Engineer.

The tendered rates shall include full compensation for the construction of the floor screeds, including the supply of all materials, mixing, laying, finishing, the forming of nosing, reading, skirting, etc.

**BE.02****Joinery:**(a) Items measured by number:

- (i) Doors (type and size indicated .....Unit: number
- (ii) Etc. for other items measured by number

(b) Items measured by linear metre:

- (i) Skirting (size indicated) ..... Unit: m
- (ii) Etc. for other items measured by length

(c) Items measured by area:

- (i) Eaves covering (type and thickness indicated) .....Unit: m<sup>2</sup>
- (ii) Etc. for other items measured by area

The units of measurement shall be the number, metre or square metre of each type and/or size of joinery item specified.

The tendered rates shall include full compensation for the supply of all materials, manufacture, cutting, waste, fixing and installation of the joinery items.

**BE.03****Floor tiling and finishes, etc:**(a) Measured by number:

- (i) (Description of item) ..... Unit: number

(b) Measured by linear metre:

- (i) (Description of item) ..... Unit: m

(c) Measured by area:

- (i) (Description of item) .....Unit: m<sup>2</sup>

The unit of measurement shall be the number, metre or square metre as applicable to each item.

The tendered rates shall include full compensation for manufacturing, providing and installing each item complete as per specifications, drawings, descriptions as scheduled or as the existing and shall include for all labour, material, waste, plant, transport, delivery, access, scaffolding, fuel, etc. to the Engineer's approval.

**ALTERATION WORK****BE.04****Alterations and repairs to existing structures:**(a) Indicate if repairs, alterations, removal or sealing, etc:

- (i) Description of individual items to be repaired, altered, removed, sealed, etc ..... Unit: m<sup>3</sup>, m<sup>2</sup>, m, number

The unit of measurement for items repaired, altered, removed, sealed, etc. shall be cubic metre, square metre, metre or number as scheduled.

The tendered rates shall include full compensation for all costs to repair, refix, remove, cutting into, realign, taking off, temporary store, etc. as specified in the Standard and Technical Specifications and shall allow for all necessary labour, plant and new material needed to leave the scheduled items as new and to the approval of the Engineer. Refer also to the general inclusion of costs in BE 06.01.01.

## **TECHNICAL SPECIFICATION**

### **BH            FITTINGS**

#### **CONTENTS**

BH 01	SCOPE
BH 02	STANDARD SPECIFICATIONS
BH 03	VARIATIONS AND ADDITIONS TO STANDARD SPECIFICATIONS
BH 04	DETAIL OF REPAIR WORK
BH 05	MAINTENANCE
BH 06	MEASUREMENT AND PAYMENT

#### **BH 01        SCOPE**

Fittings shall mean the scope of work to repair materials and components related to cupboards, shelving, signage and counters.

The complete scope of repair work shall be as described in BH 04: Detail of repair work.

#### **BH 02        STANDARD SPECIFICATIONS**

##### **BH 02.01    GENERAL STANDARD SPECIFICATIONS**

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:

OW 371	-	Specification of Materials and Methods to be used (Fourth edition, October 1993)
SANS 929	-	Plywood and composite board
SANS 1099	-	Hardwood furniture timber
SANS 1783-3	-	Softwood timber for industrial use
SANS 1385	-	Kitchen cupboards of steel, composite board and timber

##### **BH 02.02    ADDITIONAL SPECIFICATIONS**

Technical Specification BD: Walls  
Technical Specification BG: Metalwork  
Technical Specification BJ: Paintwork

##### **BH 02.03    OCCUPATIONAL HEALTH AND SAFETY ACT**

The Contractor shall be required to comply with the Occupational Health and Safety Act 85 of 1993, Construction Regulations 2014 and related regulations. Non-compliance with these regulations, in any way whatsoever, will be adequate reason for suspending the Works.

#### **BH 03        VARIATIONS AND ADDITIONS TO STANDARD SPECIFICATIONS**

##### **BH 03.01    ADDITIONAL REQUIREMENTS FOR REPAIR OF FITTINGS**



**BH 03.01.01    Built-in cupboards**

The Engineer shall inspect all cupboards for defects and shall establish which components are to be replaced or repaired. Reasons for replacement will include, but not be limited to:

- (a) Severely chipped or damaged block board;
- (b) Severely chipped or damaged decorative laminates;
- (c) Inadequacy of design, e.g. strength of hinges, failure of door furniture, etc;
- (d) Corroded steel elements.

Fixing of defects will include repairing or replacing damaged, corroded and worn-out fittings, e.g. door handles, knobs and hinges, door catches and holders, door locks, cupboard door vents, drawer slide rails, drawer handles, knobs and locks. Moving parts shall be serviced by cleaning, oiling, tightening loose screws, reinstating missing screws or aluminium pop rivets, etc. Refer to BD 03.08 and BD 03.09 of Technical Specification BD: Walls, for repairs or replacements of cupboard doors and ironmongery.

**BH 03.01.02    Kitchen cupboards**

Kitchen cupboards shall be inspected for defects. Defects will include repairing or replacing damaged, corroded and worn-out fittings, e.g. door handles, knobs and hinges, door catches and holders, door locks, cupboard door vents, drawer slide rails, drawer handles, knobs and locks. Moving parts shall be serviced by cleaning, oiling, tightening loose screws, reinstating missing screws or aluminium pop rivets, etc. Where the baked enamel of steel cupboards is scratched and worn off, the steel surface shall be sanded and painted with an approved gloss epoxy paint to match the existing colour. Severely corroded or damaged steel cupboards shall be replaced with approved new steel cupboards complying with SANS 1385, with the baked enamel complying with SANS 783 Type II.

Damaged kitchen cupboards manufactured from composite board with laminated plastic covering shall be repaired where possible by gluing loose laminated plastic covering or replacing components with new similar matching finished elements.

Damaged kitchen cupboards manufactured from timber shall be repaired by replacing cracked and broken timber components. Painted surfaces shall be varnished with water-resistant varnish (with matching stain) or painted with approved polyurethane paint. Refer to Technical Specification BJ: Paintwork.

All cupboards shall be properly screwed and fixed to walls and floors with suitable corrosion resistant screws and plastic plugs, washers, etc.

Work tops and sinks against walls shall be sealed with an approved white one part polyurethane sealant. The sealant shall be applied strictly according to the manufacturer's specifications. Old worn-out and damaged sealant shall also be replaced. Drop-in sink bowls shall also be sealed with this approved polyurethane sealant. Where the possibility exists that water can penetrate composite board, these joints in the worktops shall also be sealed.

**BH 03.01.03    Shelving**

The stability of shelves must be checked to determine the occurrence of sagging. Where required, provide adequate support for the specific application, e.g. steel tubing struts, additional timber bearers, steel brackets, etc.

Broken timber shelving shall be replaced with approved wrought hardwood or solid laminated pine varnished or painted to specification. Composite board will not be permitted. Shelves shall be in single lengths. Heads of nails and brass countersunk screws in exposed faces of joinery shall be sunk and pelleted.

**BH 03.01.04     Signage**

Safety signs shall comply with the requirements of SANS 1186 (1997). The Engineer shall survey all signage and list those items that prove to be illegible. Signs that need to be replaced shall be done in the same fashion and material as to match similar signs in the same application. The size of the signs shall be as shown on the schedules.

Where required proper and appropriate signage must be provided for door numbers, room size and room description. The size, colour, position on the door, wall, etc., height above floor level of the lettering shall be instructed by the Engineer on site or shown on the schedules. The lettering must be stencilled on to the doors and walls.

All other fire protection signage will be provided for hydrants, hose reels, etc, shall be provided under separate contract.

**BH 03.01.05     Counters**

The Engineer shall inspect all counters and counter tops for defects and shall establish which components are to be replaced or repaired. Special attention shall be given to the condition of hinges at service hatches.

All joinery liable to be damaged shall be covered with temporary coverings to the satisfaction of the Engineer and special care shall be taken to protect surfaces that are to be varnished.

Where necessary, timber counters shall be sanded down, uneven surface spots filled with an approved wood filler, all blemishes removed and then finished off in order to restore the wood to its original state.

Steel tops that have been damaged excessively shall be replaced.

**BH 04                 DETAIL OF REPAIR WORK**

The detail of the scope of work is described in the Schedule of Quantities.

**BH 05                 MAINTENANCE**

No maintenance will be required for fittings under this contract.

**BH 06                 MEASUREMENT AND PAYMENT**

**BH 06.01           MEASUREMENT AND RATES**

**BH 06.01.01      General inclusion of costs**

**Notes:**

All material scheduled to be removed shall be deemed to be existing damaged materials in small or large sections. All such redundant material shall become the property of the Contractor and must be removed from site immediately.

All new material shall be deemed to be in patchwork and shall be of approved equal quality, colours, profiles, thickness, etc and shall in all cases match the existing materials and shall be fixed (internally or externally) to existing material or surfaces.

All replacement, removal and repair work shall be done carefully as to not damage any adjacent or other material or work. Any damage to other or adjacent materials or areas caused by the negligence of the Contractor shall be repaired by him free of charge.

All work scheduled to be removed or taken out shall be deemed to include the cleaning and preparation of the remaining sections, areas, or work to receive the new material or work specified.

Repair and service work shall also include all removing, cutting, grinding, cutting into, welding, bending, strengthening, drilling, tightening, fastening, oiling, greasing, adjusting, and providing missing or damaged screws or bolts, etc to repair or to improve the items or areas as new and to match the existing. The service of cupboard doors and drawers shall be deemed to include for servicing all locks, hinges, glides, tracks, etc.

Work scheduled to be realigned and refixed shall be deemed to include all necessary new additional materials, brackets, connector plates, bolts, pip rivets, nails, screws, spacer blocks, clamps, timber, and labour, etc to leave the items as new and totally functional.

All new work are measured net and shall include all cutting, lapping, waste, bending, fixing, corners, mitres, fixing screws, pip rivets, nails, adhesive, grout, putty, etc, as well as cleaning and preparation of surfaces not already prepared as part of removed items, etc.

The removal of doors, gates or windows shall include for the removal of all existing locks, handles, striking plates, etc but exclude the hinges, etc, which shall be used for the new replaced items. All repair work (excluding paintwork) around and in the thresholds of new door frames, gates or windows build into existing brickwork in new or existing positions shall be deemed to be included in either the rates tendered for the new replacement item or the removal payment item of the frame, window, etc.

The new doors to toilets and wet areas as specified shall be fitted with rubber door stops, D-profiled pull handle and backplate sets, 15 mm roller ball catches with striking plates and all other ironmongery needed to install the doors complete. All new ironmongery shall be measured and paid for separately.

The new doors to offices, etc, as specified shall be fitted with rubber door stops, 4 lever mortice locksets with handle sets to match existing, striking plates and all other ironmongery needed to install the doors complete. All new ironmongery shall be measured and paid for separately.

All ironmongery installed on the project shall bear the SANS approved trademark and codes. Samples of all ironmongery scheduled must be according to the samples of the Department of Public Works and samples must be handed to the engineer for approval before ordering the material.

## **BH 06.02 SCHEDULED ITEMS**

### **NEW WORK**

#### **BH.01 Joinery:**

##### **(a) Items measured by number:**

- (i) Timber cupboard doors, shelves, complete  
cupboards, doors etc (type and size indicated) .....Unit: number

(ii) Etc for other items measured by number

(b) Items measured by linear metre:

(i) Timber rails, planks, frames, shelves, etc  
(size indicated) ..... Unit: m

(ii) Etc for other items measured by length

(c) Items measured by area:

(i) Pinning boards, shelves, work tops, etc  
(type and thickness indicated) ..... Unit: m<sup>2</sup>

(ii) Etc, for other items measured by area

The units of measurement shall be the number, metre or square metre of each type and/or size of joinery item specified.

The tendered rates shall include full compensation for the manufacturing and supplying of all materials, for transport, labour, cutting, waste, fixing, screws, bolts, clamps, etc and installation of the joinery items.

**BH.02**

**Steelwork:**

(a) Items measured by number:

(i) Steel cupboard or locker doors, shelves, complete  
cupboards, etc (type and size indicated)..... Unit : number or units

(ii) Etc, for other items measured by number

(b) Items measured by linear metre:

(i) Steel rails, shelves, frames, beams etc (size indicated) ..... Unit : m

(ii) Etc, for other items measured by length

(c) Items measured by area:

(i) Shelves, plates, etc (type and thickness indicated) ..... Unit : m<sup>2</sup>

(ii) Etc, for other items measured by area

The unit of measurement shall be the number, metre or square metre of each type and/or size of steelwork item specified.

The tendered rates shall include full compensation for the manufacturing, supplying of all materials and transport, and for all labour, cutting, welding, waste, fixing and installation of the steelwork items complete with a red oxide or equal approved steelwork primer or baked enamel paint finishing as specified.

(d) Supply and install Boltless rivet shelving ..... Unit : No

The unit of measurement shall be the number of bays of boltless rivet shelving complete with five shelves supplied and installed.

The unit of measurement shall include full compensation for the ordering, supply, delivery and installation of boltless shelving with a height of 2200mm x 800mm deep x 1200mm wide complete with five shelves and all the necessary accessories to form a neat installation. The minimum thickness of the steel shelves shall be 1.2 mm, the frame shall be manufactured of 1.6 mm steel and the angle upright's of 1.6 mm steel. All steel components shall be degreased; zinc phosphate and polyester epoxy powder coated process to comply with SABS standards for pre-treatment and finished in a grey colour (Colour to be confirmed on site).

The contractor shall provide the details, specifications and proposed layout of the boltless rivet shelving to the Engineer for approval in writing before ordering.

#### ALTERATION WORK

#### **BH.03**

##### **Alterations and repairs to existing fittings:**

(a) Indicate if repairs, alterations, removal or sealing, etc:

- (i) Description of individual items to be repaired,  
altered, removed, sealed, etc ..... Unit: m<sup>3</sup>, m<sup>2</sup>, m, number

The unit of measurement for items repaired, altered, removed, sealed, etc shall be cubic metre, square metre, metre or number as scheduled.

The tendered rates shall include full compensation for all costs to repair, refix, remove, cutting into, realign, taking off, temporary store, etc as specified in the Standard and Technical Specifications and shall allow for all necessary labour, plant and new material needed to leave the scheduled items as new and to the approval of the Engineer. Refer also to the general inclusion of costs in BH 06.01.01.

## **TECHNICAL SPECIFICATION**

### **BJ PAINTWORK**

#### **CONTENTS**

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#### **BJ 01 SCOPE**

This specification covers the painting/repainting and maintenance of new and existing building components and maintenance thereafter for various types of buildings and structures.

Paintwork shall mean the scope of work related to the preparation, painting and maintenance of new and existing building components. This specification does not include work related to galvanising of steelwork, which is specified elsewhere.

The complete scope of paintwork shall be as described in BJ 04: Detail of repair work.

#### **BJ 02 STANDARD SPECIFICATIONS**

##### **BJ 02.01 GENERAL STANDARD SPECIFICATIONS**

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:

SANS 515	-	Decorative paint with a non-aqueous solvent base for interior use
SANS 630	-	Decorative high gloss enamel for interior and exterior
SANS 631	-	Decorative oil gloss paint for interior and exterior use
SANS 633	-	Emulsion paints for interior decorative purposes
SANS 634	-	Emulsion paints for exterior use
SANS 678	-	Primers for wood for interior and exterior use
SANS 681	-	Undercoats for paints
SANS 683	-	Roof paints (relevant sections)
SANS 723	-	Wash primer (metal etch primer)
SANS 801	-	Epoxy-tar paints
SANS 887	-	Varnish for interior use
SANS 926	-	Two-pack zinc-rich epoxy primer
SANS 1227	-	Textured wall coatings, emulsion base, for interior and exterior use
SANS 1319	-	Zinc phosphate primers for steel
SANS 10064	-	Preparation of steel surfaces for coating
OW 371	-	Specification of Materials and Methods to be used (Fourth edition, October 1993): Section 18

##### **BJ 02.02 ADDITIONAL SPECIFICATIONS**

Technical Specification BG: Metalwork

Paint manufacturers' specifications. These specifications shall take precedence over all others.

**BJ 02.03      OCCUPATIONAL HEALTH AND SAFETY ACT**

The Contractor shall be required to comply with the Occupational Health and Safety Act 85 of 1993, Construction Regulations 2014 and related regulations. Non-compliance with these regulations, in any way whatsoever, will be adequate reason for suspending the Works.

**BJ 03      VARIATIONS AND ADDITIONS TO STANDARD SPECIFICATIONS****BJ 03.01      ADDITIONAL REQUIREMENTS FOR PAINTWORK****BJ 03.01.01      General**a) Quality control

- i) Application of all paints must be supported by the relevant paint manufacturer's technical quality control systems with regard to preparation, application, film thickness, colour/pigmentation, mixing, etc.
- ii) The Contractor must submit his programme to the Engineer well in advance, particularly where high-risk surface applications (sheet metal roofs, etc) are concerned, in order to keep the manufacturer's technical personnel informed. Paint application may not commence until the manufacturer has inspected the surface preparation and given written approval thereof to the Engineer.

b) Paint systems

- i) All paint shall be delivered to the site in the unopened containers on which the manufacturer's name and trademark appear.
- ii) All materials for paintwork shall comply with the requirements for standards from the country from which it originated and shall be approved by the Engineer.
- iii) The Contractor shall submit copies of the paint manufacturer's specifications, recommendations and datasheets to the Engineer for approval.
- iv) The coating system shall be from one manufacturer unless otherwise specified. The paint manufacturer's instructions shall be strictly adhered to.
- v) Paints, etc, shall be suitable for application on the surfaces on which they are to be applied and various coats must be compatible with each other. Those paints used externally shall be of exterior quality or suitable for exterior use.

c) Guarantee

- i) The Contractor must give a 3 year written guarantee for the quality and workmanship of the paint work (fair wear and tear excepted). The Contractor shall be liable for any peeling or flaking paint applied by the Contractor and shall execute all such work of repair, rectification and making good of painted surfaces as may be ordered in writing by the Engineer. The manufacturer must carry out inspections at regular intervals during the construction period. The Manufacturer must issue a certificate of acceptance and compliance on completion to the client.

**BJ 03.01.02      General preparation of new and existing work**

All walls and ceilings, etc, shall be thoroughly cleaned prior to commencement of painting and the premises kept clean and free from dust during painting operations. Protect all surfaces not to be painted against spotting and spilling. Clean down and make good as necessary. Locks, door handles and similar fittings or fixtures shall be removed (or masked) and refitted on completion of painting.

(a) Plaster

- (i) All surfaces, sills, ceilings, etc, shall be thoroughly dry before painting operations are started. Porous surfaces must be sealed with the appropriate sealer, thinned if necessary, before applying the paint system.
- (ii) Exterior surfaces: Any cracks shall be scraped out and filled with an approved filler or patching plaster and rubbed down flush; the whole surface shall be well brushed down to remove all loose dust and powdery material before applying the first coat of the specified paint system.
- (iii) Interior surfaces: All cracks, blow holes, etc, shall be filled with suitable stopping and rubbed down flush. The whole surface shall be smoothed to an even finish and dusted down. Any grease marks, crayon marks, etc, shall be cleaned off with sugar soap and thoroughly rinsed with clean water. The surface shall be thoroughly dry before painting operations are started.
- (iv) Ceilings: Ceilings shall be brushed down and free of all dust and powdery materials. Cover strips and cornices shall be stopped where necessary and rubbed down smooth. All nail heads shall be primed, stopped and rubbed down flush. The surface shall then be wiped or brushed free of all loose or powdery materials before applying the recommended paint system.
- (v) Fibre cement: Fibre cement surfaces shall be cleaned down and primed with an approved sealer and undercoat.

(b) Metalwork

- (i) Iron and steel: New iron and steel metalwork shall be cleaned with an approved degreaser and the most effective method available (shot or sand blasting, mechanical wire brushing, hand wire brushing) used to remove all rust and millscale. Any salt deposits resulting from a marine or industrial environment shall be removed by washing with water prior to priming.
- (ii) Galvanised surfaces: New galvanised surfaces shall be well cleaned to remove all traces of oil and dirt with galvanised iron cleaner and rinsed with clean water.

(c) Woodwork

New woodwork shall be brushed down and the surface prepared as follows: Knots shall be given a coat of an approved patented knotting. The surface shall be primed overall and all holes shall be filled. The surface shall then be rubbed down with glass paper until smooth and even. Woodwork that needs to be oiled, stained or varnished shall be free of all stains, pencil marks and other surface discolourations and blemishes and shall be stopped with tinted stopping and rubbed down.

(d) General

- (i) Colours: All colours and tints are to be submitted to the Engineer for approval. Sample colours are to be prepared in all cases for the final coat and all work must be finished to colour approved by the Engineer. Where necessary, universal undercoat must be tinted to a shade lighter than the finishing coat.
- (ii) Doors and windows: All doors and opening sections of windows must be left ajar after painting or varnishing until the paint is perfectly dry.



- (iii) Protection and cleaning off: All necessary precautions are to be taken for the protection of all finished work and other trades during painting, and all ironmongery shall be removed where possible prior to the commencement of painting and re-fixed after completion. All paint spots, stains, etc, are to be cleaned off floors, walls, glass, etc, after completion.

### **BJ 03.01.03    Paint specifications for various components**

#### **(a)   Fibre cement (ceilings)**

##### **(i)   New work**

##### **(1)   Interior**

##### **Ceilings to wet areas (ablutions, kitchens and laundries):**

- Polyurethane alkyd enamel:  
Prepare and apply one coat synthetic copolymer primer. Stop with interior crack filler, seal crack filler with above primer. Apply two coats of polyurethane alkyd enamel interior quality paint.
- Universal fungicidal additive:  
To be added to above in proportions specified by the manufacturer. This additive will only be required in specific cases.

##### **(2)   Exterior**

Preparation: Clean down to remove all dirt and grease, etc, fill nail-heads with exterior crack filler and sand down to a smooth and even surface.

Finishing coat (emulsion): Apply two coats of super acrylic copolymer PVA emulsion or polyurethane alkyd enamel.

##### **(ii)   Renovation (existing) work**

##### **(1)   Interior**

##### **Ceilings previously painted, in good condition:**

Preparation: Clean down to remove all dirt and grease, etc, fill nail-heads, cracks and defects with interior crack filler and sand down to a smooth and even surface.

Finishing coat (emulsion): Apply two coats of super acrylic copolymer PVA emulsion or polyurethane alkyd enamel.

##### **Ceilings previously painted, in poor condition (to be finished in an emulsion system):**

Preparation: Remove all loose and flaking paint, clean down to remove all dirt, grease, etc, prime nail-heads with zinc phosphate primer for steel. Apply one coat of primer to existing ceiling boards diluted with 20 % turpentine. Fill nail-heads, cracks and defects with interior crack filler and sand down to a smooth and even surface. Seal all repaired areas with above-mentioned primer.

Finishing coat: Apply two coats of super acrylic copolymer PVA.

Ceilings to wet areas:

Preparation as above, but to be followed by one coat synthetic copolymer primer and two final coats polyurethane alkyd enamel interior quality paint (with fungicidal additive, only if specified).

In cases where fungicidal attack is prevalent the prepared surface must be washed down with antiseptic solution, followed by sodium hyperchlorite and allowed to react for 15 minutes before washing down with water. Once dry, primer and finishing coats may be applied.

(2) Exterior

Not applicable.

(b) Woodwork truss/rafters (overhangs)(i) New work(1) Interior

Not applicable.

(2) Exterior

- Egg-shell/High-gloss enamel:  
Prepare and touch up knots with spirit soluble resin type knotting. Apply one coat of primer for wood. Stop with wood filler where necessary. Apply one coat of universal undercoat. Apply two coats of enamel.
- Creosote coating:  
Prepare surface to be clean, dry and sound Apply on coat of creosote wood treatment coating.

(ii) Renovation (existing) work(1) Interior

Not applicable.

(2) ExteriorWoodwork truss/rafters (overhangs) previously painted, in good condition (to be painted in egg-shell/high-gloss enamel):

Preparation: Clean down and sand to a smooth finish. Spot prime where necessary with primer for wood. Allow 24 hours drying. Stop with wood filler.

Undercoat: Apply one coat of universal undercoat. Allow 24 hours drying.

Finishing coat: Apply two coats of enamel paint.

Woodwork truss/rafters (overhangs) previously painted, in poor condition (to be finished in egg-shell/high-gloss enamel):

Preparation: Remove existing paint and sand down thoroughly. Touch up knots and resinous areas with knotting.

Primer: Apply one coat of universal undercoat. Allow 24 hours drying. Stop with wood filler and sand to a smooth finish.

Undercoat: Apply one coat of universal undercoat. Allow 24 hours drying.

Finishing coat: Apply two coats of enamel paint.

Creosote coating:

Preparation: Prepare surface. Apply two coats creosote wood treatment coating.

(c) Metalwork - steelwork and miscellaneous metal work (including general pipework)

(i) New work

(1) Interior

Unpainted:

Prepare and apply one coat zinc phosphate primer for steel. Apply one coat of universal undercoat. Apply two coats of high gloss enamel paint.

Shop-primed:

Touch up damaged primer with zinc phosphate primer for steel. Apply one coat of universal undercoat. Apply two coats of high-gloss enamel paint.

Cast-iron waste pipes:

Prepare and remove as much bitumen as possible. Apply one coat of aluminium paint. Apply one coat of universal undercoat. Apply two coats of high-gloss enamel paint.

(2) Exterior

Unpainted:

Prepare and apply one coat zinc phosphate primer for steel. Apply one coat of universal undercoat. Apply two coats of high-gloss enamel or oleoresinous aluminium paint (where applicable).

Shop-primed:

Touch up damaged primer with zinc phosphate primer for steel. Apply one coat of universal undercoat. Apply two coats of high-gloss enamel or oleoresinous aluminium paint (where applicable).

Cast-iron waste pipes:

Prepare and remove as much bitumen as possible. Apply one coat of universal undercoat. Apply two coats of high gloss enamel or oleoresinous aluminium paint (where applicable).

(ii) Renovation (existing) work

(1) Interior

Previously painted metalwork, in good condition (steel windows, door frames, miscellaneous steelwork, etc):

Preparation: Wash down with sugar soap and rise with clean water. Sand lightly and apply one coat universal undercoat.

Finishing: Apply two coats high-gloss enamel.

Previously painted metalwork, in poor condition:

Preparation: Remove all existing paint by means of scraping or wire brushing and sanding. Tightly adhering paint that cannot be removed may remain and be overcoated. Remove all signs of rust back to bright metal by sanding with emery cloth. Wash down with an approved degreaser, rinse with clean water to remove all traces thereof and allow to dry. Treat rusted areas with a water-based rust converter.

Primer: Apply one coat of zinc phosphate primer for steel. Allow overnight drying.

Undercoat: Apply one coat of universal undercoat. Allow overnight drying.

Finishing coat: Apply two coats high-gloss enamel. Allow overnight drying between coats.

Previously painted metalwork, to remove all previous paint to original surface:

Preparation: Remove all existing paint by means of scraping or wire brushing, grinding and sanding. Remove all signs of rust back to bright metal by sanding with emery cloth. Wash down with an approved degreaser, rinse with clean water to remove all traces thereof and allow to dry. Treat rusted areas with a water-based rust converter.

Primer: Apply one coat of zinc phosphate primer for steel. Allow overnight drying.

Undercoat: Apply one coat of universal undercoat. Allow overnight drying.

Finishing coat: Apply two coats high-gloss enamel. Allow overnight drying between coats.

(2) Exterior

Previously painted metalwork, in good condition:

Preparation: Wash down with sugar soap, followed by light sand-papery. Rinse with clean water.

Undercoat: Apply one coat of universal undercoat. Allow 24 hours for drying.

Finishing coat: Apply two coats of high-gloss enamel or oleoresinous aluminium paint (where applicable).

Previously painted metalwork, in poor condition:

Preparation: Remove all existing paint by means of scraping or wire brushing and sanding. Tightly adhering paint that cannot be removed may remain and be overcoated. Remove all signs of rust back to bright metal by sanding with emery cloth. Wash down with an approved degreaser, rinse with clean water to remove all traces thereof and allow to dry. Treat rusted areas with a water-based rust converter.

Primer: Apply one coat of zinc phosphate primer for steel. Allow for 24 hours drying.

Undercoat: Apply one coat of universal undercoat. Allow for 24 hours drying.

Finishing coat: Apply two coats of high-gloss enamel or oleoresinous aluminium paint (where applicable).

Previously painted metalwork, to remove all previous paint to original surface:

Preparation: Remove all existing paint by means of scraping or wire brushing, grinding and sanding. Remove all signs of rust back to bright metal by sanding with emery cloth. Wash down with an approved degreaser, rinse with clean water to remove all traces thereof and allow to dry. Treat rusted areas with a water-based rust converter.

Primer: Apply one coat of zinc phosphate primer for steel. Allow overnight drying.

Undercoat: Apply one coat of universal undercoat. Allow overnight drying.

Finishing coat: Apply two coats high-gloss enamel. Allow overnight drying between coats.

(3) Aggressive environments

Not applicable.

(d) Gypsum board (ceilings, etc)

(i) New work

(1) Interior (dry areas)

- Super acrylic PVA:  
Prepare and apply one coat synthetic copolymer primer for gypsum board diluted with 20 % turpentine. Stop with interior crack filler, seal crack filler with above-mentioned primer. Apply two coats of super acrylic copolymer PVA paint.

(2) Exterior (dry areas)

- Super acrylic PVA:  
Prepare and supply one coat of synthetic copolymer primer for gypsum board diluted with 20 % turpentine. Stop with interior crack filler, seal crack filler with above-mentioned primer. Apply two coats of super acrylic copolymer PVA paint.

(ii) Renovation (existing) work

(1) Interior

Previously painted gypsum board with PVA in good condition:

Preparation: Wash down with sugar soap to remove all dirt, grease, etc, and rinse off with clean water. When dry, make good all cracks and defects with interior crack filler and sand to a smooth and even surface.

Finishing coat: Apply two coats super acrylic copolymer PVA.

Previously painted gypsum board, in poor condition:

Preparation: Clean down. Remove all paint by sanding and scraping.

Primer: Allow overnight drying. Make good cracks and holes with crack filler. Seal crack filler with above primer and allow to dry.

Finishing coat (emulsion): Apply two coats of super acrylic copolymer PVA.

(2) Exterior

Not applicable.

(e) Cement plaster (walls) and concrete surfaces

(i) New work

(1) Interior

- Polyurethane alkyd enamel (in wet areas, kitchens, etc):  
Prepare and apply one coat bonding liquid, followed by one coat of synthetic copolymer primer for new plaster. Apply one coat of polyurethane alkyd enamel paint.
- Acrylic emulsion:  
Same as above, but apply acrylic emulsion with smooth velvet sheen interior quality paint.
- Gloss enamel:  
Same as for polyurethane alkyd enamel, but apply two coats high-gloss enamel.
- Super acrylic PVA:  
Prepare and apply one coat of synthetic copolymer primer. Apply two coats of super acrylic copolymer PVA.
- Semi-gloss pure acrylic finish:  
Prepare and apply one coat of synthetic copolymer primer. Apply one coat of pure acrylic paint.

(2) Exterior

- Pure acrylic:  
Prepare and apply one coat of alkali resistant synthetic resins bonding liquid. Stop with exterior crack filler. Apply one coat of copolymer primer. Apply one final coat of pure acrylic paint.
- Pure acrylic with Teflon:  
Preparation, priming and application as above.
- Super acrylic PVA:  
Prepare and apply one coat of synthetic copolymer primer. Apply two coats of super acrylic copolymer PVA.
- Acrylic emulsion (external textured):  
Preparation as above, followed by two coats textured exterior acrylic emulsion, allowing one hour drying time between coats.

(ii) Renovation (existing) work

(1) Interior

Previously distempered:

Preparation: Remove all distemper with a peeling agent. Rinse with clean water. Allow 48 hours to dry. Fill cracks and defects with interior crack filler. Sand down to a smooth and even surface.

Primer: Apply one coat of bonding liquid, allow a minimum of 24 hours and maximum of 72 hours for drying. Final primers as specified in BJ 03.01.03(e)(i).

Finishing coat: Apply similar paints to suit as specified in BJ 03.01.03(e)(i).

(2) Exterior

Previously painted cement plaster (walls) and surfaces, in good condition:

Preparation: Wash down thoroughly with sugar soap. Rinse with clean water. Fill with suitable exterior crack filler. Sand smooth.  
Prime with one coat bonding liquid

Finishing coat: Apply similar paints to suit as specified in BJ 03.01.03(e)(i).

Previously painted cement plaster (walls) and surfaces, in poor condition (ie peeling, crazing, etc, not previously limewashed):

Preparation: Remove all paint and fill with suitable exterior crack filler.

Priming coat: Prime with one coat bonding liquid, allow to dry for a minimum of 24 hours and a maximum of 72 hours.

Finishing coat: Apply similar paints to suit as specified in BJ 03.01.03(e)(i).

(f) Fibre cement board (fascias and ceilings)

(i) New work

(1) Interior

New and wet asbestos sheets shall be allowed to dry out before painting is commenced.

Ceiling boards must be well primed on both sides with an approved sealer/undercoat before fixing.

- Super acrylic PVA:  
Prepare and apply one coat of sealer/undercoat. Prime nail heads with metal primer. Stop with filler. Apply two coats of super acrylic copolymer PVA.

(2) Exterior

New and wet asbestos sheets shall be allowed to dry out before painting is commenced.

Fascia boards and barge boards shall be well primed on both sides and edges painted with sealer/undercoat before fixing.

All sides of fascia boards must receive final coatings.

- Super acrylic PVA:  
Prepare and apply one coat sealer/undercoat. Prime nail heads with zinc phosphate metal primer. Stop with filler. Apply two coats of super acrylic copolymer PVA.

(ii) Renovation (existing) work

(1) Interior

Previously painted fibre cement board with emulsion paint, in good condition:

Preparation: Clean down thoroughly to remove any signs of dirt or grease. Fill all screw heads with a flexible resistant filler after screw heads have been primed.

Finishing: Apply two coats of super acrylic copolymer PVA paint.

Previously painted fibre cement board in poor condition:

Preparation: Remove previous paint coatings with super paint stripper. Thoroughly wash down with sugar soap and rinse with clean water. Prime nail and screw heads with zinc phosphate metal primer. Allow to dry.

Primer: Apply one coat of synthetic copolymer primer to all surfaces including back and edges, allow to dry. Fill all screw heads with weather resistant filler, allow to dry, sandpaper smooth and touch up with primer.

Finishing: Apply two coats of super acrylic copolymer PVA paint.



(2) Exterior

Previously painted fibre cement board with emulsion paint in good condition:

Preparation: Clean down thoroughly to remove any signs of dirt or grease. Fill all screw heads with a flexible weather resistant filler after screw heads have been primed.

Finishing: Apply two coats of super acrylic copolymer PVA paint.

Previously painted fibre cement board, in poor condition:

Preparation: Remove previous paint coatings with super paint stripper. Thoroughly wash down with sugar soap and rinse with clean water. Prime nail and screw heads with zinc phosphate metal primer. Allow to dry.

Primer: Apply one coat of sealer/undercoat to all surfaces including back and edges, allow to dry. Fill all screw heads with weather resistant filler. Allow to dry and sandpaper smooth. Touch up with primer.

Finishing: Apply two coats of super acrylic copolymer PVA paint.

(g) Galvanised iron roof (also gutters and rainwater pipes)

(i) New work

(1) Interior

Not applicable.

(2) Exterior

Galvanised iron - roofs: Water-based pure acrylic emulsion paint:

Scrub down thoroughly with degreaser, followed by a cleaner for galvanised iron. Rinse off thoroughly and ensure that all traces of cleaner have been removed and that the surfaces are free of any grease and oil. Apply one coat of galvanised metal primer. Allow to dry for 5 hours. (Must be overcoated within 24 hours maximum.) Apply one coat of water-based pure acrylic emulsion paint with non-fading pigment.

Galvanised iron - roofs: Mat acrylic roof paint:

Scrub down thoroughly with degreaser, followed by a cleaner for galvanised iron. Rinse off thoroughly and ensure that all traces of cleaner have been removed and that the surface is free of any grease and oil. Apply two coats of mat acrylic roof paint.

Galvanised iron - gutters and rainwater pipes: Gloss enamel:

Scrub down thoroughly with degreaser, followed by a cleaner for galvanised iron. Rinse off thoroughly and ensure that all traces of cleaner have been removed and that the surface is free of any grease and oil. Apply one coat of primer for galvanised iron. Allow to dry for 5 hours. (Must be overcoated within 24 hours maximum.) Apply two coats of gloss enamel paint with non-fading pigment.

(ii) Renovation (existing) work

(1) Interior

Not applicable.

(2) Exterior

Previously painted galvanised iron, in good condition:

Preparation: Thoroughly scrub down with fibre scrubbing brushes and sugar soap and rinse with clean water.

Finishing coat: Apply one coat water-based pure acrylic emulsion paint with non-fading pigment.

Unpainted or previously painted galvanised iron, in poor condition (ie flaking, peeling and rusting):

Preparation: Remove all previous paint coatings with steel wire brushes, plumber's egg-shaped lead scrapers, and coarse floor sandpaper. Remove all traces of rust with emery cloth back to bright metal and apply approved rust converter. Thoroughly scrub down using galvanised iron cleaner and rinse with clean water.

Primer: Apply one coat of galvanised metal primer. Allow a minimum of 5 hours and a maximum of 72 hours for drying.

Finishing coat: Apply one coat of water-based pure acrylic emulsion paint with non-fading pigment.

(h) Timber (doors, cornices, window frames, counters, skirtings, etc)

(i) New work

(1) Interior

- Polyurethane alkyd enamel (wet areas, kitchens, etc):  
Prepare knots with spirit soluble resin type knotting. Prime with primer (sanding sealer) for wood. Fill imperfections where necessary with wood filler. Apply one coat of universal undercoat. Apply two coats of polyurethane alkyd enamel.
- High-gloss/egg-shell enamel:  
Prepare knots with spirit soluble resin type knotting. Prime with primer (sanding sealer) for wood. Fill imperfections where necessary with wood filler. Apply one coat of universal undercoat. Apply two coats of enamel.
- Gloss/suede varnish (interior quality solvent based):  
Prepare knots with spirit soluble resin type knotting. Fill imperfections with wood filler. Sand surfaces to a smooth finish in grain direction and dust off.  
Thin first coat down in a ratio of 3 parts varnish to 1 part mineral turpentine and apply. Allow to dry for 24 hours. Apply two full-strength final coats with 24 hours drying time between applications.

(2) Exterior

- High-gloss/egg-shell enamel:  
Prepare with spirit soluble resin type knotting. Apply one coat of primer for wood. Fill where necessary with wood filler. Apply one coat of universal undercoat. Apply two coats of high gloss enamel.
- Gloss/suede varnish (exterior quality ultraviolet resistant solvent based):  
Prepare knots with spirit soluble resin type knotting. Fill imperfections with wood filler. Sand surfaces to a smooth finish in grain direction and dust off.  
Thin first coat down in a ratio of 3 parts varnish to 1 part mineral turpentine and apply. Allow to dry for 24 hours. Apply two full-strength final coats with 24 hours drying time between applications.

(ii) Renovation (existing) work

(1) Interior

Previously painted woodwork, in good condition (to be finished in polyurethane alkyd enamel):

Preparation: Wash sown with sugar soap to remove all dirt, grease, etc, then rinse off with clean water. Sand down to a smooth and mat surface. Make good cracks and defects with wood filler and after 24 hours drying, sand down again.

Finishing coat: Apply two coats of polyurethane alkyd enamel. Allow 24 hours for drying between coats.

Previously varnished woodwork in good condition (to be finished with interior quality varnish):

Repair defects with wood filler. Sand surfaces to a mat finish and apply two final coats varnish with 24 hours drying time between applications.

Previously painted woodwork in poor condition (to be finished with high-gloss/egg-shell enamel):

Preparation: Remove all paint, varnish and stain with super paint stripper. Wash down thoroughly with sugar soap and rinse with clean water. When surface is completely dry, sand down and apply one coat of spirit soluble resin type knotting to all knots. Fill all cracks and defects with wood filler and after 24 hours of drying, sand down to a smooth and even surface. Apply one coat oleoresinous wood primer. Apply one coat universal undercoat.

Finishing coat: Apply two final coats enamel.

Previously stained and varnished or painted woodwork in poor condition (to be finished in polyurethane alkyd enamel):

Preparation: Remove all paint, varnish and stain with super paint stripper. Wash down thoroughly with sugar soap and rinse with clean water. When surface is completely dry, sand down and apply one coat of spirit soluble resin type knotting to all knots. Fill all cracks and defects with wood filler and after 24 hours of drying, sand down to a smooth and even surface. Apply one coat oleoresinous wood primer.

Finishing coat: Apply one coat polyurethane alkyd enamel.  
Previously varnished woodwork in poor condition (to be finished with interior quality varnish):

Remove all varnish with paint stripper. Wash down to dry completely. Further preparation and applications as for BJ 03.01.03(h)(i): New work - interior.

(2) Exterior

Previously painted woodwork, in good condition (to be repainted with high-gloss/egg-shell enamel):

Preparation: Clean down and sand to a smooth finish. Spot prime where necessary with oleoresinous wood primer. Allow 24 hours for drying. Stop defects with a flexible weather resistant wood filler.

Undercoat: Apply one coat of universal undercoat. Allow 24 hours drying.

Finishing coat: Apply two coats of enamel.

Previously varnished woodwork in good condition (to be finished with exterior quality ultraviolet resistant solvent based varnish):

Preparation and application as for similar interior item above.

Previously stained and varnished or painted woodwork, in poor condition (to be finished in high-gloss/egg-shell enamel):

Preparation: Remove all paint, varnish and stain with super paint stripper. Wash down thoroughly with sugar soap and rinse with clean water. When surface is completely dry, sand down and apply one coat of spirit soluble resin type knotting to all knots. Fill all cracks and defects with wood filler and after 24 hours drying, sand down to a smooth and even surface. Apply one coat oleoresinous wood primer. Apply one coat universal undercoat.

Finishing coat: Apply two final coats of enamel.

Previously stained and varnished or painted woodwork, in poor condition (to be finished in polyurethane alkyd enamel):

As for similar interior item above.

Previously varnished woodwork in poor condition (to be finished with exterior quality ultraviolet resistant solvent based varnish):

Preparation and application as for similar interior item above.

(i) Concrete and cement surfaces - floor paint

(i) New work

Exterior and interior

Preparation: Remove laitance, residual cement spillage, etc, by means of carborundum grinding and vacuum clean to remove all dust. Remove oil, grease or any other surface contaminants with degreaser and wash off with clean water. Allow to dry. The floor must have less than 5 % moisture content before painting may be done.

Finishing coats: Apply two coats of an alkali resistant solvent based stoep (modified alkyd) paint. The first coat may be thinned with 25 % mineral turpentine. Sixteen hours drying time must be allowed between coats.

(ii) Renovation (existing) work

Exterior and interior

Previously painted concrete and cement surfaces, in good condition:

Preparation: Remove any loose and flaking paint by means of carborundum grinding, back to firm feathered edges. Remove any polish, grease, oil and other contaminants with degreaser, wash clean and allow to dry. Sand old paint to a mat finish and vacuum clean to remove all dust.

Finishing coats: Apply two coats as for new work above.

Previously painted concrete and cement surfaces, in poor condition:

Strip completely by suitable means and treat as for new work above.

(j) Cement plaster or facebrick walls and concrete surfaces where damp penetration is evident

(i) Renovation

Exterior and interior

Preparation: Remove all damaged paintwork, efflorescence, loose friable material, etc, back to bare and sound substrate. Repair all damaged surfaces with suitable approved materials to match original surface.

Surfaces may remain damp and in some cases will require additional wetting, depending on the particular coating used.

Damp sealing coats: Apply two coats approved synthetic polymer modified water barrier coating in strict accordance with the particular product manufacturer's specifications. Allow 24 hours between coats unless otherwise specified.

Finishing coats: Apply decorative finishing coats to suit, as in BJ 03.01.03(e).

**BJ 04**      **DETAIL OF REPAIR WORK**

The detail of the scope of work is described in the Schedule of Quantities.

**BJ 05**      **MAINTENANCE**

No maintenance will be required for paintwork under this contract.

**BJ 06      MEASUREMENT AND PAYMENT****BJ 06.01      MEASUREMENT AND RATES****BJ 06.01.01      General inclusion of costs and specific specifications****Notes:**

All material scheduled to be removed shall be deemed to be existing damaged material. All such redundant material shall become the property of the Contractor and must be removed from site immediately.

All new material shall be deemed to be in patchwork and shall be of approved equal quality, colours, profiles, thickness, etc and shall in all cases match the existing materials and shall be applied (internally or externally) to existing material or surfaces.

All removal and repair work shall be done carefully as to not damage any adjacent or other material or work. Any damage to other or adjacent materials or areas caused by the negligence of the Contractor shall be repaired by him free of charge.

All work scheduled to be removed or taken out shall be deemed to include the cleaning and preparation of the remaining sections, areas, or work to receive the new material or work specified.

Repair work shall also include all cutting, grinding, cutting into, welding, bending, strengthening, drilling, etc to repair or to improve the items or areas as new and to match the existing.

Work scheduled to be realigned and refixed shall be deemed to include all necessary new additional materials, brackets, connector plates, bolts, pip rivets, nails, screws, spacer blocks, clamps, timber, and labour, etc to leave the items as new and totally functional.

All new work are measured net and shall include all cutting, lapping, waste, bending, fixing, corners, mitres, fixing screws, pip rivets, nails, adhesive, grout, putty, etc, as well as cleaning and preparation of surfaces not already prepared as part of removed items, etc.

All paintwork shall include for surface preparation, cleaning, primer(s), undercoat(s) and final coat(s) as specified by the manufacturers and in the Technical Specifications. Scheduled items in the Schedule of Quantities are mainly brief descriptions of the final coat(s) to identify the paint system as specified in the Specifications.

Most steel surfaces such as gratings, screens, gates, doors, mesh, louvres, burglar proofing, windows, etc are measured both sides on the net flat overall area of the item. Paint to roof covering and side cladding, etc are measured wet on the flat overall area of the items and not along the girth of the sheeting. All final re-measurements for payment purposes will be done on the same principles.

Rates tendered for paintwork shall be deemed to include for all "line cutting" between different colours of paint specified by the Engineer in dados, skirtings, etc.

Rates tendered for paintwork on ceilings and cornices shall be deemed to include for paint on cover and jointing strips.

Rates tendered for paintwork on ceilings, wall panelling, divisions, etc shall be deemed to include for timber door frames, jointing and cover strips, skirtings, cornices, quadrant beads, etc if painted with the same specified paint material and in the same colour schemes.

Where specified to be painted in contrasting colours, varnished or with a different paint material the paintwork on the door frames, skirtings, cornices, beads, cover strips, etc will be measured and paid for separately per linear metre.

### **Specific specification for floor paint**

#### **Preparation:**

The concrete floor must have less than 3% moisture before painting is attempted. Remove laitance, residual cement spillage, etc by Carborandum grinding. Vacuum clean to remove all dust. Remove oil, grease, or any other surface contaminants with degreaser. Allow to dry thoroughly before painting.

#### **Paint system:**

Apply one coat of an alkali resistant solvent based stoep (modified alkyd) paint. The first coat may be thinned with approximately 25% mineral turpentine to aid penetration.

Apply one finishing coat of an alkali resistant solvent based stoep (modified alkyd) paint.

### **Protection of existing furniture, carpets, finishings, cupboards, etc during paint procedures**

#### **Protection, sheets and screens:**

All existing finishings, carpets, floors, furniture, etc shall be carefully handled, moved when instructed within the specific room, building or area to be painted, covered with sheets, screens or other approved methods to protect the items or finishings against damage or spilled paint spots or stains. Any damage caused to the mentioned existing items shall be rectified or replaced by the Contractor without additional payment.

The costs of sheets, covers, screens and all labour to address the above shall be deemed to be included in the tendered rates for the individual payment items or in the general preliminary cost items. No claims by the Contractor in this regard will be entertained.

## **BJ 06.02      SCHEDULED ITEMS**

### **NEW UNPAINTED SURFACES:**

## **BJ.01      Paint to new unpainted surfaces:**

#### **(a) Description of surface:**

##### **(i) Brief description of final paint type:**

- (a) Description of application area or item  
to be painted ..... Unit: m<sup>2</sup>, m, number

- (b) Etc, for other areas or items

The unit of measurement shall be the number, metre or square metre as applicable to each item.

The tendered rates shall include full compensation for manufacturing, providing and applying each item complete as per specifications, drawings, descriptions as scheduled or as the existing and shall include for all labour, material, preparation work, waste, plant, transport, delivery, access, scaffolding, fuel, miscellaneous items and material, etc to the Engineer's approval.

**PREVIOUSLY PAINTED SURFACES:**

**BJ.02**

**Paint to previously painted surfaces:**

(a) Description of surface:

(i) Brief description of final paint type:

(a) Description of application area or item  
to be painted ..... Unit: m<sup>2</sup>, m, number

(b) Etc, for other areas or items

The unit of measurement shall be the number, metre or square metre as applicable to each item.

The tendered rates shall include full compensation for manufacturing, providing and applying each item complete as per specifications, drawings, descriptions as scheduled or as the existing and shall include for all labour, material, preparation work, waste, plant, transport, delivery, access, scaffolding, fuel, miscellaneous items and material, etc to the Engineer's approval.

**PREVIOUSLY PAINTED SURFACES IN POOR CONDITION:**

**BJ.03**

**Paint to previously painted surfaces in poor condition:**

(a) Description of surface:

(i) Brief description of final paint type:

(a) Description of application area or item  
to be painted ..... Unit: m<sup>2</sup>, m, number

(b) Etc, for other areas or items

The unit of measurement shall be the number, metre or square metre as applicable to each item.

The tendered rates shall include full compensation for manufacturing, providing and applying each item complete as per specifications, drawings, descriptions as scheduled or as the existing and shall include for all labour, material, preparation work, waste, plant, transport, delivery, access, scaffolding, fuel, miscellaneous items and material, etc to the Engineer's approval.



PREVIOUSLY PAINTED SURFACES TO REMOVE ALL PREVIOUS PAINT TO ORIGINAL SURFACE:

**BJ.04**

**Paint to previously painted surfaces to remove all previous paint to original surface**

(a) Description of surface:

(i) Brief description of final paint type:

(a) Description of application area or item  
to be painted ..... Unit: m<sup>2</sup>, m, number

(c) Etc, for other areas or items

The unit of measurement shall be the number, metre or square metre as applicable to each item.

The tendered rates shall include full compensation for manufacturing, providing and applying each item complete as per specifications, drawings, descriptions as scheduled or as the existing and shall include for all labour, material, preparation work, waste, plant, transport, delivery, access, scaffolding, fuel, miscellaneous items and material, etc to the Engineer's approval.

## **TECHNICAL SPECIFICATION**

### **CE            WATER DISTRIBUTION NETWORKS**

#### **CONTENTS**

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CE 08	MEASUREMENT AND PAYMENT

#### **CE 01            SCOPE**

This specification covers the materials, equipment, methods, testing and work required for the installation of an irrigation network. Such distribution networks may comprise:

- (a) Primary and secondary distribution pipelines
- (b) Irrigation pipe networks and sprinklers
- (c) Valves

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

This 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 specification, unless otherwise specified in the Particular Specification.

#### **CE 02            STANDARD SPECIFICATIONS**

##### **CE 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:

SANS 1200 D	-	Earthworks
SANS 1200 DB	-	Earthworks (pipe trenches)
SANS 1200 G	-	Concrete (structural)
SANS 1200 L	-	Medium-pressure pipelines
SANS 1200 LB	-	Bedding (pipes)

##### **CE 02.02            OCCUPATIONAL HEALTH AND SAFETY ACT**

The Contractor shall be required to comply with the Occupational Health and Safety Act 85 of 1993, Construction Regulations 2014 and related regulations. Non-compliance with these regulations, in any way whatsoever, will be adequate reason for suspending the Works.

**CE 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.

**CE 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.

**CE 03              OPERATING AND MAINTENANCE MANUALS**

No operating and maintenance manuals will be developed for this section.

The contractor shall use the Maintenance Control Plan (see SA Maintenance) to schedule routine preventative maintenance activities.

**CE 04              EXECUTION OF REPAIR WORK**

**CE 04.01      GENERAL**

The Contractor shall investigate and inspect all areas of the installation to confirm the extent of the work required and shall report to the Engineer.

Installations and equipment shall be repaired as specified in the Particular Specification. This repair work shall include but not be limited to the specified Particular Specification details.

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 12 months from date of completion of repair work. On completion of the required and specified work the systems, installations and equipment shall be commissioned and handed over if the satisfaction of the Engineer has been obtained.

Repair work items for the irrigation network shall be categorised under the following headings:

- (a) Installation of pipelines
- (b) Cleaning of e pipelines
- (c) Installation of fittings
- (d) Repair of existing structures.

**CE 04.02      INSTALLATION OF PIPELINES**

This section covers the requirements for the installation of irrigation pipelines.

**CE 04.02.01    General**

Installation of the irrigation network is detailed in the Particular Specification and may include but not be limited to the following:

- (a) Installation of pipework
- (b) Commissioning of water storage tanks
- (c) Introduction of additional connections from McGregor furrow system;
- (j) Test pipe system for leakage;
- (k) Installation of new valves, gaskets, gland packings, seals, bolt and nuts, etc;
- (l) Where valves do not close properly, all these valves shall be refurbished, de-scaled and if necessary replaced;
- (n) Repair, service, test and readjust pressure-reducing valves. Pressure gauges are to be recalibrated and checked. Up and downstream pressures are to be logged. Downstream pressure has to be adjusted to an acceptable level, taking into account the allowable working pressure of the system and its components;
- (o) Repair, service and check the proper functioning of all non-return valves;
- (s) Installation of water storage tanks, including ball float and/or filling valves to these tanks where required;
- (v) Pressure test and sterilise repaired new installation and equipment;
- (w) Reinstatement and making good of walls, tiling, floors, concrete, finishes, holes, chases, surfaces, etc, to an acceptable level where repair, upgrade and/or service work have been executed.

**CE 04.02.02    Construction**

The Engineer will indicate the pipeline sections in need of repair and shall instruct the Contractor with regard to the repair work to be done.

**(a)    Excavation**

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

The depth of the excavation for each type and size of pipeline shall depend on site conditions and the amount by which the excavation is to exceed the proposed level of the invert of the pipeline 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.

Cutting, breaking out and replacing of concrete pavements will be paid under Subclause CA.02.

Excavations shall extend such that, where possible cut in may be reduced by lifting adjacent pipes.

(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 m<sup>3</sup> shall be classified as hard material.

Where more than 40 % of any material (by volume) consists of boulders each exceeding 0,10 m<sup>3</sup> 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.

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

(d) Removal of damaged pipelines

Where indicated by the Engineer damaged sections of pipelines shall be completely removed and replaced.

(e) Pipe couplings

Repair sections will be joined, utilising existing pipe sockets and collars where possible.

Repair couplings shall be used with the approval of the Engineer.

(f) Laying of uPVC pipelines

New sections of uPVC pipelines shall be laid on a granular bed suitable for flexible pipelines as directed by the Engineer. The inside of the pipes 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.

Refer to SANS 1200 LB: Bedding (pipes), for the specification on bedding.

(g) Laying of asbestos cement, concrete or galvanised mild steel pipelines

New sections of the pipelines shall be laid on class A or B bedding as directed by the Engineer. The inside of the pipes 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.

Refer to SANS 1200 LB: Bedding (pipes), for the specification on bedding.

(h) 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.

(i) Concrete encasement

Where instructed by the Engineer pipes shall be encased in concrete. All such encasing shall be done in accordance with the Engineer's instructions and sufficient allowance shall be made for movement joints.

(j) Extension of existing pipelines

Where existing pipelines require extension or where damaged sections are replaced the new sections shall be placed at the same grade and, where they join the existing service, at the same level as the existing pipeline.

Existing chambers or other structures which may obstruct any new work shall be demolished and removed. The demolition and reconstruction of new structures shall be paid for under the relevant sections in the specification.

(k) Construction in existing roads

Road crossings shall either be constructed utilising sufficient provision of bypass roads or utilising the half width of the road. At all times a through route shall be maintained for all traffic.

(l) Repairing of leaks

Where leaks occur at pipe sockets or collars the affected section shall be cut from the pipeline and repaired using repair couplings.

Where obvious leaks occur due to displaced sealing rubbers, the rubbers shall be replaced if the replacement can be done economically by lifting adjacent pipes.

(m) Replacement of pipes damaged by exposure to extensive ultraviolet light

Pipes damaged as a result of excessive exposure to sunlight shall be replaced where indicated by the Engineer.

**CE 04.02.03 Quality standard**

Pipelines shall be laid at even gradients within the points of correction, to the satisfaction of the Engineer and the applicable specifications.

**CE 04.02.04 Materials**

Materials and equipment to be used for repair items shall be suitable and/or adaptable to the existing installation and shall comply with the following:

(a) Supercast cast-iron pipes and fittings

Supercast cast iron pipes can be used for underground and above ground installations. Plain ended cast iron pipes and fittings shall be used, manufactured from 150, Grade A, grey iron in accordance with SANS 1034. Fittings and pipes shall be free of pinholes, blowholes, blemishes, flash and foundry sand and have a smooth bore. All pipes and fittings shall be sand blasted and coated on the inside and outside by submersion in a corrosion inhibiting oxide primer or bitumen paint.

The pipes and fittings shall be joined by means of stainless steel neoprene couplings as supplied by the manufacturer's of the pipe system. The coupling shall be installed according to the manufacturer's specification and is to be tightened with a torque wrench to a torque of 6,8 Nm.

(b) uPVC pipe and fittings under ground

uPVC pipes and fittings can be used for above ground installations.

For pipe sizes larger than 160 mm diameter, uPVC class 6 pressure pipe to SANS 966 shall be used with prefabricated uPVC bends and junctions. Prefabrication shall be done by means of hot-air welding of fittings to be covered with three layers of fibreglass reinforced lining over welded sections. The resin to be used shall be as specified by the manufacturer for usage with PVC. Bends shall be manufactured out of 3 to 4 sections per bend. Pipe joints shall be done by means of couplings fixed with solvent cement for PVC piping. This joint shall be reinforced with a fibreglass lining of three layers.

Piping is to be supported and bracketed with properly sized and designed brackets consisting of two half sections clamped over the pipe and hung with two hanger rods.

Pipes are to be pressure tested in sections as specified in this specification.

(c) Prefabricated galvanised steel piping and fittings above ground

The pipe to be used shall be plain-ended medium gauge uncoated pipe to SANS 62, galvanised to SANS 763 and shall be approved by the Galvanising Association of South Africa. All fittings are to be manufactured out of the same material, welded with flanged ends or rolled ends to fit clampon fittings. Fittings are only to be galvanised after manufacturing. All joints are to be either flanged or equipped with clampon couplings. All fittings and junction to be 45° sections.

The pipe system must be properly secured and bracketed at regular intervals with correctly sized and designed galvanised brackets.

Pipes are to be pressure tested in sections as specified in this specification.

(d) Geberit HDPe pipe and fittings

Geberit HDPe pipes and fittings can be used for underground and above ground installations where specified. Pipes shall be plain ended and only Geberit HDPe bends and fittings shall be used. Jointing of pipes and fittings shall be done by butt welding, electro-sleeve couplings and/or flanged joints. Pipes and fittings shall only be installed by Geberit approved installers and the Contractor shall furnish a certificate to this effect. Pipes and fittings shall be installed strictly according to the Geberit application technique.

Pipes are to be pressure tested in sections as specified in this specification

(e) Galvanised steel pipe installations

(i) All galvanised steel pipes shall be medium gauge mild steel screwed and socketed pipes to SANS 62 and shall be normalised and marked as such by the manufacturer. Pipes shall be hot-dipped galvanised to SANS 763 and shall be approved by the Galvanising Association of South Africa.

(ii) All fittings shall be malleable cast-iron fittings to SANS 509 and galvanised to SANS 763 and shall be approved by the Galvanising Association of South Africa.

- (iii) All 80 diameter and larger pipes shall be joined with Class 16 flanged couplings to SANS 1123/1600. The bolts, nuts and spring washers to be used on these joints shall be cadmium plated.
- (iv) In pipe ducts and elsewhere pipes shall be fixed onto walls, soffits, etc, with approved type of supports, holderbats, clamps, etc. Brackets shall be designed to structurally support and fix the pipe system and shall have enough clearance from walls, soffits, etc, to insulate hot-water pipes and maintain equipment.
- (v) Pipes shall be supported according to the manufacturer's specifications with approved brackets at the following maximum intervals:

NORMAL SIZE (mm)	HORIZONTAL (mm)	VERTICAL (mm)
15 dia to 20 dia	1 200	1 830
32 dia to 40 dia	1 830	2 450
50 dia to 150 dia	2 450	3 050

- (vi) Pipes shall be installed in such a manner as to prevent airlocks. A minimum rise of 1:250 shall be maintained to high points, which shall be fitted with suitable air release valves.
  - (vii) All pipes shall be marked according to SANS 10140 or as specified by the Engineer. All surface pipes shall be painted.
  - (viii) Pipes shall be installed flush unless otherwise instructed by the Engineer.
  - (ix) Provision shall be made for thermal contraction and expansion.
  - (x) The type of pipe joint compound shall be approved by the Engineer and used sparingly with good quality hemp. For pipes larger than 80 mm diameter a jointing compound such as Epidermix 32 shall be used.
  - (xi) Any pipes buried shall have at least 900 mm cover and be coated and wrapped to SANS 11 17 and tested in the presence of the Engineer.
  - (xii) All exposed hot-water pipes shall be lagged as specified.
  - (xiii) All pipework and fittings shall be pressure tested and sterilised as specified.
  - (xiv) Valves shall be installed on all branch pipes and ball-o-stop valves on all connectors to basin pillar cocks, sink mixers, cistern type WCs and other fittings.
  - (xv) Approved type expansion bellows shall be installed where required for expansion and contraction to prevent excessive stain on fittings and pipe joints.
- (f) uPVC underground pipe installations
- (i) uPVC piping shall conform to SANS 966 with rubber ring type joints.
  - (ii) All bends shall be uPVC type fittings with rubber ring joints.
  - (iii) All other fittings such as T-pieces, reducers, flanges, etc, shall be bitumen-dipped cast iron rubber ring jointed fittings to SANS 546.



- (iv) No solvent weld type fittings will be allowed.
- (v) All cast iron fittings shall be coated and wrapped to SANS 1117.
- (vi) All pipes shall be laid on a 100 mm sand-bedding cradle and covered with 300 mm sand before backfilling.
- (vii) All backfilling shall be to the Engineer's specification and approval.
- (viii) Pipe trenching and bedding shall be as follows:

AREA	MINIMUM COVER	BEDDING TYPE	MAIN FILL
Vehicle traffic	1 100	Flexible pipe bedding as per SANS 1200 LB	Soilcrete
Under surface bed	600		Soilcrete
Other areas	900		90% of modified AASHTO density

- (ix) All thrust blocks shall be cast between the pipe and the undisturbed trench material.
- (x) No concrete shall come into direct contact with the uPVC pipe. At the thrust blocks the bend shall be wrapped with Densopol 80 HT Tape or approved equivalent.
- (xi) DPE pipe connections to UPVC pipes up to 50 mm diameter can be done by means of SG iron manufactured saddles with the appropriate gaskets and cadmium-plated bolts and nuts.
- (xii) All pipe crossings under traffic areas shall be backfilled with soilcrete and compacted as specified.
- (xiii) All pipework shall be pressure tested with all joints uncovered, to the satisfaction of the Engineer.
- (xiv) Suitably sized air release valves built into valve chambers shall be installed at all high points of the pipeline.

(g) HDPe underground pipe installations

- (i) HDPe piping shall be Type 4 HDPe pipe to SANS 533.
- (ii) All fittings shall be of Plasson compression type, conforming to ISO/DIS 3458.
- (iii) All pipes shall be laid on a 100 mm sand bedding cradle and covered with 300 mm of sand of selected material.
- (iv) All backfilling shall be to the Engineer's specification and approval.
- (v) Pipe trenching and bedding shall be as follows:

AREA	MINIMUM COVER	BEDDING TYPE	MAIN FILL
Vehicle traffic	1 100	Flexible pipe	Soilcrete
Under surface bed	600		Soilcrete

Other areas	900	bedding as per SANS 1200 LB	90% of modified AASHTO density
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- (vi) No concrete shall come into direct contact with the HDPE pipe. At these points the fittings shall be wrapped with a Densopol 80 HT tape or approved equivalent.
- (vii) All pipe crossings under traffic areas shall be backfilled with soilcrete and compacted as specified.
- (viii) All pipework shall be pressure tested with all joints uncovered to the satisfaction of the Engineer.
- (ix) Suitably sized air release valves built into valve chambers shall be installed at all high points of the pipeline.

(h) Valves

- (i) Gate valves underground in valve chambers to connect to uPVC piping (65 mm NB and larger)

Gate valves are to be equipped with non-rising spindle, spherical graphite iron body to SANS 936 Grade 42, cast-iron nitrile butadine rubber-covered gate, stainless steel spindle, nitrile butadine rubber O-rings and seals, cast iron bonnet and gunmetal thrust collar to BS 1400 LG2.

The valve shall conform to SANS 664 and/or 665, and shall be capable of withstanding a working pressure of 1 600 kPa.

The valve shall be fitted with a square key spindle top to close the valve in a clockwise direction and socket ends to SANS 665 to fit into uPVC Class 12 pipe and installed to detail.

- (ii) Gate valves underground in valve chamber to connect to HDPE piping

The gate valves shall be of the dezincified brass type with brass gate, brass body, non-rising spindle and BSP threaded socket ends. The valve shall conform to SANS 776 Class 125. The valve shall be able to withstand a working pressure of 1 600 kPa. The valve shall be fitted with a hand wheel on an extended spindle shaft of 700 mm to close in a clockwise direction and installed to detail.

- (iii) Gate valves above ground for temperatures up to 40 °C to connect to steel piping (65 mm NB and larger)

Gate valves to be equipped with non-rising spindle, spherical graphite iron body to SANS 936 Grade 42, cast-iron nitrile butadine rubber-covered gate, stainless steel spindle, nitrile butadine rubber O-rings and seals, cast iron bonnet and gunmetal thrust collar to BS 1400 LG2.

The valve shall conform to SANS 664 and/or 665, and shall be capable of withstanding a working pressure of 1 600 kPa.

The valves shall be fitted with flanged ends to SANS 1123/1600, hand wheel to close the valve in a clockwise direction and installed in an upright position or side ways to a maximum 90° from upright.

- (iv) Gate valves above ground for temperatures above 40 °C to connect to steel piping (65 mm NB and larger)

Gate valve shall be equipped with non-rising spindle, spherical graphite iron body to SANS 963 Grade 42, cast-iron gate, gunmetal seat and gate rings, high-tensile bronze spindle, cast-iron bonnet and gunmetal thrust collar to BS 1400 LG2.

The valve shall conform to SANS 665 and shall be capable of withstanding a working pressure of 1 600 kPa and a temperature of 90 °C.

The valve shall be fitted with flanged ends to SANS 1123/1600, hand wheel to close the valve in a clockwise direction and installed in an upright position or sideways to a maximum 90° from upright.

(v) Gate valves above-ground to fit to copper pipes (65 mm NB and larger)

Gate valves shall be equipped with non-rising spindle, gunmetal bronze or dezincified brass body, gunmetal or dezincified brass gate, graphite asbestos packing in the gland.

The valve shall be fitted with a hand wheel to close in a clockwise direction and installed in an upright position or sideways to maximum 90° from upright.

The valve shall be equipped with flanges to SANS 1123/1600, hand wheel to close the valve in a clockwise direction and installed in an upright position or sideways to a maximum 90° from upright.

(vi) Gate valves above-ground for temperatures up to 100 °C (up to 50 mm NB)

The gate valves shall be of the dezincified brass type with brass gate, brass body, non-rising spindle and BSP threaded socket ends. The valve shall conform to SANS 776-1965 Class 125.

The valve shall be able to withstand a working pressure of 1 600 kPa.

The valve shall be equipped with a hand wheel to close in a clockwise direction.

The valve shall be installed in an upright position or sideways to a maximum 90° from upright and shall be so placed with other fittings to be removable without cutting the pipework.

(vii) Ball-O-Stop valves (15 mm diameter - 25 mm diameter)

This valve shall be a full-way ballcock type with BSP threaded ends. This valve shall conform to SANS 1056 Part 3, 1985, shall be rated for a test pressure of 2 000 kPa, and shall be chrome-finished where exposed.

(viii) Angle regulating valves

This valve shall be a 15 mm diameter chromium-plated angle regulating valve with a 350 mm chromium-plated copper tube and cap nuts where required.

(i) Strainers

(i) Strainers for connection to steel or uPVC pipes (65 mm NB and larger)

These strainers shall be of the Y-type with cast iron body, stainless steel or bronze strainer element and shall be equipped with flanged ends to SANS 1123/1600. The whole size of the strainer element shall be maximum 1 mm diameter and be removable without dismantling of pipework. The strainer shall be suitable for a temperature of up to 90 °C at a 1 000 kPa pressure rating and installed with the element facing downwards or a maximum of 45° sideways.

- (ii) Strainers for connection to steel and copper pipes (up to 50 mm NB)

The strainers shall be of the Y-type with bronze or dezincified brass body, stainless steel strainer element and must be equipped with BSP threaded socket ends. The whole size of the strainer element shall be maximum 0,8 mm diameter. The strainer shall be suitable for a temperature of up to 90 °C at a pressure rating of 1 000 kPa and installed with the element facing downwards or a maximum of 45° sideways.

(j) Non-return valves

- (i) Non-return valves for cold water (65 mm NB and larger)

The non-return valve shall be of the spring-loaded dual flap plate type fitted between two flanges (wafer).

The non-return valve shall be equipped with a cast-iron body, aluminium bronze plates, stainless steel springs and neoprene seals on the plates. The valves shall be suitable for a working pressure of 1 000 kPa.

- (ii) Non-return valves for hot water (up to 100 mm diameter) and cold water (up to 50 mm NB)

The non-return valve shall be of the spring-loaded piston type, with bronze or dezincified brass body, stainless steel spring and bronze disc with neoprene seal fitted with BSP threaded socket ends. The valve shall be suitable for a working pressure of 1 000 kPa and a temperature of up to 90 °C. All valves shall be installed as to be removable without extensive pipework removal.

(k) Air release valves and vacuum breakers

- (i) Double orifice double-acting air release valves with sizes from 50 mm NB to 200 mm NB

The air release valve shall be fitted with small and large orifice. The air release valve shall be fitted with a cast-iron or stainless steel body, stainless steel or fibreglass balls, integral shut-off valve and flanged ends to SANS 1123/1600. The valve shall be equipped with an anti-shock facility.

The valve shall be suitable for maximum pressure of 1 600 kPa.

- (ii) Single orifice air release valves for main water lines with sizes from 25 mm NB to 50 mm NB

The air release valve shall be fitted with a small orifice, cast-iron or stainless steel body, fibre glass or stainless steel ball float and BSP threaded inlet.

When the valve is installed a shut-off valve shall be installed on the inlet side. The valve shall be equipped with an anti-shock facility.

The valve shall be suitable for maximum pressure of 1 600 kPa.

- (iii) Single orifice double purpose air release valves for domestic water lines up to 15 mm NB

The air release valves shall be fitted with a stainless steel float, brass or cast steel body with an integral shut-off valve fitted.

The valve shall be capable to withstand a working pressure of 1 000 kPa at 110 °C.

## (iv) Vacuum breaker up to 40 mm diameter

The vacuum breakers shall be fitted with neoprene seal, spring-loaded disc in a dezincified brass or bronze body. The valve shall seal watertight and shall be designed to withstand a working pressure of 1 000 kPa and a temperature of 90 °C.

(l) Pressure-reducing valves

## (i) Combination pressure reducing stations

Where a high peak flow can occur as well as a small flow and the small flow is out of the range of the large pressure-reducing valve, a small pressure-reducing valve shall be installed in parallel with the large pressure-reducing valve. The two pressure-reducing valves in parallel shall be set according to the manufacturer's specification.

## (ii) Large pressure-reducing valves (65 mm NB and larger)

The pressure reducing valve shall be equipped with a cast iron body, neoprene-nylon reinforced diaphragm, bronze seal disc washer, stainless steel shaft and flanged ends. The valve shall be pilot operated and shall be designed to handle high flows at a minimum head loss.

The valve must be adjustable to handle a wide range of incoming pressure at a constant downstream pressure.

The valve shall be equipped with flanged ends to SANS 1123/1600.

## (iii) Small pressure-reducing valves (15 mm NB - 50 mm NB)

The pressure-reducing valve shall be equipped with brass body, balanced single seat and integral strainer. The valve shall be able to handle a wide range of incoming pressure while the downstream pressure stays constant with maximum inlet pressure of 1 000 kPa and a maximum water temperature of 40 °C.

The valve shall be equipped with BSP male threaded brass union couplings.

(m) Water meters

## (i) Combination water meters

Where high peak flow as well as a low flow can occur, and the low flow is out of the registration range of large water meter, a small diameter water meter shall be installed in parallel with the large water meter to cater for the low flows with integral automatic change-over valves. These valves shall be designed to have a minimum pressure drop at the operating point.

## (ii) Water meters (50 mm NB and larger)

These water meters shall be of the dry type with all gears and transmission and roller counters in a dry head, and shall be equipped with flanged ends to SANS 1123, cast-iron body with high quality corrosion proof coating. The meter must be protected from magnetic fields and sealed to prevent tampering with adjustments. The meter must be able to work up to a pressure of 1600 kPa under a maximum water temperature of 40 °C. The scale of meter must be in cubic metre (m<sup>3</sup>) and equipped with needle indicators reading in litres. The accuracy of the meter shall be not less than 98 %.

The meters shall be installed with leading and trailing lengths of pipes to the manufacturer's specification.

(iii) Water meters (up to 50 mm NB)

The meter shall be of the volumetric rotary piston type with brass body equipped with union couplers. The meter reading must be in kilolitres. The meter shall have an accuracy of not less than 98 %. The meter must be able to operate up to a water pressure of 1000 kPa at a water temperature of 40 °C.

The meters shall be installed with leading and trailing lengths of pipes to the manufacturers specification.

**CE 04.04      CLEANING OF PIPELINES**

The work under this section involves the removal of silt, debris and lime deposits from within the pipelines and the general cleaning in areas resulting from leakage.

**CE 04.04.01      Construction**

Prior to the cleaning of any pipeline sections, the Contractor shall arrange with the Engineer for an inspection of the pipe route. Based on the inspection, the Engineer will instruct the Contractor as to which sections of the network require cleaning.

Visual inspections utilising check circuit TV cameras will not be required unless deemed essential on large diameter pipelines.

Sections of the pipeline may be removed for a more detailed inspection. Such sections will be repaired as specified in Subclause CE 04.02. Sections will only be cut from the pipeline where specifically instructed by the Engineer.

The method to be applied for the cleaning of the pipelines will be chemical or mechanical and shall be followed by disinfection of the related section. The method to be applied for each section of the pipeline will be instructed by the Engineer.

Material removed from the pipelines shall be disposed of as instructed by the Engineer.

The Contractor shall discuss the method proposed for the scouring of the pipelines where insufficient scour valves are present with the Engineer prior to implementation.

**CE 04.04.02      Quality standard**

Pipelines shall be cleaned such that head losses along the pipe route are negligible under simulated fire flow, when measured at convenient points along the route.

**CE 04.05      REPAIR OF FITTINGS**

**CE 04.05.01      Construction**

The Engineer will indicate the fittings that are to be repaired.

The repair of the following fittings may be required:

- (a) Gate valves
- (b) Fire hydrants
- (c) Viking Johnson couplings
- (d) Pressure-reducing valves
- (e) Ferrules
- (f) Domestic water meters

- (g) Bulk water meters
- (h) Stop-cocks
- (i) Tees
- (j) Bends
- (k) End caps
- (a) Saddles
- (b) Sprinklers.

#### **CE 04.06      REPAIR OF STRUCTURES**

The Engineer will indicate the structures that are to be repaired or cleaned from debris.

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

The reinstatement of damaged structures shall be carried out to the same standards prescribed for new construction.

#### **CE 05      TESTS AND INSPECTIONS ON COMPLETION**

Except where otherwise provided in the Contract, the Contractor shall provide all labour, materials, power, fuel, accessories and properly calibrated and certified instruments necessary for carrying out such tests. The Contractor shall make arrangements for such tests and he shall give at least 72 hours notice to the Engineer, in writing, prior to commencement of the test.

In the event of the plant or installation not passing the test, the Employer shall be at liberty to deduct from the Contract price all reasonable expenses incurred by the Employer or the Engineer attending the repeated test.

Whenever any installation or equipment is operated for testing or adjusting as provided for above, the Contractor shall operate the entire system for as long a period as may be required to prove satisfactory performance at all times in the occupied space served by that system for up to twenty-four hours a day continuously until the system is handed over.

The Contractor shall provide all labour and supervision required for such operation and the Employer may assign operating personnel as observers, but such observation time shall not be counted as instruction time.

After complete installation of the system all equipment shall be tested, adjusted and readjusted until it operates to the satisfaction and approval of the Engineer.

The Contractor shall submit certificates of tests carried out to prove the quality and proper functioning of all equipment and also certificates to be obtained from all relevant authorities and statutory bodies, etc.

#### **CE 06      QUALITY ASSURANCE SYSTEM**

The Contractor shall institute an approved quality assurance (QA) system which shall be submitted to the Employer or Engineer for approval. The records of this QA system shall be kept throughout the duration of the Contract and be submitted to the Engineer at regular intervals as required.

**CE 08      MEASUREMENT AND PAYMENT****CE.01      WATER DISTRIBUTION PIPELINES****CE.01.01      Repair of existing pipelines ..... Unit: metre (m)**

The unit of measurement shall be per metre length of pipe replaced. In each case the Contractor shall agree on the length of pipe to be replaced and the method of coupling the pipes.

The tendered rate shall include full compensation for cleaning and grubbing, excavation, removal of existing pipeline, dealing with water logged conditions, provision of bedding and additional backfill, logging and backfilling of replacement pipeline, finishing, repair of kerbs, road surfaces, accommodation of traffic, excavation in all materials, removal of unsuitable material from the trench, disposal of surplus materials.

Separate items will be scheduled for house connections and distribution pipes.

The provision of the materials will be measured separately under CE 01.02.

**CE.01.02      Supply and installation of pipework and fittings****(a) Pipelines ..... Unit: metre (m)**

The unit of measurement shall be the metre of pipe replaced.

**(b) Fittings ..... Unit: number**

The unit of measurement shall be the number of fittings installed.

The unit of measurement shall be per metre length of pipe being replaced. In each case the Contractor shall agree on the length of pipe to be replaced.

The tendered rate shall include full compensation for cleaning and grubbing, all excavations to the specified depth, removal of existing pipeline, dealing with water logged conditions, provision of bedding and additional backfill, logging and backfilling of replacement pipeline, finishing, repair of kerbs, road surfaces, accommodation of traffic, excavation in all materials, removal of unsuitable material from the trench, disposal of surplus materials and pressure testing of the completed pipeline.

**CE.01.03      Replacement of manhole covers, grid inlets and the like****(a) SANS 558 Type 4 - covers, grids, etc, only:**

- (i) Maximum dimension up to 300 mm ..... Unit: number
- (ii) Maximum dimension 301 mm - 600 mm ..... Unit: number
- (iii) Maximum dimension 601 mm - 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 300 mm ..... Unit: number
- (ii) Maximum dimension 301 mm - 600 mm ..... Unit: number
- (iii) Maximum dimension 601 mm - 900 mm ..... Unit: number
- (iv) Maximum dimension over 900 mm ..... Unit: number



(c) SANS 558 Type 2A - covers, grids, etc, only:

- (i) Maximum dimension up to 300 mm .....Unit: number
- (ii) Maximum dimension 301 mm - 600 mm .....Unit: number
- (iii) Maximum dimension 601 mm - 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 300 mm .....Unit: number
- (ii) Maximum dimension 301 mm - 600 mm .....Unit: number
- (iii) Maximum dimension 601 mm - 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 from the site.

**CE.01.04      Repair of corrosion protection**

Corrosion protection of pipes with diameters of:

- (a) Up to 100 mm dia ..... Unit: metre (m)
- (b) 101 to 200 mm dia ..... Unit: metre (m)
- (c) 201 to 300 mm dia ..... Unit: metre (m)
- (d) 301 to 400 mm dia ..... Unit: metre (m)

The unit of measurement shall be meter length of pipe painted with corrosion protection in accordance with Specification LB: Corrosion protection.

The tendered rate shall include full compensation for preparation of pipe fittings, application of corrosion protection and curing of corrosion protection.

Separate items shall be scheduled for different types of pipework.

**CE.02      REPAIR OF FIRE WATER PIPE RETICULATION NETWORK**

Measurement and payment items from CE.01, CE.03, CE.04 and CE.05 will be utilised for work done on the external fire water pipe reticulation. Additional payment items for specialist fittings shall be paid under Specification JC.

**CE.03      CLEANING OF PIPELINE****CE.03.01      Cleaning of deposits in pipeline by mechanical means for pipes of diameters of:**

- (a) Up to 100 mm dia ..... Unit: metre (m)
- (b) 101 to 200 mm dia ..... Unit: metre (m)
- (c) 201 to 300 mm dia ..... Unit: metre (m)

(d) 301 to 400 mm dia ..... Unit: metre (m)

**CE.03.02      Scouring of pipeline to remove trapped debris for pipes of diameters of:**

(a) Up to 100 mm dia ..... Unit: metre (m)

(b) 101 to 200 mm dia ..... Unit: metre (m)

(c) 201 to 300 mm dia ..... Unit: metre (m)

(d) 301 to 400 mm dia ..... Unit: metre (m)

The unit of measurement shall be metre length of pipe cleaned or scoured.

The unit rate of measurement for item CA.03.01 shall include full compensation for the emptying of the pipeline, cleaning, refilling and reporting on the condition of the pipe after cleaning. The rate shall also include the disposal of waste material in and appropriate manner.

The unit of measurement for item CA.03.02 shall include full compensation for the scouring of the pipeline and refurbishing of the pipeline. The unit of measurement shall be the total length of filled pipeline from which the water is scoured. The length shall be agreed with the Engineer prior to scouring.

The provision of additional scour points shall also be included in the rate.

**CE.04      REPAIR OF FITTINGS**

**CE.04.01      Servicing of valves ..... Unit: number**

The unit of measurement shall be the number of valves serviced.

The tendered rate shall include full compensation for cleaning, removing rust, scale or other solids from surfaces or moving parts, proper greasing of all moving parts, preparation for corrosion protection coating and painting of valves.

Separate items will be listed in the Schedule of Quantities for different types and sizes of equipment.

**CE.04.02      Recondition valves ..... Unit: number**

The unit of measurement shall be the number of valves reconditioned.

The tendered rate shall include full compensation for dismantling, cleaning, removing rust, removing scale or other solids from surfaces and moving parts, replacing components such as hinges, spindles, hard wheels or gates, swing axles, swing gates, replacing or repair of seals, skimming of seal surfaces, proper greasing of all moving parts, preparation for corrosion protection, painting or any other action or cost necessitated to recondition a valve to a perfect functional drop tight condition.

Separate items will be listed in the Schedule of Quantities for different types and sizes of equipment.

**CE.04.03      Decommission and remove valves ..... Unit: number**

The unit of measurement shall be the number of valves decommissioned and removed.

The tendered rate shall include full compensation for all labour and equipment required to decommission and remove valves, such as installation of temporary isolating valves or blank flanges, removal of unserviceable valves, loosening and

removal of bolts and nuts, or any other related action required. Excavation to exposed partially buried valves shall also be included in the rate.

Separate items will be scheduled in the Schedule of Quantities for different types and sizes of valves.

**CE.04.04      Install and Commission valves .....Unit: number**

The unit of measurement shall be the number of valves commissioned and installed.

The tendered rate shall include full compensation for all labour and equipment required to commission and installation valves, such as installation of temporary isolating valves or blank flanges, removal of unserviceable valves, loosening and removal of bolts and nuts, or any other related action required. Excavation to exposed partially buried valves shall also be included in the rate.

Separate items will be scheduled in the Schedule of Quantities for different types and sizes of valves.

**CE.04.05      Supply and install valves .....Unit: number**

The unit of measurement shall be the number of valves supplied and installed.

The tendered rate shall include full compensation for all labour and equipment required to supply and installation of valves, such as, removal of unserviceable valves, loosening and removal of bolts and nuts, or any other related action required. Excavation to exposed partially buried valves shall also be included in the rate.

Separate items will be scheduled in the Schedule of Quantities for different types and sizes of valves.

**CE.04.06      Repair of house connections .....Unit: number**

The unit of measurement shall be the number of house connections repaired.

The tendered rate shall exclude the provision of new fittings measured under CE. 01.02 but shall otherwise include full compensation for appurtenant fittings, excavation, backfilling and other necessary work to repair existing house connections. All connections to the distribution pipelines, up to a diameter of 32 mm shall be measured as "house connections".

**CE.05      REPAIR OF STRUCTURES**

**CE.05.01      Demolition and removal of damaged existing structures**

- (a) Plain concrete ..... Unit: cubic metre (m<sup>3</sup>)
- (b) Reinforced concrete ..... Unit: cubic metre (m<sup>3</sup>)
- (c) Brickwork ..... Unit: square metre (m<sup>2</sup>)
- (d) Precast concrete manhole sections ..... Unit: number

The unit of measurement for CE.05.01(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 CE.05.01(c) and (d) shall be the square metre length of brickwork and the number of precast concrete manhole sections.

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. Excavation and backfill shall also be included for constructing the precast concrete manholes inclusive of all work required to complete the work as shown on the drawings.

The reinstatement of damaged sections shall be paid for under the relevant items for constructing new structures.

**CE.05.02      Cleaning of existing manholes, chambers and other structures..... Unit: cubic metre (m<sup>3</sup>)**

The unit of measurement shall be the cubic metre of debris and other material to be disposed, removed from manholes, chambers and other structures.

The tendered rates shall include full compensation for all labour, equipment and tools for removal of the material, trimming the bedding and for loading, transporting and disposing of the material.

**CE.05.03      Overhaul on material for haul in excess of 1,0 km**

- (a)    Excavated material to spoil.....Unit: cubic metre kilometre (m<sup>3</sup>-km)
- (b)    Existing structures demolished.....Unit: cubic metre kilometre (m<sup>3</sup>-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. 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.

**CE.05.04      Repair of structures**

- (a)    Brickwork ..... Unit: square metre (m<sup>2</sup>)
- (b)    Concrete ..... Unit: cubic metre (m<sup>3</sup>)
- (c)    Precast concrete manhole sections .....Unit: number

The unit of measurement shall be the cubic metre of brickwork or concrete constructed.

The tendered rate shall include full compensation for the provision of materials, transport, preparation and placing of foundations, labour and all other associated work to complete the work required.

Separate items will be scheduled for specific installations.

**CE.05.05      Marker posts.....Unit: number**

The unit of measurement shall be the number of marker posts installed.

The tendered rate shall include full compensation for the manufacture and installation complete as shown on the drawings.

**CE.05.06      Sample testing**

- (a)    Extract sample to determine lime deposition, corrosion and general condition for pipes of:
  - (i)    Up to 100 mm dia .....Unit: number
  - (ii)    101 to 200 mm dia.....Unit: number
  - (iii)    201 to 300 mm dia.....Unit: number

(iv) 301 to 400 mm dia.....Unit: number

The unit rate of measurement shall be the number of sample tests carried out.

The tendered rate shall include full compensation for cutting into pipe and extraction of sample, visual inspection and reporting on condition of pipe. The tendered rate shall also include full compensation for the appropriate disposal of the sample and for the repair of the section pipeline.

Compensation for provision of new pipes and fittings, shall be measured under CE 01.

#### **CE.05.07      New structures**

Precast concrete manhole sections.....Unit: number

The unit of measurement shall be the number of new pre-cast manholes constructed complete with precast top, manhole frame, cover and finishing.

The tendered rate shall include full compensation for the provision of materials, transport, preparation and placing of foundations, labour and all other associated work to complete the work required.

#### **CE.06      TESTS AND INSPECTIONS OF REPAIR WORK**

##### **CE.06.01      Pressure testing**

(a) Pressure test pipeline in sections of pipes with diameter of:

- (i) Up to 100 mm dia ..... Unit: metre (m)
- (ii) 101 to 200 mm dia..... Unit: metre (m)
- (iii) 201 to 300 mm dia..... Unit: metre (m)
- (iv) 301 to 400 mm dia..... Unit: metre (m)

The unit of measurement shall be the metre length of pipe tested.

The tendered rate shall include full compensation for isolation of test section, filling of section with water, testing for required duration and reporting on performance of pipes, the provision of any additional water shall also be included in the rate. The rate shall also include the provision of all equipment, labour and supervision necessary for the completion of the pressure test.

##### **CE.06.02      Provision of equipment for visual inspection of underground pipeline 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 pipeline network.

##### **CE.06.03      CCTV inspection of underground pipework**

(a) Pipes of diameter:

- (i) Up to 300 mm dia ..... Unit: metre (m)
- (ii) 301 to 600 mm dia..... Unit: metre (m)

The unit of measurement shall be the metre length of pipe inspected.

The tendered rate shall include full compensation for all inter-pipe relocations required to conduct a thorough check of the pipework where indicated by the Engineer.

**CE.07**

**LOCATE AND CONNECT INTO THE EXISTING WATER NETWORK**

(a) Locate and connect into the existing water network pipeline.....Unit: number

The tendered rate shall include the provision of all equipment, labour, fittings and material required to locate the existing water network pipeline, excavate and expose the existing pipe, blank off any unnecessary connections, and connect to the new pipeline.



## **TECHNICAL SPECIFICATION**

### **CF           SEWERAGE NETWORKS**

#### **CONTENTS**

CF 01	SCOPE
CF 02	STANDARD SPECIFICATIONS
CF 03	OPERATING AND MAINTENANCE MANUALS
CF 04	EXECUTION OF REPAIR WORK
CF 05	TESTS AND INSPECTIONS ON COMPLETION OF REPAIR WORK
CF 06	QUALITY ASSURANCE SYSTEM
CF 07	MEASUREMENT AND PAYMENT

#### **CF 01           SCOPE**

This specification covers all aspects regarding the priority and breakdown maintenance of sewerage networks which may include the following installations:

- (a)       Sewer pipelines and manholes
- (b)       Open sewerage channels
- (c)       Conservancy tanks.

#### **CF 02           STANDARD SPECIFICATIONS**

##### **CF 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:

- SANS 1200 D   - Earthworks
- SANS 1200 DB - Earthworks (pipe trenches)
- SANS 1200 L   - Medium-pressure pipelines
- SANS 1200 LB - Bedding (pipes)
- SANS 1200 LC - Cable ducts
- SANS 1200 LD - Sewers

##### **CF 02.02       OCCUPATIONAL HEALTH AND SAFETY ACT**

The Contractor shall be required to comply with the Occupational Health and Safety Act 85 of 1993, Construction Regulations 2014 and related regulations. Non-compliance with these regulations, in any way whatsoever, will be adequate reason for suspending the Works.



**CF 02.03      MANUFACTURER'S SPECIFICATIONS, CODES OF PRACTICE AND  
INSTALLATION INSTRUCTIONS**

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

**CF 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.

**CF 03                      OPERATING AND MAINTENANCE MANUALS**

No operating and maintenance manuals will be developed for this section.

**CF 04                      EXECUTION OF REPAIR WORK**

**CF 04.01              GENERAL**

The Contractor shall investigate and inspect all areas of the installation to confirm the extent of the work required and shall report to the Engineer.

Installations and equipment shall be repaired as specified in the Particular Specification. This repair work shall include but not be limited to the specified Particular Specification details.

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 12 months from date of completion of repair work. On completion of the required and specified work the systems, installations and equipment shall be commissioned and handed over if the satisfaction of the Engineer has been obtained.

**CF 04.02              REPAIR OF EXISTING PIPELINES AND STRUCTURES**

This section covers the work in connection with the construction of sewerage networks and associated sewerage structures such as manholes, cleaning eyes and the like. It also covers the removal and replacement of damaged and broken pipes and sewerage structures, as well as repairs to existing pipes and structures.

**CF 04.02.01          General**

Installation of the irrigation network is detailed in the Particular Specification and may include but not be limited to the following:

- (a) Installation of pipework

- (b) Commissioning of water storage tanks
- (c) Introduction of additional connections from McGregor furrow system;
- (j) Test pipe system for leakage;
- (k) Installation of new valves, gaskets, gland packings, seals, bolt and nuts, etc;
- (l) Where valves do not close properly, all these valves shall be refurbished, de-scaled and if necessary replaced;
- (n) Repair, service, test and readjust pressure-reducing valves. Pressure gauges are to be recalibrated and checked. Up and downstream pressures are to be logged. Downstream pressure has to be adjusted to an acceptable level, taking into account the allowable working pressure of the system and its components;
- (o) Repair, service and check the proper functioning of all non-return valves;
- (s) Installation of water storage tanks, including ball float and/or filling valves to these tanks where required;
- (v) Pressure test and sterilise repaired new installation and equipment;
- (w) Reinstatement and making good of walls, tiling, floors, concrete, finishes, holes, chases, surfaces, etc, to an acceptable level where repair, upgrade and/or service work have been executed.

**CF 04.02.02****Construction**

The Engineer will indicate the location at which sections of pipeline are in need of repair after the appropriate surveys have been completed by the Contractor.

**(a) Excavation**

The width of the excavation shall be sufficient to allow the proper laying, bedding and backfilling of the pipelines. The width of the excavation for each type and size of pipeline shall be as specified in SANS 1200 DB.

The depth of the excavation for each type and size of pipeline shall depend on site conditions and the amount by which the excavation is to exceed the proposed level of the invert of the pipeline and shall be sufficient to allow for the type and thickness of bedding material as 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 extend such that, where possible, cut in may be reduced by lifting adjacent pipes.

**(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 m<sup>3</sup> shall be classified as hard material.

Where more than 40 % of any material (by volume) consists of boulders each exceeding 0,10 m<sup>3</sup> 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 sub-bases 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.

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

(d) **Removal of damaged pipelines**

Where indicated by the Engineer damaged sections of pipelines shall be completely removed and replaced.

Excavation shall be carried out as described for new pipeline installation and the excavated material shall be, if suitable, preserved for backfilling. The damaged pipe materials shall be disposed of where instructed by the Engineer.

(e) **Pipe couplings**

Repair sections shall be joined utilising existing pipe sockets and collars where possible.

Repair couplings shall be used with the approval of the Engineer.

(f) **Laying of vitrified clay pipes and fittings**

New sections of vitrified clay pipes shall be laid on granular bed as directed by the Engineer. The inside of the pipes 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.

(g) **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.

(h) **Concrete encasement**

Where instructed by the Engineer pipes shall be encased in concrete. All such encasing shall be done in accordance with the Engineer's instructions and sufficient allowance shall be made for movement joints.

(i) **Extension of existing pipelines**

Where existing pipelines require extension or where damaged sections are replaced the new sections shall be placed at the same grade and, where they join the existing service, at the same level as the existing pipeline.

Existing chambers or other structures which may obstruct any new work shall be demolished and removed. The demolition and reconstruction of new structures shall be paid for under the relevant sections in the specification.

(j) Construction in existing roads

Road crossings will either be constructed utilising sufficient provision of bypass roads, or they will be done utilising the half width of the road. At all times a through route shall be maintained for all traffic.

(k) Repairing of leaks

Where leaks occur at pipe sockets or collars the effected section will be cut from the pipeline and repaired using repair couplings.

Where obvious leaks occur due to displaced sealing rubbers they will be replaced if the replacement can be done economically by lifting adjacent pipes.

(l) Sewer manholes

All manhole cover frames shall be cast into the concrete cover slabs.

Manholes in trafficable areas shall be provided with heavy duty covers and frames and surrounded by concrete slabs.

(m) Steep sewers

Sewer pipes in the ground with a slope steeper than 1:5 and under surface beds shall be encased in concrete.

(n) External sewers

The sewer outside the boundary of the building complex shall be constructed strictly in accordance with the details and specifications of the Local Authority.

(o) As-built services

Existing drainage invert levels and positions are to be checked against invert levels given on the drawings before work commences. The Engineer must be informed immediately of any discrepancy.

The Contractor shall be responsible for the compilation of as-built plans of sewerage network, showing all pipes, pipe diameters, invert levels and associated structures.

All existing services are to be located and opened before the proposed work commences.

(p) Testing

The drainage system shall be tested according to the specifications laid down by the NBRI. This test shall be carried out in the presence and to the satisfaction and approval of the Engineer.

(q) Ingress of foreign material

During construction all pipe ends are to be suitably plugged to prevent any ingress of dirt, rubble, etc.

(r) CCTV surveys

Modern technology video surveying equipment and detection equipment shall be utilised to establish blockage problems and positions of such problems.

(s) Proximity to buildings

Any drainage pipe within the 45° range below building foundations shall be encased in concrete or soilcrete as specified.

(t) Repair to existing structures

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

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.

(u) Repair to existing channels

Existing channels shall be cleaned. Broken sections of lined channels shall be repaired. Such repair work shall comprise patching of concrete and replacement of precast sections.

**CF 04.02.03    Quality standard**

Pipelines shall be laid at even gradients to the satisfaction of the Engineer and the applicable specifications.

**CF 04.02.04    Materials**

Materials and equipment to be used for repair items shall be suitable and/or adaptable to the existing installation and shall comply with the following:

(a) Manhole covers

Manhole covers, etc, shall have covers and frames complying with SANS 558.

(b) Vitrified clay pipe and fittings

Vitrified clay pipe shall only be used for underground installations. The pipes and fitting shall strictly conform to SANS 559. The pipes and fittings shall have a minimum crushing strength of 45 kN/m.

The joining method to be used shall be polypropylene couplings with integral rubber seal similar or equal to Vitrosleeve in accordance with SANS EN 295: Vitrified clay pipes and fittings and pipe joints for drains and sewers, allowing up to 2,5° angular movement per joint and 5 mm line displacement per joint. The joint shall retain an effective water seal with respect to above conditions with a 6 m water head.

Pipes shall be cut using an approved pipe cutter and the end shall then be trimmed by means of a pipe trimmer to remove any sharp edges.

All fittings underground shall consist of vitrified clay and shall comply with SANS 559.

The piping system shall be tested according to the NBRI information sheet X/BOU 2-34.

#### CF 04.02.05

#### **Air test for sewer and drains**

The following air test as specified in the NBRI information sheet X/BOU 2-34 shall be applicable to all air tests on new sewers and drains installed under the repair Contract, and shall be executed by the Contractor and witnessed by the Engineer.

##### (a) Method of air testing

All openings in the pipeline are plugged by means of sewer testing plugs. The sewer plug at the lowest end of the pipeline is connected to an air supply hose, which is attached to a mechanically driven air blower, compressor or hand pump. Air is pumped into the pipeline at a pressure of approximately 375 mm water gauge. The pressure is held at this level for a period of two minutes to allow the air temperature to become constant. Subsequently the air supply is closed off and the time recorded for the air pressure to drop from 250 to 125 mm water gauge. If the recorded time is less than the value given in the table below, it means that the pipeline is leaking and does not comply with the required standards of tightness. The apparatus required for the air test is commercially available.

The following requirements have to be taken into account when performing the air test:

- (i) Air-permeable pipelines such as vitrified clay or asbestos cement should preferably be tested when moist or wet.
- (ii) The trench shall be partially backfilled before the test is carried out. This is required to stop possible temperature variations and to prevent damage to the pipeline during subsequent backfilling operations.
- (iii) The testing equipment shall be shielded from the direct rays of the sun.
- (iv) Flexible joints are recommended for sewer and drain pipelines. Good quality flexible joints are superior to cement caulked joints and they also provide the pipeline with flexibility to prevent cracking due to subsequent soil movement.
- (v) The test method is very sensitive to flaws in the pipeline, such as cracks or leaking joints. The actual positions of flaws along the pipeline can be determined by using the specialised equipment.
- (vi) If the pipeline is below the water table and subjected to external water pressure, the test method should be modified by the Engineer to ensure that the final pressure value is higher than that of the external water pressure acting on the lowest part of the installation.

The minimum times for pressure drop of 250 mm to 125 mm water gauge are given in table CF 04.02.05/1 below.

TABLE CF 04.02.05/1

PIPE DIAMETER (mm)	MINIMUM TIME (min - s)	CRITICAL LENGTH OF PIPELINE	MINIMUM TIME(s) FOR LONGER LENGTH
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		(m) (58 m <sup>2</sup> internal surface area)	(L) OF PIPELINE
100	1 to 58	184,6	0,640 L
150	2 to 57	123,1	1,439 L
200	3 to 56	92,3	2,559 L
225	4 to 26	82,1	3,239 L
250	4 to 55	73,8	3,998 L
300	5 to 54	61,5	5,757 L
375	7 to 23	49,2	8,996 L
450	8 to 51	41,0	12,954 L
525	10 to 20	35,2	17,632 L
600	11 to 49	30,8	23,030 L

**CF 04.03****CLEANING OF SEWERAGE NETWORK**

The work involved under this section is the removal of silt, debris and vegetation from within the pipelines and manholes and the general cleaning of areas where leakage has occurred. This can be done either mechanically or chemically according to the more appropriate method as specified by the Engineer.

**CF 04.03.01****Construction**

The Contractor shall arrange with the Engineer for an inspection of the pipe route before the cleaning of any pipeline sections is carried out.. Based on the inspection, the Engineer will instruct the Contractor as to which sections of the network require cleaning.

Visual inspections utilising closed-circuit TV cameras will not be required unless deemed essential and will be specifically requested by the Engineer.

Sections of the pipeline may be removed for a more detailed inspection. Such sections shall be repaired as specified in Subclause CF 04.02.02. Sections shall only be cut from the pipeline where specifically instructed by the Engineer.

The method to be applied for the cleaning of the pipelines shall be chemical or mechanical. The method to be used for each section of the pipeline will be instructed by the Engineer.

Material removed from the pipes shall be disposed of as instructed by the Engineer.

Where insufficient scour values are present, the method for scouring of the pipelines shall be discussed and agreed with the Engineer prior to implementation.

**CF 04.04****REPAIR OF FITTINGS****CF 04.04.01****Construction**

The Engineer will indicate the fittings that are to be repaired, but these fittings shall not be limited to those specifically indicated by the Engineer.

Repair of the following fittings may be required:

- (a) Cleaning eyes
- (b) Permanent plug stoppers
- (c) Channel sections.

**CF 05      TESTS AND INSPECTIONS ON COMPLETION OF REPAIR WORK**

Except where otherwise provided in the Contract, the Contractor shall provide all labour, materials, power, fuel, accessories and properly calibrated and certified instruments necessary for carrying out such tests. The Contractor shall make arrangements for such tests and he shall give at least 72 hours notice to the Engineer, in writing, prior to commencement of the test.

In the event of the plant or installation not passing the test, the Employer shall be at liberty to deduct from the Contract price all reasonable expenses incurred by the Employer or the Engineer attending the repeated test.

Whenever any installation or equipment is operated for testing or adjusting as provided for above, the Contractor shall operate the entire system for as long a period as may be required to prove satisfactory performance at all times in the occupied space served by that system for up to twenty-four hours a day continuously until the system is handed over.

The Contractor shall provide all labour and supervision required for such operation and the Employer may assign operating personnel as observers, but such observation time shall not be counted as instruction time.

After complete installation of the system all equipment shall be tested, adjusted and readjusted until it operates to the satisfaction and approval of the Engineer.

The Contractor shall submit certificates of tests carried out to prove the quality and proper functioning of all equipment and also certificates to be obtained from all relevant authorities and statutory bodies, etc.

**CF 06      QUALITY ASSURANCE SYSTEM**

The Contractor shall institute an approved quality assurance (QA) system which shall be submitted to the Employer or Engineer for approval. The records of this QA system shall be kept throughout the duration of the Contract and submitted to the Engineer at regular intervals as required.

**CF 07      MEASUREMENT AND PAYMENT****CF.01      SEWERAGE NETWORKS****CF.01.01      Repair of existing pipelines ..... Unit: metre (m)**

The unit of measurement shall be per metre length of pipe replaced. In each case the Contractor shall agree on the length of pipe to be replaced and the method of coupling the pipes.

The tendered rate shall include full compensation for cleaning and grubbing, excavation, removal of existing pipeline, dealing with water logged conditions, provision of bedding and additional backfill, bedding and back filling of replacement pipeline, cutting to length, finishing, repair of kerbs, road surfaces, accommodation of traffic, excavation in all materials, removal of unsuitable material from the trench and disposal of surplus materials.

The tendered rate shall include full compensation for all material, plant and labour required to temporarily by-pass (if required) the pipe section being replaced.

The provision of the materials will be measured separately under CF. 01.02.



**CF.01.02      Supply and installation of pipework and fittings**

- (a)
- Pipelines
- ..... Unit: metre (m)

The unit of measurement shall be the metre of pipe replaced.

- (b)
- Fittings
- ..... Unit: number

The unit of measurement shall be the number of fittings installed.

The tendered rate shall include full compensation for cleaning and grubbing, excavation, removal of existing pipeline, dealing with water logged conditions, provision of bedding and additional backfill, bedding and back filling of replacement pipeline, cutting to length, finishing, repair of kerbs, road surfaces, accommodation of traffic, excavation in all materials, removal of unsuitable material from the trench and disposal of surplus materials.

The tendered rate shall include full compensation for all material, plant and labour required to temporarily by-pass (if required) the pipe section being replaced.

**CF.01.03      Replacement of manhole covers, grid inlets and the like**

- (a)
- SANS 558 Type 4 - covers, grids, etc, only:

- (i) Maximum dimension up to 300 mm .....Unit: number
- (ii) Maximum dimension 301 mm - 600 mm .....Unit: number
- (iii) Maximum dimension 601 mm - 900 mm .....Unit: number
- (iv) Maximum dimension over 900 mm .....Unit: number

- (b)
- SANS 558 Type 4A - frames only for covers, grids, etc:

- (i) Maximum dimension up to 300 mm .....Unit: number
- (ii) Maximum dimension 301 mm - 600 mm .....Unit: number
- (iii) Maximum dimension 601 mm - 900 mm .....Unit: number
- (iv) Maximum dimension over 900 mm .....Unit: number

- (c)
- SANS 558 Type 2A - covers, grids, etc, only:

- (i) Maximum dimension up to 300 mm .....Unit: number
- (ii) Maximum dimension 301 mm - 600 mm .....Unit: number
- (iii) Maximum dimension 601 mm - 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 300 mm .....Unit: number
- (ii) Maximum dimension 301 mm - 600 mm .....Unit: number
- (iii) Maximum dimension 601 mm - 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 cover/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 from the site.

**CF.01.04      Manholes and inspection chambers**

**CF.01.04.01      Raising or lowering of existing manholes or inspection chambers of all types:**

- (a)      Raise/lower 0 m up to and including 0,5 m .....Unit: number
- (b)      Raise/lower exceeding 0,5 m up to and including 1 m.....Unit: number

The unit of measurement shall be the number of manholes/inspection chambers raised/lowered within the specified dimensions.

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 manhole beds, the disposal of material, dealing with subsurface or surface water, benching and for other operations necessary for completing the work as specified.

Payment shall distinguish between soft and hard material. The tendered rates shall include full compensation for transporting the excavated material from the site.

**CF.01.04.02      Breaking into existing sewer and building a new manhole**

- (a)      Pre-cast concrete manhole:
  - (1)      Depth exceeding 0,5 m up to and including 1,0 m.....Unit: number
  - (2)      Depth exceeding 1,0 m up to and including 1,5 m.....Unit: number
  - (3)      Depth exceeding 1,5 m up to 2,0 m    Unit: number

The unit of measurement shall be the number of manholes constructed within the specified dimensions.

The tendered rate shall include full compensation for excavation, building a new manhole over the sewer, breaking into the existing sewer, building the channelization under wet conditions, ensuring the water tightness of the new connection, supplying all the necessary materials, removing surplus material, all labour and equipment required to make the connection, and liaison with the local authorities. Provision for manhole covers shall be made under CF 01.03 payment.

**CF.01.04.03      Connecting to existing sewer ..... Unit: sum**

The tendered sum shall include full compensation for excavation, making an opening in the existing manhole, installing new pipes in the new opening, for breaking out and modifying the channelization inside the manhole to suit the new pipe layout, ensuring the water tightness of the new connection, supplying all the necessary materials, removing surplus material and debris all labour and equipment required to make the connection, and liaison with the local authorities.

**CF.01.04.04    Repair of channels..... Unit: metre (m)**

The unit of measurement shall be the length of channel section repaired.

The tendered rate shall include full compensation for cleaning, patching, repairing of existing channels, irrespective of diameter and position. The rate shall also include all necessary materials, equipment and labour required.

**CF.02            CLEANING OF SEWERAGE NETWORK****CF.02.01        Mechanical cleaning of sewer pipes and structures:**

- (a)    Up to 150 mm .....Unit: metre
- (b)    151 mm to 300 mm.....Unit: metre
- (c)    301 mm to 450 mm.....Unit: metre
- (d)    More than 450 mm .....Unit: metre

The unit of measurement shall be the metre of pipe cleaned, measured once along the soffit of the culvert. 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 approved manner and ensuring that the material will not wash into drainage trenches.

**CF.02.02        Chemical cleaning of sewer pipes and structures:**

- (a)    Up to and including 150 mm.....Unit: metre
- (b)    151 mm to 300 mm.....Unit: metre
- (c)    301 mm to 450 mm.....Unit: metre
- (d)    More than 450 mm .....Unit: metre

The unit of measurement shall be the metre of pipe cleaned, measured once along the soffit of the culvert. For multiple pipes each individual pipe shall be measured separately.

The tendered rates shall include full compensation for supply of chemical agents, equipment, labour and the effective application of the cleaning process.

**CF.02.03        Provision of equipment for visual inspection of underground pipe networks ..... Unit: lump sum**

The tendered sum shall include full compensation for the provision of suitable equipment, such as TV surveillance equipment, torches, lights and mirrors, etc, to enable a thorough visual inspection of the pipe network.

**CF.02.04        Use of CCTV surveillance equipment..... Unit: metre (m)**

The unit of measurement shall be the metre of pipe inspected.

The rate shall be fully inclusive of all associated equipment and interpipe moves and recording equipment.

**CF.02.05      Visual inspection of underground pipe network ..... Unit: sum**

The tendered sum shall include full compensation for all processes necessary to complete a thorough check of the sewer network including lifting and replacing manhole covers, using relevant equipment and any clearing necessary to allow the visual inspection to proceed.

**CF.02.06      Demolition and removal of damaged existing structures:**

(a)    Plain concrete .....Unit: cubic metre (m<sup>3</sup>)

(b)    Reinforced concrete .....Unit: cubic metre (m<sup>3</sup>)

(c)    Kerbing and channelling ..... Unit: metre (m)

(d)    Pipework ..... Unit: metre (m)

The unit of measurement for CF.02.06(a) and (b) shall be the cubic metre of existing material demolished, determined from 70 % of the rates cubic metre capacity of the truck used to remove the material.

The unit of measurement for CF.02.06(c) and (d) shall be the metre length of kerbing and channelling or pipework 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.

The reinstatement of damaged sections shall be paid for under the relevant items for constructing new structures.

**CF.03      TESTS AND INSPECTIONS**

(a)    Pressure testing of pipelines .....Unit: metre

The unit of measurement shall be the length of sewer pipeline tested.

(b)    Testing of manholes .....Unit: number

The unit of measurement shall be the number of manholes tested after repair.

The tendered rates shall include full compensation for all labour, materials, power, fuel, accessories and properly calibrated and certified instruments necessary for carrying out relevant tests as per SANS 1200. Submission of certificates from tests and equipment and any costs involved in obtaining such from relevant authorities shall also be included in the tendered sum.

## **PARTICULAR SPECIFICATION**

### **PAA PLUMBING AND DRAINAGE INSTALLATION**

#### **CONTENTS**

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PAA 02	GENERAL DESCRIPTION OF INSTALLATION
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PAA 04	STATUS OF EXISTING INSTALLATION
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#### **PAA 01 SCOPE**

This specification covers the particulars of the servicing and priority and breakdown maintenance work to the plumbing and drainage installations at the various sites. This particular specification shall be read in conjunction with the Technical Specification AA: Plumbing and Drainage Installation, and all additional and technical specifications compiled as part of this document, in particular the following Additional Specifications:

- SB: Operating and Maintenance Manuals
- SC: General Decommissioning, Testing and Commissioning Procedures
- SD: General Training

The intended repair work to this installation will restore the existing installations to safe, efficiently functional systems that comply with all statutory regulations and applicable standards, in the process repairing all defects and shortfalls.

The sites consist of various buildings, as listed below, which form part of the repair and maintenance contract for plumbing and drainage installation.

1. McGregor Green Village
  - (i) Residential Area:
    - (a) Semi-detached dwelling (No. 418)
  - (ii) Main House:
    - (a) Dwelling footprint 450m2 under roof

#### **PAA 02 GENERAL DESCRIPTION OF INSTALLATIONS**

The existing plumbing and drainage installations provide potable hot and cold water to the McGregor house. The potable cold-water installation is provided with supply points from the underground reticulation networks outside the buildings to an above ground reticulation network via service ducts, ceiling voids and chased into walls to outlet points. The potable hot-water installation is provided with supplies from domestic geysers. The external 418 units does not have access to any hot-water.

This contract also provides for priority and breakdown maintenance of the fire water piped reticulation network, excluding the fire fighting equipment, which is dealt with under Particular Specification PJC: Conventional Fire Fighting equipment.

Technical details of sanitary and brassware, as well as the plumbing and drainage installations are given in PAA 03.

### **PAA 03      TECHNICAL DETAILS OF EXISTING INSTALLATIONS**

At the time of compilation of this document the existing installations consisted of the equipment and plant listed below with their relevant technical details.

#### **PAA 03.01      SANITARY AND BRASSWARE: GENERAL**

	SANITARY WARE	BRASSWARE	TRAP
WCs (cistern)	Armitage Shanks/Vaal: white, floor-mounted, vitreous china	Not applicable	Not applicable
Cistern (WC)	Wall-mounted, white, CI; Wall-mounted, white, vitreous china; Wall-mounted, white, plastic	Ball-o-stop shut off valves and CP flexible connections	Not applicable
Urinals (flush)	Not applicable	Not applicable	Not applicable
WHBs	Armitage Shanks, white wall- mounted, white enamel;	Cobra 15 mm, CP star handle pillar taps	Flexi P-trap; Flexi S-trap
Showers		15 mm CP under-tile stop-cocks	
Wash troughs	Stainless steel single bowl,	Cobra 15 mm, CP star handle wall type taps.	Flexi P-trap,
Baths	White enamel, 2 m long	Cobra 20 mm, CP star handle wall type taps	Not applicable
Sinks	Stainless steel, cabinet- mounted	20 mm CP star handle taps, 20 mm Cobra taps CP sink mixer with over arm swivel outlet	Flexi P-trap, lead P-trap
Wash tubs	Not applicable	Not applicable	Not applicable

#### **PAA 03.02      SANITARY DRAINAGE PIPING: GENERAL**

	PIPE	FITTINGS	EQUIPMENT
Gullies	VCP	CI or plastic grating	Not applicable
Waste pipes	GMS, uPVC	Brass, uPVC	Not applicable
Soil pipes	S&S CI, uPVC	S&S CI, uPVC	Not applicable
Cleaning eyes	CI (ABC), uPVC	Not applicable	Not applicable
Vent pipes	S&S CI	S&S CI	Not applicable

**PAA 03.03      DOMESTIC WATER PIPING: GENERAL**

	PIPE	FITTINGS	EQUIPMENT
Cold-water piping	Cu Polycop	Conex, soldered GMS	Brass gate shut-off valve Brass gate shut-off valve
Hot-water piping	Cu GMS	Conex, soldered GMS	Brass gate shut-off valve Brass gate shut-off valve

**PAA 03.04      FIRE WATER PIPING: GENERAL**

	PIPE	FITTINGS	EQUIPMENT
Fire water piping	Not applicable	Not applicable	Not applicable

**PAA 03.05      FIRE WATER INSTALLATION QUANTITIES**

The fire fighting equipment currently installed is listed in Particular Specification PJC: Conventional Fire Fighting Equipment. The piped reticulation networks to these equipment items shall form part of this contract where applicable.

**PAA 04      STATUS OF EXISTING INSTALLATION**

The status of the equipment and installation at the time of compilation of this document is summarised below:

**PAA 04.01      SANITARY AND BRASSWARE**

The condition of sanitary and brassware varies between the different rooms and are therefore grouped as shown earlier.

- (a) Cisterns: some cisterns need to be replaced;
- (b) WHBs: numerous replacements, some are to be destined;
- (c) Baths: To be removed;
- (d) Pillar, wall-mouthed and hose bib taps, sink mixers and under-tile stop cocks are to be serviced and replaced where necessary;
- (e) Some of the shower heads are to be replaced with water-saving fixture;
- (f) Domestic water geysers: To be removed, and soar-geysers to be installed.

**PAA 04.02      PLUMBING AND DRAINAGE INSTALLATION**

- (a) Some cleaning eyes to be replaced;
- (b) A number gully gratings are missing or broken;
- (c) Some gullies are blocked and requires cleaning;
- (d) Sewer pipes are to be unblocked;
- (e) Broken waste pipes are to be replaced;
- (f) Ventilation pipes are to be shortened; roofs repaired and vent valves installed.

**PAA 05      DETAILS OF WORK**

The following work shall form part of the repair work to Building Services. This work shall be done in accordance with the relevant regulations, codes, specifications and Technical Specification AA: Plumbing and Drainage Installations, as set out in this document. The work to be included is set out in PAA 05.01 and PAA 05.02 below and shall be read in conjunction with the Schedule of Quantities and Technical Specifications.

The repair work shall be carried out in accordance with the requirements of Additional Specification SC: General Decommissioning, Testing and Commissioning Procedures.

**PAA 05.01      GENERAL DESCRIPTION OF WORK**

**PAA 05.01.01** The Contractor shall at the start of the Priority and Breakdown Maintenance Contract inspect the items, systems, equipment, components and installations listed below. This inspection shall involve the determination of any defects, leaks, damages, shortfalls, structural soundness, repairs required, details of existing equipment, suitability of equipment for the purpose it serves, etc. The Contractor shall report back to the Engineer in writing on all the above and the following items. No repair work shall commence prior to approval by the Engineer:

- (a) Sanitary and brassware, including traps, brackets, piping, pan connectors, etc;
- (b) Sanitary drainage installation, including fittings, traps, floor drains, gullies, cleaning eyes, manholes, grease and oil separators, etc;
- (c) Domestic water piped installation, including fittings, valves, strainers, lagging and cladding, non-return valves, safety valves, etc;
- (d) Bracketing system;

**PAA 05.01.02** The general scope of work at the time of going on tender is defined as follows:

- (a) Replacing of irreparably damaged, missing and unsuitable sanitary and brassware, including the isolation, removal and stripping of the existing equipment;
- (b) Replacing of irreparably damaged, corroded and unsuitable sanitary drainage piping, including fittings, brackets, traps, floor drains, oil and grease separators, cleaning eyes and gullies, etc;
- (c) Replacing of irreparably damaged, corroded and unsuitable domestic water piping, including fittings, brackets, valves, strainers, water meters, lagging and cladding, etc;
- (d) Replacing of irreparably damaged, corroded and unsuitable fire water piping, including fittings, brackets, valves, non-return valves, pressure gauges, etc;
- (e) Replacing of irreparably damaged and corroded domestic or industrial geysers, including valves, pressure-reducing valves, air release valves, strainers, non-return valves, vacuum breakers and safety valves;
- (f) Servicing, cleaning and repair of existing sanitary ware including removal of stains, repair of chipped enamel, replacing of damaged and missing seats and lids, de-scaling and cleaning of cisterns and servicing of filling and flushing mechanisms, fixing of loose fixtures and brackets, cleaning of traps, etc;
- (g) Servicing, overhauling and cleaning of existing brassware, including dismantling, de-scaling, repair kits, replacing of washers, gland packing and gaskets, replacing of missing tap handles and flushing assemblies, etc;
- (h) Servicing, cleaning and repair of existing domestic water and drainage pipe installations, including traps, floor drains, gullies, manholes, valve chambers, grease and oil separators, brackets, valves, vacuum breakers, strainers, pipe lagging and cladding, etc;



- (i) Servicing and repair of existing fire water piped reticulation, including fittings, valves, pressure gauges, brackets, etc;
- (j) Installation of solar-powered geysers, including solar panels, all brackets and fittings;
- (k) Handing over of complete systems on completion of the repair work to the satisfaction of the Engineer, when the maintenance period shall commence;
- (l) The supply and compilation of operating and maintenance manuals;
- (m) The testing, adjusting and commissioning of all systems;
- (n) The introduction of a maintenance control plan, including logging, recording and control procedures.

**PAA 05.02      REPAIR WORK TO PLUMBING AND DRAINAGE INSTALLATION**

The repair work to this installation shall at least include, but not be limited to the work listed below. Any items, components or installations not detailed in particular but found to be defective or inoperative during the inspection and report phase, shall be repaired or replaced as instructed by the Engineer.

**PAA 05.02.01      McGregor Green Village**

- (i) Service and repair domestic hot and cold-water installations, including pressure testing of existing systems, and replace items that are beyond repair. Where necessary, replace entire system with capillary soldered copper pipe system.
- (ii) Service and repair drainage system, including rodding of system, and replace damaged or leaking pipes and fittings, manhole covers, cleaning and inspection eyes, gullies and gully gratings.
- (iii) Service and repair brassware, such as taps, stop-cocks and flushing mechanisms with repair kits, and replace items that are missing or beyond repair.
- (iv) Service and repair sanitary ware, including chip repair, de-staining and re-coating of baths, WC bowls and wash hand basins, dent removal and de-staining of wash troughs and kitchen sinks and replacement of damaged or missing parts such as WC seats and lids and cistern lids. Replace missing or irreparably damaged equipment. The following replacement items shall be installed where required:
  - (1) Ceramic and Plastic cisterns
  - (2) Closed coupled cistern and pan systems
  - (3) Paraplegic WC system
  - (4) Ceramic wash hand basins

**PAA 05.03      REPLACEMENT OF ELECTRIC GEYSERS WITH ALTERNATIVE ENERGY SUPPLY HOT WATER SYSTEMS**

**PAA 05.03.01      Installation of Solar Powered Geysers**

- (a) The installation of a solar heating system comprising of hot water storage tank /s and solar heat collector panels.

- (b) The system /s provided should be able to be installed and operate under the following specific conditions:

- i) Close coupled unit for roof installation for pitched roofs
- ii) Close coupled unit for roof installation for flat roofs
- iii) In roof split system for pitched roofs
- iv) In roof split system for flat roofs
- v) Forced circulation / pump assisted system capable of operating with the storage tanks and heat collection panels being up to 30m apart.

- (c) The following criteria will be applicable to the systems:

**(i) Solar Storage tank:**

Capacity: 100 ℓ / 150 ℓ / 200 ℓ / 300ℓ / 450 ℓ (Tanks may be connected in series, but no more than 3 tanks should be connected to obtain the desired capacity)

Heating method: Direct

Working pressure: 400kPa

External Casing: UV resistant Polyurethane or corrosion resistant material

Back up element: 2kW per 100 ℓ storage capacity

**(ii) Solar Collector**

Area / Size: The area of the solar collector should ideally be 1m<sup>2</sup> per 60 ℓ of storage capacity.

Outer Casing: Corrosion resistant material

Heating Manifold: Flat plate collector or similar approved system

Working pressure: 400kPa

- (d) The unit should be able to provide heated water of an approximate temperature of 55° C in summer and 40° C in winter.
- (e) Solar geysers shall be SABS approved or SABS tested and suitable for local conditions.
- (f) Suppliers of solar geysers shall be accredited on the Eskom database.
- (g) The system should be provided with a warranty of minimum 5years by the manufacturer.

## **PAA 06 MEASUREMENT AND PAYMENT**

All new building work and repair work to existing structures and buildings necessitated by repairs to the plumbing and drainage services as scheduled shall be done in accordance with the structural and building section of the Technical and Particular Specifications. The costs of such building and repair works shall be deemed to be included in the tendered rates for the applicable items as scheduled in this section.

### **PAA.01 INSPECTION AND REPORT ON EXISTING INSTALLATIONS**

.....Unit: item

The unit of measurement shall be the item reported on.

The tendered rate shall include full compensation for the inspection and written report on all items, systems, components, equipment and installations, including the establishment of defects, leaks, damage, shortfalls, structural soundness, repairs required, details of existing equipment and suitability of the equipment for the purpose it serves.

**PAA.02**      **ISOLATION, STRIPPING, DISMANTLING AND REMOVAL  
OF EXISTING BRASSWARE, SANITARY WARE  
AND PIPING INSTALLATIONS**.....Unit: number, metre

The unit of measurement shall be the number of each item of brassware and sanitary ware and metre of piping removed, including fixtures and fittings.

The tendered rates shall include full compensation for the isolation, dismantling and removal of irreparably damaged, broken and/or unsuitable brassware (flush valves, taps, mixers, shower roses, under tile stop-cocks, demand bib taps, hose bib taps, shut-off valves, etc) and sanitary ware (water closets, cisterns, basins, urinals, baths, wash troughs, sinks, etc) including all associated pipe work, brackets, traps, pan connectors, etc.

The tendered rates shall also include full compensation for the isolation, stripping, dismantling and removal of irreparably damaged, broken or unsuitable pipe work installed on surface, underground, chased into walls, in ceiling voids and/or service ducts, as well as the plugging off of connections to this pipe work.

The tendered rate shall also include full compensation for the removal off site and/or to storage of all removed items as mentioned above.

**PAA.03**      **ISOLATION, STRIPPING, DISMANTLING AND REMOVAL  
OF EXISTING GEYSER INSTALLATIONS** .....Unit: number

The unit of measurement shall be the number of each geyser installation removed, including associated pipe work and fittings.

The tendered rates shall include full compensation for the isolation, stripping, dismantling and removal of irreparably damaged, broken and/or corroded domestic geysers, including shut-off valves, non-return valves, strainers, pressure-reducing valves, vacuum breakers, air release valves, safety valves, etc, and the removal off site.

**PAA.04**      **SUPPLY AND INSTALLATION OF SANITARY WARE  
AND BRASSWARE**.....Unit: metre, number

The unit of measurement shall be the number of each item of sanitary and brassware supplied and installed, including all associated pipe work and fittings.

The tendered rate shall include full compensation for the supply, delivery, positioning, installation, testing, cleaning, commissioning and hand-over of sanitary and brassware including all necessary pipe work, traps, brackets, fittings, bends, junctions, cleaning eyes, etc, to connect the sanitary and brassware to the existing water supply and/or drainage installation.

The tendered rate shall also include full compensation for chasing and/or building into walls and the reinstating of existing surfaces such as floors, walls, ceilings, etc.

**PAA.05**      **SUPPLY AND INSTALLATION OF DRAINAGE PIPING INSTALLATION**.....  
.....Unit: metre, number cubic meter

The unit of measurement shall be the metre of each type of piping or fittings in the installation supplied and installed, including all fixtures.

The tendered rates shall include full compensation for the supply, delivery, installation, testing, cleaning, commissioning and handover of new drainage piping, installed on surface against walls or soffits, underground, in ceiling voids, chased or built into walls and/or service ducts, including all necessary bends, junctions, tees, cleaning eyes, covers, traps, floor drains, gratings, brackets, hangers, etc, to hand over a complete and effective installation that complies with local government regulations.

The tendered rates shall also include full compensation for the necessary underground works such as excavation, pipe bedding, fill blanket, backfilling and compaction and for the reinstatement of existing surfaces such as floors, walls, ceiling, roads, paving, etc, as well as connection to the existing drainage installation.

**PAA.06****SUPPLY AND INSTALLATION OF DOMESTIC****WATER PIPING INSTALLATION ..... Unit: metre**

The unit of measurement shall be the metre of each type of piping in the installation supplied and installed, indicating all fixtures and fittings.

The tendered rates shall include full compensation for the supply, delivery, installation, testing, cleaning, sterilising, commissioning and hand-over of new water piping installed on surface against walls or soffits, underground, in ceiling voids, chased or built into walls and/or in service ducts, including all necessary bends, tees, reducers, elbows, valves, strainers, adapters, brackets, hangers, etc, to hand over a complete and effective installation that complies with local government regulations.

The tendered rates shall also include full compensation for the supply and installation of hot-water pipe insulation and cladding.

The tendered rates shall also include full compensation for the necessary underground works such as excavation, pipe bedding, fill blanket, backfilling and compaction and for the reinstatement of existing surfaces such as floors, walls, ceilings, roads, paving, etc, as well as connection to the existing domestic water installation.

**PAA.07****SUPPLY AND INSTALLATION OF DOMESTIC****GEYSER INSTALLATION INCLUDING SHUT-OFF VALVES,****STRAINERS, DRIP TRAY, NON-RETURN VALVES,****EXPANSION RELIEF VALVE, SAFETY VALVE,****DRAIN PIPING AND ELECTRICAL CONNECTION: .....Unit: number**

The unit of measurement shall be the number of each geyser installation supplied and installed, including all associated pipe work, valves and fittings.

The tendered rate shall include full compensation for the supply and installation of domestic geysers, including shut-off valves, non-return valves, strainers, vacuum breakers, air release valves, safety valves, etc, as well as connection to existing piping and electrical supply.

**PAA.08****SUPPLY AND INSTALLATION OF FIRE WATER****RETICULATION PIPEWORK ..... Unit: metre**

The unit of measurement shall be the metre of each type of pipe work supplied and installed in the firewater reticulation, including all fixtures and fittings.

The tendered rate shall include full compensation for the supply, delivery, installation, testing, cleaning, commissioning and hand-over of new fire water reticulation pipe work installed on surface against walls or soffits and/or underground, including all necessary bends, tees, reducers, elbows, valves, adapters, brackets, hangers, pressure gauges, etc, to hand over a complete and effective installation that complies with local government regulations.

The tendered rates shall also include full compensation for the necessary underground work such as excavation, pipe bedding, fill blanket, backfilling and compaction and for the reinstatement of existing surfaces such as floors, walls, ceilings, roads, paving, etc, as well as connection to the existing fire water reticulation network.

**PAA.9**      **SERVICING, CLEANING AND REPAIR OF  
SANITARY WARE**.....Unit: number

The unit of measurement shall be the number of each item of sanitary ware serviced, cleaned and repaired, including all associated pipe work and fittings.

The tendered rate shall include full compensation for the repair or replacement of all damaged or missing parts, servicing of all movable parts, cleaning of stained sanitary ware with approved cleaning agent, fixing of loose fixtures and brackets according to manufacturer's specifications, de-scaling and cleaning of cisterns and servicing of filling and flushing mechanisms, cleaning of all traps, fixing or replacing of damaged or missing shower, urinal and channel outlet gratings and any other work or action required to hand over an effective system that complies with local government regulations.

**PAA.10**      **SERVICING, OVERHAULING AND CLEANING  
OF BRASSWARE** ..... Unit: number

The unit of measurement shall be the number of each item of brassware serviced, overhauled or cleaned, including all associated pipe work and fittings.

The tendered rate shall include full compensation for dismantling, cleaning and de-scaling, replacement of all gaskets, gland packing and seals on all valves, repair or replacement of all damaged or missing parts, replacement kits for worn or leaking flush valves, taps and mixers, repair or replacement of leaking, corroded or damaged flush pipes, readjusting of timing mechanisms on flush valves and metering taps and any other work or action required to hand over an effective system that complies with local government regulations.

**PAA.11**      **SERVICING, CLEANING AND REPAIR OF  
DOMESTIC WATER AND DRAINAGE  
PIPE INSTALLATIONS**..... Unit: number, metre, item

The unit of measurement shall be the metre of each type of pipe installation serviced, cleaned and repaired, including all fixtures and fittings.

The tendered rates shall include full compensation for inspection, sampling testing, servicing, cleaning and repair of existing piping and equipment such as:

- (a) Video surveying of all underground drainage pipe work to establish root ingress, damaged and corroded pipe work, fat build-up, blockages, incorrect falls, sagging and to provide as-built information;
- (b) Initial unblocking and cleaning of all drainage pipe work, traps, floor drains and gullies;
- (c) Pressure testing of piping and taking of water piping samples to determine state of corrosion and scaling;
- (d) Repair work to damaged manholes, gullies, cleaning eyes, valve chambers, etc, including builders' work and benching;
- (e) Repair of existing bracketing systems including fixing and repair of existing brackets and hangers, as well as the supply and installation of additional brackets where required;
- (f) Emptying, cleaning, checking, testing and repair of oil and grease separators;

- (g) Service and repair to all valves, strainers, pressure-reducing valves, water meters, non-return valves, air release valves and vacuum breakers, including new gaskets, gland packing and seals;
- (h) Taking of water samples and bacteriological testing to determine the compliance with the relevant codes of practice;
- (i) Repairing and/or replacement of damaged hot-water pipe lagging and cladding;
- (j) Preparation, painting and repainting of pipe work and;
- (k) Any other work or action to hand over an effective installation that complies with local government regulations.

**PAA.12****SERVICING, CLEANING AND REPAIR OF DOMESTIC GEYSERS**.....

Unit: number

The unit of measurement shall be the number of domestic geysers serviced, cleaned and repaired, including all fixtures and fittings.

The tendered rate shall include full compensation for the isolation, servicing, cleaning and repair of domestic geysers in accordance with the manufacturer's specifications, including de-scaling, testing for leaks, replacing of elements, replacement of safety valve and replacement of thermostat and set point, and replacement of connections if required and any other work or action to hand over an effective system that complies with local government regulations.

**PAA.13****SERVICING AND REPAIR OF FIRE WATER PIPED RETICULATION NETWORKS**.....

Unit: metre

The unit of measurement shall be the metre of each type of piping in the firewater network serviced and repaired, including all fixtures and fittings.

The tendered rates shall include full compensation for the inspection, testing, servicing and repair of existing piping and equipment such as:

- (a) Pressure testing of piping and taking of pipe samples to determine the extent of corrosion and scaling;
- (b) Repair or replacement of damaged, leaking, broken and corroded pipe work or fittings;
- (c) Repair and service to all valves, including new gaskets, gland packing and seals;
- (d) Repair, service, adjustment and calibration of all pressure gauges;
- (e) Repair and fixing of existing brackets and hangers and the installation of additional brackets and hangers where required;
- (f) Any other work or action to hand over an effective system that complies with local government regulations.

**PAA.14****CLEANING OUT SEPTIC TANKS AND DISPOSE OF CONTENTS OFF-SITE**.....

Unit: number

The unit of measurement shall be the number of septic tanks thoroughly cleaned and pumping the waste into a tanker and disposing of all the waste off site at a wastewater dumping area.

**PAA.15**      **SUPPLY AND INSTALLATION OF INDUSTRIAL GEYSER INSTALLATION**.....Unit: number

The unit of measurement shall be the number of each geyser installation supplied and installed, including all associated pipe work and fittings.

The tendered rates shall include full compensation for the supply and installation of industrial geyser installations including isolating lever-ball valves (from 22 to 50mm), 400 kPa expansion relief valve, drain connection, overflow pipe, inline circulating pump (25mm), Temperature and pressure safety valve, electrical control panel, bulk hot water vessel, pump supply cable, dual thermostat, hot water outlet, y-strainer, pressure gauge, non-return valve, temperature gauge, balanced cold water and expansion valve stand pipe.

**PAA.16**      **SERVICING, CLEANING AND REPAIR OF INDUSTRIAL GEYSERS**.. Unit: number

The unit of measurement shall be the number of industrial geysers serviced, cleaned and repaired, including all fixtures and fittings.

The tendered rate shall include full compensation for the isolation, servicing, cleaning and repair of industrial geysers in accordance with the manufacturer's specifications, including de-scaling, testing for leaks, servicing, checking or replacing of isolating lever-ball valves (from 22 to 50mm), 400kPa expansion relief valve, drain connection, overflow pipe, inline circulating pump (25mm), Temperature and pressure safety valve, electrical control panel, dual thermostat, y-strainer, pressure gauge, non-return valve, temperature gauge, and any other work or action to hand over an effective system that complies with local government regulations.

**PAA.17**      **SUPPLY AND INSTALLATION OF SOLAR POWERED GEYSER INSTALLATION**.....Unit: number

The unit of measurement shall be the number of each solar powered geyser installation supplied and installed, including all associated pipe work and fittings.

The tendered rates shall include full compensation for the supply and installation of solar powered geysers which shall include all solar storage tanks and solar collector panels, including shut-off valves, non-return valves, strainers, pressure-reducing valves, vacuum breakers, air release valves, safety valves, etc, as well as connection to existing piping, electrical, lagging & cladding supply.

**PAA.18**      **SUPPLY AND INSTALLATION OF DOMESTIC GALVANISED GEYSER DRIP TRAY**.....Unit: number

The unit of measurement shall be the number of each geyser drip tray installation supplied and installed, including isolation and re-installation of geyser.

The tendered rates shall include full compensation for the supply and installation of the geyser drip trays including isolation of geyser and re-installation of geyser on drip tray.

**PAA.19**      **SUPPLY AND INSTALLATION OF PILLAR TAPS AND PIPE CONNECTIONS**.....Unit: metre, number

The unit of measurement shall be the number of each item of sanitary and brassware supplied and installed, including all associated pipe work and fittings.

The tendered rate shall include full compensation for the supply, delivery, positioning, installation, testing, cleaning, commissioning and hand-over of sanitary and brassware including all necessary pipe work, traps, brackets, fittings, bends, junctions, cleaning

eyes, etc, to connect the sanitary and brassware to the existing water supply and/or drainage installation.

The tendered rate shall also include full compensation for chasing and/or building into walls and the reinstating of existing surfaces such as floors, walls, ceilings, etc.



## **ADDITIONAL SPECIFICATION**

### **SC            GENERAL DECOMMISSIONING, TESTING AND COMMISSIONING PROCEDURES**

#### **CONTENTS**

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SC 03	DETAILED COMMISSIONING PROGRAMME
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SC 10	DECOMMISSIONING
SC 11	RECOMMISSIONING, COMMISSIONING AND COMPLETION OF INSTALLATIONS
SC 12	MEASUREMENT AND PAYMENT

#### **SC 01            SCOPE**

This specification encompasses all aspects of the repairs of systems and services that form part of an installation, including the factory and on-site testing, decommissioning, installation and commissioning of all equipment, instrumentation and materials reconditioned, supplied and installed as part of an installation as defined in Additional Specification SAB: Ordinary and Breakdown Maintenance.

The specified procedures are the minimum requirements to be supplemented by various technical and particular specifications in this document. These requirements shall apply to all commissioning work scheduled as part of the initial repair work on installations, as well as commissioning work that is part of the routine preventive and corrective maintenance.

#### **SC 02            PHASED REPAIRS AND UPGRADING OF THE INSTALLATION**

When an installation consists of parallel systems or components, the complete installation and all its components shall be repaired without taking the complete installation out of commission at any time, unless otherwise specified in the Technical Specifications.

In order to schedule the repairs of an installation, all work shall be done in phases as specified in the Technical Specifications and illustrated in detail on the Drawings. Repairs of each part shall terminate with the successful reconditioning of that part. Each part of the system shall be decommissioned and recommissioned in the sequence specified in the Technical Specifications and on the Drawings.

The Contractor shall install all the necessary temporary specials, spool pieces, supporting frames and brackets to provide a functional link between each repaired and upgraded part of the system and the part of the installation that has not yet been

## SC.2

repaired and upgraded during recommissioning. Electrical and instrumentation Contractors and subcontractors shall ensure that the system remains operational as specified, using either existing or newly installed instruments, cables and controls.

Payment is based on the successful recommissioning of a specific part of the installation.

### SC 03

#### **DETAILED COMMISSIONING PROGRAMME**

No work of any kind on any part of the existing installation shall take place prior to the Engineer's approval of a detailed commissioning programme. This programme shall be submitted in addition to the general programme for planning and monitoring contract progress, at least two weeks prior to any programmed shutdown. The programme shall be the coordinated product of the Engineer and the User Client. Commissioning programmes shall take all process requirements into account. The detailed commissioning programme shall indicate all actions necessary for:

- (a) Decommissioning
- (b) Recommissioning of parts of the installation
- (c) Commissioning of the installation as a whole.

All work deemed necessary for practical completion of the installation shall be indicated on the commissioning programme.

The programme shall indicate the milestones to be achieved before shutdown and decommissioning as activities of zero duration, all of which shall be prerequisites linked to the "start" of decommissioning.

The following specific actions shall be included in the programme, clearly indicating the time allowed for:

- (a) Communication, including the time for confirmation of the official shutdown;
- (b) Draining parts of the installation to sumps, where available, or to other storage facilities provided by the Contractor;
- (c) Installation of temporary blanked flanges or other means of isolation where necessary;
- (d) Partial decommissioning and removal of existing material and equipment to perform work, including protection of pipework against hot work, cutting into pipework, loosening bolts, flanges and all other work necessary for recommissioning;
- (e) Installation of temporary functional links (pipe specials) between any two parts of the installation;
- (f) Each individual field weld, subject to the Engineer's approval;

### SC.3

- (g) Non-destructive testing of materials, for manufacturing/construction quality and for producing test results;
- (h) Installation of all instruments and their connection to SCADA systems;
- (i) Installation and connection of all power cables;
- (j) De-aeration of all pipe sections;
- (k) Communication between the Contractor, the Engineer, the Employer and the User Client;
- (l) Start-up of the complete system, indicating start-up procedures.

Inspection of the prefabricated installation, testing of all equipment prior to final commissioning, pressure testing and non-destructive testing shall be clearly scheduled in the project progress programme.

Day 30 tests and instruction/training sessions with the User Client shall be scheduled in the project progress programme.

### SC 04

#### **COMMISSIONING COMMUNICATION CHANNELS**

The Contractor shall communicate with the User Client's operating and maintenance managers via the Engineer to finalise start-up after decommissioning in accordance with the specified procedures.

The following key parties shall be involved before and during shutdown and decommissioning of any part of the system:

Contractor:	Site Agent
Engineer:	Resident Engineer
Employer:	Representative of Area Manager
User Client:	Operating and Maintenance Manager.

### SC 05

#### **COMMISSIONING RISK CONTROL AND PENALTIES**

- (a) The safety instructions stipulated by the Occupational Health and Safety Act, 1993 (Act 85 of 1993) shall be adhered to at all times.
- (b) The Contractor shall not be allowed to work on any part of the installation without obtaining a commissioning check permit on the day of shutdown. A typical example of a commissioning check permit is included in this document, referring to the minimum required milestones to be achieved prior to decommissioning.
- (c) Payment reductions for exceeding the maximum permissible down-time during maintenance shall apply as stipulated in the General Conditions of Contract and

#### SC.4

the Contract Data. This stipulation does not include shutdowns during programmed routine preventive maintenance work.

#### **SC 06** **DELAYS OF SCHEDULED SHUTDOWNS**

Specific dates on which an installation shall be shut down for decommissioning shall be finalised during coordination meetings of all the parties involved, including the Engineer, the Employer, the User Client and the Contractor.

Although a date for each shutdown will be scheduled at the coordination meetings, the actual date of the shutdown shall be determined by the process requirements and user demands, allowing for a window of seven (7) calendar days from the date of the planned shutdown.

Prospective bidders shall make allowances in their bid rates for the shutdown to occur at any time during this seven-day period. No additional payment shall be due if the shutdown occurs within this seven-day period.

If the Contractor fails to commence with the shutdown and decommissioning of the installation within the scheduled period, all additional costs arising from the shutdown at a later stage shall be for the Contractor's account.

#### **SC 07** **MATERIAL AND EQUIPMENT PROCUREMENT AND PROTECTION**

It is the responsibility of the Contractor to ensure the functionality of all units of new equipment prior to decommissioning, before installation of any specific part of the system. If the equipment, whether free-issued or not, does not conform to the functionality specifications during pre-installation testing, the Contractor shall notify the Engineer in writing without delay.

#### **SC 08** **TESTING OF EQUIPMENT PRIOR TO RECOMMISSIONING**

The equipment shall be tested for functionality after pre-installation of equipment in parts of the installation.

- (a) The Contractor shall inform the Engineer well in advance of his intention to perform the first tests and start-up of equipment in order to allow a representative of the Engineer to witness the tests. The extent of all precommissioning tests and checks shall be agreed with the Engineer prior to commencement.
- (b) The Contractor shall first conduct his own tests of the equipment. When he is satisfied that the equipment complies with the specifications, he shall notify the Engineer that he is ready for the official tests on completion. The Contractor shall not conduct an official test without the Engineer's presence or approval. All equipment shall conform to the specified requirements.
- (c) Before starting up any part of the installation or filling the tanks and sumps with liquid, the Contractor shall clean out the tanks, pipes, fittings, equipment or structures and, if necessary, make arrangements with other Contractors to remove their building rubble from the structures, check that all safety devices and

alarms have been set and activated, all nuts have been tightened correctly, that all the equipment is complete and ready for start-up, that the plant has been installed correctly, and that copies of the operating manuals have been handed to the Engineer.

- (d) The Contractor shall start up each section of equipment after ensuring that oil fillings, lubrication, vibration monitoring, cable termination and so on have been correctly completed. He is also responsible for the first refilling of all lubricating oils and for adjusting the plant to operate according to the specifications. Before any equipment is started or energised, the Contractor shall ensure that it is safe in terms of the personnel and equipment on the site to do so. The Contractor's tendered rates and sums shall allow for these costs.

All equipment shall be tested according to the relevant specifications that form part of this document.

No shutdown or decommissioning of any part of the system shall take place unless all the equipment to be installed have been tested by the Contractor and approved by the Engineer.

## **SC 09      TESTING OF MATERIAL AND EQUIPMENT SPECIFICATIONS AND WORKMANSHIP**

All results of the required non-destructive, precommissioning and manufacturing testing shall be submitted to the Engineer well in advance of testing the equipment on recommissioning. All such test results shall be submitted before Day 1 commissioning tests and no certificate of practical completion shall be issued prior to receipt of the required test results.

## **SC 10      DECOMMISSIONING**

The decommissioning period shall commence on the instant of the entire system shutdown. The recommissioning period shall start in parallel with decommissioning.

Shutdown and decommissioning shall not proceed without compliance with all the milestones in the detailed commissioning programme. The list of milestones in this document is not complete but indicates the minimum requirements. Milestones to be achieved prior to shutdown and decommissioning may be added to the programme at the Engineer's discretion.

The Contractor is responsible for the safe decommissioning of all material, equipment, components and instrumentation to avoid damage to parts or components of the installation.

## **SC 11      RECOMMISSIONING, COMMISSIONING AND COMPLETION OF INSTALLATIONS**

### **SC 11.01      RECOMMISSIONING**

## SC.6

Recommissioning means the commissioning of all sections or systems that form part of the installation to meet the required functional specifications for the individual section or system prior to commissioning of the repaired and upgraded installation.

The Contractor is responsible for the recommissioning of all parts of the system and he shall perform the tasks listed below.

- (a) Prior notice shall be given to and proper arrangements shall be made for recommissioning with the Employer, the Engineer, the User Client and the suppliers of equipment that is affected by recommissioning and testing.
- (b) If plant and equipment supplied by others are to be commissioned, the supplier's specific permission together with all requirements related to commissioning shall be obtained prior to recommissioning without in any way altering the General Conditions of Contract and the Contract Data with reference to the Contractor's liability in terms of defects.
- (c) The new and reconditioned parts of the installation shall be thoroughly inspected by a responsible representative of the Contractor to ensure that manufacture/construction and installation work have been completed according to the specifications.

## SC 11.02

### **COMMISSIONING AND COMPLETION OF REPAIRS AND UPGRADING WORK**

Commissioning means commissioning of the repaired and upgraded installation as a whole to perform in perfect working order.

- (a) The commissioning period for each installation as a whole:
  - (i) Commences with the Day 1 tests of the complete repaired and upgraded installation;
  - (ii) Includes commissioning of all sections and systems that have been recommissioned prior to the Day 1 tests;
  - (iii) Includes training of the User Client's operating personnel and the maintenance teams;
  - (iv) Terminates with a Day 30 test in compliance with the commissioning report.
- (b) The purpose of the Day 1 tests is to ensure that:
  - (i) The electronic, electrical and mechanical equipment and materials are functional and in perfect working order with respect to each other and the installation as a whole;
  - (ii) The commissioning period, including training, commences on successful completion of the Day 1 tests;
  - (iii) The Contractor is entitled to a certificate of practical completion for the repairs and upgrading of the installation on successful completion of the Day 1 tests;

## SC.7

- (iv) The Contractor becomes responsible for maintenance of the installation and is entitled to performance-based payments in compliance with Additional Specification SA: General Maintenance.
- (c) Commissioning shall be undertaken over a trouble-free period up to Day 30. During this period the Contractor shall train the User Client's operators and his maintenance team for operating and maintaining the installation. This training shall allow for all possible operational conditions, including emergency conditions, the correct servicing of every part, the type of oil or grease to be used, and similar tasks. The training shall take place by means of demonstrations, and the operating and maintenance manuals shall be referred to for this purpose.
- (d) Day 30 commissioning tests shall be performed thirty calendar days after the successful completion of the Day 1 tests. The commissioning period of the installation terminates upon the successful completion of the Day 30 tests.
- (e) The Contractor shall conduct all the tests required to satisfy the Engineer that the installation is performing according to specification, and shall make allowance for these tests in his bid rates and prices. These tests shall be conducted to certify that the installation, as repaired, upgraded and installed, is in perfect working order in terms of the specified functional requirements. The Contractor shall note that all equipment is to be tested as part of an installation, where appropriate, and will not be passed if all protection devices, interlocking with other equipment, etc, are not fully functional.
- (f) The Engineer shall provide commissioning sheets to the Contractor at least three weeks before the commissioning period commences, for all the equipment supplied, reconditioned and installed by the Contractor. The Contractor shall complete the commissioning sheets during the commissioning period and all items listed shall be entered. No completion certificate will be issued for an installation of which the equipment has incomplete commissioning reports. Information that is not available or applicable, or instances where certain tests have not been carried out, are subject to the Engineer's decision.
- (g) Commissioning of the plant (which includes the thirty days between the Day 1 and Day 30 tests) includes operating under conditions that adequately prove that all the specifications have been met. All safety devices, standby plant, automatic controls and protection devices shall be adequately tested for reliability and correct functioning. The Contractor may be called upon to repeat testing during the maintenance period if the performance of the equipment is suspected to be substandard. Costs related to such tests shall be for the Contractor's account and shall comply with the specified requirements. Copies of updated commissioning reports shall be provided to the Engineer within two days after a test has been performed.
- (h) The Contractor is responsible for providing all labour and materials (including testing equipment) during the commissioning period and shall carry out all the servicing and adjustments to ensure that the installation operates as specified. Valid calibration certificates shall be available for all testing equipment on the site during the commissioning period.

## SC.8

- (i) Programmes for the Day 1 tests, Day 30 tests and instruction/training sessions with the User Client's operators and maintenance team shall be prepared by the Contractor and submitted to the Engineer at least two weeks before the commissioning period commences. The Contractor shall provide weekly updates of these schedules for the duration of the commissioning period.
- (j) The Contractor shall note that if any equipment fails during the commissioning period, the equipment shall be repaired or replaced by the Contractor, and testing and commissioning shall commence from scratch.
- (k) Successful commissioning of an installation entitles the Contractor to a certificate of completion for the installation.

### SC 12

#### **MEASUREMENT AND PAYMENT**

#### SC12.01

##### **DECOMMISSIONING AND REMOVING PARTS OF THE**

**INSTALLATION** ..... Unit: sum

The unit of measurement shall be a sum.

The sum bid shall include full compensation for all actions and labour required for shutdown and decommissioning of the entire installation as specified to enable decommissioning and removal of parts of the installation as listed in the Bill of Quantities.

The sum bid shall include full compensation for the decommissioning and removal of the parts and components of an installation as listed individually in the Bill of Quantities, including actions and/or costs resulting from such work, to enable the recommissioning of parts of the repaired and/or upgraded installation.

The sum bid shall include full compensation for final dismantling of decommissioned materials and equipment and the removal of all such items to stores on site, as directed by the Engineer.

#### SC12.02

##### **COMMISSIONING AND TESTING OF PARTS OF THE INSTALLATION**..... Unit: sum

The unit of measurement shall be a sum.

The sum bid shall include full compensation for commissioning and testing parts of the installation to be operational while still incomplete in relation to the entire repaired and/or upgraded system or installation.

Separate payment items shall be billed for separate parts of the system.

#### SC12.03

##### **SERVICING/REPAIR, COMMISSIONING AND TESTING OF THE** **INSTALLATION**..... Unit:

sum

The unit of measurement shall be a sum.

The sum bid shall include full compensation for commissioning the upgraded installation as a whole and for all costs and expenses related to labour, removal, repair,



## SC.9

reinstallation and testing of material and equipment during the commissioning period for each part of the installation. The sum bid shall include full compensation for the final commissioning and testing, including Day 1 and Day 30 tests, of all parts and components of the installation to the specified functional condition.

Payment shall be based on successful completion of the Day 30 tests.

### SC12.04

#### **PROVISION FOR SAFETY AND HOT WORK REQUIREMENTS**

##### **DURING SHUTDOWN** ..... Unit: number

The unit of measurement shall be the number of shutdowns during which all the required safety and hot work requirements are provided.

The bid rates shall include full compensation for all the required safety and hot work requirements and arrangements in accordance with the specifications during a shutdown period, including all labour, personnel, equipment, materials and consumables required.

## SECTION 37(2) MEMORANDUM OF AGREEMENT

Between

**SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE**

(Hereinafter referred to as SANBI)

And

.....

Company registration number: .....

(Hereinafter referred to as **“the Contractor”**)

In terms of Section 37(2) of the Occupational Health and Safety Act 85 of 1993 and its regulations, henceforth referred to as the OHS Act, the provision of Section 37(1) of the same act apply to ..... henceforth referred to as the contractor, in as far as, SANBI shall not be responsible or liable for the actions or inaction's whatsoever in contravention of the OHS Act taken by the employees of the contractor, in the fulfillment of the contract undertaken by the contractor.

As an **employer in your own right**, you, the contractor are obliged to comply with all the provisions of the OHS Act while on the premises of SANBI, you shall also be required to comply with the conditions and safety procedures of SANBI.

SANBI hereby reserves the right to cause all work undertaken by the contractor, that is in contravention of the OHS Act and that has come to the attention of SANBI to cease, until satisfied that such contravention has been rectified. Noncompliance to SANBI arrangements and procedures will adversely affect future contracts, while serious noncompliance may lead to immediate expulsion from the premises.

## 2. **REQUIREMENTS, ARRANGEMENTS AND PROCEDURES FOR CONTRACTORS**

- 2.1 It is a condition of this contract that your employees, and any sub-contractors, be covered in terms of the Compensation for Occupational Injuries and diseases Act 130 of 1993 as amended. A copy of good standing with the Compensation Commissioner shall be attached to the signed copy of this legal document. Furthermore, the contractor or sub-contractor certifies that such cover will not expire during the execution of the task nor will the contractor become in arrears with any payment due to the Commissioner or any other documentation required by the Commissioner.
- 2.2 The contractor furthermore agrees to the following health and safety rules of SANBI:
- 2.2.1 The contractor shall have available a copy of the OHS Act on request.
  - 2.2.2 Any contractor with more than five employees at any time on the premises shall have available a first aid box for prompt first aid.
  - 2.2.3 Any contractor with five or more employees shall have at least one competent and valid first aider on the premises at their workplace. Should there be fifty or more employees on the premises a further first aider for every fifty employees or part thereof shall be available.
  - 2.2.4 Any contractor with less than five employees on the premises shall ensure that such employees are made conversant with the first aider at their workplace.
  - 2.2.5 The contractor shall keep up to date and available for inspection all applicable legally required registers.
  - 2.2.6 The contractor shall make himself and his employees conversant with SANBI emergency and evacuation procedures.
  - 2.2.7 The contractor shall not misuse anything, which is supplied in the interest of health and safety.
  - 2.2.8 The contractor shall adhere to all SANBI safe working procedures.
  - 2.2.9 The contractor shall be subject to the health and safety and security rules of SANBI.
  - 2.2.10 No intoxicating drugs or liquor will be consumed on or brought onto the premises and no person under the influence or who appears to be under the influence will be permitted to come onto or remain on the premises or at a workplace.

### **3. INDEMNIFICATION**

- 3.1 The contractor hereby certifies that all contracting workmen recognize the inherent hazards that exist on the premises of SANBI and that the Contractor:

- 3.1.1 Enters the property entirely at his/her own risk and therefore the Contractor waives any claim of whatsoever nature against SANBI, its employees, agents and/or mandataries in respect of any loss, damage and/or injury whether same is the result of any negligent act or omission on the part of SANBI, its employees, agents and/or mandataries or other independent contractors or by a third person or by way of defective equipment or materials supplied by the company, and further the Contractor;
- 3.1.2 Hereby indemnifies SANBI, its employees, agents and/or mandataries against any claims from the Contractor's employees and/or from any other person, arising and being caused in the manner set out above.

**4. ACCEPTANCE**

- 4.1 I, .....the Contractor, do hereby declare that my company.....acknowledge having read and understood the conditions contained in this legal document and furthermore, our employees agree to abide by these conditions.

\_\_\_\_\_  
**CONTRACTOR**

\_\_\_\_\_  
**DATE**

\_\_\_\_\_  
**SANBI PROJECT MANAGER**

\_\_\_\_\_  
**DATE**

\_\_\_\_\_  
**WITNESS 1**

\_\_\_\_\_  
**DATE**

\_\_\_\_\_  
**WITNESS 2**

\_\_\_\_\_  
**DATE**

## **HEALTH & SAFETY SPECIFICATIONS FOR MINOR CONTRUCTION WORK ACTIVITES AT SANBI PREMISES.**

### **1. PURPOSE**

The objective of the Health and Safety Specifications is to provide guidelines to the principal contractor for complying with the requirements of the Occupational Health and Safety Act (OHSA), Act 85 of 1993 and its regulations.

The Health and Safety Specifications do not replace the OHSA and relevant regulations, but is a supplementary document to the requirements of the relevant legislation and the conditions of the contract agreement between SANBI and the Principal Contractor.

It does not imply that sections of legislation not referred to in full in this document are of less importance and/or not relevant. The Contractor remains responsible to comply with the Act, its regulations and the contracting company's own health and safety plan.

In terms of Section 37 of the Occupational Health and Safety Act (1993), SANBI is required to control persons/organisations conducting activities for or on their behalf (Mandatories). The Construction Regulations promulgated under the Occupational Health and Safety Act (Act no. 85 of 1993), is requiring SANBI to compile an occupational health and safety specification for any intended project classified as construction work and to provide the specification to prospective tenderers/mandatories. The dual objective of this specification is to ensure that the mandatories and service providers entering into a contractual agreement/relationship with SANBI achieves and maintains an acceptable level of occupational health, safety and environmental performance whilst conducting activities while performing the contract work.

### **2. Scope of Occupational Health, Safety and Environmental (SHE) Specification**

The scope of this Occupational Health, Safety and Environmental (SHE) Specification is to address the reasonable and foreseeable aspects of occupational health, safety and environmental management, which will be affected by the contract work and it covers any of the following activities:

- Alterations and renovations to existing buildings
- Demolition work (portion of buildings)
- Altering and opening of existing walls
- Dismantling, storage and disposal of material
- Removal of a canopy fixed to façade
- Breaking up of mass concrete/brick paved areas and/or brick work
- Removal of all sanitary fittings
- Preparatory work to existing surfaces
- Work conducted inside existing buildings
- Earth works/open face excavations/trenches/backfilling

Concrete work, formwork and/or reinforcing  
 Concrete in foundations – superstructure  
 Rough formwork  
 Steel reinforcement  
 Masonry work/water proofing of roof coverings  
 Carpentry and joining  
 Ceilings installation, partitioning/access flooring  
 Iron monger work  
 Installation of bathroom fittings  
 Structural steelwork/metal work  
 General plastering work  
 Tiling work  
 Paint work on new work (external plastered walls)  
 External works – preparation of soil for paving  
 Removal of existing work  
 Building up of openings  
 Re-fixing of existing palisade fencing  
 Earth works and filling (import material)  
 Soil poisoning (Submit Medical Safety Data Sheets (MSDS))  
 Concrete formwork and reinforcement  
 Formwork to soffits of solid slab, sides of bases  
 Reinforced concrete casts – strip footings and bases  
 Masonry work for new work  
 General brick work (one and two brick walls)  
 Building of superstructure  
 Installation of concrete lintels  
 Waterproofing (damp proofing of walls/floors/roofs)  
 Installation of roof coverings (galvanized steel)  
 Installation of roof insulation  
 Carpentry and joining work (new work scope)  
 Installation of ceilings/partitions and access flooring  
 Installation of electrical light fittings  
 Installation of suspended ceilings  
 Ironmongery work  
 Installation of bathroom fittings  
 Metal work including door frame installations, gates and screens  
 External/internal plastering work (New work scope)  
 Tiling, including wall tiling/floor tiling  
 Plumbing and drainage work (New work scope)  
 Disinfection of water pipe work (requires MSDS of disinfectant)

Soil drainage (Sewer, pipe and drain fittings)  
Water supply provision  
Installation of fire appliances  
Boundary and yard walls/palisade fencing  
Aprons, compaction of surfaces  
Construction of generator plinth  
Signage installation  
Installation of electrical fencing  
Construction and installation of steel canopies with roof coverings  
Internal electrical installations  
Site electrical reticulation  
Electronic installations to existing buildings

### **3. Health and safety risks( as baseline assessment)**

The following are potential risks associated with the above work activities:

- Falling from height
- Exposure to electricity (Overhead and underground cables)
- Proximity to flammable or combustible materials causing injury
- Climbing steps and working on platforms
- Risk of vehicles overturning
- Risk of eye injury from flying particles and dust
- Cancer risk from exposure to asbestos
- Slips, trips and falls due to untidy work area
- Manual handling activity injuries
- Risk of using various types of machinery and tools
- Contact with moulds, fungi and bacteria
- Contracting dermatitis
- Exposure to cuts and abrasions
- Being struck by machinery
- Loss of fingers/limbs
- Risk of pain or injury from performing repetitive tasks
- Exposure to noise
- Being struck by falling objects
- Risk of eye injury from solvent splashes or vapour
- Contracting vibration white finger
- Exposure to hand and foot injury
- Sun exposure

#### **4. SITE SPECIFIC HEALTH AND SAFETY REQUIREMENTS BASED ON PROJECT SCOPE**

1. The principal contractor and all appointed sub-contractors shall be registered with the Department of Labour Compensation Commissioner or an appropriate similar private insurer and have available a valid Letter of Good Standing at all times from such.
2. Ensure a SHE file is submitted before work commences to SANBI's Occupational Health and Safety department of the Corporate Services Division for evaluation.
3. Ensure all employees undergo medical examination and are declared fit for the job they are employed for by a registered medical practitioner.
4. Ensure all employees under their control undergo company specific induction and SANBI site specific induction.
5. Ensure before work commences that employees are trained in the health and safety risks associated with the work they are conducting.
6. Ensure employees are trained in company procedures, policies, method statements and informed of SHE requirements as per the specification.
7. Ensure legislative requirements are complied with for the duration of the contract and ensure that its employees comply.
8. Ensure that the 37 (2) Agreement has been signed before any work commences and that a copy is kept on the SHE file.
9. Ensure that a 37(2) Agreement(s) is signed between the company and any other sub-contractor which may be appointed.
10. Ensure that sub-contractors have valid Letter of Good Standing from the Department of Labour Compensation Commissioner or a registered private compensation insurer.
11. Prevent any employee or visitor who is under the influence of any alcohol or drugs (in a state of intoxication) on site.
12. Ensure the safety of employees who are taking legal medication.
13. Hand over a consolidated SHE file at the end of the contract to SANBI.
14. Stop employees who are conducting unsafe acts and/or creating an unsafe environment from doing so.
15. Report and all reportable incidents to SANBI and ensure that they are investigated.
16. Ensure work is supervised by competent personnel and that work is done by competent employees.
17. Ensure pre-task risk assessments are done by a competent person and that employees are informed of the risks and the risk control measures in place.
18. Conduct tool box talks to communicate SHE issues in connection with the work being done and any other aspects thereof.
19. Ensure that the appointed personnel as per the SHE file are executing their duties as per the legal appointment made.
20. Ensure a first aid kit is made available in case of any emergency and that a trained certified first aider is available per shift.
21. Ensure that good housekeeping is maintained and that materials are store/stacked properly in designated areas.
22. Make provision for sufficient waste receptacles and ensure that the correct disposal of the different waste materials takes place.



23. Stop any work from being executed that are not in accordance with the rules for the site or which poses a threat to the health and safety of the people.
24. Service provider will be required to provide a signed (by Managing Director/Chief Executive Officer) copy of the Company's health and safety policy to the SHE file.
25. The principal contractor is responsible for the investigation of all accidents and/or incidents where employees and non-employees were injured to the extent that they had to receive medical treatment other than first aid.
26. No fires or open flames are allowed on site unless directly used for construction purposes, e.g. acetylene blowtorch for welding. All available precautions will be taken to prevent the spread of a fire.
27. The Principal Contractor will establish a Personal Protective Equipment Policy and a Personal Protective Equipment study will be conducted to determine the types of Personal Protective Equipment (PPE) to be supplied related to the hazards and risks emanating from the tasks to be performed by its employees and those of sub-contractors.
28. All employees must be provided with PPEs relevant to the hazard associated with the task at hand.
29. All employees shall, as a minimum, be required to wear the following personal protective equipment for the duration of the contract on any of SANBI projects:
  - Protective overalls;
  - Protective hand and footwear;
  - Protective headwear; and
  - Eye, face and ear protection.
30. A pre-emptive risk assessment will be required for any work to be carried out above **two meter** from the ground or any floor level. This work will be classified as "work in elevated positions".
31. As far as is practicable, any person working in an elevated position will work from a platform, ladder or other device that is at least as safe as if working at ground level.
32. Prohibition signage must be displayed where work is performed.

## 5. WASTE MANAGEMENT

The following requirements shall be incorporated into the waste management plan to be submitted

### Solid Waste:

- Littering on site and the surrounding areas is prohibited.
- Clearly marked litterbins must be provided on site. The Contractor must monitor the presence of litter on the work sites as well as the construction campsite.
- All bins must be cleaned of litter regularly.
- All waste removed from site must be disposed at a municipal/permitted waste disposal site.
- Excess concrete, building rubble or other material must be disposed of in areas designated specifically for this purpose and not indiscriminately over the construction site.
- The entire work area and all construction sites must be swept of all pieces of wire, metal, wood or other material foreign to the natural environment.

- Contaminated soil must be treated and disposed of at a permitted waste disposal site or be removed and the area rehabilitated immediately.
- Waste must be recycled wherever and whenever possible.

**Hazardous Waste:**

- No hazardous materials must be disposed of in the veld or anyplace other than a registered landfill for hazardous material. Hazardous waste must be stored in containers with tight lids that must be sealed and must be disposed of at an appropriately permitted hazardous waste disposal site. Such containers must not be used for purposes other than those originally designed for. The service provider must maintain a hazardous material register.

**7. General competence requirement**

The service provider shall ensure that its personnel and sub-contractors' personnel are trained and competent to carry out work safely and without risk to health (Training to be completed before work commences). The service provider shall ensure that follow-up and refresher training is conducted as the work progresses and whenever the scope or nature of the work changes

Prepared by: OHS Department  
15 September 2018

**South African National Biodiversity Institute**

Request for bids for the appointment of a contractor for the renovation and restoration work to Porter's Lodge including the garden visitor toilets for the South African National Biodiversity Institute (SANBI) at the Harold Porter National Botanical Garden, Bettys Bay  
Contract: **SANBI G497/2023**

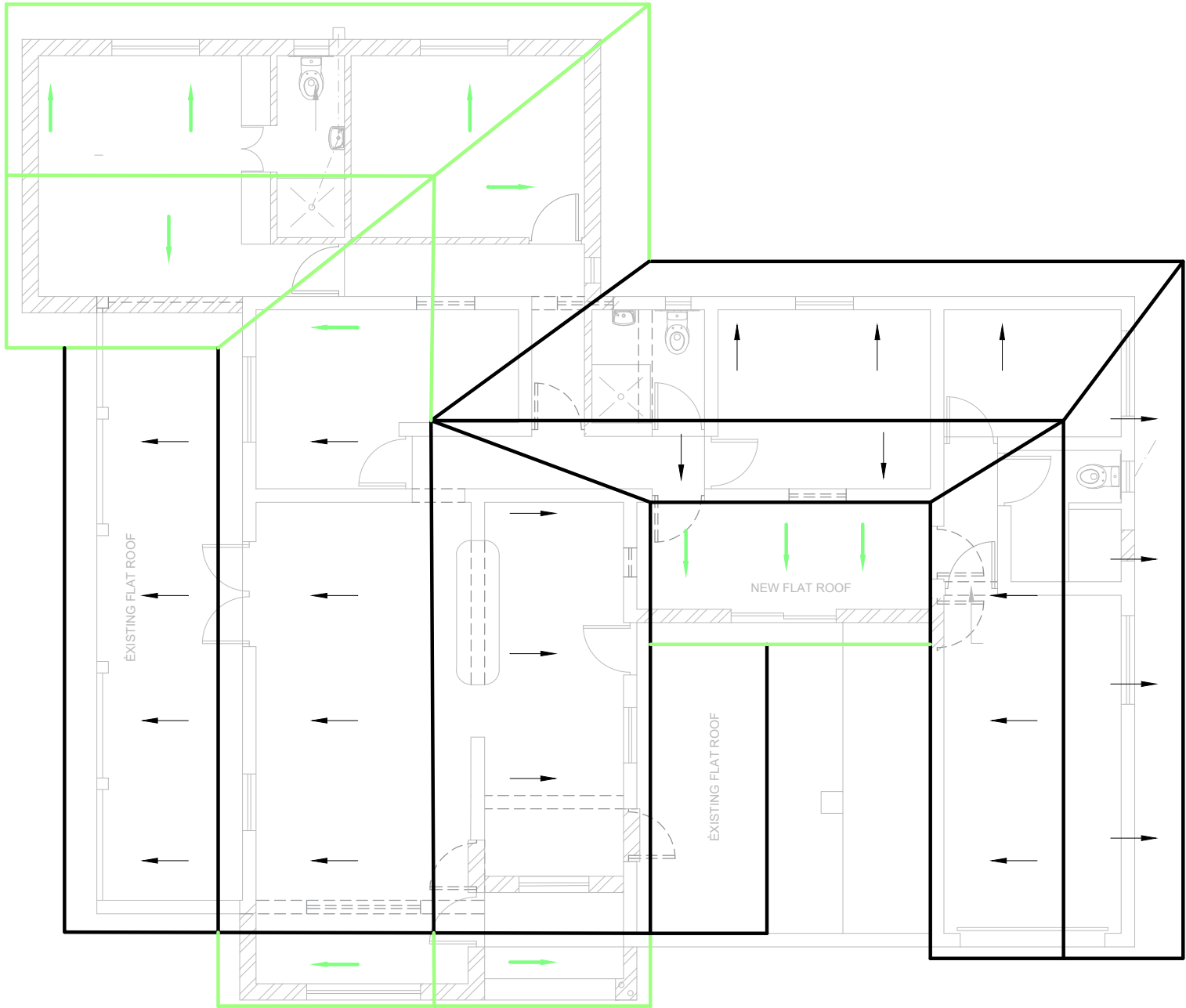
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**ANNEXURE B: DRAWINGS**

<b>DRAWING TITLE</b>	<b>DRAWING NUMBER</b>
FLOOR PLAN LAYOUT	0550-01
ELECTRICAL DIAGRAM AND ROOF LAYOUT	0550-02

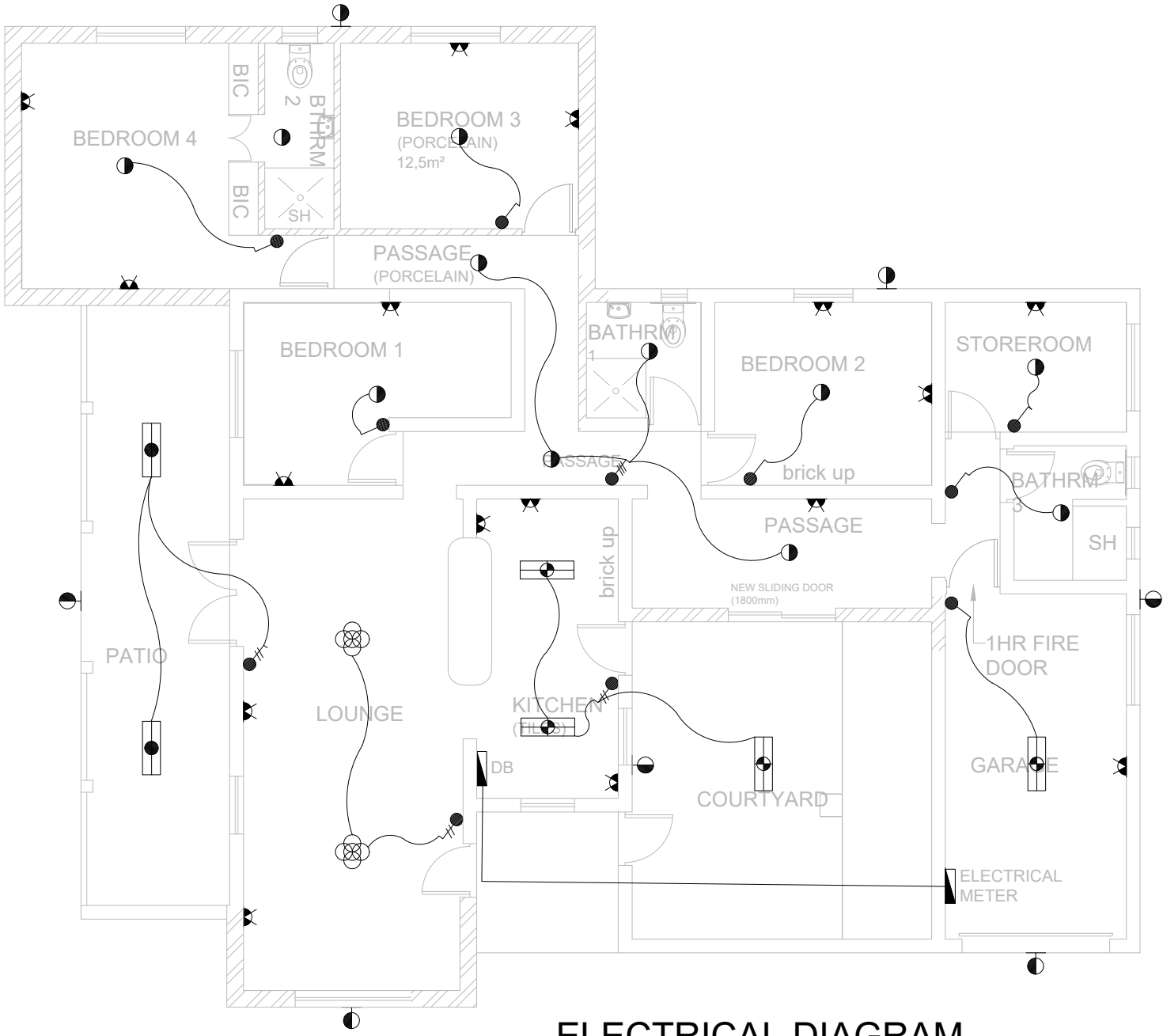






ROOF LAYOUT  
SCALE: 1:100

FOR ROOF CONSTRUCTION NOTES REFER TO DWG 0550-1



ELECTRICAL DIAGRAM

Energy Usage									
Item	Room	Average Room Size (m2)	Number of rooms	Total Area(m2)	Type of Light Fitting	Light per Fitting	No. of Light Fittings	Total Watts	Power (W/m2)
1	KITCHEN	12,00	1	12,00	Lascon M6V - 27W LED	27	1	27,0	2,25
2	LOUNGE	30,00	1	30,00	Chandeliers	36	2	72,0	2,40
3	PASSAGE	20,00	3	60,00	Bulkhead IP65	18	3	54,0	0,90
4	BEDROOM 1	11,60	1	11,60	Bulkhead IP65	18	1	18,0	1,55
5	BEDROOM 2	11,30	1	11,30	Bulkhead IP65	18	1	18,0	1,59
6	BEDROOM 3	12,50	1	12,50	Bulkhead IP65	18	1	18,0	1,44
7	BEDROOM 4	17,50	1	17,50	Bulkhead IP65	18	1	18,0	1,03
8	BATHROOM 1	3,80	2	7,20	Bulkhead IP65	18	1	18,0	2,50
9	BATHROOM 2	3,80	2	7,60	Bulkhead IP65	18	1	18,0	2,37
10	BATHROOM 3	4,30	2	8,60	Bulkhead IP65	18	1	18,0	2,09
11	GARAGE	17,50	1	17,50	Lascon M6V - 27W LED	27	1	27,0	1,54
12	STOREROOM	6,60	1	6,60	Bulkhead IP65	16	1	16,0	2,42
13	PATIO	24,00	1	24,00	Lascon M6V - 37W LED	37	2	74,0	3,08
14	EXTERNAL AREA	19,50	1	90,00	Wall-Bulkhead IP65	18	7	126,0	1,40
15	COURTYARD	26,80		26,80	Lascon M6V - 37W LED	237	1	237	8,84
Total								324,00	35,42
Calculation of Energy usage per annum (KWh/m2 a)									
W	Day	Annual			W.h.a	m2	KWh/m2 a		
324,00	10,00	365,00			1182600,00	1182,60	253,20	4,67	Internal Lighting
SANS 10400 XA 2021 requires that the maximum energy usage for Dwelling Houses should not exceed 80kwh/m2 a									

Theoretical Annual Energy Consumption VAm2	
Voltage(V)	230 V
Current(A)	54 A
Area(m2)	221,6 m2
V/A	12420 VA
Energy Demand	56,05 VAm2
SANS 10400 XA 2021 requires that max Energy Demand <56VAm2	

Lighting Power Density	
Power (W/m2)	35,42 W
Number of rooms	15
Power density-Average	2,36 W/m2
SANS 10400 XA 2021 requires that Lighting Power density not exceed <4W/m2	

No.	DATE	AMENDMENT	D.P.W.
0	OCT'23	FOR INFORMATION	S.I

LEGEND

ELECTRICAL LEGEND

1 lever 1 way switch

2 lever 1 way switch

1 lever 2 way switch

2 lever 2 way switch

18W ceiling mounted LED bulkhead IP65

18W wall mounted LED bulkhead IP65

20W | 50W wall mounted LED floodlight IP65

Lascon M6V - 27W LED

Lascon M6V - 37W LED

Distribution Board

Single wall socket with switch (300mm AFFL)

Single wall socket with switch in weatherproof box (300mm AFFL) (1100mm AFFL)

Double wall socket with switch (300mm AFFL)

Double wall socket with switch (1100mm AFFL)

Dedicated single socket outlet

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client

SANBI

Biodiversity for Life

South African National Biodiversity Institute

consultant

VIRTUAL  
CONSULTING ENGINEERS

discipline

ELECTRICAL

service

SANBI HAROLD PORTER  
GARDEN:

ELECTRICAL DIAGRAM  
AND  
ROOF LAYOUT

PROFESSIONAL SENIOR ARCHITECTURAL  
TECHNOLOGIST

MOGAMAT SHAHIEN ISHMAIL

14:31 PM (Africa/Johannesburg) on 02 Nov 2023

project number

0550

drawing title

PROPOSED ALTERATIONS  
AND ADDITIONS @ERF 2801  
CLODE STREET,BETTY'S BAY

ref.no. ...

designed B.PHALISO

scale N.T.S

drawn B.PHALISO

date OCT'23

checked S.ISHMAIL

drawing number

0550-02

revision

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