

SBD1

PART A INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE (SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE)					
BID NUMBER:	Q10261-2023	CLOSING DATE:	01 March 2024	CLOSING TIME:	11:00
DESCRIPTION	THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE REQUIRES A PROFESSIONAL SERVICE PROVIDER FOR THE INSTALLATION AND 24-MONTH MAINTENANCE OF A 160KVA STANDBY GENERATOR AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN IN CAPE TOWN. <u>Please note:</u> It is estimated that tenderers should have a CIDB contractor grading designation of Level 2 EB or higher.				
Submission of proposals: proposals must be emailed to S.SCM-Quotations@sanbi.org.za with a copy to Ms. Mogadingwane at R.modiba@sanbi.org.za Please state the Bid number as the reference number on the subject line when responding to the RFQ.					
BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO			TECHNICAL ENQUIRIES MAY BE DIRECTED TO:		
CONTACT PERSON	Rorisang Mogadingwane		CONTACT PERSON	Amjad Hendricks	
TELEPHONE NUMBER	012 843 5000		TELEPHONE NUMBER	+27 21 799 8420	
FACSIMILE NUMBER	N/A		FACSIMILE NUMBER	N/A	
E-MAIL ADDRESS	R.modiba@sanbi.org.za		E-MAIL ADDRESS	A.Hendricks@sanbi.org.za	
SUPPLIER INFORMATION					
NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE		NUMBER		
CELLPHONE NUMBER					
FACSIMILE NUMBER	CODE		NUMBER		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:		OR	CENTRAL SUPPLIER DATABASE No:	MAAA
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE	[TICK APPLICABLE BOX] ☐ Yes ☐ No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT		[TICK APPLICABLE BOX] ☐ Yes ☐ No
[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]					

ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ No [IF YES ENCLOSE PROOF]	ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ No [IF YES, ANSWER THE QUESTIONNAIRE BELOW]
---	---	--	--

QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS

IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)? ☐ YES ☐ NO

DOES THE ENTITY HAVE A BRANCH IN THE RSA? ☐ YES ☐ NO

DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA? ☐ YES ☐ NO

DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA? ☐ YES ☐ NO

IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION? ☐ YES ☐ NO

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

PART B

TERMS AND CONDITIONS FOR BIDDING

1. BID SUBMISSION:
1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION. 1.2. ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED--(NOT TO BE RE-TYPED) OR IN THE MANNER PRESCRIBED IN THE BID DOCUMENT. 1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT. 1.4. THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (SBD7).
2. TAX COMPLIANCE REQUIREMENTS
2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS. 2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VERIFY THE TAXPAYER'S PROFILE AND TAX STATUS. 2.3 APPLICATION FOR TAX COMPLIANCE STATUS (TCS) PIN MAY BE MADE VIA E-FILING THROUGH THE SARS WEBSITE WWW.SARS.GOV.ZA 2.4 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID. 2.5 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER. 2.6 WHERE NO TCS PIN IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED. 2.7 NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE, COMPANIES WITH DIRECTORS WHO ARE PERSONS IN THE SERVICE OF THE STATE, OR CLOSE CORPORATIONS WITH MEMBERS PERSONS IN THE SERVICE OF THE STATE."

NB: FAILURE TO PROVIDE / OR COMPLY WITH ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.

SIGNATURE OF BIDDER:

CAPACITY UNDER WHICH THIS BID IS SIGNED:
 (Proof of authority must be submitted e.g. company resolution)

DATE:

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

SBD 4

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

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

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

2. Bidder's declaration

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

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 institution	State

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:

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

.....

- 2.3 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:

.....

3 DECLARATION

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

- 3.1 I have read and I understand the contents of this disclosure;
 3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;
 3.3 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium² will not be construed as collusive bidding.
 3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.
 3.4 The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.
 3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.
 3.6 I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting

² Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

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

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

- a) The applicable preference point system for this tender is the **80/20** preference point system.
- b) The **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

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

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

P_{min} = Price of lowest acceptable tender

3.2. FORMULAE FOR DISPOSAL OR LEASING OF STATE ASSETS AND INCOME GENERATING PROCUREMENT

3.2.1. POINTS AWARDED FOR PRICE

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

$$P_S = 80 \left(1 + \frac{Pt - P_{max}}{P_{max}} \right) \text{ or } P_S = 90 \left(1 + \frac{Pt - P_{max}}{P_{max}} \right)$$

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

P_{max} = Price of highest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

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

the 90/10 and 80/20 preference point system.

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

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

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

The specific goals allocated points in terms of this tender	Number of points allocated (80/20 system) (To be completed by the organ of state)	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. 100% black ownership (Points will be allocated based on the percentage of ownership per goal. Information will be verified on CSD. CSD must be attached as proof)	10	
Categories of persons historically disadvantaged by unfair discrimination on the basis of gender. 100 % female ownership (Points will be allocated based on the percentage of ownership per goal. Information will be verified on CSD. CSD must be attached as proof)	10	
TOTAL	20	

DECLARATION WITH REGARD TO COMPANY/FIRM

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

4.4. Company _____ registration _____ number:

Stop Fraud, Theft and Corruption without Fear or Favour - Call our Hotline 0800 160 999 Anytime

4.5. TYPE OF COMPANY/ FIRM

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

.....

.....

.....

SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE



INSTALLATION AND 24-MONTH MAINTENANCE OF A 160kVA STANDBY GENERATOR FOR THE GARDEN OFFICE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN IN CAPE TOWN

QUOTATION No. Q10261-2023

FEBRUARY 2024

NAME OF TENDERER:

TENDER AMOUNT:

CLOSING DATE: 01 March 2024

CLOSING TIME: 11H00



Tender Notice and Invitation to Tender

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

The appointment of a contractor for the Installation and 24-Month Maintenance of a new 160kVA Standby Generator at the Garden Office of the Kirstenbosch National Botanical Garden in Cape Town.

Tender documents will be available as from **15 February 2024** and will be available **ONLINE ONLY** on the SANBI website www.sanbi.org (click on "Opportunities").

No briefing session or site inspection will be held.

(a) CIDB registration

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 **2 EB** class of construction work, are eligible to have their tenders evaluated.

Joint ventures are eligible to submit tenders provided that:

1. every member of the joint venture is registered with the CIDB;
1. the lead partner has a contractor grading designation in the **2 EB** class of construction work; and
2. 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 **2 EB** class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.

(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.

Potential service providers are required to submit the following Administrative documentation.

- SBD forms (SBD 1, 4 and 6.1). The Standard Bidding Forms (included in the bid documentation) must be completed and submitted with this proposal.
- The specific goals allocated in terms of this RFQ are as follows:
 - Categories of persons historically disadvantaged by unfair discrimination on the basis of race. Information will be verified on CSD report. Points will be allocated based on the percentage of ownership per goal. 100% black ownership = 10 points.
 - Categories of persons historically disadvantaged by unfair discrimination on the basis of gender. Information will be verified on CSD report. Points will be allocated based on the percentage of ownership per goal. 100% female ownership = 10 points
- A current copy of the Central Suppliers Database (CSD) registration report or registration number must be provided.

Potential service providers are required to submit the following Mandatory documentation, Failure to do so will lead to disqualification.

- Service providers with one or more employees are required by law to contribute to the Compensation Fund. A valid letter of good standing certificate with COIDA is required. The certificate should be issued by the Department of Labour.
- Proof of Public Liability Insurance or Letter to intend.
- It is estimated that tenderers should have a CIDB contractor grading designation of Level 2 EB or higher.

Fraud and Corruption

- Any effort by a Bidder to influence the bid evaluation, bid comparisons or bid award decisions in any matter, may result in rejection of the bid concerned. SANBI shall reject a submission if the Bidder has committed a proven corrupt or fraudulent act, or any other improper conduct in bidding for any other work.
- SANBI may disregard any submission if that Bidder, or any of its directors -
 - have abused the Supply Chain Management (SCM) system of any Government Department/ institution; have committed proven fraud, corruption or any other improper conduct in relation to such system; have failed to perform on any previous contract and the proof thereof exists; and/or
 - is restricted from doing business with the public sector if such a bidder obtained preferences fraudulently or if such bidder failed to perform on a contract based on the specific goals.

Closing date for quotations

The closing date for submission of responses is **01 March 2024 at 11:00 AM.**

Submissions should be e-mailed to S.SCM-Quotations@sanbi.org.za with a copy to Ms. Mogadigwane at R.modiba@sanbi.org.za.

For Technical information, contact Mr Amjad Hendricks on 012 843 5000 or e-mail A.Hendricks@sanbi.org.za

PLEASE NOTE: Emailed applications must not be more than 8MB.

FORM OF OFFER AND ACCEPTANCE

PROJECT TITLE:	INSTALLATION AND 24-MONTH MAINTENANCE OF A 160kVA STANDBY GENERATOR FOR THE GARDEN OFFICE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN IN CAPE TOWN
CONTRACT NO:	Q10261-2023

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the appointment of a contractor for the Installation and 24-Month Maintenance of a 160kVA Standby Generator for the Garden Office at the Kirstenbosch National Botanical Garden in Cape Town.

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

.....
.....

Date

witness

.....

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 *[which includes this Agreement]*
- Part C2 Pricing Data
- Part C3 Scope of Work
- Part C4 Site Information

and drawings and documents or parts thereof, which may be incorporated by reference into Parts C1 to C4 above.

Deviations from and amendments to the documents listed in the 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

.....

Date

.....

witness

.....

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.

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

C.1.2 Contract Data

PROJECT TITLE:	INSTALLATION AND 24-MONTH MAINTENANCE OF A 160kVA STANDBY GENERATOR FOR THE GARDEN OFFICE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN IN CAPE TOWN
CONTRACT NO:	Q10261-2023

C.1.2 Contract Data

The General Conditions Of Contract For Construction Works, Third Edition (2015), published by the South African Institution of Civil Engineering, Private Bag X200, Halfway House, 1685, is applicable to this contract and is obtainable from www.saice.org.za

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

Part 1: Data provided by the Employer

Clause	Data
1.1.1.13	Clause 1.1.1.13: Defects Liability Period The Defects Liability Period is 12 months , measured from the date of the Certificate of Completion
1.1.1.14	Clause 1.1.1.14: Due Completion Date Installation period for the generator is 3 months after access to the installation. The time for achieving Practical Completion is 24 months after the Commencement Date
1.1.1.15	The name of the Employer is The South African National Biodiversity Institute , represented by Mr C Willis and/or such persons or person duly authorised thereto be the Employer in writing.
1.2.1.2	The Employer's address for receipt of communications is: Submission of proposals: proposals must be emailed to S.SCM-Quotations@sanbi.org.za with a copy to Ms. Mogadingwane at R.modiba@sanbi.org.za
1.1.1.16	The name of the Engineer is the Ukhukhula Holdings (Pty) Ltd
1.2.1.2	The address of the Engineer is: Ukhukhula Holdings (Pty) Ltd 117 Strand Street Cape Town, 8000 Tel: 082 335 0535 Fax: 086 552 3309
1.1.1.26	Clause 1.3.: Pricing Strategy The Pricing Strategy is a re-measurement contract.

3.1.3	Clause 3.1.3: Specific Approval of the Employer Required The Engineer is required to obtain the specific approval of the Employer before executing any of the following functions or duties: 1 Clause 6.3: Variations 2 Clause 5.11.1: Suspension of the Works 3 Clause 5.12: Extension of Time for Practical Completion
5.3.1	Clause 5.3.1: Commencement of the Works The documentation required before commencement with Works execution are: Health and Safety Plan (Refer to Clause 4.3) Initial programme (Refer to Clause 5.6) Security (Refer to Clause 6.2) Insurance (Refer to Clause 8.6)
5.3.2	Clause 5.3.2: Timeframe to deliver documentation The time to submit the documentation required before commencement with Works execution is Fourteen (14) days.
5.4.2	The access and possession of Site shall not be exclusive to the Contractor but as set out in the Site Information.
5.8.1	Clause 5.8.1: Non-Working Times The non-working days are Saturdays and Sundays. The special non-working days are: 1. All gazetted public holidays falling outside the year end break. 1. The year-end break commencing on 16 December 2022 and ending on 15 January 2023.
5.12.2.	Clause 5.12.2.: Some reasons for extension of time Clause 5.12.2.2: Abnormal climatic conditions. <i>Add the following:</i> Regardless of the cause of any delay an extension of time will only be considered if it can be shown that the activity delayed is on the critical path indicated on the Programme of Works (Clause 5.6.1). No extension of time will be granted in respect of any delays attributed to normal climatic conditions. Normal Climatic Conditions shall be deemed to include normal rainfall and associated wet conditions and materials, strong winds and extremes of temperature. However, in the event that delays to critical activities exceed the number of working days listed below for each month, then abnormal climatic conditions shall be deemed to exist, and an extension of time shall be granted in accordance with the provisions of that Clause. The number of days quoted below shall be regarded as a fair estimate of the delays to be anticipated and allowed for under normal climatic conditions where inclement weather prevents or disrupts work on the critical path. January 9 days May 5 days September 6 days February 9 days June 4 days October 9 days March 10 days July 4 days November 9 days

	April 8 days August 5 days December 10 days Claims for delays for abnormal climatic conditions shall be accompanied by substantiating facts and evidence, which shall be submitted timeously as each day or half-day delay is experienced. Should an extension of time be granted by the Engineer such extension of time will be added to the Time for Completion. It shall be further noted that where the critical path is not affected, no extension of time for <u>abnormal</u> climatic conditions or for any other reason will be entertained. Rainfall of 10mm or less per day shall be deemed to be normal climatic conditions.
5.13.1	Clause 5.13.1: Penalty for Delay The penalty for failing to complete the Works is R 500.00 per day
5.16.3	Clause 5.16.3: Latent defect liability The latent defect period is one (1) year for the project.
6.2	Clause 6.2: Security The Form of Guarantee is to contain the wording of the pro-forma document as per the contract document. The liability of the guarantee shall be for 10% of the Approved Contract Sum.
6.8.2	Clause 6.8.2: Contract Price Adjustment Contract Price Adjustment: Is NOT applicable
6.8.3	Clause 6.8.3: Variation in Cost of Special Materials Price adjustments for variations in the costs of special materials are not allowed
6.10.1.5	Clause 6.10.1.5: Interim Payments - Materials on Site No percentage advance on materials on site but not yet built into the Permanent Works is allowed for, or will be paid.
6.10.3	Clause 6.10.3: Retention Money The percentage retention on the amounts due to the Contractor is 10% (ten percent). The limit of retention is 5% of the Contract Sum, including allowances for contingencies. This reduces to 2,5% upon the issue of the Certificate of Completion. The remaining 2,5% retention will be released upon the issue of the Final - Approval Certificate upon lapse of the defects liability period. Security plus Retention amount will not exceed 15% of the Contract Sum
6.10.4	Clause 6.10.4: Delivery, dissatisfaction with and payment of payment certificate <i>Replace "28 days" in the second last sentence with "30 days"</i>
6.10.6	Clause 6.10.6: Set-Off and Delayed Payments A guarantee in lieu of retention is not permitted
6.10.6.2	Clause 6.10.6.2: Set-Off and Delayed Payments <i>Replace the words "prime overdraft rate certified by the Contractor's banker" with the words "interest rate as determined by the Minister of Finance, from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No. 1 of 1999), will apply"</i>
6.10.8	Clause 6.10.8: Contractor's completion statement

	<i>Replace “28 days” in the last sentence with “30 days”</i>
6.10.9	Clause 6.10.9: Final payment certificate <i>Replace “28 days” in the last sentence with “30 days”</i>
6.12	Clause 6.12: Additional <i>Add Clause 6.12 as follows:</i> In respect of any amount owed by the Contractor to the Employer, the Contractor shall pay the Employer interest at the rate as determined by the Minister of Finance, from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No. 1 of 1999), will apply
8.6.1	Clause 8.6.1: Insurance <i>Add the following:</i> Damage to the Works (a) Without in any way limiting the Contractor's obligations in terms of the Contract, the Contractor shall bear the full risk of damage to and/or destruction of the Works by whatever cause during construction of the Works and hereby indemnifies and holds harmless the Employer against any such damage. The Contractor shall take such precautions and security measures and other steps for the protection and security of the Works, as he may deem necessary. (a) The Contractor shall at all times proceed immediately to remove or dispose of any debris arising from damage to or destruction of the Works and to rebuild, restore, replace and/or repair the Works. (b) The Employer shall carry the risk of damage to or destruction of the Works and material paid for by the Employer that is the result, whether direct or indirect or proximate or remote, of the excepted risks as set out in Clause 8.6.2. (d) Where the Employer bears the risk in terms of this Contract, the Contractor shall, if requested to do so, reinstate any damage or destroyed portions of the Works and the costs of such reinstatement shall be measured and valued in terms of Clause 6.7 hereof.
8.6.1.1.2	Clause 8.6.1.1.2: Insurance The value of the materials supplied by the Employer to be included in the insurance sum is -Nil.
8.6.1.1.3	Clause 8.6.1.1.3: Insurance The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is -Nil.
8.6.1.3	Clause 8.6.1.3: Insurance The limit of indemnity for liability insurance is R5 000 000.00 for any single claim – the number of claims to be unlimited during the construction.
8.6.1.5	Clause 8.6.1.5: Additional Insurance Additional Insurance is required for the following:

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

Annexure A

This annexure contains all the criteria that the Employer shall use to evaluate tenders. In accordance with 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 the 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 Specific Goals

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 the Tender Data will be used to determine the tenders 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	<u>Contractor's Experience</u> - 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. <table><tr><th>Sub-Criteria</th><th>Points</th></tr><tr><td>One relevant Project</td><td>10</td></tr><tr><td>Two relevant Projects</td><td>20</td></tr><tr><td>Three relevant Projects</td><td>30</td></tr><tr><td>Four relevant Projects</td><td>40</td></tr><tr><td>Five relevant Projects</td><td>50</td></tr></table> Notes: 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 to be awarded the points. - Appointment letters and reference letters must be on the employer's letterhead, dated and signed by the employer.	Sub-Criteria	Points	One relevant Project	10	Two relevant Projects	20	Three relevant Projects	30	Four relevant Projects	40	Five relevant Projects	50	50	
	Sub-Criteria	Points													
	One relevant Project	10													
	Two relevant Projects	20													
	Three relevant Projects	30													
	Four relevant Projects	40													
	Five relevant Projects	50													
	2	<u>Contractor's Resources: Proposed personnel</u> - CVs for proposed key personnel (At least 2 – Site Agent & Site Supervisor) indicating: - Previous work experience - Total number of years' working experience in construction - Qualifications or artisan's certification or other recognised training courses completed - Electrical Registration <i>Note: 'Years experience' will only be considered for electrical relevant CV's which includes the relevant qualifications and certifications</i> <table><tr><th>Sub-Criteria</th><th>Points</th></tr><tr><td>Combined CV experience of less than 5 years</td><td>10</td></tr><tr><td>Combined CV experience of more than 5 years</td><td>20</td></tr><tr><td>Combined CV experience of more than 10 years</td><td>30</td></tr><tr><td>Combined CV experience of more than 15 years</td><td>40</td></tr><tr><td>Combined CV experience of more than 20 years</td><td>50</td></tr></table>	Sub-Criteria	Points	Combined CV experience of less than 5 years	10	Combined CV experience of more than 5 years	20	Combined CV experience of more than 10 years	30	Combined CV experience of more than 15 years	40	Combined CV experience of more than 20 years	50	50
		Sub-Criteria	Points												
		Combined CV experience of less than 5 years	10												
Combined CV experience of more than 5 years		20													
Combined CV experience of more than 10 years		30													
Combined CV experience of more than 15 years		40													
Combined CV experience of more than 20 years		50													
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 particular aspect of the requirements and evidence given of skill / experience sought
4	Above acceptable - response / answer / solution demonstrating real understanding of requirements and evidence of ability to meet it.
5	Excellent - response / answer / solution provides confidence that the tenderer will add real value to the project.

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

3 Stage 3: Tender Price and Specific Goals

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

After calculation of the scores for Tender Price and for Specific Goals, 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 Specific Goals

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

PART 2: DATA PROVIDED BY THE CONTRACTOR

Clause

1.1.1.9 The Contractor is

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

Physical address:

Postal address:

.....

.....

.....

.....

.....

.....

.....

.....

Telephone:

Fax:

Email:.....

C1.3 Form of Guarantee

PERFORMANCE GUARANTEE

For use with the General Conditions of Contract for Construction Works, Third Edition (2015),

GUARANTOR DETAILS AND DEFINITIONS

“Guarantor”
 means:.....

Physical
 Address:.....

“Employer”
 means:.....

“Contractor”
 means:.....

“Engineer”
 means:.....

“Works”
 means:.....

“Site”
 means:.....

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

“Contract Sum” means: The accepted amount inclusive of tax of
 R.....

Amount in
 words:.....

“Guaranteed Sum” means: The maximum aggregate amount of
 R.....

Amount in
 words:.....

“Expiry Date”
 means:.....

CONTRACT DETAILS

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

PERFORMANCE GUARANTEE

Stop Fraud, Theft and Corruption without Fear or Favour - Call our Hotline 0800 160 999 Anytime

1. The Guarantor's liability shall be limited to the amount of the Guaranteed Sum.
2. The Guarantor's period of liability shall be from and including the date of issue of this Performance Guarantee and up to and including the Expiry Date or the date of issue by the Engineer of the Certificate of Completion of the Works or the date of payment in full of the Guaranteed Sum, whichever occurs first. The Engineer and/or the Employer shall advise the Guarantor in writing of the date on which the Certificate of Completion of the Works has been issued.
3. The Guarantor hereby acknowledges that:
 - 3.1 any reference in this Performance Guarantee to the Contract is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a surety ship;
 - 3.2 its obligation under this Performance Guarantee is restricted to the payment of money.
4. Subject to the Guarantor's maximum liability referred to in 1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 4.1 to 4.3:
 - 4.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Engineer in an Interim or Final Payment Certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 4.2;
 - 4.2 A first written demand issued by the Employer to the Guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) days has elapsed since the first written demand in terms of 4.1 and the sum certified has still not been paid;
 - 4.3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum certified in 4.
5. Subject to the Guarantor's maximum liability referred to in 1, the Guarantor undertakes to pay to the Employer the Guaranteed Sum of the full outstanding balance upon receipt of a first written demand from the Employer to the Guarantor at the Guarantor's physical address calling up this Performance Guarantee, such demand stating that:
 - 5.1 the Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 5; or
 - 5.2 a provisional or final sequestration of liquidation court order has been granted against the Contractor and that the Performance Guarantee is called up in terms of 5; and
 - 5.3 the aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provisional liquidation court order.
6. It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4 and 5 shall not exceed the Guarantor's maximum liability in terms of 1.
7. Where the Guarantor has made payment in terms of 5, the Employer shall upon the date of issue of the Final Payment Certificate submit an expense account to the Guarantor showing how all monies received in terms of this Performance Guarantee have been expended and shall refund to the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Performance Guarantee shall bear interest at the prime overdraft rate of the

Employer's bank compounded monthly and calculated from the date payment was made by the Guarantor to the Employer until the date of refund.

8. Payment by the Guarantor in terms of 4 or 5 shall be made within seven (7) calendar days upon receipt of the first written demand to the Guarantor.
9. Payment by the Guarantor in terms of 5 will only be made against the return of the original Performance Guarantee by the Employer.
10. The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.
11. The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.
12. This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.
13. This Performance Guarantee, with the required demand notices in terms of 4 or 5, shall be regarded as a liquid document for the purposes of obtaining a court order.
14. Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate's Courts Act No 32 of 1944, as amended, to the jurisdiction of the Magistrate's Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's Court.

Signed at
 ..

Date.....

Guarantor's signatory (1)

Capacity
 .

Guarantor's signatory (2)

PROJECT TITLE:	INSTALLATION AND 24-MONTH MAINTENANCE OF A 160kVA STANDBY GENERATOR FOR THE GARDEN OFFICE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN IN CAPE TOWN
CONTRACT NO:	Q10261-2023

C2 Pricing Data

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 bid 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 as a result 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.

PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUAN- TITY	RATE	AMOUNT
SANS 1200 A	1.00	<u>PRELIMINARY AND GENERAL CHARGES</u>				
	1.01	Preliminary and General Charges Scheduled fixed preliminary and general charges to cover all charges during the contract related to risks, head-office cost, site overheads, supervision, scaffolding, financing costs, general expenses and quality control.	-	-	sum	
	1.02	Occupational Health and Safety Compliance with the Occupational Health and Safety Act and Regulations	-	-	sum	
	1.03	Guarantees Provision for 12 month written guarantee on the complete installation and all related installed components	No	1		
		<u>GENERATOR: 160kVA</u>				
	2.00	<u>CIVIL WORKS</u>				
	2.01.00	Generator Plinth				
	2.01.1	Excavate 100mm deep 2.5m x 5.0m area in pickable soil, level and compact (final dimensions to be confirmed with generator size).	m ³	1.25		
	2.01.2	Excavate 400mm deep 2.5m x 5.0m area in hard rock, level and compact (final dimensions to be confirmed with generator size).	m ³	5		
	2.01.3	Import G5 material for 2 layers of 150mm x 2.5m x 5m	m ³	3.75		
	2.01.4	Import C4 (2.5%) material for a layer of 200mm x 2.5m x 5m	m ³	2.5		
	2.01.5	Cast 25MPa Concrete (400mm x 2.5m x 5.0m) with chamfer all sides (25mm x 25mm) and cable entries (110mm PVC sleeves) and with 60kg steel per 1m ³ concrete.	m ³	5		
PS						

Stop Fraud, Theft and Corruption without Fear or Favour

160 999 Anytime

- Call our Hotline 0800

PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUAN- TITY	RATE	AMOUNT
		Brought forward				
	2.02.00	Excavations for Sleeves, Cables and Markers				
	2.02.01	Excavate 600mm wide and 800mm deep in hard rock. Install sleeves and selected backfill and compact. Compaction will be done in layers of 100mm, and provision must be made for supply and installation of cable warning tape to be laid 200mm above the highest sleeve.	m ³	2.4		
	2.02.02	Supply and install cable markers: Concrete cable markers fixed flush to the NGL with 25MPa concrete. The marker will be a galvanized steel plate fixed with casted bolts and engraved indicating direction by means of arrows and the words "LV CABLE"	no	1		
	2.03.00	Sleeves				
		Supply and install the following PVC Sleeves including short lengths and jointing, laid in trench (trenching and backfilling measured elsewhere). PVC fittings with "safe lock" seal ring joints.				
	2.03.01	110mm Diameter PVC sleeve	m	20		
	2.03.02	110mm Diameter Flexible PVC sleeve	m	3		
	2.04	Palisade Fence				
		Industrial Fully Galvanised Steel Palisade Fence - 1.8m high - with pedestrian access gate, and posts founded in concrete	m	20		
	3.00	<u>STANDBY GENERATOR & CHANGE-OVER</u>				
		<u>Notes:</u> 1) All panels will be manufactured from 2mm 3CR12 stainless steel. 2) Normal power will be coloured (power coated) orange and emergency panels, signal red. 3) The fault level are 30kA. 4) The fault level, guarantee period, emergency number while under guarantee, fed from and size of cables as well as all statutory labelling will be installed on front of the panels with engraved Masonite (black on white).				
	3.01	Standby Generator				
		Supply and install an 160kVA , 400V, 3 Phase Standby generator with a output voltage of 400V at 50Hz. The generator will be supplied with a built-in double bund fuel tank installed below machine housing with an adequate capacity of 500L (integrated fuel tank). The unit will be installed in a lockable weather- and sound proof canopy with a maximum noise of 80 dB @15m. The generator main load breaker will be 4-Pole 300A and situated in the canopy. The change over panel with the interconnecting cables/bus bars will be installed on the front of the generator. The following breakers (make provision for a 15kA fault level) and contactors and breakers including 350A N/C and 350A N/O Change-over Contactors				
			-	-	sum	

PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUAN- TITY	RATE	AMOUNT
		Brought forward				
	3.02	<u>CABLES</u>				
		Supply and install the following stranded bare copper conductor as earth cables with terminations (inclusive of 8 terminations):				
	3.02.01	70mm ² (2 in parallel)	m	24		
		Supply and install the following 4-core PVC/PVC/SWA/PVC600/1000V manufactured to SANS 1507-3 with terminations (inclusive of 8 terminations):				
	3.02.02	70mm ² 4-Core (2 in parallel)	m	24		
	3.03	<u>EARTHING</u>				
	3.03.01	Supply and install the following earth mat at the generator with the following specifications:				
		The earth mat will be installed 1m below the NGL (include excavations in hard rock in this price). The earth mat will be 1.2m x 1.2m and constructed with 70mm ² stranded bare copper conductor with all joints cad-welded. The mat will be in blocks of 400mm x 400mm (grid). Two separate 70mm ² stranded copper earth cables will be connected (cad-welded) to the mat with a separation of at least 800mm and brought to the surface through a PVC sleeve to enter the generator plinth from below. No sections of the earth mat will therefore protrude to be seen from the outside. The tails will be connected to the steel frame of the generator and to all the earth continuity conductors. The fuel tank will also be connected to the earth bar and all connections will be underground of at least 1 meter. Two x 50kg bentonite bags will be worked in around the soil directly covering the mat.	-	-	sum	
	4.00	<u>DISTRIBUTION KIOSK</u>				
	4.01	Supply and install new breakers inside distribution kiosk with the following: 300A 4-Pole Breaker	no	1		
	4.02	Supply and Install new 2-door kiosk on pre-cast concrete plinth including excavations, move of existing breakers, and re-connect of existing cables to different buildings	no	1		
		Supply and Install Ammeters and Voltmeters:				
	4.04	Ammeters with CT's for 160kVA full load with selector switch (R, W, B Phases)	no	3		
	4.05	Voltmeter with selector switch (R-N, W-N, B-N, R-W, W-B, B-R) for each bus bar	no	1		

PAYMENT REFERS TO	ITEM NO	DESCRIPTION	UNIT	QUAN- TITY	RATE	AMOUNT
		Brought forward				
	5.00	<u>CABLES AND BUS BARS</u>				
	5.01	Supply and install cable:				
	5.01.01	70mm² flexible un-armoured cable including 4 terminations	m	6		
	5.01.02	50mm² 4-core Cable	m	10		
	5.01.03	50mm² BCC	m	10		
	5.01.04	Terminations: 50mm² 4-core Cable	m	4		
	5.01.05	Terminations: 50mm² BCC	m	4		
		<u>MAINTENANCE: 24 MONTHS</u>				
	6.00	<u>DIESEL FUEL</u>				
	6.01	Supply diesel fuel 50ppm to test generator	litre	100		
	6.02	Supply diesel fuel 50ppm to fill tank	litre	500		
	7.00	<u>GENERATOR SERVICE (250 HOURS)</u>				
PS 23	7.01	160kVA Generator - Perform checks, cleaning, tests, and periodical maintenance as required and stipulated by the manufacturer including all consumables, material, filters, gaskets, oil, transport and labour (all inclusive).	no	4		
PS 21	8.00	<u>BREAKDOWN CALL-OUT</u>				
	8.01	Emergency Breakdown (12 Hours) response time	No	18		
	8.02	Allow the sum of R 34,000.00 for breakdown parts/components not covered by the initial 12-month warranty or not included as part of service item 8.01 above	-	PC	sum	34,000.00
	8.03	Charge required by Contractor on item 8.02 above	%	34,000	%	
PS 22	9.00	<u>PAYMENT REDUCTIONS</u>				
		Payment reductions shall be applied per hour (or part thereof) that a generator is not working - calculated from the moment a breakdown has been logged <i>and</i> the contractor notified, and measured until the generator-power supply to the building is restored.				
	9.01	Downtime per hour or part thereof (exceeding 36 hours)	hour	-	- R 500.00	Rate only
		SUBTOTAL				
		Stop Fraud, Theft and Corruption without Fear or Favour - Call our Hotline 0800 160 999 Anytime				
		VALUE ADDED TAX (VAT) @ 15%				

SCHEDULE OF INFORMATION OF EQUIPMENT

ENGINE		
1.	Maker's Name	
2.	Country of Origin	
3.	Manufacturer's Type No.	
4.	Continuous sea level rating after allowing for ancillary equipment:	
	a) in b.h.p	
	b) in kW	
5.	Percentage derating for site conditions, in accordance with B.S.S 5514	
	a) for altitude	
	b) for temperature	
	c) for humidity	
	d) total derating	
6.	Net output on site in kW	
7.	Nominal speed in r.p.m	
8.	Number of Cylinders	
9.	Strokes per working cycle	
10.	Stroke in mm	
11.	Cylinder in bore in mm	
12.	Swept volume in cm ³	
13.	Mean piston speed in m/min	
14.	Compression ratio	
15.	Cyclic irregularity	
16.	Fuel consumption of the complete generating set on site in kg/kWh of alternator output at:	
	a) Full Load	
	b) 3/4 Load	
	c) 1/2 Load	
NOTE : A tolerance of 5% shall be allowed above the stated value of the fuel consumption.		
17.	Make of fuel injection system	
18.	Capacity of fuel tank in litres	
19.	Is gauge glass fitted to tank?	
20.	Method of starting	
21.	Voltage of starting system	
22.	Method of cooling	

23.	Type of radiator if water-cooled		
24.	Type of heater for warming cylinder heads		
25.	Capacity of heater in kW		
26.	Method of protection against high temperature		
27.	Method of protection against low oil pressure		
28.	Type of governor		
29.	Speed variation in %		
	a)	Temporary	
	b)	Permanent	
30.	Minimum time required for assumption of full load in seconds		
31.	Recommended interval in running hours for:		
	a)	lubricating oil change	
	b)	decarbonising	
32.	Type of base		
33.	Can plant be placed on solid concrete floor?		
34.	Are all accessories and ducts included?		
35.	Is engine naturally aspirated?		
36.	Are performance curves attached?		
37.	Type of coupling to be used (flexible or disc)		
ALTERNATOR			
1.	Is alternator tropicalised?		
2.	Symmetrical short circuit current at terminals in Amperes		
3.	Type of coupling		
BATTERY			
1.	Maker's name		
2.	Country of origin		
3.	Type of battery		
4.	Voltage of battery		
5.	Number of cells		
6.	Capacity in Ah		
DIMENSIONS			
1.	Overall dimensions of set in mm	Length _____	
		Width _____	
		Height _____	
2.	Is plant room adequate for the installation of the set?		

3.	Mass of Genset (with fuel)	
4.	Size of door entrance required	
5.	Size of louvers required in Plant Room door	

SWITCHBOARD		
1.	Maker's name	
2.	Country of origin	
3.	Is board set mounted?	
4.	Finish of board	
5.	Make of volt, amp, and frequency meters	
6.	Dial size of meters in mm	
7.	Scale range of voltmeter	
8.	Scale range of ammeters	
9.	Ratio of current transformer	
10.	Make of hour meter	
11.	Range of cyclometer counter	
12.	Smallest unit shown on counter	
13.	Make of circuit breaker	
14.	Type of circuit breaker	
15.	Rating of circuit Breaker in A	
16.	Settings range of overload trips	
17.	Settings range of instantaneous trips	
18.	Make of change-over equipment	
19.	Make of voltage relay	
20.	Type of control equipment	
21.	Make of mains isolator	
22.	Type of indicators for protective devices	
23.	Rating of Amps of :	
	a) change over equipment	
	b) mains isolators	
	c) by-pass switch	
24.	Make of rectifier	
25.	Type of rectifier	
26.	Is battery charging automatic?	
27.	Are volt and ammeters provided for charging circuit?	

C3 Scope of Work

PROJECT TITLE:	INSTALLATION AND 24-MONTH MAINTENANCE OF A 160kVA STANDBY GENERATOR FOR THE GARDEN OFFICE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN IN CAPE TOWN
CONTRACT NO:	Q10261-2023

SCOPE OF WORK

EMPLOYER'S OBJECTIVES

The Employer's objective is the Installation and 24-Month Maintenance of a 160kVA Standby Generator for the Garden Office at the Kirstenbosch National Botanical Garden in Cape Town.

OVERVIEW OF THE WORKS

- Establishment
- Construction of a Concrete Plinth
- Supply, delivery and Installation of a new 160kVA Standby Generator including diesel storage reservoir and automatic change-over panel to supply standby power the following buildings:
 - Garden office
 - White House
 - Manor House (Guest House)
 - Protea Shed (ablution)
 - Gate House 3 – Rycroft Gate
 - Irrigation Pump Station
 - Protea Borehole
- Upgrading the cable between the meter and the breaker and a new external DB mounted on poles on a plinth.
- Maintenance of the Generator for a period of 24 months.

LOCATION OF THE WORKS

The works is located at the Garden Office Municipal Transformer next to Rhodes Drive at the Kirstenbosch National Botanical Garden in Cape Town.

Coordinates: 33° 59' 32.75" S 18° 25' 56.22" E

DESCRIPTION OF SITE AND ACCESS

The garden is easily accessible via public roads. Access to the site will be granted upon prior arrangement with the SANBI maintenance personnel.

TEMPORARY WORKS

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

DESCRIPTION OF THE WORKS

1.1. GENERAL

Should any requirement or provision of the Project Specification conflict with any requirement or provision of any other specification section or clause that are applicable to the Contract or any drawing, the prevailing specification will be in the following order:

- a. Particular Specification
- a. Project specifications
- b. Drawings
- c. General Specification

1.1. SCOPE OF CONTRACT

The contract shall comprise the supply of all labour, materials, workmanship, machinery, equipment, transport, attendance on others and everything stated or implied which is, or may be, necessary in and for the entire completion of all the following works:

- Establishment
- Construction of a Concrete Plinth
- Supply, delivery, installation and testing of a 160kVA Standby Generator including diesel storage reservoir and automatic change-over panel.
- Connection of generator to existing infrastructure
- Maintenance of the Generator for a period of 24 months.
- Compliance to regulations relating to Health and Safety and the Environmental Management Acts

1.2. CONSTRUCTION WORKS SPECIFICATION

PORTION A

PROJECT SPECIFIC ELECTRICAL SPECIFICATIONS

PS 1 SCOPE OF WORKS

This specification covers the contract engineering, manufacture, supply, delivery, installation, wiring, commissioning, testing and handing over in complete working order for immediate use. A guarantee for twelve (12) months will be applicable on all equipment and workmanship from commissioning for the following:

- The installation of a new standby generator and associated infrastructure:
 - Garden office: 160kVA Generator
- Excavations and the installation of LV cables.
- All other associated work.
- All equipment must be for weather conditions at the site specified
- Maintenance of the 160kVA generator will be performed for the remainder of the 24-month contract after installation and commissioning

PS 2 STANDBY GENERATORS AND CONTROL PANELS

2.1 GENERAL

This Specification covers the supply, delivery, factory testing and complete installation and re-testing on site and handover in full working order of the equipment and all associated equipment.

Full particulars, performance curves and illustrations of the equipment offered must be submitted with the tender. Contractors may quote for their standard equipment, complying as closely as possible with this Specification, but any deviations from the Specification must be fully detailed.

The questionnaire included in this document must be completed by bidders in all respects.

The Employer reserves the right not to bind itself to accept the lowest or any tender.

Each diesel alternator set called for in this Specification will be used as a Standby Unit for the continuity of electrical power supply to emergency services.

The following are a summary of the requirements and are additional to SABS standards:

Standby Capacity	: 160kVA
Generator Type Brushless	: Self excited, static regulated
IP rating	: Drip proof IP 22
Over speed capacity	: 50%

Voltage regulation	: ½% Steady state
	: 1% No Load to Full Load
Time	: Maximum time to “full on load” from time of mains failure: 15 Seconds (70% load) and 19 Seconds (Full load).
Frequency	: 50Hz
Voltage LV	: 400V, 3 Phase
Fuel tank	: Integrated fuel tank (500 litre).
Additional equipment	: Heavy duty air cleaner : Air pre-cleaner : Battery chargers : Battery racks : Charging alternators : A single set of change-over contactors 1 x 350A N/O from standby generator 1 x 350A N/C from main supply.
Standby Panel	: Main feed to Standby Panel: 300A

2.2 REQUIREMENTS

The set shall be fully automatic, i.e. it shall start when any one phase of the main supply fails, and shall shut down when the normal supply is re-established. The set shall be capable of delivering the specified output continuously under the site conditions mentioned below, without overheating. The engine shall be capable of delivering an output of 100% of the specified output for 2 hours in any period of 3 hours consecutive running.

2.3 BASE REQUIREMENTS

The engine and alternator of the set shall be built together on a common Simplex type frame, which will have anti-vibration mountings/pads between the frame and concrete floor. The set shall be placed direct on a concrete floor.

2.4 OUTPUT AND VOLTAGE

Output voltage : 400/231V
 Frequency : 50 Hz

2.5 DERATING

The engine must be de-rated for the site conditions as set out.

The de-rating of the engine for site conditions shall be strictly in accordance with B.S.S. 5514 of 1977 as amended to date. Any other methods of de-rating must have the approval of the Engineer and must be motivated in detail. Such de-rating must be guaranteed in writing and proved by the successful contractor at the site test.

2.6 DELIVERY & REMOVAL OF EQUIPMENT

Deliver to site and install.

2.7 ENGINE

The engine shall be a four stroke, full compression ignition, direct injection and of the readily available type industrial rated type diesel engine.

The standby generator will be manufactured with a **Volvo** or **Scania** engine.

The engine shall comply with the requirements laid down in B.S.S. 5514 and must be of the direct injection, compression ignition type, running at a speed not exceeding 1 500 rpm.

The engine shall be amply rated for the required electrical output of the set when running under the above-mentioned site conditions. The starting period for either manual or automatic switching-on until the taking over by the generating set, in one step, on a load equal to the specified site electrical output, shall not exceed 15 seconds.

2.8 RATING

The set shall be capable of delivering the specified output continuously under the site conditions, without overheating. The engine shall be capable of delivering an output of 110 % of the specified output for one hour in any period of 12 hours consecutive running in accordance with BS 5514.

2.9 DE-RATING

The engine must be de-rated for the site conditions as set out in the Technical Specification, Section 3 of this document.

The de-rating of the engine for site conditions shall be strictly in accordance with BS 5514 of 1977 as amended to date. Any other methods of de-rating must have the approval of the Engineer and SANBI and must be motivated in detail. Such de-rating must be guaranteed in writing and proved by the successful Tenderer at the site test.

2.10 STARTING AND STOPPING

The engine shall be easily started from cold, without the use of any special ignition devices, under summer as well as winter conditions, against full load.

Contractors must state what arrangements are provided to ensure easy starting in cold weather. Full details of this equipment must be submitted. In the case of water-cooled engines, any electric heaters shall be thermostatically controlled. The electrical circuit for such heaters shall be taken from the control panel and must be protected by a suitable circuit breaker.

An electric starter motor must be fitted to the engine.

Besides the automatic starting and stopping, provision must be made on the control board for manual starting and stopping of the set.

The automatic control shall make provision for three consecutive starting attempts. Thereafter the set must be switched off, and the start failure relay on the switchboard must give a visible and audible indication of the fault.

2.11 STARTER BATTERY

The set must be supplied with a fully charged "Lead Acid" type battery, complete with the necessary electrolyte. The battery must have sufficient capacity to provide the starting torque stipulated by the engine makers, and for at least six consecutive starting attempts.

The batteries will form an integral part of the generator or will be in separate panels that are of same external appearance as the main panel.

2.12 COOLING

The engine must be water-cooled type, a built-on heavy duty, tropical type pressurized radiator must be fitted.

All water-cooled engines shall be equipped with a centrifugal pump to circulate the water through the engine and radiators. The radiator and engine cooling system shall be filled with a rust inhibitor solution.

Protection must be provided against running at excessive temperatures. The operation of this protective device must give a visual and audible indication on the switchboard. All air ducts for the cooling of the engines are to be allowed for. An air duct shall be supplied from the radiator face to the air outlet louver.

Where louvers are to be fitted to accommodate the cooling system, such louvers shall be sized according to the requirements of the manufacturer of the Standby Alternator set.

Lubrication of the main bearing and other important moving parts shall be by forced feed system. An automatic low oil pressure cut-out must be fitted, operating the stop solenoid on the engine, and giving a visible and audible indication.

2.13 FUEL PUMP AND FUEL

Fuel injection equipment must be suitable for operation with the commercial brands of diesel fuel normally available locally.

2.14 FUEL TANK (160kVA GENERATOR)

A new lockable fuel tank should be provided. Also see details described under 2.1 above. Additional to the above the following will apply:

Should the fuel tank require a fuel cooler this must be fitted.

The lockable tank shall be fitted with a breather, a Rochester type fuel gauge, and a low-level alarm, giving an audible and visible signal on the switchboard and on the outside of the building via a siren and red rotating signal light. A by-pass switch must be installed on the panel. A low level will be at 20% of the total fuel capacity.

An electric pump, fitted with a suitable length of oil-resistant hose, must be supplied, for filling the fuel tank from 200-liter drums placed at ground level or from a tanker at a distance of not less than 20m from the tank.

An electrical supply point must be installed at the electric pump of 16A and must consist of a watertight socket outlet unit. It will be supplied with a cable of 10mm² 2 Core Armoured dimensions. The supply point must be fed from the Standby Generator Panel via a 20A single phase Circuit Breaker.

2.15 GOVERNOR

The speed of the engine shall be controlled by an ELECTRONIC governor in accordance with Class A0 of BSS.5514.

When full load is suddenly switched off or on, the temporary speed variation shall not exceed 2%. The permanent speed variation shall not exceed +/- 0.8% of the nominal engine speed. External facilities must be provided on the engine to adjust the nominal speed setting.

2.16 FLYWHEEL

A suitable flywheel must be fitted, so that lights fed from the set will be free from any visible flicker.

The cyclic irregularity of the set must be within the limit laid down in B.S.S.5514 of 1958.

2.17 EXHAUST SYSTEM

SILENCERS

It is essential to keep the noise level as low as possible. An effective exhaust silencing system of the residential type is also to be provided, as specified in SABS 0103-1983, as amended.

The exhaust pipe shall be installed in such a way that the expelled exhaust fumes will not cause discomfort to the public. The exhaust pipe must be flexibly connected to the engine to take up vibrations transmitted from the engine, which may cause breakage.

Contractors shall quote for the supply & installation of silencers and baffles to ensure that the environment around the canopy is suitable for day-to-day work, without exceeding acceptable daily noise levels as applicable to a residential environment. The muffler and piping shall be manufactured from 3CR12

ATTENUATION

Sound attenuation must be provided to ensure that the maximum sound level generated by the unit when measured at a height of 1.2 meters at a distance of 7 meters in any direction from the outside of the unit must not exceed 80 dB when the plant is running at full load. All sound attenuation material must be of a non-flammable type.

2.18 ACCESSORIES

The engine must be supplied complete with all accessories, instruction manuals, spare parts lists, etc. A spare set of fuel filters is to be supplied with the necessary tools for removal and refitting.

2.19 SAFETY NOTICES

All safety notices as specified in the OHS Act must be fitted to the container and a suitable 9kg dry powder fire extinguisher must be provided adjacent to the generator.

A set of Laminated drawings of the switchboard/control panel must be affixed to the outside of the generator.

2.20 ALTERNATOR

The alternator shall be of the self-excited brushless type, with enclosed ventilated drip-proof housing, and must be capable of supplying the specified output continuously with a temperature rise not exceeding the limits laid down in **B.S.S. 2613 for rotor and starter windings with Class F or H insulation.**

Both windings must be fully impregnated for tropical climate and must have an oil resisting varnish finish.

2.21 RATING

Unless stated to the contrary, the alternator shall generate the specified voltages on three-phase and at 50 Hz. The alternator shall be rated for the specified output and power factor as detailed.

The alternator may be of the two bearing or single bearing type equipped with ball or roller bearings. The bearings must be pre-lubricated to ensure long service periods without attention.

The alternator must be equipped with damper windings, enabling the unit to accommodate an unbalanced load of at least 25% of full load at any load and at the normal operating conditions without incurring any damage.
The alternator shall be rated for 160kVA.

2.22 CONSTRUCTION

The rotor shall be dynamically balanced, and all the windings and rotating components shall be suitable to withstand an over speed of 50%.

2.23 EXCITATION

The excitation system shall be designed to promote rapid voltage recovery, following the sudden application of the full load. The voltage shall recover to within 2,5% of the steady state voltage within 0,3 seconds following the application of full load and the transient voltage dip shall not exceed 10%.

2.24 WAVE FORM

The voltage wave form of the alternator shall be such that the total voltage of the harmonic frequencies shall not exceed 5% of the voltage of the fundamental frequency over the range from no load to full load.

2.25 RADIO INTERFERENCE

The alternator shall be suppressed to comply fully with the requirements of BS 800 as revised, as well as with all South African Department of Posts and Telegraph requirements.

2.26 REGULATION

The alternator must be self-regulated, the inherent voltage regulation not exceeding plus or minus 2.5% of the nominal voltage specified above, at all loads with the power factor between unity and 0,8 and within the driving speed variations of 4.5% between no-load and full load.

2.27 PERFORMANCE

The excitation system shall be designed to promote rapid voltage recovery following the sudden application of the full load. The voltage shall recover to within 2½% of the steady state within 300 milli-seconds following the application of full load and the transient voltage dip shall not exceed 10%.

2.28 COUPLING

The engine and alternator must be directly coupled by means of a first-class quality flexible coupling, or acceptable disc drive coupling.

2.29 AUTOMATIC CONTROL CUBICLE

A set mounted automatic control cubicle shall be supplied, the cubicle to incorporate all equipment necessary for the control and protection of the generating set, the automatic change-over, and the battery charging.

The cubicle shall be a totally enclosed free standing unit, and shall consist of steel panels, carried on a substantial angle iron framework or pressed steel panels welded.

The cubicle shall be flush fronted; all equipment shall be mounted on the back of the front plate on suitable supports.

All equipment, connections and terminals shall be easily accessible. The front panels shall be hinged, with square key locking. Self-tapping screws shall not be used in the construction of the cubicle. The ironwork of the cubicle shall be thoroughly de-rusted, primed with zinc-chromate, and finished with two coats of first-class red enamel, or powder coated in Signal Red.

Suitably rated terminals shall be provided for all main circuits and for the control and protection circuits. Where cable lugs are used, these shall be crimped on the cable. All terminals shall be clearly marked.

For the fine wiring, each wire shall be fitted with a cable or wire marker of approved type, and the numbering of these markers shall be shown on the wiring diagram of the switchboard.

All equipment on the cubicle, such as contactors, isolators, bus-bars, etc., shall have ample current carrying capacity to handle the full load alternator current, as well as the rated fault current of the LV Panel.

2.30 SWITCHBOARD/CONTROL PANEL

A switchboard/control panel using a PLC type controller in preference to a Proprietary controller shall be used. Note; Relay logic panels are not acceptable. The switchboard will be positioned in the plant room and the following switchgear rated for a 35kA fault level must be provided.

300 Amp four pole draw out motorised isolator for isolation of the normal mains supply.

300 Amp four pole draw-out motorized circuit breaker with overload and short circuit protection suitable for switching and protection of the generator output.

Note: the above switches shall perform the changeover and must be electrically and mechanically interlocked.

The following alarm circuits with the necessary sensors must be provided on the control panel.

- START FAILURE
- LOW OIL PRESSURE
- HIGH ENGINE TEMPERATURE
- OVERSPEED
- UNDERSPEED
- LOW RADIATOR WATER LEVEL
- ABNORMAL GENERATOR VOLTAGE ($\pm 10\%$ OF NORMAL)
- LOW DAY TANK FUEL LEVEL
- UNIT NOT ON AUTO
- BATTERY CHARGE FAILURE

In addition to the above supervisory indication lamps for MAINS-LOAD and GENERATOR-LOAD to indicate which system is supplying the load must be provided.

Controls must be provided in the control panel to control the fuel replenishment pump.

2.31 EARTHING

An earth bar shall be fitted in the control panel.

The neutral point of the system must be solidly connected to the earth of the control panel.

Suitable terminals must be provided on the earth bar for connection of the main earth conductors, which will be supplied and installed by others.

2.32 OPERATIONAL REQUIREMENTS

An automatic changeover with electrical and mechanical interlocking shall be provided installed in an approved position in the control cubicle. This changeover switches shall open when the normal "supply" voltage is interrupted and will automatically close when the terminal voltage of the

alternator reaches its nominal voltage, thereby connecting the alternator on load.

Voltage and frequency monitor shall be installed to monitor the normal "supply".

The starting cycle shall consist of three-time relays, with two relays which will be adjustable between 0- 30 seconds. The two-time relays shall perform the starting cycle. The starting cycle shall actuate the first-time relay, which will energize the starter motor of the engine for the pre-set time. The second time relay shall perform the "wait period" before the second and third starting attempt has been actuated.

After three unsuccessful starting cycles the third time relay shall be actuated to interrupt any further starting cycles and give an alarm "Start Failure". The third time relay shall have an adjustable time range of not less than 60 seconds.

When the alternator output voltage reaches the nominal value, the changeover contactor shall be activated to transfer load to the alternator.

A time delay shall be actuated when the supply network voltage is restored. This delay shall be adjustable between 0 - 10 minutes and shall actuate the changeover contactor to connect the load on back to the supply network.

After the load has been re-established to the supply network, the alternator set shall be switched off, by means of a run-down time, which will be adjustable between 0 - 10 minutes.

Should any of the above-mentioned control circuits or relays fail, the load shall be transferred automatically from the alternator to the supply network.

A siren must be of the continuous duty type or must be connected to an intermittent duty time relay.

A switch must be installed in the hooter circuit, to stop the audible signal. This switch shall be inside the cubicle with a suitable notice on the exterior.

The output terminals from the alarms in the AMF panel shall be wired to terminals in a flush mounted white 300 x 300, flush mount enclosure in the "manager's" office (maximum 300m from the generator room) indicating the following:

- Common Alarm
- Low fuel alarm
- Generator on Load indicator lamp.
- Mains on Load indicator lamp.
- Audible common alarm with cancel push button.

All indicator lamps shall be of the LED type or suitable connections for connecting to a building management system.

A stop delay with timer is required for the set, to keep the set running for an adjustable period of one to fifteen minutes after the return of the mains supply, before changing back to that supply and keep the set running for a further adjustable cooling period at no-load before stopping.

A four-position selector must be provided on the control panel, marked "Auto", "manual", "test" and "off".

With the selector on "auto", the set shall automatically start and stop, according to the mains supply being available or not.

With the selector on "test" it shall only be possible to start and stop the set with the push buttons, but the running set shall not be switched to the load.

With the selector on "manual", the set must take the load when started with the push button, but it must not be possible to switch the set on to the mains, or the mains on to the running set.

With the selector on "off", the set shall be completely disconnected from the automatic controls, for cleaning and maintenance of the engine.

2.33 BATTERY INSTALLATION

The starting batteries shall be adequately rated to suit the equipment provided. Battery terminals shall be coated with "Coprastip" or equivalent conductive grease. The battery shall preferably be mounted adjacent to the equipment.

Where electric starting is employed, the combination engine generator set shall be equipped with a fully charged lead-acid battery with the following requirements:

The battery shall have ample capacity for providing the starting torque stipulated by the engine manufacturer, and capacity for 3 such starts in a five-minute period.

The battery shall be supplied with a charger unit as described below.

2.34 BATTERY CHARGER

The switchboard detailed below shall contain facilities for charging the batteries from the mains.

The battery charger shall be of the fully automatic type and shall consist of an air-cooled transformer, silicon bridge rectifier, fuses and switching arrangement. All equipment shall be suitably rated and designed to automatically deliver a trickle or boost charge as determined by the battery voltage. The boost charge in amps shall not exceed 20% of the rated battery capacity.

A constant trickle charge facility is not acceptable. The charger shall switch off automatically when the battery is fully charged.

The charger must be provided with a Voltmeter and charge ammeter. These instruments must be mounted on the control panel door.

2.35 SWITCHBOARD/CONTROL PANEL

A switchboard / control panel must be provided for the control, metering and switching of the diesel alternator set.

Fault Level - The board and its equipment shall be rated at not less than the 380V asymmetrical prospective fault level specified in the detailed specification of the Electrical Installation, minimum 36 kA.

2.36 EQUIPMENT IN SWITCHBOARD

The following equipment is required on the board:

One flush 96 mm square dial voltmeter scaled 0 - 500V, reading the alternator voltage.

One flush voltmeter selector switch with three metering and one-off position, connecting the voltmeter between phases and neutral.

One flush 96mm square dial indicating type frequency meter, indicating the alternator frequency.

One hour meter with cyclometer counter, reading the number of hours the plant has been operating. The smallest figure on this meter is to read 1/10th hours.

One set of fuses or m.c.b.'s for potential circuits of the meters.

Three flush 96mm square dial ammeters for measuring the alternator current, scaled to suit, complete with the necessary current transformer - **combined instantaneous and maximum demand meters are required.**

- One triple pole circuit breaker for mains isolation.
- One set triple pole automatic change-over equipment with voltage and time delay relays, fitted with mechanical interlocks.
- One triple pole circuit breaker for alternator protection against overload and short circuit conditions.
- One four position operation selector switch, as specified.
- Two push buttons or one switch marked "START" and "STOP" for manual starting and stopping the set.
- One battery charger as specified, complete with flush ammeter and voltmeter.
- One stop delay as specified.
- Relays with reset push buttons as specified, for engine protection.
- Two low fuel level alarm devices.
- One warning hooter and one siren.
- One low battery voltage alarm device.
- Suitable terminals for incoming main and alternator cables, for the outgoing feeder, and for the earth connection.
- Any other equipment necessary for the correct and safe operation of the installation.
- A "General Alarm" output contact which will be in fail safe position, and will initiate general alarm should any one of the above-mentioned alarms be initiated.
- Panel lights to indicate: 1) Mains - Load; 2) Generator Load, to indicate which system is supplying the load.

2.37 MARKINGS

All labels, markings or instructions on the switchgear shall be as per the section on Coding, Labelling and Notices.

All timers or adjustable controls within the control panel shall be clearly labelled. A label indicating the settings of all adjustable controls shall be fitted inside the control panel.

2.38 INSTALLATION

Except for the supply and connection of the incoming main and outgoing feeder cables, tenderers must include for the complete installation and wiring of the plant in running order.

The installation must comply with the regulations of the "Factories, Machinery and Building Works Act" of 1941, as amended to date, and with the "Standard Regulations for the Wiring of Premises" second edition as amended, as well as the General Specification for Electrical Installations appended hereto, or available on request.

For the alternator circuit P V C SWA PVC sheathed cable shall be used. For the control circuits either multi-core P V C cable OR PVC insulated wires in conduit may be used. The neutral of the system must be solidly earthed.

Additional to the above, "Moving Machinery", "Noise" and "Danger" signs must be installed.

2.39 OCCUPATIONAL HEALTH & SAFETY ACT (OHSACT)

This installation shall comply in its entirety with the Occupational Health & Safety Act, and its amendments to date, and with all other regulations and specifications governing the works.

WARNING NOTICES

On the generator canopy, a clearly legible and indelible warning notice shall be mounted in a conspicuous position. The notice shall be made of non-corrodible and non-deteriorating material, preferably plastic, and must read as follows:

This engine will start without notice. Turn selector switch on control board to "OFF" before working on the plant.

2.40 DRAWINGS

The successful tenderer will submit for approval within four weeks after adjudication of the Tender, three paper copies of the following drawings:

Complete detailed general layout drawing.
Working drawings of the cooling and exhaust systems.
Complete detailed and dimensional drawings of the alternator set with all auxiliary equipment.
Wiring diagrams of the control protection and alarm circuitries.
Detailed layout of the equipment to be installed on the control panel.

All drawings shall be drawn on CAD (Caddie) or DWG format and shall meet the requirements of SABS 0111-1980 as amended and SABS-1980 as amended, where applicable.

2.41 INFORMATION REQUIRED

Tenderers must furnish detailed descriptions and illustrations of the equipment offered and must complete the questionnaire following this

specification. Failure to submit any of the information asked for may disqualify the tender.

2.42 GUARANTEE

The successful tenderer will be required to guarantee the complete plant for a period of 12 months from the date it has been taken over by the client, in running order.

If during this period the plant is not in working order, or not working satisfactorily owing to faulty material, design, or workmanship, the contractor shall be notified, and immediate steps shall be taken by him to rectify the defects and/or replace the affected parts on site, at his own expense.

2.43 MAINTENANCE

The successful tenderer shall be required to maintain the plant in good running condition to the approval of the Engineer for a period of **24 months**.

All rates shall be as specified on the form of tender.

2.44 INSTRUCTION OF OPERATOR

After completion of the installation, and when the plant is in running order, the successful tenderer will be required to instruct an attendant in the operation of the plant, until he is fully conversant with the equipment and the handling thereof.

Three copies of maintenance, fault-localizing and operating manual are to be handed over to the representative on site.

One set of manuals with all drawings shall be fixed in a plastic jacket inside the panel.

2.45 INTERNAL LABELLING

An "Ozakling" type label showing the part number, description and setting of all removal relays, monitors and timers shall be affixed to the inside of the panel. Typical timer settings shall be noted.

All removable items shall be labelled both on the item, and on or adjacent to the plug-in base on the panel.

A full set of drawings, including schematics and general arrangement drawings shall be provided to SANBI.

2.46 TESTS

The following tests are to be carried out:

At the supplier's premises, before the generating set will be delivered to site. The Engineers may be present during the test to satisfy themselves that the generating set complies with the specification and delivers the specified output. The test must be carried out in accordance with B.S.S. 5514. The Engineer must be advised in time of the date of the test at least seven days prior to the test.

At the site after completion of the installation, all the instruments which may be required for the tests have to be provided by the successful tenderer.

Note that it will be necessary to conduct tests on load banks on site. On site tests shall be carried out for one hour on full load and one hour at 10% overload.

Test reports of both tests as specified under (a) and (b) are to be submitted to the Engineer.

2.47 LOCATION OF GENERATOR

The location of the generator is as per the Engineer's instructions. The successful bidder shall be responsible for placing the set onto a new plinth (measured in the BOQ) – 33°59'32.75" S 18°25'56.22" E.



2.48 MANUALS

Three copies of the complete set of manuals shall be provided to the full approval of the Engineer. The contract shall be deemed as "Incomplete" until all manuals, drawings and descriptive literature are received and approved by the Engineer and will result in a minimum of 10% of the contract moneys being withheld.

2.49 COMPLIANCE WITH SPECIFICATION

Tenderers are to provide a clause by clause written confirmation that their offer complies with the clauses of this document. Where their offer does not comply, it is to be clearly indicated in the compliance schedule.

2.50 SIGNAGE

All signage as required to comply with local Fire Regulations, as well as SABS-0142 & SABS 0400 shall be supplied and fitted on the outside.

PS 3 CABLE SLEEVE PIPES

Where cables cross under roadways, other services and where cables enter buildings, the cables shall be installed in PVC solid or flexible pipes with diameters suitable for the specified cables with additional space of 50%.

The electrical contractor will be responsible for all excavations, installation of sleeves, backfill and making neat of all.

The ends of all sleeves shall be sealed with a non-hardening watertight compound after the installation of cables. All sleeves intended for future use shall likewise be sealed.

The soil around the sleeves will be free of stones or any material that could damage the sleeves.

PS 4 NOTICES

All sign boards during construction in public areas will be installed according to regulations in order to limit accidents. All excavations shall be properly barricaded.

PS 5 ELECTRICAL EQUIPMENT

All equipment and fittings supplied must be in accordance with the approved quality specification, suitable for the relevant supply voltage and frequency and must be approved by the Client's representative.

PS 6 DRAWINGS

The drawings generally show the scope and extent of the proposed work and shall not be held as showing every detail of the work to be executed.

The position of power points, switches and light points that may be influenced by built-in furniture must be established on site, prior to these items being installed.

PS 7 BALANCING OF LOAD

The Electrical Contractor is required to balance the load as equally as possible over the multiphase supply.

PS 8 WORK SEQUENCE

The sequence, in which the work must be carried out, must be established in consultation with the SANBI representative.

PS 9 SUPERVISION

The work shall at all times, for the duration of the contract be carried out under the supervision of a skilled and competent representative of the contractor, who will be able and authorised to receive and carry out instructions on behalf of the contractor. A sufficient number of workmen shall be employed at all times to ensure satisfactory progress of the work. **A qualified 3-phase electrician shall be permanently on site to supervise the work.**

PS 10 SUPPLY OF MATERIAL

The Client reserves the right to supply any item of material of equipment required for this service.

The Contractor shall take delivery and install such material or equipment.

PS 11 SERVICE CONDITIONS

All plant shall be designed for the climatic conditions appertaining to the service.

PS 12 SWITCHES AND SOCKET OUTLETS

The installation of switches and socket outlets must conform to the specifications, and shall be **CRABTREE**, or other approved type as per Engineer.

PS 13 EARTHING AND BONDING

The Contractor will be responsible for all earthing and bonding of installation; the earthing and bonding is to be carried out strictly to the specification and to the satisfaction of the Client's representative.

PS 14 INTERRUPTIONS OF ELECTRICAL SUPPLY

All interruptions of the electrical supply that may be necessary for the execution of the work will be subject to prior arrangement between the Contractor, the user Client, and the Client's representative.

PS 15 REGULATIONS AND CODES

The complete electrical installation shall be carried out in full compliance with the Wiring Code and with any Regulations or Codes of Practice in force or adopted in the area in which the contract is to be carried out. Tenderers shall familiarize themselves with all

such Regulations or Codes before finalizing their prices; no price variations to the contract based on lack of knowledge or such Regulations or Codes will be allowed.

PS 16 CONDUIT AND WIRING

Conduit and conduit accessories shall be black enamelled/galvanised conduit or black enamelled/galvanised plain end conduit in accordance with SABS 162, 763 and 1007 respectively.

NOTE:

Where plain end conduit is offered, all switches and light fittings must be supplied with a permanent earth terminal for the connection of the earth wire.

Lugs held by switch fixing screws or self-tapping screws will not be acceptable.

PS 17 CABLES

Note: All LV cables will be PVC/SWA/PVC/CU.

The electrical contractor shall allow for the supply and complete installation of all distribution cables as indicated on the drawings, and listed in the Schedule of Cables.

Tenderers must base their tender on the amounts of cable, including earth conductors, as indicated in the Bill of Quantities. During the course of the work the actual lengths will be measured on site and adjustments will be made according to the price per meter length as inserted by the tenderer for the particular cable size concerned.

Tenderers must base their cost for trenching in earth; hard rock on the total quantities as indicated in the Bill of Quantities. The actual quantities, based on the dimensions as specified below for trenches for the applicable number of cables to be laid, will be measured on site during the course of the service and adjustments made according to the price per cubic meter as inserted by the tenderer. Payment for cable trenching having a greater volume than that specified for the purpose will not be considered except where extra excavations are necessary to by-pass obstacles such as water pipes, drains, large boulders etc. In all such instances the amount of the extra excavations must be agreed upon on site between the Engineer and the contractor.

Cables in soil will be buried 1,5m underground. Cables that are attached to roofs or walls will be tied with aluminium strapping (25mm) every 400mm to 100mm cable racks.

The storage, transportation, handling and laying of the cables shall be according to first class practice, and the contractor shall have adequate and suitable equipment and labour to ensure that no damage is done to cables during such operations.

The cable-trenches shall be excavated to a depth of 0,6m deep below ground level and shall be 450mm wide for one to three cables, and the width shall be increased where more than three cables are laid together so that the cables may be placed at least two cable diameters apart throughout the run. The bottom of the trench shall be level and clear and the bottom and sides free from rocks or stones liable to cause damage to the cable.

The contractor must take all necessary precautions to prevent the trenching work being in any way a hazard to the personnel and public and to safeguard all structures, roads, sewage works or other property on the site from any risk of subsidence and damage.

In the trenches made in soft and hard rock the cables shall be laid on a 75mm thick bed of earth and be covered with a 150mm layer of earth before the trench is filled in. No joints will be allowed in cables.

The laying of cables shall not be commenced until the trenches have been inspected and approved. The cable shall be removed from the drum in such a way that no twisting, tension or mechanical damage is caused and must be adequately supported at intervals during the whole operation. Particular care must be exercised where it is necessary to draw cables through pipes and ducts to avoid abrasion, elongation or distortion of any kind. The ends of such pipes and ducts shall be sealed to approval after drawing in of the cables.

Backfilling (after bedding) of the trenches is to be carried out with a proper grading of the material to ensure settling without voids, and the material is to be tamped down after the addition of every 150mm. The surface is to be made good as required.

On each completed section of the laid and jointed cable, the insulation resistance shall be tested to approval with an approved "Megger" type instrument of not less than 500 V for low tension cables.

Earth continuity conductors are to be run with all underground cables constituting part of a low-tension distribution system. Such continuity conductors are to be stranded bare copper of a cross-sectional area equal to at least half that of one live conductor of the cable, but shall not be less than 4mm² or more than 70mm². A single earth wire may be used as earth continuity conductor for two or more cables run together, branch earth wires being brazed on where required.

PS 18 LAYING, JOINTING AND MAKING OFF OF ELECTRICAL CABLES

NB : The requirements specified hereafter, are aimed essentially at high tension cable but are also valid for low tension cable, where applicable.

- 18.1 The use of the term "Inspector" includes the engineer or inspector of the Client or an empowered person of the concerned supervising consulting engineer's firm.
- 18.2 No cable is to be laid before the cable trench is approved and the soil qualification of the excavation is agreed upon by the contractor and inspector.
- 18.3 After the cable has been laid and before the cable trench is backfilled the inspector must ensure that the cable is properly bedded and that there is no undesirable material included in the bedding layer.
- 18.4 All cable jointing and the making off of the cables must only be carried out by qualified experienced cable jointers. Helpers of the jointers may not saw, strip, cut, solder, etc. The cable and other work undertaken by them must be carried out under the strict and constant supervision of the jointer.
- 18.5 Before the contractor allows the jointer to commence with the jointing work or making off of the cable (making off is recognized as half a joint) he must take care and ensure:

that he has adequate and suitable material available to complete the joint properly and efficiently. Special attention must be given to ensure the cable

ferrules and cable lugs are of tinned copper and of sufficient size. The length of the jointing lugs must be at least six times the diameter of the conductor,

that the joint pit is dry and that all loose stones and material are removed,

that the walls and banks of the joint pit are reasonably firm and free from loose material which can fall into the pit,

that the necessary cofferdams or retaining walls are made to stop the flow of water into the joint pit,

that the joint pit is provided with suitable groundsheets so that the jointing work is carried out in clean conditions,

that the necessary tents or sails are installed over the joint pit to effectively avert unexpected rainfall and that sufficient light or lighting is provided,

that the necessary means are available to efficiently seal the jointing or cable end when an unexpected storm or cloudburst occurs, regardless of how far the work has progressed,

that the cables and other materials are dry, undamaged and in all respects are suitable for the joint work or making off,

that the heating of cable oil, cable compound, plumbers metal and solder is arranged that they are at the correct temperature when required so that the cable is not unnecessarily exposed to the atmosphere and consequently the ingress of moisture (care must be taken of overheating).

- 18.6 Before the paper insulated cables are joined, they must be tested for the presence of moisture by the cable jointers test. This consists of the insertion of a piece of unhandled insulated impregnated paper tape in warm cable oil heated to a temperature of $130^{\circ}\text{C} \pm 5^{\circ}\text{C}$. Froth on the surface of the oil is an indication that moisture is present in the impregnated insulation and the amount of the froth gives an indication of the moisture present.
- 18.7 If the cable contains moisture or is found to be otherwise unsuitable for jointing or making off the inspector is to be notified immediately and he will issue the necessary instruction to cope with the situation.
- 18.8 The joint or making off of paper insulated cables must not be commenced during rainy weather.
- 18.9 Once a joint is in progress the jointer must proceed with the joint until it is complete and before he leaves the site.
- 18.10 After the individual cores have been insulated they must be well basted with hot cable oil and again after the applicable separator and/or belt insulation tape is applied before the lead joint sleeve is placed in position.
- 18.11 The lead joint sleeve must be thoroughly cleaned and prepared before it is placed on the cable and must be kept clean during the whole jointing process. Seal the filling apertures of the sleeve with tape until the sleeve is ready for compound filling.

- 18.12 The plumbing joints employed to solder the joint sleeve to the cable sheath, must be cooled off with tallow and the joint sleeve is to be filled with compound while it is still warm. Top up continuously until the joint is completely filled to compensate for the compound shrinkage.
- 18.13 The outer joint box must be clean and free from corrosion. After it has been placed in position it must be slightly heated before being filled with compound. Top up until completely full.
- 18.14 As far as cable end boxes are concerned the requirements as set out above are valid where applicable.

PS 19 DISTRIBUTION BOARDS, CIRCUIT BREAKERS, SOCKET OUTLETS AND SWITCHES

19.1 DISTRIBUTION BOARDS

The electrical contractor shall supply and install the distribution boards as indicated on the drawings. All distribution boards shall comply with the quality specification and be approved by the Engineer or by the Client's representative.

All DB's as well as both ends of cables will be marked with engraving on aluminium plate.

All distribution boards shall be manufactured according to the detail specifications and drawings and shall be inspected and **approved** by the Engineer before installation.

The Engineer shall first approve any other type of distribution board, which may be submitted as an alternative.

All bus bars and lugs shall be insulated, and wiring shall enter the switch gear from the back of the distribution board.

All circuit breakers will be the quality of **SCHNEIDER** or better.

Quality Specification and Manufacturers:

All switchgear and equipment shall comply with the specification in the document.

Wiring:

The manufacturers shall internally wire all distribution boards. Wiring between switchgear and busbars shall be done by means of PVC insulated stranded copper conductors, fixed to the busbars with copper lugs, and brass bolts.

Only color-coded wiring shall be accepted, e.g.: Red, yellow, and blue for phases, and black for neutral.

Wiring coloured by means of PVC insulated tape shall not be accepted.

Wiring shall be neatly strapped in a vertical and horizontal manner. All instrument and control wiring shall be 2.5mm² PVC insulated copper conductors and shall be numbered for ease of tracing circuits.

Colour:

The colour of all distribution boards shall be light stone and all painting shall be done in accordance with the standard paint specifications in part 3 of this specification.

Doors:

Where specified, doors shall be of the removable type.

19.2 CIRCUIT BREAKERS & ISOLATORS

All circuit breakers will be similar to SCHNEIDER or better and all circuit breakers will be of the Hydraulic Magnetic type.

19.3 SOCKET OUTLETS

All socket outlets will have metal plate covers and will be pop-riveted in place of installing 2 x screws.

19.4 SWITCHES

WATERTIGHT SWITCHES

GENERAL DESCRIPTION

Watertight switches and socket outlets will be a single unit with a cover only protecting the socket outlet itself. It will be double weather protected.

RATINGS

Electrical : 16A, 230V, 1 Phase
Weather : IP 66

Separate Compartments:

Where distribution boards have separate compartments, they shall be separated by means of a metal dividing section, and be equipped with individual removable circuit breaker covers.

Legend Cards:

Legend cards covered by removable glass or 1.6mm transparent acrylic plastic shall be fitted to the inside of the door of the distribution board and circuits shall be noted on this legend card. Legend cards shall be as follow, *for example*:

Main -	Main Isolator Switch OR Local Isolator Switch (As case may be).
L1 -	Lights; Bedroom 1, Bedroom 2 & Kitchen.
P1 -	Plugs; Bedroom 1, Bedroom 2 & Kitchen.
ELU1 -	Earth leakage unit for plug circuits 1, 2 & 3.

PS 20 BILLS OF MATERIALS

- 20.1 This Bill of Quantities forms part of, and must be read in conjunction with the specification.
- 20.2 No alteration, erasure or addition is to be made in the text of the Bill of Quantities. Should any alteration, erasure or addition be made it will not be recognized but the original wording of the Bill of Quantities will be adhered to.
- 20.3 The Client will check the completed Bill of Quantities and reserves the right to adjust any individual price and to rectify any discrepancy whilst the total tender price as quoted remains unaltered.
- 20.4 The quantities given in the Bill for cable, cable markers, earth wire laid with cable, overhead conductors, overhead earth wire and excavations cannot be regarded as exact and are subject to measurement on site after completion of the service and adjustments will be made according to the unit rates given in the Bill.

In the event of discrepancies between the drawings, specifications and Bill of Quantities the Engineer shall decide whether the work as executed shall be re-measured on site.

NOTE:

Checking of Cable and Overhead Conductor Lengths

Notwithstanding the fact that the lengths of cables and overhead conductors as given in the Bills of Quantities have been measured from scaled drawings, the contractor shall check such lengths on site before ordering the cable as he will not be paid for excess cable after the completion of the service. Any allowance for off-cuts shall be made in the

unit rates. The final measurements shall be based on the nett route length of the cables and overhead lines concerned.

20.5 Where alternative prices for gear of different manufacture are quoted the lowest alternative price for gear to specification must be quoted against the relevant item in the Bill of quantities. The remaining alternative prices must be furnished separately.

20.6 The unit prices quoted in the Bill of Quantities must include for such small Installation materials as are required for the complete installation in accordance with the specification.

PS 21 BREAKDOWNS

Whenever a breakdown is logged with the Contractor, the Contractor shall attend to the repair of the breakdown within 12 hours after it was logged with the Contractor.

The Contractor will be remunerated for the call-out by means of a re-measurable payment item as measured in the schedule of quantities.

PS 22 MAXIMUM MAINTENANCE DOWN-TIME

After a complaint has been logged and forwarded to the Contractor, the Contractor shall be expected to minimise the maintenance down-time until the system component is fully operational to the satisfaction of the Engineer. Should the Contractor not respond within the maximum down-time, the Engineer may arrange, at the cost of the Contractor, for the necessary repair work to be done by others.

Should the actual down-time exceed the maximum down-time the Contractor shall be liable to a payment reduction for the difference between actual down-time and maximum down-time.

This is reflected in the table below:

REQUIRED MAINTENANCE	MAXIMUM DOWN-TIME ALLOWED	PAYMENT REDUCTION IF EXCEEDED
Breakdown	36 Hours	R 200/hour

PS 23 GENERATOR SERVICE

1. The following activities shall be INCLUDED as part of the generator service:
 - check oil level and top up as required.
 - check oil viscosity for dilution by water or fuel.
 - check starter battery terminals and apply contact grease.
 - check battery cables for damage and secure terminations.
 - check battery electrolyte.
 - check battery voltage and record.
 - check battery voltage drop during engine cranking and record.
 - check battery charger operation after cranking test.
 - check starter motor for abnormal noise.
 - check diesel engine while running for noise, vibration or loose components.
 - check all flexible hoses for leaks, corrosion and ageing.
 - check all engine V-belts.
 - monitor engine / alternator coupling for noise.
2. Verify that alarm functions are operational by simulation:
 - low oil pressure.
 - high engine temperature.
 - low engine coolant level.
 - abnormal speed.
 - synchronising failure (if applicable)
 - cooling water pump failure.
 - cooling tower fan failure (if applicable).
 - low battery voltage.
 - low fuel day tank.
 - fuel pump failure.
 - low fuel bulk tank (if applicable).
3. Test that following alarms trigger correctly by creating the alarm condition:
 - Unit not in auto : turn selector switch to manual or test
 - Battery charger failure : switch off AC supply to battery charger
 - Auxiliary supply failure : switch off auxiliary power supply
4. Alternator shall be checked for accumulation of dust on the regulator and for any loose components.
5. Test run shall be undertaken, if possible on load, and volt, ampere and frequency readings recorded.
6. Alternator shall be cleaned and switched back into 'auto' mode.
7. Complete Standby Generator log sheets

8. Record running hours, diesel consumption etc in the following prescribed format (example):

	Previous Measurement	This Measurement	Consumption	Average per day
Date:	01-Apr-22	03-May-22	Total	32 days
Diesel Supplied:			2077	liters
Running Hours:			(hours)	(hrs/day)
Generator (hrs)	2535.6	2927.6	392.0	12.3
Average Diesel consumption			5.3	ltrs/hr

PORTION B

PA HEALTH AND SAFETY SPECIFICATION

PA1 DESCRIPTION OF WORK

The Contract shall comprise the supply of all labour, materials, workmanship, machinery, equipment, transport, attendance on others and everything stated or implied which is, or may be, necessary in and for the entire completion of all the following works:

- Establishment
- Construction of a Concrete Plinth
- Supply, delivery and Installation of a 160kVA Standby Generator including diesel storage reservoir and automatic change-over panel.
- Maintenance of the Generator for a period of 24 months.

PA2 DESCRIPTION OF THE SITE

The site is located at the **Garden Office Municipal Transformer** next to Rhodes Drive at the Kirstenbosch National Botanical Garden in Cape Town. Coordinates: 33° 59' 33" S 18° 25' 56" E.

PA3 APPLICATION OF CONSTRUCTION REGULATIONS 2014

The intended construction work falls within the scope of "construction work" as defined in the Construction Regulations, 2014 made under the Occupational Health and Safety Act no. 85 of 1995, as amended ("the Act").

PA4 POTENTIAL SOURCES OF RISK

The following potential sources of risk to the health and safety of persons on the site have been identified, and must, as a minimum, be appropriately addressed by the Principal Contractor in the Principal Contractor's Health and Safety Plan. In addition, the Principal Contractor must perform its own risk assessments to enable it to take the necessary precautions to protect the health and safety of persons on the site, to comply with the Principal Contractor's obligations under the Act and all Regulations made there under, including the Construction Regulations. All such precautionary measures and procedures must be included in the Principal Contractor's Health and Safety Plan, which must be submitted to the Client for review and approval and where applicable should include:

- Excavation work
Ground conditions for the purposes of safe excavation shall be assessed by a competent person.
The ground type and condition and water table shall be logged in accordance with Civil Engineering practice.
- Material hoists
- Explosive powered tools
- Construction vehicles and mobile equipment
- Electrical installations and electrical machinery
- Use and temporary storage of flammable liquids
- Housekeeping
- Stacking and storage practices
- Fire risks and fire precautions
- Welfare facilities on the site

- Use of jackhammers
- Air compressors
- Noise
- Portable electrical tools
- Compressed gases and vessels under pressure
- Intoxicated persons on site
- Existing underground water, electricity and other services
- Use of ladders
- Dust
- Explosives

PA5 HEALTH AND SAFETY MANAGEMENT SYSTEM

Health and Safety Philosophy

The Client is required to ensure a working environment which, as far as reasonably practicable, is safe and without risk to the health of persons on the site.

PA5.1 Contractor Health and Safety Management System

The Principal Contractor will ensure and demonstrate to the Client that he, and all contractors to be appointed on this construction project, has adequately allowed for the cost of health and safety measures which may be required during the construction work.

PA5.2 Appointment of Client's Health and Safety Adviser

The Client will appoint a Health and Safety Adviser who will visit the site regularly to monitor and audit the execution of the contractor's Health and Safety Plans on behalf of the Client, without thereby limiting the contractor's own responsibility for health and safety, or attracting any vicarious responsibility or liability for the contractor's acts or omissions.

PA5.3 Occupational Health and Safety Act Section 37(2) Agreements

The Principal Contractor, as well as all contractors, must sign the Client's Section 37(2) agreement before commencement of their particular work.

For purposes of general communication regarding construction work progress, the Client appoints the Engineer.

PA6 CONTRACTOR HEALTH AND SAFETY PLANS

Each contractor and sub-contractor working on the site must prepare a Health and Safety Plan to address and manage all applicable sources of risk as per items under point 4 of this specification as well as any other sources of risk which are identified during the contractor's own risk assessments. The Principal Contractor shall incorporate these into a single Health and Safety Plan for the execution of the entire contract works ("the Health and Safety Plan"). Should any further risks be identified in the course of the construction work, such risks must be assessed and addressed in amended Health and Safety Plans which must then be submitted to the Client for approval.

The Health and Safety Plan must also address the following matters:

- i) Legal appointments required by the Act and any Regulations under the Act.
- i) Procedures for compliance with all requirements of the Act and in particular Sections 8 and 9 of the Act.
- ii) Undertaking and procedure to stop any work which endangers the safety or health of any person.
- iii) System for recording and reporting of incidents both internal and external to the Department of Labour.
- iv) Copy of the Act and its Regulations to be kept on the site and to be readily available to employees.
- v) Incident register to be kept on the site.

- vi) Employment of only persons who are competent and have the necessary knowledge, training, qualifications and experience to perform the required construction work safely and effectively.
- vii) Appointment of only competent, knowledgeable, trained, qualified and experienced persons to supervise the construction work.
- viii) Procedures and arrangements for first aid facilities on the site.
- ix) Procedures and arrangements for prompt reporting of injuries and other losses / incidents.
- x) Emergency plans to deal effectively with potential site emergencies.
- xi) Use of effective processes for the identification and close out of root causes of incidents and accidents.
- xii) Attendance by all contractors of monthly site health and safety meetings.
- xiii) Demonstration by all contractors of their health and safety monitoring and auditing systems to ensure compliance with their Health and Safety Plans, as part of their Health and Safety Plans.
- xiv) Effective site health and safety induction programme for all workers on the site.

PA7 ADDITIONAL DUTIES OF PRINCIPAL CONTRACTOR

- i) The Principal Contractor must notify the Department of Labour of the intention to carry out construction work.
- i) The Principal Contractor must coordinate the activities of all contractors and sub-contractors in the interest of health and safety.
- ii) The Principal Contractor must carry out all other duties described in Regulation 5 of the Construction Regulations 2003.
- iii) The Principal Contractor must register in terms of the Compensation for Occupational Injuries and Diseases Act or any other compensation funds approved by the Commissioner for its workmen, and provide to the Client proof thereof and also that it is in good standing with the Compensation Commissioner or approved insurer.

PA8 GENERAL

- i) Nothing contained in or omitted from this Health and Safety Specification, or the Health and Safety Plan based on this specification, shall relieve the Principal Contractor of any of its obligations or liabilities.
- i) The Client shall not be liable for any civil claim because of anything contained in or omitted from this Health and Safety Specification.

PA9 MEASUREMENT AND PAYMENT

In addition to the allowance that the contractor would normally make in his rates for Health and Safety Aspects, the contractor shall price for all things necessary required to fulfil the requirements of the OHS Act and Regulations in the items scheduled in Schedule 1, General A.