

## REQUEST FOR QUOTATION (RFQ)

**RFQ NUMBER: WCR 04/2025**

**REQUEST FOR QUOTATION (RFQ) FOR THE APPOINTMENT OF AN ELECTRICAL CONTRACTOR FOR THE ENGINEERING, SUPPLY, INSTALL, TEST AND COMMISSION INCLUDING MAINTENANCE OF SOLAR SYSTEM AT VARIOUS STATIONS**

**SECTION 1: SBD1****PART A INVITATION TO BID****YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF PASSENGER RAIL AGENCY (PRASA)**

BID NUMBER:	WCR 04/2025	CLOSING DATE:	19 March 2025	CLOSING TIME:	12H00
DESCRIPTION	APPOINTMENT OF AN 3EB OR 3EP OR HIGHER ELECTRICAL CONTRACTOR FOR THE ENGINEERING, SUPPLY, INSTALL, TEST AND COMMISSION INCLUDING MAINTENANCE OF SOLAR SYSTEM AT VARIOUS STATIONS FOR A MAINTENANCE PERIOD OF 24 MONTHS FROM THE DATE OF SITE HANDOVER IN WCR.				

**BID RESPONSE DOCUMENTS SHALL BE ADDRESSED AS FOLLOWS:**

BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT (STREET ADDRESS):

**PASSENGER RAIL AGENCY OF SOUTH AFRICA, CORPORATE REAL ESTATE,**

**PRASA TENDER DROP OFF OFFICE**

**3 OLD MARINE DRIVE**

**CAPE TOWN**

**BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO**

CONTACT PERSON	Mandla Mnguni
TELEPHONE NUMBER	021 818 7274
E-MAIL ADDRESS	<a href="mailto:Mandla.Nguni@prasa.com">Mandla.Nguni@prasa.com</a>

**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.....

2.1 ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES ENCLOSE PROOF]	2.2 ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?	<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES, ANSWER THE QUESTIONNAIRE BELOW ]
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### 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**
- 1.3. **PRESCRIBED IN THE BID DOCUMENT.**
- 1.4. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2022, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.

#### 2. TAX COMPLIANCE REQUIREMENTS

- 2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.
- 2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE PRASA 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:**

- ***Quotation(s) must be addressed to PRASA before the closing date and time shown above.***
- ***PRASA General Conditions of Purchase shall apply.***

## **SECTION 2**

### **NOTICE TO BIDDERS**

#### **1. RESPONSES TO RFQ**

Responses to this RFQ [Quotation] must not include documents or reference relating to any other quotation or proposal. Any additional conditions must be embodied in an accompanying letter.

Proposals must reach PRASA before the closing hour on the date shown on SBD1 above and must be enclosed in a sealed envelope.

#### **2 COMMUNICATION**

Bidder/s are warned that a response will be liable for disqualification should any attempt be made either directly or indirectly to canvass any SCM Officer(s) or PRASA employee in respect of this RFQ between the closing date and the date of the award of the business.

#### **3 BIDDERS COMPLAINTS PROCESS**

3.1 Bidders are advised utilize this email address ([Complaints@prasa.com](mailto:Complaints@prasa.com)) for lodging of complaints to PRASA in relation to this bid process. The following minimum information about the bidder must be included in the complaint:

3.1.1 Bid/Tender Description;

3.1.2 Bid/Tender Reference Number;

3.1.3 Closing date of Bid/Tender;

3.1.4 Supplier Name;

3.1.5 Supplier Contact details; and

3.1.6 The detailed complaint.

#### **4 LEGAL COMPLIANCE**

The successful Bidder shall be in full and complete compliance with any and all applicable national and local laws and regulations.

#### **5 CHANGES TO QUOTATIONS**

Changes by the Bidder to its submission will not be considered after the closing date and time.

#### **6 PRICING**

All prices must be quoted in South African Rand on a fixed price basis, including all applicable taxes.

#### **7 BINDING OFFER**

Any Quotation furnished pursuant to this RFQ shall be deemed to be an offer. Any exceptions to this statement must be clearly and specifically indicated.

## 8 DISCLAIMERS

PRASA is not committed to any course of action as a result of its issuance of this RFQ and/or its receipt of a Quotation in response to it. Please note that PRASA reserves the right to:

- Modify the RFQ's goods / service(s)/works and request Bidders to re-bid on any changes;
- Reject any Quotation which does not conform to instructions and specifications which are detailed herein; and
- Reject Quotations submitted after the stated submission deadline or at the incorrect venue.

Should a contract be awarded on the strength of information furnished by the bidder, which after conclusion of the contract, is proved to have been incorrect, PRASA reserves the right to cancel the contract.

PRASA reserves the right to award business to the highest scoring bidder/s unless objective criteria justify the award to another bidder.

Should the preferred bidder fail to sign or commence with the contract within a reasonable period after being requested to do so, PRASA reserves the right to award the business to the next highest ranked bidder provided that he/she/it is still prepared to provide the required goods at the quoted price.

## 9 LEGAL REVIEW

Proposed contractual terms and conditions submitted by a bidder will be subjected to review and acceptance or rejection by PRASA's Legal Counsel, prior to consideration for an award of business.

## 10 NATIONAL TREASURY'S CENTRAL SUPPLIER DATABASE

Bidders are required to self-register on National Treasury's Central Supplier Database (CSD) which has been established to centrally administer supplier information for all organs of state and facilitate the verification of certain key supplier information. PRASA is required to ensure that price quotations are invited and accepted from prospective bidders listed on the CSD. Business may not be awarded to a bidder who has failed to register on the CSD. Only foreign suppliers with no local registered entity need not register on the CSD. The CSD can be accessed at <https://secure.csd.gov.za/>.

## 11 PROTECTION OF PERSONAL DATA

In responding to this bid, PRASA acknowledges that it may obtain and have access to personal data of the Bidders. PRASA agrees that it shall only process the information disclosed by Bidders in their response to this bid for the purpose of evaluating and subsequent award of business and in accordance with any applicable law.

Furthermore, PRASA will not otherwise modify, amend or alter any personal data submitted by Bidders or disclose or permit the disclosure of any personal data to any Third Party without the prior written consent from the Bidders. Similarly, PRASA requires Bidders to process any personal information disclosed by PRASA in the bidding process in the same manner.

## 12 EVALUATION METHODOLOGY

PRASA will utilise the following criteria in choosing a Supplier/Service Provider:

EVALUATION CRITERIA	WEIGHTING
<b>Stage 1</b>	
Stage 1A	Mandatory Compliance Requirements
Stage 1B	Other Mandatory Compliance Requirements
Stage 1C	Documents required for Scoring
<b>Stage 2</b>	
Technical/Functional Requirements	Threshold of 70%
<b>Stage 3</b>	
Price	80
Specific Goals	20
<b>TOTAL</b>	<b>100</b>

## 13 ADMINISTRATIVE RESPONSIVENESS

The test for administrative responsiveness will include completeness of response and whether all returnable and/or required documents, certificates; verify completeness of warranties and other bid requirements and formalities have been complied with. Incomplete Bids will be disqualified.

## 14 VALIDITY PERIOD

14.1 PRASA requires a validity period of **60 Working Days** from the closing date.

14.2 Bidders are to note that they may be requested to extend the validity period of their response, on the same terms and conditions, if the internal processes are not finalized within the validity period. However, once the delegated authority has approved the process the validity of the successful bidder(s)' bid will be deemed to remain valid until finalization of the award.)

## 15 PUBLICATION OF INFORMATION ON THE NATIONAL TREASURY E-TENDER PORTAL

Bidders are to note that, bid awards, amendments and cancellations will be published on the e-tender portal and or media used to advertise the bid. For the award of business, PRASA is required to publish the prices and preferences claimed of the successful and unsuccessful Bidders *inter alia* on the National Treasury e-Tender Publication Portal, ([www.etenders.gov.za](http://www.etenders.gov.za)), on CIDB website for construction related RFQ's. (*Where applicable*).

## 16 RETURNABLE DOCUMENTS

**Returnable Documents** means all the documents, Sections and Annexures, as listed in the tables below. There are three types of returnable documents as indicated below and Bidders are urged to ensure that these documents are returned with the quotation based on the consequences of non-submission as indicated below:

Request For Quotation SCM\_2024

## 16.1. Mandatory Returnable Documents

Failure to provide Mandatory Returnable Documents at the Closing Date and time of this RFQ will result in a Bidder's disqualification. Bidders are therefore urged to ensure that all documents are returned with their Quotations.

## 17. COMPULSORY BRIEFING SESSION

A compulsory RFQ briefing session will be held on the **07 March 2025, at 10:00** for a period of an hour at **Kenilworth train Station**. The compulsory briefing session will start punctually at 10:00, and information will not be repeated for the benefit of respondents joining late.

## SECTION 3

### 1 EVALUATION CRITERIA:

#### Stage 1A – Mandatory Requirements

If you do not submit the following mandatory documents/requirements, your bid will be automatically disqualified.

Only bidders who comply with stage 1A will be evaluated further.

No.	Description of requirement	
a)	Price Schedule/Bill of Quantities (BOQ) and Price in words (Tender Form C) must be submitted as <b>Volume 2 in Envelope 2</b> .	
b)	<b>Active CIDB grading level of 3EB or 3EP or higher</b> (JVs must achieve a combined CIDB grading of 3 EB or 3 EP or higher, utilizing the CIDB JV calculator), (Bidders to ensure that their CIDB status is active on CIDB website throughout the validity of this tender). (CRS numbers to be provided for every company). Proof of CIDB registration to be attached.	

#### Stage 1B –Other Mandatory Requirements (To be submitted in envelope 1)

If you do not meet the following Other-mandatory documents/requirements, PRASA may request the bidder to submit the information within three (3) working days at pre-award stage. Should this information not be provided, your bid proposal will be disqualified.

Only bidders who comply with stage 1B at pre-award will be evaluated further.

Other-Mandatory Compliance Requirements		
No.	Description of requirement	
a)	Letter of Good Standing: COIDA	
b)	Supply of valid SARS Pin	
c)	CSD supplier registration number or CSD Report	
d)	Completion of ALL RFQ documentation (includes ALL declaration)	
e)	Briefing Session Section 8, Bidders must also reflect on the Compulsory Briefing Session Attendance Register	

f)	Bidders to fill and sign the submission register at security entrance on submission of the tender document.	
g)	Proof of Bank (i.e. letter issued by the bank)	
h)	Proof of Company Registration documents (Certificate of incorporation)	
i)	Joint Venture / Consortium agreement / Trust Deed/ Confirmation in writing of intention to enter into a JV or consortium agreement should they be awarded business by PRASA through this RFQ process (if applicable) SIGNED BY ALL PARTIES	
j)	Provide proof of offices or technical Solar workshop in this region. The Bid evaluation team may choose to visit the contractor's premises to ascertain that the bidder is indeed a contractor and not consultant.	
k)	Copies of Directors' ID documents	

### Stage 1C – Documents required for Scoring.

Documents required for Scoring - The following Non-Mandatory Documents used for purposes of scoring a bid. If not submitted by the closing date and time of this bid will not result in a Respondent's disqualification. However, Bidders will receive a score of zero for the applicable evaluation criterion:

Certified copy of ID Documents of the Owners
Audited Annual Financials/ B-BBEE Certificate/Affidavit
Certified copies of CIPC Documents / B-BBEE Certificate/Affidavit
Certified copy of ID Documents of the Owners and Doctors note confirming disability

### STAGE 2: TECHNICAL / FUNCTIONALITY REQUIREMENTS

Qualifying bidders shall then be evaluated on functionality after meeting all compliance requirements outlined above. The minimum threshold for technical/functionality requirements is 70% as per the standard Evaluation Criteria presented in Table below. Bidders who score below this minimum requirement shall not be considered for further evaluation.

Item	Criteria	Weight
1	<b>Company Experience</b>	30
2	<b>Resource and Experience and Organogram</b>	30
3	<b>Technical approach and methodology</b>	20
4	<b>Project Programme Plan</b>	20
	<b>TOTAL</b>	100

## TECHNICAL / FUNCTIONAL EVALUATION CRITERIA

The minimum threshold for technical/functionality requirements is 70%. Bidders who score below this minimum requirement shall not be considered for further evaluation.

Criteria	Scores		Points scoring	Weight
	0 = No relevant submission; 1 = Poor; 2 = Average; 3 = Good; 4 = Very Good; 5 = Excellent			
Company Experience	<p>Bidders should indicate the experience of previous work done within the Photo Voltaic Solar plant system with Electrical Building works and Electrical Infrastructure works in the last 10 years. The bidder to show or indicate the size of the PV solar plant installed in a single site or single project.</p> <p><b>The bidders are to submit the following documents:</b></p> <p>1. Provide appointment letter or contract or purchase order for each project.</p> <p>2. Provide a reference letter or Completion certificate relating to the appointment letter/ or contract or purchase order provided.</p> <p><b>The references to indicate the following:</b></p> <p>Company name, contact person and confirmation that work was completed.</p> <p>NB: The provided documents must indicate size of the PV Solar plant and the value of the contract. If the provided document does not have a size of the PV Solar plant and contract value, zero points will be</p>	No relevant submission	0	30%
		Successfully installed and completed a PV Solar Plant between 1- 12KWp.	1	
		Successfully installed and completed a PV Solar Plant between 13KWp to 20KWp	2	
		Successfully installed and completed a PV Solar Plant between 21KWp to 30KWp	3	
		Successfully installed and completed a PV Solar Plant between 31KWp to 50KWp	4	
		Successfully installed and completed a 51KWp PV Solar Plant or higher.	5	

	given, if one of the two is given, zero point will be given.			
<b>Resource and experience - 1 of 5</b>	<b>1. Team Leader - Electrical / Electronic Engineer or Electrical / Electronic Technologist</b> Contractor to provide proof in a form CVs, certified qualifications, certifications not older than 6 months and experience as specified  <b>Submit Proof of the following listed Qualifications:</b> BSc degree or BTech degree or higher With proof of ECSA registration as a Pr Eng or Pr Tech Eng	0 = No submission or irrelevant submission	0	10%
		Less than two (2) year experience.	1	
		With more than two (2) and up to three (3) years' experience.	2	
		With more than Three (3) and up to five (5) years' experience	3	
		With more than five (5) and up to nine (9) years' experience	4	
		With more than nine (9) years' experience or more.	5	
<b>Resource and experience - 2 of 5</b>	<b>2. Construction Manager</b> Built Environment qualification minimum National Diploma, Proof in a form CVs, certified qualifications certifications not older than 6 months and experience as specified.  <b>Submit Proof of the following listed Qualifications:</b> Minimum of National Diploma or higher in-Built Environment	0 = No submission or irrelevant submission	0	5%
		Less than two (2) year experience.	1	
		With more than two (2) and up to three (3) years' experience.	2	
		With more than three (3) and up to five (5) years' experience	3	
		With more than five (5) and up to nine (9) years' experience	4	
		With more than nine (9) years' experience or more.	5	

	With proof of registration as a PrCPM or PrCM, registered with SACPCMP			
<b>Resource and experience 3 of 5</b>	<b>3. Safety Officer</b> Built Environment qualification minimum National Diploma, Proof in a form CVs, certified qualifications certifications not older than 6 months and experience as specified.  <b>Submit Proof of the following listed Qualifications:</b> National Diploma or higher in-Built Environment With proof of registration as a CHSO-registered with SACPCMP	0 = No submission or irrelevant submission	0	5%
		Less than two (2) year experience.	1	
		With more than two (2) and up to three (3) years' experience.	2	
		With more than three (3) and up to five (5) years' experience	3	
		With more than five (5) and up to nine (9) years' experience	4	
		With more than nine (9) years' experience or more.	5	
<b>Resource and experience 4 of 5</b>	<b>4. Qualified Electrician with Red Seal and Wiremen's license</b> Qualified Electrician with post trade test. Proof in a form CVs, certified qualifications certifications not older than 6 months and experience as specified  <b>Submit Proof of the following listed Qualifications:</b> National Diploma / Certificate N4 or higher in-Built Environment With trade test certificate and wiremen's license authorised to work on 400VAC supply	0 = No submission or irrelevant submission	0	5%
		Less than two (2) year experience.	1	
		With more than two (2) and up to three (3) years' experience.	2	
		With more than three (3) and up to five (5) years' experience	3	
		With more than five (5) and up to nine (9) years' experience	4	
		With more than nine (9) years' experience or more.	5	
<b>Resource and experience - 5 of 5</b>	<b>5. Certified Energy Specialist or Green Card holder -</b> For PV Solar installation either individual within the consortium	0 = No submission or irrelevant submission	0	5%
		The resource has less than two (2) year experience post green card certificate.	1	

	<p>or entity or the company. The resource has experience post green card certificate. Proof in a form CVs, certified qualifications certifications not older than 6 months and experience as specified.</p> <p><b>Submit Proof of the following listed Qualifications:</b> A Green Card PV Solar Installation certificate or Certified Energy Specialist certificate</p>	The resource has more than two (2) and up to three (3) years' experience post green card certificate	2	
		The resource has more than three (3) and up to five (5) years' experience post green card certificate	3	
		The resource has more than five (5) and up to nine (9) years' experience post green card certificate.	4	
		The resource has more than nine (9) years' experience post green card certificate	5	
<p><b>TECHNICAL APPROACH AND METHODOLOGY -</b> Proposed methodology should demonstrate thorough understanding of PRASA's objectives and required deliverables as outlined in the Scope of Work and meeting PRASA's requirements.</p>	<p>A detailed methodology for the project management, engineering, building, construction, procurement, quality management, installation, testing and commissioning construction supervision and close out specific to the project listed herein.</p> <p><b>Detailed technical approach and methodology is provided that is aligned to the scope of work highlighting, but not limited, to the following elements:</b></p> <ol style="list-style-type: none"> <li>1. Addressing scope of work as per clients' requirements</li> <li>2. Risk assessment or identification relating to the project.</li> <li>3. Risk mitigation measures associated with the project.</li> </ol>	No Submission or irrelevant information provided.	0	20%
		Detailed technical approach and methodology that is aligned to the scope of work highlighting 1 element.	1	
		Detailed technical approach and methodology that is aligned to the scope of work highlighting 2 elements and project plan.	2	
		Detailed technical approach and methodology that is aligned to the scope of work highlighting 3 elements and a project plan	3	
		Detailed technical approach and methodology that is aligned to the scope of work highlighting 4 elements.	4	

	4. Information on project execution, integration and redundancy for unforeseen delays or occurrences 5. Health and safety plan.	Detailed technical approach and methodology that is aligned to the scope of work highlighting more than 4 elements.	5	
<b>Project Program plan</b>	<p><b>Tenderer has provided a detailed Gantt chart program showing but not limited to the following:</b></p> <p>Ability to execute the works in terms of the Employer's requirements within the required timeframe indicating, in a logical sequence, the order and timing of the construction that will take place to provide the works in a logical sequence. Duration of the project estimated at 2 months.</p>	No Submission or irrelevant information provided.	0	20%
		Basic project plan showing starts and end date of the project.	1	
		The programme is generic, not practical, and unrealistic. The tenderer has misunderstood certain aspects of the Scope of the Works and does not deal with the critical aspects of the project/ Work Breakdown Structure element in question as a subset of the overall project.	2	
		The tenderer has addressed all date requirements correctly, however, still has minor errors and omissions in the logic and sequencing, but adequately dealt with the overall project execution.	3	
		A detailed programme showing critical path. The tenderer has addressed all date requirements correctly and submission contains logic and sequencing which is accurate and renders the submission realistic and achievable. Project shall be completed in 2 months.	4	

		A detailed programme showing critical path. The tenderer has addressed all date requirements correctly and submission contains logic and sequencing which is accurate and renders the submission realistic and achievable. Project shall be completed in 2 months.	5	
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### Stage 3- Price and Specific Goals

The following formula, shall be used to allocate scores to the interested bidders:

The maximum points for this tender are allocated as follows:

DETAILS	POINTS
PRICE	80
SPECIFIC GOALS	20
<b>TOTAL POINTS FOR PRICE AND SPECIFIC GOALS</b>	<b>100</b>

### FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

#### POINTS AWARDED FOR PRICE

#### THE 80/20 PREFERENCE POINT SYSTEMS

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

#### 80/20

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

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

## POINTS AWARDED FOR SPECIFIC GOALS

3.1. 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:

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

The specific goals allocated points in terms of this tender	Acceptable Evidence for specific goals	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)
EME 51 % Black Owned	Audited Annual Financial Statements/ B-BBEE Certificate / Sworn Affidavit.	5	
51 % Black Owned	CIPC Documents / B-BBEE Certificate/ Sworn Affidavit	5	
51% Black Women Owned	Certified copy of ID Documents of the Owners / B-BBEE Certificate/ Sworn Affidavit	5	
51% Black Youth owned.	Certified copy of ID Documents of the Owners / B-BBEE Certificate/ Sworn Affidavit	3	
Owned by Black People with Disability (PWD)	Certified copy of ID Documents of the Owners and Doctors note confirming disability.	2	
Total		<b>20</b>	

## APPOINTMENTS OTHER THAN THE SUCCESSFUL BIDDER

- 1.1 PRASA may appoint a bidder other than the successful bidder under the following instances:
  - (i) When a successful bidder, after having been informed of the acceptance of its Bid, fails to sign a contract within a prescribe period of time e.g. 14 (fourteen) days after being called upon to do so;
  - (ii) When a successful bidder has failed to provide the necessary security, bonds or guarantees within the time required to do so by PRASA;
  - (iii) When a successful bidder fails to meet a condition precedent for the award of business (e.g. to obtain the necessary funding); and
  - (iv) When final contract negotiations with a preferred bidder fails and a contract is not agreed upon.
- 1.2 PRASA will only award a bid to a bidder other than the highest scoring bidder provided that such bid is still within the bid validity period.
- 1.3 Only if the second ranked bidder is also unable/unwilling, PRASA may proceed to the third ranked bidder.

## SECTION 4

### PRICING AND DELIVERY SCHEDULE

Bidders are required to complete the attached Pricing Schedule **Annexure: A**

- 1 Prices must be quoted in South African Rand, inclusive of all applicable taxes.
- 2 Price offer is firm and clearly indicate the basis thereof.
- 3 Pricing Bill of Quantity is completed in line with schedule if applicable (delete if not applicable).
- 4 Cost breakdown must be indicated.
- 5 Price escalation basis and formula must be indicated.
- 6 To facilitate like-for like comparison bidders must submit pricing strictly in accordance with this price schedule and not utilise a different format. Deviation from this pricing schedule could result in a bid being declared non-responsive.
- 7 Please note that should you have offered a discounted price(s), PRASA will only consider such price discount(s) in the final evaluation stage on an unconditional basis.
- 8 Bidders are to note that if price offered by the highest scoring bidder is not market related, PRASA may not award the contract to the Bidder. PRASA may:
- 9 Negotiate a market-related price with the Bidder scoring the highest points;
- 10 If that Bidder does not agree to a market-related price, negotiate a market-related price with the Bidder scoring the second highest points;
- 11 If the Bidder scoring the second highest points does not agree to a market-related price, negotiate a market-related price with the Bidder scoring the third highest points;
- 12 If a market-related price is not agreed with the Bidder scoring the third highest points, PRASA must cancel the RFQ.

I / We \_\_\_\_\_ (Insert Name of Bidding Entity) of \_\_\_\_\_  
\_\_\_\_\_ code

(Full address) conducting business under the style or title of:  
\_\_\_\_\_ represented by:

\_\_\_\_\_ in my capacity as:  
\_\_\_\_\_ being duly authorised, hereby offer to undertake and complete the above-mentioned work/services at the prices quoted in the bills of quantities / schedule of quantities or, where these do not form part of the contract, at a lumpsum, of R

\_\_\_\_\_ (amount in numbers);  
\_\_\_\_\_  
\_\_\_\_\_ (amount in words) Incl. VAT.

**DELIVERY PERIOD:** Suppliers are requested to offer their earliest delivery period possible.

Delivery will be effected within ..... working days from date of order. (To be completed by Service provider)

**SECTION 5****PRASA GENERAL CONDITIONS OF PURCHASE****General**

PRASA and the Supplier enter into an order/contract on these conditions to supply the items (goods/services/works) as described in the order/contract.

**Conditions**

These conditions form the basis of the contract between PRASA and the Supplier. Notwithstanding anything to the contrary in any document issued or sent by the Supplier, these conditions apply except as expressly agreed in writing by PRASA.

No servant or agent of PRASA has authority to vary these conditions orally. These general conditions of purchase are subject to such further special conditions as may be prescribed in writing by PRASA in the order/contract.

**Price and payment**

The price or rates for the items stated in the order/contract may include an amount for price adjustment, which is calculated in accordance with the formula stated in the order/contract.

The Supplier may be paid in one currency other than South African Rand. Only one exchange rate is used to convert from this currency to South African Rand. Payment to the Supplier in this currency other than South African Rand, does not exceed the amounts stated in the order/contract. PRASA pays for the item within 30 days of receipt of the Suppliers correct tax invoice.

**Delivery and documents**

The Supplier's obligation is to deliver the items on or before the date stated in the order/contract. Late deliveries or late completion of the items may be subject to a penalty if this is imposed in the order/contract. No payment is made if the Supplier does not provide the item as stated in order/contract.

Where items are to be delivered the Supplier:

Clearly marks the outside of each consignment or package with the Supplier's name and full details of the destination in accordance with the order and includes a packing note stating the contents thereof; On dispatch of each consignment, sends to PRASA at the address for delivery of the items, an advice note specifying the means of transport, weight, number of volume as appropriate and the point and date of dispatch; Sends to PRASA a detailed priced invoice as soon as is reasonably practical after dispatch of the items, and states on all communications in respect of the order the order number and code number (if any).

### **Containers / packing material**

Unless otherwise stated in the order/contract, no payment is made for containers or packing materials or return to the Supplier.

### **Title and risk**

Without prejudice to rights of rejection under these conditions, title to and risk in the items passes to PRASA when accepted by PRASA.

### **Rejection**

If the Supplier fails to comply with his obligations under the order/contract, PRASA may reject any part of the items by giving written notice to the Supplier specifying the reason for rejection and whether and within what period replacement of items or re-work are required.

In the case of items delivered, PRASA may return the rejected items to the Supplier at the Supplier's risk and expense. Any money paid to the Supplier in respect of the items not replaced within the time required, together with the costs of returning rejected items to the Supplier and obtaining replacement items from a third party, are paid by the Supplier to PRASA.

In the case of service, the Supplier corrects non-conformances as indicated by PRASA.

### **Warranty**

Without prejudice to any other rights of PRASA under these conditions, the Supplier warrants that the items are in accordance with PRASA's requirements and fit for the purpose for which they are intended, and will remain free from defects for a period of one year (unless another period is stated in the Order) from acceptance of the items by PRASA.

### **Indemnity**

The Supplier indemnifies PRASA against all actions, suits, claims, demands, costs, charges and expenses arising in connection therewith arising from the negligence, infringement of intellectual or legal rights or breach of statutory duty of the Supplier, his subcontractors, agents or servants, or from the Supplier's defective design, materials or workmanship.

The Supplier indemnifies PRASA against claims, proceedings, compensation and costs payable arising out of infringement by the Supplier of the rights of others, except an infringement which arose out of the use by the Supplier of things provided by PRASA.

### **Assignment and sub-contracting**

The successful Bidder awarded the contract may only enter into a subcontracting arrangement with PRASA's prior approval. The contract will be concluded between the successful Bidder and PRASA, therefore, the successful Bidder and not the sub-contractor will be held liable for performance in terms of its contractual obligations.

**Governing law**

The order/contract is governed by the law of the Republic of South Africa and the parties hereby submit to the non-exclusive jurisdiction of the South African courts.

**SECTION 6****SBD4****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 interest<sup>1</sup> in the enterprise, employed by the state? **YES/NO**

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

Full Name	Identity Number	Name of State institution

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

2.2.1 If so, furnish particulars:

.....  
 .....

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

- 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 Bidder's declaration regarding PEPs/PIPs

PRASA requires bidders to disclose if they have Politically Exposed Persons ("PEP")<sup>2</sup> or Prominent Influential Persons ("PIP")<sup>3</sup> and related individuals in their organisation and/or beneficial owners / shareholders who are PEP/PIP.

PRASA reserves the right not to enter into a business relationship with such person, official or entity, provided there are objective factors that justify the conclusion of such business relationship, and the decision is based on achieving the best interest of PRASA.<sup>4</sup>

- 3.1 Is the bidder a PEP/PIP? **YES/NO**

- 3.2 Does the bidder have an existing relationship with a PEP/PIP? **YES/NO**

- 3.3 Where a relationship with a PEP/PIP exists, the bidder is required to furnish particulars of the nature of the exposure, term of the office and description of activities relating to exposure, in table below.

Name of PEP/PIP & Nature of the Exposure/Influence	Term of the office	Description of activities relating to Exposure/Influence

<sup>2</sup> Both foreign and domestic politically exposed person as specified in Schedule 3A and 3B of the Financial Intelligence Centre Act No. 38 of 2001 as amended. (refer to Annexure 2 of the PRASA Code of Conduct for dealing with Politically Exposed Persons, Prominent Influential Persons and Related Parties).

<sup>3</sup> As reflected in Schedule 3C of the Financial Intelligence Centre Act No.38 of 2001 (refer to Annexure 2.1.2 of the PRASA Code of Conduct for dealing with Politically Exposed Persons, Prominent Influential Persons and Related Parties).

<sup>4</sup> Clause 4.5 of the PRASA Code of Conduct for dealing with Politically Exposed Persons, Prominent Influential Persons and Related Parties.

### 3.4 Declaration:

I/We the undersigned \_\_\_\_\_ (Name) hereby certify that the PEP/PIP information furnished in this bid document is true and correct. We further certify that we understand that where it is found that we have made a false declaration or statement in this bid, PRASA may disqualify our bid or terminate a contract we may have with PRASA where we are successful in this tender.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Position

\_\_\_\_\_  
Name of bidder

## 4 DECLARATION

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

- 3.1 I have read and I understand the contents of this disclosure;
- 3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;
- 3.3 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium<sup>5</sup> will not be construed as collusive bidding.
- 3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.
- 3.4 The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.
- 3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.
- 3.6 I am aware that, in addition and without prejudice to any other remedy provided to combat any

<sup>5</sup> Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 1, 2, 3 and 4 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

## SECTION 7

## SBD 6.1

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

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

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

#### 1. GENERAL CONDITIONS

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

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

1.2 **To be completed by the organ of state**

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

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

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

1.4 **To be completed by the organ of state:**

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	80
SPECIFIC GOALS	20
<b>Total points for Price and Specific Goals</b>	<b>100</b>

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

#### 3.2. POINTS AWARDED FOR PRICE

##### 3.1.1 THE 80/20 PREFERENCE POINT SYSTEMS

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

#### 80/20

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

Where

$P_s$  = Points scored for price of tender under consideration

$P_t$  = Price of tender under consideration

$P_{min}$  = Price of lowest acceptable tender

### 4. POINTS AWARDED FOR SPECIFIC GOALS

4.1. In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goals stated in table 1 below as may be supported by proof/ documentation stated in the conditions of this tender:

4.2. In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that, if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of state must, in the tender documents, stipulate in the case of—

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

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

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	Acceptable Evidence for specific goals	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)
EME 51 % Black Owned	Audited Annual Financial Statements/ B-BBEE Certificate / Sworn Affidavit.	5	
51 % Black Owned	CIPC Documents / B-BBEE Certificate/ Sworn Affidavit	5	
51% Black Women Owned	Certified copy of ID Documents of the Owners / B-BBEE Certificate/ Sworn Affidavit	5	
51% Black Youth owned.	Certified copy of ID Documents of the Owners / B-BBEE Certificate/ Sworn Affidavit	3	
Owned by Black People with Disability (PWD)	Certified copy of ID Documents of the Owners and Doctors note confirming disability.	2	
Total		20	

#### DECLARATION WITH REGARD TO COMPANY/FIRM

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

4.4. Company registration number: .....

4.5. TYPE OF COMPANY/ FIRM

- ☐ 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:** .....

.....

.....

.....

## SECTION 8

## CERTIFICATE OF ATTENDANCE OF COMPULSORY RFQ BRIEFING

<b>Request number:</b>	<b>WCR 04/2025</b>
<b>Request for Proposal:</b>	<b>Appointment of an 3EB OR 3EP or HIGHER Electrical Contractor for The Engineering, Supply, Install, Test and Commission Including Maintenance of Solar System at Various Stations for a Maintenance Period of 24 Months from the date of Site handover in WCR.</b>

**Attendance**

This is to certify that \_\_\_\_\_ has / have today attended the site inspection / RFQ briefing session to which this enquiry relates.

THUS DONE and SIGNED at \_\_\_\_\_ on this \_\_\_\_\_ day of \_\_\_\_\_

\_\_\_\_\_ for / on behalf of PRASA

\_\_\_\_\_ Designation

**Acknowledgement**

**This is to certify that the Bidder attended the above mentioned briefing session/ site inspection and has / have acquainted himself / themselves with the Contract, Project Specification / Special Conditions, Specifications and / or Bills of Quantities / Schedule of Quantities / Schedule of Prices, together with the drawings enumerated therein, as laid down by the PRASA for the carrying out of the proposed WORKS to which the enquiry relates**

**THUS DONE and SIGNED at \_\_\_\_\_ on this \_\_\_\_\_ day of \_\_\_\_\_**

**DULY AUTHORISED SIGNATORY(IES)      WITNESSES**

1. _____	1. _____
2. _____	2. _____
3. _____	3. _____

## SECTION 9

### SPECIFICATION/SCOPE OF WORK

Region/s	Scope of Works	Size	Yes/ No
WC	Roof top Solar Plant – Grid tied	20 kW	Yes
	Battery back-up	2 Hours	Yes
	Technical and Operational Training	Official attendance of Solar course	Yes

The scope of work consists of:

- Installation of photovoltaic solar plant system – 20KW
- Battery Backup as specified in BoQ.
- Training of PRASA personnel to SAPVIA standard

#### 9.1 INSURANCE REQUIREMENTS FOR THE PROJECT

PRASA, as the Employer/Principle, can take out insurances.

#### 9.2 TARGETED AREA BY THIS PROJECT

##### WC Region Roof top installation

WC	Size of Installation	Single/ Three Phase	Roof Type	WBS No.
Fish Hoek Station	20 KWp	3 Phase	Tiles	2.6. NA.25.001-04-02
Kenilworth Station	20 KWp	3 Phase	Tiles	2.6. NA.25.001-04-03
Eerste River	20 KWp	3 Phase	Tiles	2.6. NA.25.001-04-04
Retreat	20 KWp	3 Phase	IBR	2.6. NA.25.001-04-05

#### 9.3 PRASA'S RESPONSIBILITIES

The Contractor to be provided with the scope of work, specification, bill of quantities, drawings, and site access by Prasa PM.

#### **9.4 EXTENT AND COVERAGE OF THE PROPOSED PROJECT**

**The project will cover the following areas:**

- The rooftop of railway Station

#### **9.5 MEASUREMENTS AND PAYMENT**

The appointed service provider will be notified of a brief in terms of payment.

#### **9.6 FORM OF CONTRACT**

The form of contract shall be JBCC..

#### **9.7 OTHER RELATED PROJECTS**

The related project for the site is as follows:

As and when contracts

#### **10. SPECIFICATION OF THE WORK OR PRODUCTS OR SERVICES REQUIRED**

As laid down in BoQ.

#### **TECHNICAL INFORMATION TO BE PROVIDED WITH TENDER**

The Bidders shall submit the following document as part of the evaluation.

- Organisational Experience with solar installation.
- Organisational Experience with electrical installation for substation, electrical reticulation, building electrical reticulation, etc.
- Certified certificates for the required resources (academic and professional)
- Team organogram
- Method statement with Risk assessment and safety plan
- Project programme

## TECHNICAL SPECIFICATIONS RELATED TO THIS PROJECT

The design for this project shall meet technical capabilities & performance requirements.

The site requires 3-phase 20 KW / 625kVA, 400V on site. High voltage lithium iron phosphate batteries to be used. High cycle life with high rate of charge and discharge. 10-year warranties on batteries required. Supplier to be able to offer nationwide back and support and maintain appropriate levels of spares and inventory. Batteries to be highly compatible to specified inverter its communications and operations. EMS to be able to provide remote monitoring, management and diagnostics and data resolution. Battery BMS modules to have intelligent touchscreen display and wifi enabled monitoring. Batteries to be easily transported and be able to fit into rack mounted cabinets that can fit through a standard single door. System architecture is to enable scalable battery design allowing for easy future addition to storage capacity should this be required. Batteries to have standard on board BMS voltage protection, current limiting, with electronic circuit breakers. Batteries to exceed 6000 cycles @50% DOD (Degree of depletion) and have design life of ~15 years.

The site required 20 KW / 625kVA, 400V on site. Therefore, by design the following shall be provided.

**Proposed 550Wp tier one, Grade A solar panels to be used.**

**The following shall also be required from the contractor:**

- The contractor shall submit shop drawings for PRASA's approval prior to any procurement. No equipment shall be ordered prior to PRASA's official written approval.
- The shop drawings to be in full compliance with the general requirements and performance specifications as set out in this RFQ document.
- The Contractor takes complete liability for patent and latent defects.
- The designs to be signed off and approved by a respective ECSA (Engineering Council of South Africa) registered Professional Engineer or Professional Engineering Technologist.
- The installation shall be carried out and approved by the electrician and someone with green card or an energy specialist.
- All the design, fabrication, construction etc. conforms to the relevant legislative requirements, SANS Standards and SABS codes.
- The PV Plant and documents are appropriately labelled and in a coherent manner.
- The PV Plant is designed with due consideration to the site environmental conditions.
- Appropriate care is exercised, and confirmation is made to site measurements before proceeding with design & manufacture of the complete works as dimension accuracy.

- The design provides performance guarantee for minimum of 99.5% as annual plant availability. Plant availability is measured in terms of time during which the plant is supplying energy as per demand.
- The design and construction of the PV Plant complies with current standards and statutory obligations arising from current legislation and regulations, including statutory legislation and codes of practice, and relevant South African and international standards.

### **Material Quality Specification**

- All components and materials supplied are designed, manufactured, and tested in accordance with the latest applicable IEC and SANS standards.
- Equipment Products, Components and/or Accessories conform to all applicable Product Safety Standards appropriate for the intended markets.
- Materials and products used are suitable for the service conditions.
  - All *works*, materials, parts, components etc. supplied/replaced be new, both in the construction of the PV Plant and maintenance of the PV Plant throughout the Operation Maintenance Period.
- Any materials or substances that are generally known at the time of use to be deleterious, a health risk, or a fire hazard, either in use or in their manufacture.
- Where possible, all materials used are recyclable.
- Substances known to deplete the ozone layer, whether specifically excluded from use by current EC legislation, as refrigerants or foaming or filling agents for insulation.
- Any materials or substances that support mould, bacterial growth or vermin or cause objectionable odours under service conditions.
- Materials and products delivered to site bear the manufacturer's name, brand name and any other data required to verify that their performance and specification complies with the requirements of this document.
- Materials and products are appropriately CE/UL marked and/or SABS approved.
- Follows the manufacturers' instructions on the installation and use of materials and products.
- Selects materials & products regarding standardisation and availability of spare parts and for ease of maintenance.
- Use the same manufacturer for materials or products of a similar type and that identical parts of similar products are interchangeable.
- Materials and components are transported and stored in accordance with manufacturer's guidelines.

- Provides suitable packaging for the protection of all materials and equipment during delivery, storage, and where exposed to damage on site. The Contractor returns re-usable packaging to the supplier. The Contractor takes particular care to protect and maintain plant and equipment delivered early.
- Examines materials and products supplied when delivered to site and immediately prior to installation. The Contractor replaces any damaged or faulty materials or products.
- Stores all materials on raised boarded platforms under weatherproof covers and/or according to manufacturers' specifications.
- Protects all materials and equipment which may be exposed to damage, inclement weather, or ultraviolet light.
- Ensures that sensitive plant and equipment items not to be exposed to dirt or dust at any time to maintain manufacturers' warranties and long-term reliability.
- Replaces/Repairs any damage to finished materials and replace equipment prior to Final Completion of the project.
- Provides the critical spare parts, provided by the bidder during tender submission, on site upon Final Completion.

## **Building Works**

### **Installation of new Roof Sheeting - Design Statement**

Prior to commencement of new solar panels installation on the identified roof location, existing deteriorated roof sheeting shall be removed and replaced with new.

All building works to be carried out in conjunction with Architect and Structural engineer drawings and specification, works to comply with South African Building Standards.

All buildings, structures, cable trenches/routings, and service routes which are incorporated in this contract are functionally and efficiently located and that each building/component is sized for optimum space usage.

All design, fabrication, construction etc. conforms to the relevant legislative requirements, SANS Standards and SABS codes.

### **Mounting Structure**

- Designs, procures, and construct the most efficient means for mounting PV modules.
- The mounting structure is of roof mounted, fixed type and facing North where possible. Should north facing orientation not be possible, then both west and west orientations on at least 2 strings to be designed. The structure withstands all possible static, dynamic, and seasonal loads at site condition.
- All PV mounting structures are off-the-shelf products as much as possible.
- The proposed mounting structures (product) have proven track record and the product have been installed in PV projects for more than 100 KW capacity.
- The mounting structures are designed for optimum PV module orientations.
- The row-to-row distance is selected to minimize the shading losses.
- The mounting structure is designed for minimum 25 years of operation and the Contractor provides minimum 5 years as warranty on material/product.
- The mounting structure solutions which is efficient, cost effective and reliable. The design reduces installation time and material waste.

### **Electrical Works**

- This section defines the electrical works for the Project.
- All design, fabrication, construction etc. conforms to the relevant legislative requirements, SANS Standards and SABS codes.

### **Photovoltaic (PV) Capability**

The PV capacity of 20 KW (twenty kilowatt) system. The DC capacity is the sum of nominal power of all modules to be installed.

### **Photovoltaic (PV) Module**

- The solar panel minimum wattage shall be 550Wp per panel.
- Supply and install the PV Modules to achieve the specified levels of performance for the required design life of 25 years under the prevailing site environmental conditions to be determined with minimum 12-year warranty on panels provided.
- PV Modules technology is either of monocrystalline silicon (c-Si) type. All PV modules supplied for the Plant are of the same type, size and from a single manufacturer.
- The module manufacturer complies with followings.
  - Has been producing PV modules commercially for last five years,
  - Has an experience in minimum of 50 MWp cumulative capacities in PV installation.

- The PV modules minimum guarantees from the manufacturer are.
  - Power Output Warranty: maximum power output degradation of 10% and 20% of rated peak power respectively for 10 years and 25 years operational period.
  - Linear Degradation: first year degradation not more than 3.0% and linear degradation from second year and onwards not more than 0.75% per year.
  - Workmanship guarantee: Product guarantee against manufacturing defects for a minimum of 10 years.
  - Positive tolerance: rated power output tolerance must be positive e.g. 0/+5%.
- The module rated peak power (defined at STC condition) is used to determine the peak power of the Plant. The peak power is the sum of the manufacturer's name plate data sheets for each individual module.
- The flash test data from manufacturer (measurement according to IEC 60904 part I) for each module to be installed in the project. The sum of power in flash test data is equal to or higher than peak power of the Plant.
- All modules to have valid industry standard certifications; IEC 61215 and IEC 61730, issued by reputable testing institutions according to IEC.
- The module arrangements to be decided to minimize the losses due to mismatching. Proper sorting method and only modules from the same set is used in in the same string.
- All transportation, storage, handling, and installation of the modules to be in accordance with the specifications from the manufacturer, as to not to void the module manufacturer's warranty.

Solar Panels
Minimum Requirements. Must be the same or higher
Peak power (Pmax): 550W or higher
Mono-crystalline type
Efficiency - 20% minimum
Open Circuit Voltage (Voc): 45.9V
Max Power Voltage (Vmp): 41.77V
Short Circuit Current (Isc): 18.57A
Max Power Current (Imp) :15.57A
Power Selection: 0 ~+ 5W
Power tolerance - +/-5 W

<b>Solar Panels</b>
<b>Minimum Requirements. Must be the same or higher</b>
IEC 61215-1/1-11-2;2016 and IEC 6173D-1/2;2016
Safety class based on IEC 61140: Class II
Maximum System voltage: 1000V or higher
Maximum Over current protection Rating: 25A
Power Production tolerance: +_3%
Open circuit voltage Tolerance: +_2%
Short Circuit Current tolerance: +_4%
Fire performance - Class C as per IEC 61730
Front cover - 3.2 mm tempered glass
Frame - Anodized aluminium alloy, crossbar enhanced
Application class – A
Junction box - IP68, 3 bypass diodes.
Temperature Co-efficient = -0.37 % (Pmax), -0.29 % (VOC) and 0.05 % (ISC)
Operating temperature - 40 to +85 degrees Celsius

### **DC Combiner box**

- The DC combiner boxes are designed for use for external condition with a design lifetime of 25 years.
- The combiner box includes string fuse for each string. The fuse rating is sized according to the requirement from module and inverter manufacturer.
- The DC combiner box includes lightning current and overvoltage surge arrestor.
- The DC combiner box includes array on-load disconnect switch, which is accessible without opening the combiner box. This switch allows for isolating array connected to box for maintenance and emergency purpose and is lockable.
- The combiner boxes are equipped with sun shields where exposed to direct sunlight. To prevent overheating inside the boxes, reduced terminal occupancy is considered. The place of installation location must be easily accessible and offer a secure base for working on the device.
- The cable labelling and single line diagram of connections inside the combiner box is kept on each combiner box.

## Inverters and inverter-charger

- Selects hybrid Inverters with proven track records in terms of performance and operation.
- PRASA has adopted similar or equivalent to engineering design to DEYE, SUNSYNK, SOLIS.
- Where specific municipalities or electricity authorities have specified certain brand or product names of Solar systems, then it's incumbent of PRASA to align to such.
- Provide an inverter arrangement that gives overall optimal energy yield over the life of the Project, considering the site conditions and the proposed module layouts.
- All inverters installed are of same type, size and from a single manufacturer.
- Inverters selected for the installation to conform to the following specifications.
  - Inverter is selected with respect to local climatic and environmental condition and is equipped to operate in high temperature regions,
  - The inverter power is not derated for the temperature range between -10°C and +40°C.
- Inverters selected for the installation has a minimum of 5 years product guarantee against manufacturing defects.
- Inverters can log performance parameters (input power, output power). The data storage management process and stores the operating data of the inverter.
- The inverter manufacturer's warranties for the site-specific environment and installation type to be confirmed.
- The inverters comply with all relevant national and international certificate labels and suitable of installation in South Africa.
- All transportation, storage, handling, and installation of the inverters are in accordance with the specifications from the manufacturer, as to not to void the inverter manufacturer's warranty.
- The solar charge controller shall be at least 30kW.
- The Inverter-charger shall be of 20kW.

The solar inverters shall be installed on the load side of the inverter-chargers and must comply with the following:

Provision of at least 130% on inverter output for PV is required for inverters to meet the minimum specification.

No transformer required - the hybrid inverter is sufficient for office type electrical loads – transformer-based inverter only required for high startup motor type loads

INVERTERS		
Item No.	Description	Minimum Requirements
<b>1</b>	<b>AC (Grid-connected)</b>	
1,1	Apparent power	110kVA
1,2	Rated power	20kW
	Grid voltage	380VAC - 400VAC
1,3	Rated voltage	400V
1,4	Rated current	144A per Inverter
1,5	Voltage range	360V - 440V
1,6	Rated frequency	50/60Hz
1,7	Frequency range	45~55/55~65Hz
1,8	THDI	<3%
1,9	PF	0.8lagging - 0.8leading
1,10	AC connection	Three phase 4-wire + protective earth
1,11	AC input	200kVA
1,12	Adjustable grid code selection	Yes
1,13	Transformer less topology	Yes
1,14	DC/AC output converter	True three-phase bridge topology
1,15	AC connection type	Aluminium and copper up to 240mm <sup>2</sup>
1,16	Anti-islanding protection	Yes
1,17	Efficiency	98,40%
1,18	Night consumption	< 0.6 W
1,19	Wireless remote monitoring	Yes, with Wi-Fi logger card
1,20	User interface	4 x LED & web interface
<b>2</b>	<b>DC (Battery and PV)</b>	
2,1	Max. PV open-circuit voltage	1000V DC
2,2	Max. PV power	150kWp
2,3	PV MPPT voltage range	480V - 8050V DC
2,4	Number of independent MPPT	6 per inverter
2,5	DC input pairs per MPPT	4
2,6	DC switch rating per MPPT	50A or higher

INVERTERS		
Item No.	Description	Minimum Requirements
2,7	Max DC input power	17500kW per MPPT
2,8	Battery voltage range at Max. charge power	500V - 600V
2,9	Battery voltage range	352-600V
2,10	Max. charge power	150kW
2,11	Max. discharge power	110kW
2,12	Max. charge current	300A
2,13	Max. discharge current	313A
2,14	Reverse polarity protection	Yes
2,15	Lifetime free online monitoring	Yes
2,16	DC input individual current monitor	Yes (individual string current monitoring)
<b>3</b>	<b>General Information</b>	
3,1	Protection degree	IP54
3,2	Noise emission	<65dB(A)@1m
3,3	Operating temperature	-25 °C~+60 °C
3,4	Cooling	Forced air
3,5	Relative humidity	0-95% non-condensing
3,6	Maximum operating altitude	2000 m without derating
3,7	Dimension (W/H/D)	1200/1900/800mm
3,8	Weight	1025kg
3,9	Build-in transformer	Yes
3,10	Transfer between on/off grid	Automatic≤10ms
3,11	Standby consumption	<30W
3,12	Detachable wiring box	Yes
3,13	Relative humidity	0 to 100 % condensing
3,14	Cooling	Forced air
3,15	Input and output surge protection	Yes, pluggable Type 2, monitored

INVERTERS		
Item No.	Description	Minimum Requirements
3,16	Photovoltaic array isolation control	as per IEC 62109
3,17	Safety standard	IEC 62109-1 & 2
<b>4</b>	<b>Communication</b>	
4,1	Display	Touch screen
4,2	Communication	RS485/CAN

### AC combiner panel

AC combiner panels will have individual incoming circuit breakers for each solar inverter. The incoming circuit breakers shall have isolation behaviour and be suitably selected to allow spare capacity when compared to the solar inverter output as well as being correctly selected to protect the AC cable.

The AC combiner panel shall be fitted with busbars to combine the incoming AC circuits before entering the main output AC circuit breaker. The busbars shall be rated at 1.6 A/ mm<sup>2</sup> and be suitably supported for the site-specific prospective fault current (short-circuit current).

Neutral and earth bars will be of the same rating as the phase busbars. All busbars and wiring shall be adequately rated and suitably supported. The minimum busbar fault current rating shall be 10 kA.

The main output AC circuit breaker shall have isolation behaviour. Suitable busbar extensions shall be fitted to the circuit breaker for easy termination / connection of the outgoing AC cabling.

The AC combiner panel shall be fitted with a power meter on the main output AC circuit breaker that measure current, voltage, power factor, kVA, kW, kVAr as well as maximum values.

### Solar modules and installation

Solar modules must be the mono-crystalline type and comply with the following:

- Maximum system voltage : 1000 V
- Efficiency : 20% minimum
- Fire performance : Class C as per IEC 61730
- Tier rating : 1

- Application class : A
- Power tolerance : +/- 5 W
- Cell arrangement : 144
- Front cover : 3.2 mm tempered glass
- Frame : Anodized aluminium alloy, crossbar enhanced
- Junction box : IP68, 3 bypass diodes.
- Cable : 4 or 6 mm<sup>2</sup>
- Connector : T4 series
- Temperature Co-efficient : -0.37 % (Pmax), -0.29 % (VOC) and 0.05 % (ISC)
- Operating temperature : -40 to +85 degrees Celsius

Bidders must provide solar panel that are same or higher of the above specification. This is linked and depends on the proposed structure and required supply.

The solar modules shall be installed on a suitable mounting system. The mounting system shall be certified and have appropriate installation instructions. Weather conditions must be considered when the mounting system is designed to match the installation site's weather conditions.

Solar modules must be installed in neatly arranged rows with consideration for cleaning, servicing, and maintenance. For this reason, access paths must be included in the design. A maximum linear string must have an access path every 50m. The design must be submitted for approval to the engineer prior to ordering and installation of any equipment.

Where appropriate, permanent safety lines or anchors for temporary safety line must be included in the design and the Contractors offer.

The Contractor shall provide the weight of all equipment in their data sheets as part of the quotation submission.

## Inverter-Charger

Three phase inverter-chargers must comply with the following:

- Inverter size : 20 KW / as per designs
- Parallel operation possibility : Yes
- Power control : Yes
- Remote monitoring : Yes
- Remote control : Yes
- Remote configuration : Yes (with configurable access levels)
- AC Input /Output voltage range : 220V 380V, 230V/ 400V (3L +N+PE)
- AC Input frequency : 45Hz to 65Hz
- DC Input voltage range : 160 to V to 700V
- DC Charge current : 37A
- Safety standard : IEC 6219-1/2
- Efficiency : less than or equal to 97.5 %
- IP rating : 65
- Anti-islanding : Yes
- Overload capacity : 110% for 10min / 120% for 1min
- Cooling : Intelligent air cooling
- Maximum altitude : 2000m
- Interface : Touch screen

## Cabling

- The design and installation of power and control cables and execution of associated work is in accordance with relevant SANS Standards and cables are SABS approved.
- All cables in the Plant are fastened adequately to avoid swinging and tension and durable mounted in such a way as to protect them from rodent attack, weathering and UV radiation.
- All cables are uniquely numbered (permanent labelling) to facilitate later traceability & fault location. Circuits and cables are planned and installed to ensure accessibility and ease of maintenance.
- Electrical conductors are selected with an insulation level applicable to the system voltage for which they are used and capacities suitable for the load being served. The type of cable

used is determined by individual circuit requirements and individual equipment manufacturer's recommendations. Current carrying conductors are either copper or aluminium.

### DC Connectors

- Modules connectors and DC cables connectors are compatible and from the same manufacturer throughout the project.
- To use cables with connectors which are contact-proof and designed to avoid corrosion.

DC cabling and installation shall comply with the following:

- DC cable standard : IEC 62930
- Installation standard : IEC 60364-4
- DC voltage rating : 1000 V
- Cable size : minimum 6 mm<sup>2</sup>
- Connectors : MC4
- Junction boxes : IP65, UV and weatherproof
- Cable installation: on roof : Below solar modules allowed.
- Cable installation: from solar modules to DC isolators: Galvanized conduit
- Cable installation : Earth- and short-circuit proof.
- Cable installation : UV and weatherproof
- Parallel strings : Fused on positive and negative poles with PV rated DC fuses.
- Field array enclosures : Must include surge protection and fuse protection of strings.
- Earthing : Galvanized conduits to be bonded with earth strapping
- Earthing : All solar modules to have individual earth wires to structure
- Earthing : Mounting structure to be earthed with minimum 16 mm<sup>2</sup> wire

All connections and extensions to be done with T4 connectors. No joining or extending of solar cable to be done with terminals or strip connectors.

## Lithium-Ion Battery

Only lithium iron phosphate batteries will be considered. As charging and discharging voltages and currents are critical to batteries these must be considered in the selection of the battery. The battery backup time to be sized to meeting design criteria.

The battery shall be Lithium-Ion (LiFe PO<sub>4</sub>) that operates for at least 6000 cycle at 50% Depth of Discharge (DoD), and or 5500 cycles at 80% DoD and minimum of 10-years lifespan. The maximum load duration shall be 5 minutes per 30-minute cycle, 2 x maximum overload to handle for 2 seconds. The fly leads minimum to be 1800mm long, power cable Red – positive, black – negative.

### The battery shall comply with the following:

Nominal voltage - 2-Hour's backup supply for a 20 KW solar plant, (minimal battery storage capacity of 40 KW battery storage capacity, 80% DOD (ie. Min 50 Kwh total capacity).

- Nominal voltage : 512 V (to suit inverter - charger)
- Charge / Discharge current : to meet recharge design criteria.
- Cooling fan : No
- Enclosure : Heavy duty custom made; powder coated
- External interface : CAN Bus
- Protection current limiting : Electronic Circuit breaker, BMS voltage protection,
- Remote tripping over CAN Bus : Yes
- Manual reset : Yes
- Cell under- & over voltage protection : Yes
- Built-in temperature protection : Yes
- Minimum SOC control : Yes
- Human machine interface : Yes, with 0-100% state of charge indication
- Wi-Fi remote monitoring : Yes
- Warranty : +10 years / 6000 cycles, 80% DoD
- Service life : >20 years at low cycle.
- Mounting : Floor standing

The following shall form part of the battery equipment.

- **Control interface** - RJ45 Socket x 2 – CAN Bus for Interfacing with Compatible Inverters and System Controllers, connection of parallel batteries.
- **Protection** - Shunt Trip Circuit Breaker sized to suit max current, can be tripped by BMS if critical fault, manual reset. Includes overcurrent, cell under and over voltage, temperature, weak cell detection, minimum SOC control.
- **Human Interface** - State of Charge Display (0 to 100%), Error light, Error Reset Button, Serial RS232 Plug for Programming (note the Lite 80/56 has a CAN port for programming and not a serial port), Wi-Fi remote monitoring.
- **Warranty** - 10 years 6000 cycles for average 80% DoD, and max 90% DoD
- **Service Life** - >15 years (>5 500 cycles) expected life at 80% DoD (1), >20 years (>7 500 cycles) at 50% DoD.
- **Essential Accessories** – These shall be required for battery connection to the PC - Lite 5/4 up to Lite 60/42 - Serial RS232 to USB adapter (must be the brand supplied by same supply that supplies the batteries). CANdapter as per the battery supplier (must be the brand supplier that supplies the batteries and shall be supplied with battery). CAN Bus Termination Resistor (as per the battery supplier) – one required per battery, must be the brand supplied by same supply that supplies the batteries) and must be included with the battery package.

Lithium-Ion Battery	
Description	Requirements
Battery Size	2-Hour's backup supply for a constant 20kW load min 50 kwh total capacity for 40 Kwh usable capacity at 80%.
Nominal voltage	512 V
Enclosure	Heavy duty custom made; powder coated to fit through standard single door (Standard server cabinet width as per spec BOQ)
External interface	CAN Bus
Protection	Circuit breaker with shunt
Remote tripping over CAN Bus	Yes

Lithium-Ion Battery	
Description	Requirements
Manual reset	Yes
Cell under- & over voltage protection	Yes
Built-in temperature protection	Yes
Minimum SOC control	Yes
Human machine interface	Yes, with 0-100% state of charge indication
Wi-Fi remote monitoring	Yes
Warranty / Lifetime	+ 10 years / 7 500 cycles at 50% DoD or 5 500 cycles at 50% DoD
Mounting	Floor standing

### Earthing

- Earthing system for the PV Plant that eliminates the risk to personnel or animals of electric shock under normal operating conditions as well as fault conditions. Furthermore, the earthing system ensures the functionality of electrical protection equipment during electrical faults.
- The designs of the earthing system in accordance with Solar PV industry best practice and in compliance with SANS 10200:1985 and SANS 10292:2001.

### Surge and Lightning Protection

- The lightning protection systems to be according to relevant SANS standards. The lightning protection system protects the equipment and project against damage caused by lightning strikes.
- Overvoltage protection is installed at DC side as well as AC side of the inverter, DBs and within the PV arrays.

### Security system

The site shall be equipped with closed-circuit television & CCTV) and access control as per PRASA PM.

**GENERAL MAINTENANCE ACTIVITIES BUT NOT LIMITED TOO: -**

<b>Sub-system or component</b>	<b>Maintenance action</b>	<b>Frequency</b>
Site	Verify: Cleanliness (accumulation of debris around and or under array)	Monthly
Inverters	Check fan and cooling elements	Monthly
PV modules	Verify cleanliness (dust or fungus) Check for visual defects including - fractures - browning - moisture penetration - frame corrosion	Monthly
		Monthly
Wiring installation	Verify mechanical integrity of conduits Verify insulation integrity of cables installed without conduit Check String boxes for: - tightness of connections; - water accumulation/build-up; - integrity of lid seals; - integrity of cable entrance and/or conduit sealing - integrity of clamping devices Verify: Surge arresters for degradation Check connections for - tightness of connections; - corrosion	Monthly Monthly Monthly
		Monthly
<b>Sub-system or component</b>	<b>Maintenance action</b>	<b>Monthly</b>
Electrical characteristics	Measure open circuit voltages	Monthly
	Measure short circuit currents	Monthly
Protective devices	Verify integrity of fuses	Monthly
	Verify operation of MCCB	Monthly
	Verify operation of solar array isolation device	Monthly
	Verify tightness and integrity of bolts and other fastening devices	Monthly
Mounting structures	Inspect for corrosion	Monthly
Monitoring and control system	Visual inspection of hardware	Monthly
	Remotely check integrity of system communication	Monthly
	Integration with existing Backup generator	Monthly