



<p>SUPPLY, INSTALL AND COMMISSIONING OF SOLAR PV SYSTEM AT LERALLA, BIRCHLEIGH AND ISANDO</p>
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1. INTRODUCTION

The work is: Appointment of a contractor for the scope of work entails supply, installation, and commissioning of 5KVA solar PV system at Van Riebeeckpark, Birchleigh and Isando train station.

2. BACKGROUND OF THE PROJECT

The passenger railway services offered by PRASA at the subject corridors are not at par with the normal operations of passenger rail service. The railway infrastructure at these facilities has been rendered functionally obsolete due to the acts of vandalism that occurred over the past years. PRASA infrastructure such as railway tracks and related overhead track equipment, ticket office buildings, platform surfaces, lighting equipment, ablution facilities, retail/commercial facilities, parking, etc. has been damaged beyond use.

PRASA CRES strategy has pointed to a need for rapid development of the Rail Top Priority Corridors, in line with the Service Resumption and the Infrastructure Investment and Development in these Corridors.

The installation of the 5KVA will provide the ticket office with sufficient power supply as well as lighting on the platforms. Thus, turning the ticket office into functional state

3. DETAILS OF THE PREFERRED SOLUTION

The preferred solution is to procure a service provider to supply, installation and commission the solar PV system.

4. AREAS TARGETED FOR THIS PRODUCTS OR WORK OR SERVICE REQUIRED.

4.1 Birchleigh train station

4.2 Van Riebeeckpark train Station

4.3 Isando train station.

5. SCOPE OF WORK

The scope of work entails supply, installation, and commissioning of 5KVA solar PV system at Van Riebeeckpark, Birchleigh & Isando train station.

The high-level scope of work to be executed under this project will include, but not. Limited to the following:

5.1 Birchleigh Train Station: Ticket office

5.1.1 Supply of a complete 5KVA Solar PV Systems

5.1.2 Installation of a complete 5KVA Solar PV system according to SANS 10142

5.1.3 Commissioning of a complete 5KVA Solar PV system

5.2. Van Riebeeckpark Train Station: Ticket office

5.2.1 Supply of a complete 5KVA Solar PV Systems

5.2.2 Installation of a complete 5KVA Solar PV system according to SANS 10142

5.2.3 Commissioning of a complete 5KVA Solar PV system

5.3. Isando Train Station: Ticket office

5.3.1 Supply of a complete 5KVA Solar PV Systems

5.3.2 Installation of a complete 5KVA Solar PV system according to SANS 10142

5.3.3 Commissioning of a complete 5KVA Solar PV system

6. SPECIFICATIONS

6.1 ELECTRICAL WORKS

6.1.1 5000-Watt off Hybrid inverter. Nominal DC 48V. Output voltage 230VAC 50Hz at 5000 Watts.

6.1.2 24V 100AH deep cycle Lithium-Ion battery pack, stand and side covers Include all relevant cables, bracket, lugs, and ferrules as per manufacturer's specifications.

6.1.3 160Amp battery disconnect.

6.1.4 32 Amp AC Switch with a 63 Amp Change over Switch and Box.

6.1.5 Sundries (Trunking and Clips, Lugs and Ferrules plus Nitto tape.)

6.1.6 Heavy duty lockable battery cabinet

6.1.7 Battery fuse and holder

6.1.8 PV Surge arrestor device

6.1.9 12-way surface mount distribution board. Complete as stipulated in the BOQ.

6.2. SOLAR PANELS

- 6.2.1 Peak power 455 Watts each PV modules to be fitted on top of galvanized stand (priced elsewhere) such that maximum solar radiation is absorbed by solar panel. Include all brackets, antivandal claps, cables, lugs, and ferrules as per manufacturer's specifications (Portrait Install)
- 6.2.2 Mounting Kits suitable for Corrugated Roof
- 6.2.3 DC Combiner DC 600V Box 2 In 2 Out
- 6.2.4 Earth spike and cabling (Sans 60613) Regulations
- 6.2.5 PV cable 6mm Red and Black Cable from Combiner box and Panels
- 6.2.6 Sundries (Trunking, MC 4 Connectors, Hazard Stickers)

7. WARRANTY

The repaired components must be supplied with a 12-month warranty from the date of fitment for the work that was carried out.

8. COMPLIANCE

- 8.1 Non-conformances (NCR) must be returned within 10 working days.
- 8.2 All components, once tested and certified, shall be issued with a compliance certificate.
- 8.3 All components must have a quality assurance label indicating the name of the organization, date, card tested by.
- 8.4 All components should be SABS approved.

9. PRICE ADJUSTMENTS

Prices will be fixed for the duration of this contract.

10. PENALTIES

- 11.1. Should the Contractor fail to deliver on or before the agreed date, a penalty of 1% per day will be charged on the total value of the Purchase order (PO) but shall not exceed 10 percent of the total value of the PO.
- 11.2. PRASA CRES reserves the right to test the product at any given time during the contract period for compliance. The Contractor will be held liable with costs for any deviations in the specifications which may have resulted in damages and downtime to Rolling Stock equipment. A meeting will be convened by both parties to discuss the outcome of the investigation and the costs incurred.

12. DEMOLITION

The contractor is responsible for the demolition of the existing equipment and the transportation of the existing equipment from Birchleigh station to Elandsfontein Depot.

13. OVERALL STAFFING AND KEY PROFESSIONAL STAFF

A contractor shall provide qualified and experienced professional staff for the following.

13.1 Project manager

13.2 Electrician / millwright / electro mech.

13.3 Construction health and safety officer

14. MINIMUM QUALIFICATIONS OF KEY PROFESSIONAL STAFF

14.1 Project manager - Electrical qualification (Degree, Diploma or N-level certificate).

14.2 Electrician / millwright / electro mech- Minimum 5 years' experience in Electrical building environment.

14.3 Construction health and safety officer - The desired minimum qualifications for the Construction Health and Safety Officer are as follows: Minimum of 3 years industry experience as a health and safety officer.

15. GENERAL INFORMATION

15.1 The contract shall be registered with the ECB as laid down in the Electrical a. Installation Regulations of the Occupational Health and Safety Act 85/1993, clause 5.

15.2 The electrical contractor shall be or have in his employment an accredited person
Proof must be supplied of the above requirements: PV Green Card Holder

15.3 All materials/components shall be of high standard (SABS approved)

15.4 All components/materials supplied and installed shall be new and will be capable of providing specified power at 380V.

15.5 A contractor is not allowed to sub- contract without the permission of the Prasa project manager.

15.6 Contractor: Successful tender who is appointed by PRASA-CRES and will be responsible for carrying out the work as per this specification.

15.7 The Contractor shall always be responsible for supervision of the work and for

- follow-up instructions to monitor that the work is being done to specification. He shall immediately take appropriate remedial action, in areas where the specified standards are not achieved.
- 15.8 The Contractor shall allow PRASA representatives to visit plant workshop sites. anytime to monitor/inspect construction process and ticket office facilities.
- 15.9 The PRASA Maintenance engineering department shall at any time during Contract periods carry out inspection of the contractor's performance methods and procedures.
- 15.10 The contractor shall provide transport, equipment, tools, consumables, supervision, protection, and labor necessary to successfully complete the contract.

16. SAFETY

- 16.1 The Contractor shall comply with requirements of safety legislations and regulations in all respects.
- 16.2 The contract shall submit a COVID -19 safety compliance plan.
- 16.3 All vehicles shall be roadworthy.
- 16.4 The contractor shall be responsible for security of personnel and material onsite as well as during transit.
- 16.5 Normal protection measures in accordance with the Protection Manual shall apply.
- 16.6 An effective safety procedure to be followed by all personnel on any work site in the case of approaching rail traffic shall be compiled by the Contractor and implemented before any work commences. This procedure shall be updated whenever the need arises, and any changes shall be communicated to all employees on a works site before work proceeds.
- 16.7 It is the requirement of this contract that the contractor should provide PRASA with a Safety File with a detailed safety plan prior to being issued with a site access certificate, in accordance with the latest version of the OHS Act and the SPK7 and the E4E. (safety file check list shall be provided by PRASA).
- 16.8 The Contractor shall make necessary arrangements for sanitation, water, and electricity on site during the installation of the equipment.

17. COMMISSIONING AND TESTING

Designated PRASA personnel, in conjunction with the Contractor, shall carry out the final commissioning test. The Contractor shall carry out any remedial work, necessary.

18. HANDING OVER

The handovers shall be for each portion of the work when the Electrical System is tested and commissioned to the satisfaction of the Project Manager, in accordance with the details as set out in the handing over documentation by PRASA.

19. SECURITY

The contractor shall provide on-site security for personnel and material stock and should ensure that patrols are in place at the section handed over to the contractor and until the completed work is handed over to PRASA. No claims of material or losses shall be lodged with the client for stolen goods during the construction before the completed work is handed over to PRASA.

20. MEASUREMENT AND PAYMENTS

- 21.1 Completed work will be inspected and Invoices will be submitted to finance department after passing the inspection and testing.
- 21.2 Any rejected and incomplete work will not be paid for until it is rectified.

21. PRICING SCHEDULE

- 22.1 Prices must be quoted in South African Rand, inclusive of all applicable taxes.
- 22.2 The price offer is firm and clearly indicates the basis thereof.
- 22.3 Pricing Bill of Quantity is completed in line with schedule if applicable.
- 22.4 Cost breakdown must be indicated.
- 22.5 Price escalation basis and formula must be indicated.
- 22.6 To facilitate like-for-like comparison bidders must submit pricing strictly in accordance with this price schedule and not utilize a different format. Deviation from this pricing schedule could result in a bid being declared non-responsive.

- 22.7 PRASA CRES is not obligated to appoint the lowest bidder.
- 22.8 Pricing Preliminary & Generals, Health & safety should be inclusive of all stations on tender.

22. BILL OF QUANTITIES

BILL OF QUANTITIES

LERALLA STATION.

SCHEDULE OF QUANTITIES AND RATES / PRICE (S)

Item No.	Description	Unit	Qty	Rate/unit (Excl VAT)	Total Price (Excl VAT)
	SECTION 1				
1.1	Preliminary and General				
	All Preliminary and General applicable to this project	No.	1	R	R
	Occupational Health and safety				
1.2	Compliance with Occupational Health and Safety Act (Act 85 of 1993) and its regulations and with the Employers Health and Safety	No.	1	R	R
	<u>SECTION 2</u>				
	<u>ELECTRICAL WORKS</u>				
	<u>TICKET OFFICE</u>				
2.1	Supply and fit Minimum: 5000-Watt off Hybrid inverter. Nominal DC 48V. Output voltage 230VAC 50Hz at 5000 Watts. Include all relevant cables, lugs, and ferrules as per manufacturer's specifications	No.	1	R	R
2.2	Supply and fit 24V 100AH deep cycle Lithium-Ion battery pack, stand and side covers Include all relevant cables, bracket, lugs, and ferrules as per manufacturer's specifications	No.	2	R	R
2.3	Supply of 160Amp battery disconnect.	No.	1	R	R

2.4	Supply of 32 Amp AC Switch with a 63 Amp Change over Switch and Box.	No.	1	R	R
2.4	Sundries (Trunking and Clips, Lugs and Ferrules plus Nitto tape.)	Sum	1	R	R
2.5	Connect above system to DB.	Sum	1	R	R
2.6	Supply and connect of Cable Run from DB to Inverter	m	50	R	R
2.7	Supply and connect of Cable from Battery to Inverter	m	5	R	R
2.8	Heavy duty lockable battery cabinet	No.	1	R	R
2.9	Battery fuse and holder	No.	4	R	R
2.10	PV Surge arrestor device	No.	4	R	R
2.11	Supply and fit 12-way surface mount distribution board. 63 Amps Earth leakage for AC protection, 20 Amp circuit breaker for plug socket protection x 2. PV modules isolator 20 Amps x 10. 3 x 63 Amps circuit breaker for batteries. Surge protection (SPD). Include all relevant cables, lugs, and ferrules as per manufacturer's specifications	No.	1	R	R
2.12	Battery fuse and holder	No.	4	R	R
	<u>SECTION 3</u> <u>SOLAR</u>				
3.1	Supply and fit PV Modules. Minimum: Peak power 455 Watts each PV modules to be fitted on top of galvanized stand (priced elsewhere) such that maximum solar radiation is absorbed by solar panel. Include all brackets, antivandal claps, cables, lugs, and ferrules as per manufacturer's specifications (Portrait Install)	No	8	R	R
3.2	Supply and install of mounting Kits suitable for	Sum	1	R	R

	Corrugated Roof				
3.4	Supply and install DC Combiner DC 600V Box 2 In 2 Out	No.	1	R	R
3.5	Supply of earth spike and cabling (Sans 60613) Regulations	Sum	1	R	R
3.6	Supply of PV cable 6mm Red and Black Cable from Combiner box and Panels.	m	50	R	R
3.7	Sundries (Trunking, MC 4 Connectors, Hazard Stickers)	Sum	1	R	R
3.8	Supply and connect of Cable Run from DB to Inverter	m	50	R	R
3.9	Connect above system to Invertor.	No.	1	R	R
	<u>SECTION 4</u>				
	<u>EAR THING</u>				
4.1	Earth bonding for all the buildings as per SANS 10142 and the specification including 1.2 Earth spike x 6.	No.	1	R	R
	<u>SECTION 5</u>				
	<u>ELECTRICAL COMPLIANCE</u>				
	All work to comply to SANS 10142 Compliance certificate to be provided on completion. Pricing to include all necessary complete connection				
5.1	Certificate of compliance and all other testing required including 12 months guarantee	Item	1	R	R
	CARRIED TO SUMMARY				
	SUB-TOTAL TOTAL			R	R

BILL OF QUANTITIES

BIRCHLEIGH STATION.

SCHEDULE OF QUANTITIES AND RATES / PRICE (\$)

Item No.	Description	Unit	Qty	Rate/unit (Excl VAT)	Total Price (Excl VAT)
	SECTION 1				
1.1	Preliminary and General				
	All Preliminary and General applicable to this project	No.	1	R	R
	Occupational Health and safety				
1.2	Compliance with Occupational Health and Safety Act (Act 85 of 1993) and its regulations and with the Employers Health and Safety	No.	1	R	R
	SECTION 2				
	<u>ELECTRICAL WORKS</u>				
	<u>TICKET OFFICE</u>				
2.1	Supply and fit Minimum: 5000-Watt off Hybrid inverter. Nominal DC 48V. Output voltage 230VAC 50Hz at 5000 Watts. Include all relevant cables, lugs, and ferrules as per manufacturer's specifications	No.	1	R	R
2.2	Supply and fit 24V 100AH deep cycle Lithium-Ion battery pack, stand and side covers Include all relevant cables, bracket, lugs, and ferrules as per manufacturer's specifications	No.	2	R	R
2.3	Supply of 160Amp battery disconnect.	No.	1	R	R

2.4	Supply of 32 Amp AC Switch with a 63 Amp Change over Switch and Box.	No.	1	R	R
2.4	Sundries (Trunking and Clips, Lugs and Ferrules plus Nitto tape.)	Sum	1	R	R
2.5	Connect above system to DB.	Sum	1	R	R
2.6	Supply and connect of Cable Run from DB to Inverter	m	50	R	R
2.7	Supply and connect of Cable from Battery to Inverter	m	5	R	R
2.8	Heavy duty lockable battery cabinet	No.	1	R	R
2.9	Battery fuse and holder	No.	4	R	R
2.10	PV Surge arrestor device	No.	4	R	R
2.11	Supply and fit 12-way surface mount distribution board. 63 Amps Earth leakage for AC protection, 20 Amp circuit breaker for plug socket protection x 2. PV modules isolator 20 Amps x 10. 3 x 63 Amps circuit breaker for batteries. Surge protection (SPD). Include all relevant cables, lugs, and ferrules as per manufacturer's specifications	No.	1	R	R
2.12	Battery fuse and holder	No.	4	R	R
	<u>SECTION 3</u> <u>SOLAR</u>				
3.1	Supply and fit PV Modules. Minimum: Peak power 455 Watts each PV modules to be fitted on top of galvanized stand (priced elsewhere) such that maximum solar radiation is absorbed by solar panel. Include all brackets, antivandal claps, cables, lugs, and ferrules as per manufacturer's specifications (Portrait Install)	No	8	R	R
3.2	Supply and install of mounting Kits suitable for	Sum	1	R	R

	Corrugated Roof				
3.4	Supply and install DC Combiner DC 600V Box 2 In 2 Out	No.	1	R	R
3.5	Supply of earth spike and cabling (Sans 60613) Regulations	Sum	1	R	R
3.6	Supply of PV cable 6mm Red and Black Cable from Combiner box and Panels.	m	50	R	R
3.7	Sundries (Trunking, MC 4 Connectors, Hazard Stickers)	Sum	1	R	R
3.8	Supply and connect of Cable Run from DB to Inverter	m	50	R	R
3.9	Connect above system to Invertor.	No.	1	R	R
	<u>SECTION 4</u>				
	<u>EAR THING</u>				
4.1	Earth bonding for all the buildings as per SANS 10142 and the specification including 1.2 Earth spike x 6.	No.	1	R	R
	<u>SECTION 5</u>				
	<u>ELECTRICAL COMPLIANCE</u>				
	All work to comply to SANS 10142 Compliance certificate to be provided on completion. Pricing to include all necessary complete connection				
5.1	Certificate of compliance and all other testing required including 12 months guarantee	Item	1	R	R
	CARRIED TO SUMMARY				
	SUB-TOTAL TOTAL			R	R

BILL OF QUANTITIES

ISANDO STATION.

SCHEDULE OF QUANTITIES AND RATES / PRICE (S)

Item No.	Description	Unit	Qty	Rate/unit (Excl VAT)	Total Price (Excl VAT)
	SECTION 1				
1.1	Preliminary and General				
	All Preliminary and General applicable to this project	No.	1	R	R
	Occupational Health and safety				
1.2	Compliance with Occupational Health and Safety Act (Act 85 of 1993) and its regulations and with the Employers Health and Safety	No.	1	R	R
	<u>SECTION 2</u>				
	<u>ELECTRICAL WORKS</u>				
	<u>TICKET OFFICE</u>				
2.1	Supply and fit Minimum: 5000-Watt off Hybrid inverter. Nominal DC 48V. Output voltage 230VAC 50Hz at 5000 Watts. Include all relevant cables, lugs, and ferrules as per manufacturer's specifications	No.	1	R	R
2.2	Supply and fit 24V 100AH deep cycle Lithium-Ion battery pack, stand and side covers Include all relevant cables, bracket, lugs, and ferrules as per manufacturer's specifications	No.	2	R	R
2.3	Supply of 160Amp battery disconnect.	No.	1	R	R

2.4	Supply of 32 Amp AC Switch with a 63 Amp Change over Switch and Box.	No.	1	R	R
2.4	Sundries (Trunking and Clips, Lugs and Ferrules plus Nitto tape.)	Sum	1	R	R
2.5	Connect above system to DB.	Sum	1	R	R
2.6	Supply and connect of Cable Run from DB to Inverter	m	50	R	R
2.7	Supply and connect of Cable from Battery to Inverter	m	5	R	R
2.8	Heavy duty lockable battery cabinet	No.	1	R	R
2.9	Battery fuse and holder	No.	4	R	R
2.10	PV Surge arrestor device	No.	4	R	R
2.11	Supply and fit 12-way surface mount distribution board. 63 Amps Earth leakage for AC protection, 20 Amp circuit breaker for plug socket protection x 2. PV modules isolator 20 Amps x 10. 3 x 63 Amps circuit breaker for batteries. Surge protection (SPD). Include all relevant cables, lugs, and ferrules as per manufacturer's specifications	No.	1	R	R
2.12	Battery fuse and holder	No.	4	R	R
	<u>SECTION 3</u> <u>SOLAR</u>				
3.1	Supply and fit PV Modules. Minimum: Peak power 455 Watts each PV modules to be fitted on top of galvanized stand (priced elsewhere) such that maximum solar radiation is absorbed by solar panel. Include all brackets, antivandal claps, cables, lugs, and ferrules as per manufacturer's specifications (Portrait Install)	No	8	R	R
3.2	Supply and install of mounting Kits suitable for	Sum	1	R	R

	Corrugated Roof				
3.4	Supply and install DC Combiner DC 600V Box 2 In 2 Out	No.	1	R	R
3.5	Supply of earth spike and cabling (Sans 60613) Regulations	Sum	1	R	R
3.6	Supply of PV cable 6mm Red and Black Cable from Combiner box and Panels.	m	50	R	R
3.7	Sundries (Trunking, MC 4 Connectors, Hazard Stickers)	Sum	1	R	R
3.8	Supply and connect of Cable Run from DB to Inverter	m	50	R	R
3.9	Connect above system to Invertor.	No.	1	R	R
	<u>SECTION 4</u>				
	<u>EAR THING</u>				
4.1	Earth bonding for all the buildings as per SANS 10142 and the specification including 1.2 Earth spike x 6.	No.	1	R	R
	<u>SECTION 5</u>				
	<u>ELECTRICAL COMPLIANCE</u>				
	All work to comply to SANS 10142 Compliance certificate to be provided on completion. Pricing to include all necessary complete connection				
5.1	Certificate of compliance and all other testing required including 12 months guarantee	Item	1	R	R
	CARRIED TO SUMMARY				
	SUB-TOTAL TOTAL			R	R

<u>STATION</u>		<u>AMOUNT</u>
VAN RIEBEECKPARK		R
BIRCHLEIGH		R
ISANDO		R
	<u>SUBTOTAL</u>	R
	<u>VAT @ 15%</u>	R
	<u>GRAND TOTAL</u>	R