VOLUME 3

SOUTH AFRICAN NATIONAL PARKS

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK

CONTRACT NO: CI-GK-0132

TENDER DOCUMENT

November 2022

ISSUED BY:
Mr. Garret Kobe
Manager SCM: Infrastructure and Special Projects
SOUTH AFRICAN NATIONAL PARKS
P.O. BOX 787
PRETORIA
0001

NAME OF TENDERER: .....

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK
CONTRACT No. CI-GK-0132

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The Tenderer is required to check the numbers of pages and should any be found to be missing or duplicated, or should any of the typing be distinct, or any doubt or obscurity arise as to the meaning of any description or particular of any item, or if the Tender Document contains any obvious errors, then the Tenderer must immediately inform the Employer and have them rectified or explained in writing as the case may be. No liability whatsoever will be admitted by reason of the Tenderer having failure to comply with the foregoing instructions.

1: The Tender

Part T1: Tendering procedures

SBD1

PART A

INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE SOUTH AFRICA NATIONAL PARKS					
BID NUMBER:	**CI-GK-0132**	CLOSING DATE:	**9 December 2022**	CLOSING TIME:	**11h00**
DESCRIPTION:					

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK

CONTRACT No. CI-GK-0132

T1.1: Tender Notice and Invitation to Tender

The South African National Parks invites tenders for the **The Design, Construction, Delivery, Commissioning and Maintenance of Solar PV Plants At Mata Mata And Nossob Camps in the Kgalagadi Transfrontier Park**

Only those tenderers who satisfy the following eligibility criteria and who provide the required evidence in their tender submissions are eligible to submit tenders and have their tenders evaluated:

CIDB:

The following tenderers who are registered with the **CIDB**, or are capable of being so registered prior to the evaluation of submissions, are eligible to have their tenders evaluated:

It is estimated that tenderers must have a CIDB contractor grading designation of **6EP** or higher.

Joint ventures are eligible to submit tenders provided that:
1. every member of the joint venture is registered with the CIDB;
2. the lead partner has a contractor grading designation in the **6EP** class of construction work; and
3. the combined contractor grading designation calculated in accordance with the Construction industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a **6EP** class of construction work or a value determined in accordance with Regulation 25 (1B) of 25(7A) of the Construction Industry Development Regulations

Preferences:

Preference are offered to tenderers for Broad-Black Based Empowerment (B-BBEE) Status Level of Contribution in terms of the Preferential Procurement Regulations, 2017;

- 80/20 preference point system for acquisition of goods or services for Rand value equal to or above R30 000 and up to R50 million.

Pre-Qualification:

1) As part of the eligibility criteria, tenderers shall further be required to satisfy the following functionality criteria and be required to demonstrate their ability to undertake the work and to provide proof of experience, expertise, personnel, plant and equipment to undertake work of this nature.

The following functionality criteria apply:

a) Experience in relation to the number and value of recent projects hybrid/ photovoltaic installation/ construction (on-grid and off-grid)

b) Experience in relation to the size and technical specifications of recent projects.

c) Qualifications and experience of key personnel accountable/ responsible for this project

d) Methodology and approach to the project

Bidders making the minimum evaluation weighted score of 350 out 500 or 70% will pass to the price/preference stage. The formula to calculate the % functionality is: % = Weighted score/(100*5)*100.

2) In terms of PPPFA regulations, Solar Photovoltaic System Components must have a 70% local content threshold. This will be included in the tender and form part of the screening during compliance. Circular No. 02 of 2016/2017: Solar Photovoltaic System and Components will apply

The physical address for collection of tender documents and site clarification meeting is:
Admin Building of the Kgalagadi Transfrontier Park, Twee Rivieren.

Full tender documents will ONLY be available at the compulsory clarification meeting.
A non-refundable tender deposit of R 200-00 payable in cash is required on collection of the tender documents.

All Queries;
Queries relating to the issue of these documents may be addressed to:

Mr	Garret Kobe	Tel No:	(012) 426 5132
		e-mail	garret.kobe@sanparks.org

A compulsory clarification meeting with representatives of the Employer will take place at **Admin Building of the Kgalagadi Transfrontier Park, Twee Rivieren** on **24 November 2022 starting at 11:00.** The Tenderers shall inspect and examine the Site and its surroundings and shall satisfy themselves before submitting their tender as to the form and nature of the Site, the quantities and nature of the work and materials necessary for the completion of the Works and the means of access of the Site, the accommodation they may require and in general shall themselves obtain all necessary information as to risk, contingencies and other circumstances which may influence or affect their tender. **The tenderers must be represented at the site inspection by a person who is suitably qualified and experienced to comprehend the implications of the work involved. Attendance of the site inspection is compulsory and a tender will be disqualified if the site inspection is not attended by a representative of the tenderer.**

The closing time for receipt of tenders is **9 December 2022 @ 11:00 hrs.** Tenders in sealed envelopes marked clearly with the identification details: **"The Design, Construction, Delivery, Commissioning and Maintenance of Solar PV Plants At Mata Mata And Nossob Camps in the Kgalagadi Transfrontier Park",** must be deposited in the tender box situated at **South African National Parks Groenkloof, 643 Leyds Street, Muckleneuk, Pretoria** on or before the stated closing time. There is a tender register at the Security Office of the Entrance Gate. Please ensure that this register is completed when your deliver the tender document. If the tender document is couriered, please ensure that it is correctly marked as a tender to be deposited in the Tender Box.

Tenders may only be submitted on the tender documentation that is issued. Telephonic, facsimile, email and late tenders will not be accepted.

Requirements for sealing, addressing, delivery, opening and assessment of tenders are stated in the Tender Data.

BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO		TECHNICAL ENQUIRIES MAY BE DIRECTED TO:	
CONTACT PERSON	**Garret Kobe (SCM Manager)**	CONTACT PERSON	**Ronald Mulder (Green Energy Manager)**
TELEPHONE NUMBER	**012 426 5132**	TELEPHONE NUMBER	**083 470 1901**
E-MAIL ADDRESS	**Garret.kobe@sanparks.org**	E-MAIL ADDRESS	**ronnie.mulder@sanparks.org**

SUPPLIER INFORMATION						
NAME OF BIDDER						
POSTAL ADDRESS						
STREET ADDRESS						
TELEPHONE NUMBER	CODE		NUMBER			
CELLPHONE NUMBER						
FACSIMILE NUMBER	CODE		NUMBER			
E-MAIL ADDRESS						
VAT REGISTRATION NUMBER						
SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:		**OR**	CENTRAL SUPPLIER DATABASE No:	MAAA	
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE	TICK APPLICABLE BOX] ☐ Yes ☐ No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT		[TICK APPLICABLE BOX] ☐ Yes ☐ No	

[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]

ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	☐Yes ☐No [IF YES ENCLOSE PROOF]	ARE YOU A FOREIGN BASED SUPPLIER FOR **THE GOODS /SERVICES /WORKS OFFERED?**	☐Yes ☐No [IF YES, ANSWER PART B:3]

QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS

IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?	☐ YES ☐ NO
DOES THE ENTITY HAVE A BRANCH IN THE RSA?	☐ YES ☐ NO
DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?	☐ YES ☐ NO
DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?	☐ YES ☐ NO
IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?	☐ YES ☐ NO

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

PART B
TERMS AND CONDITIONS FOR BIDDING

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

PROTECTION OF PERSONAL INFORMATION ACT, 4 of 2013 (POPIA)

SANParks adheres to the Protection of Personal Information Act, 4 of 2013 (POPIA) requirements regarding personal information which came into effect 1 July 2021.

As SANParks, we are committed to protecting your privacy and ensuring that personal information collected is used properly, lawfully and transparently.

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK CONTRACT No. CI-GK-0132

T1.2: Tender Data

The conditions of tender are the Standard Conditions of Tender as contained in **Annex C of the CIDB Standard for Uniformity in Construction Procurement (August 2019)** which are reproduced without amendment or alteration for the convenience of tenderers as an Annex to the Tender Data.

The Standard Conditions of Tender make several references to the Tender Data for details that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the standard conditions of tender.
Each item of the Tender Data given below is cross-referenced to the clause in the Standard Conditions of Tender to which it mainly applies.

Clause number	
C.1.1	The employer is the South African National Parks.
C.1.2	The following documents form part of this tender: **VOLUME 1** : The General Conditions of Contract for Construction Works, Third Edition, 2015, prepared by the South African Institution of Civil Engineering (SAICE). This publication is available and tenderers must obtain copies at their own cost from the South African Institution of Civil Engineering (SAICE), Private Bag X200, Halfway House 1685, Tel: (011) 805 5947, Fax: (011) 805 5971, e-mail: civilinfo@saice.org.za. **VOLUME 2:** 2.1) The Standard Specifications SANS/SABS-1200, 10400 as prepared by the South African Bureau of Standards (SABS) are applicable to this Contract. This publication is available and tenderers must obtain copies at their own cost from the South African Institution of Civil Engineering (SAICE), Private Bag X200, Halfway House 1685, Tel: (011) 805 5947, Fax: (011) 805 5971, e-mail: civilinfo@saice.org.za. 2.2) And all applicable International Electrotechnical Commission (IEC) regulations available from the International Electrotechnical Commission, email inmail@iec.ch The tender documents issued by the Employer comprise: **VOLUME 3**: The Contract Document in which is bound: **THE TENDER** **Part T1: Tendering procedures** T1.1 - Tender notice and invitation to tender T1.2 - Tender data **Part T2: Returnable documents** T2.1 - List of returnable documents T2.2 - Returnable schedules **THE CONTRACT** **Part C1: Agreements and Contract data** C1.1 - Form of offer and acceptance C1.2 - Contract data C1.3 - Performance Bond **Part C2: Pricing data** C2.1 - Pricing assumptions C2.2 - Pricing Schedule **Part C3: Scope of work** C3 - Scope of Work, Specifications and Site Information

C.1.4	The employer's agent is : Name: South African National Parks General Manager: Infrastructure & Special Projects. Address: 643 Leyds Street Muckleneuk Pretoria Tel: 012-426 5126 E-mail: antionet.vanwyk@sanparks.org
C.2.1	The following tenderers who are registered with the CIDB, or are capable of being so registered prior to the evaluation of submissions, are eligible to have their tenders evaluated: Only those tenderers who satisfy the following eligibility criteria and who provide the required evidence in their tender submissions are eligible to submit tenders and have their tenders evaluated: The following tenderers who are registered with the CIDB, or are capable of being so registered prior to the evaluation of submissions, are eligible to have their tenders evaluated: a) It is estimated that tenderers must have a cidb contractor grading designation of **6EP** or higher.s Joint ventures are eligible to submit tenders provided that: 1. every member of the joint venture is registered with the CIDB; 2. the lead partner has a contractor grading designation in the **6EP** class of construction work; and 3. the combined contractor grading designation calculated in accordance with the Construction industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a **6EP** class of construction work or a value determined in accordance with Regulation 25 (1B) of 25(7A) of the Construction Industry Development Regulations

C2.1

In terms of PPPFA regulations, Solar Photovoltaic System Components must have a 70% local content threshold. This will be included in the tender and form part of the screening during compliance. Circular No. 02 of 2016/2017: Solar Photovoltaic System and Components will apply.

Designated Sector Circular/Instruction Note #	Product Description	Product Type/ Activity/ Component	Application / Physical Properties	Stipulated Minimum Threshold	Status of Circulars / Instruction Notes
Circular No. 02 of 2016/2017: Solar Photovoltaic System and Components	**Solar PV Components**	Laminated PV Modules	The local process will include tabbing & stringing of cells, encapsulation and lamination; Final assembly and testing in compliance with IEC Standards	15%	**Active**
		Module Frame	All aluminium PV Module Frames, PV mounting structures/racks, clamps, brackets, foundation components and fasteners are to be manufactured from locally produced extruded, rolled, cast or forged products.	65%	
		DC Combiner Boxes	Enclosures must be made from SMC and moulded in South Africa	65%	
		Mounting Structure	All aluminium PV Module Frames, PV mounting structures/racks, clamps, brackets, foundation components and fasteners are to be manufactured from locally produced extruded, rolled, cast or forged products.	90%	
		Inverter	Must be assembled locally	40%	

C.2.1

As part of the eligibility criteria, tenderers shall further be required to satisfy the following functionality criteria and be required to demonstrate their ability to undertake the work and to provide proof of experience, expertise, personnel, plant and equipment to undertake work of this nature.
The following functionality criteria apply:

a) Experience in relation to the number and value of recent projects hybrid/ photovoltaic installation/ construction (on-grid and off-grid)
b) Experience in relation to the size and technical specifications of recent projects.
c) Qualifications and experience of key personnel accountable/ responsible for this project
d) Methodology and approach to the project

Bidders making the minimum evaluation weighted score of 350 out 500 or 70% will pass to the price/preference stage. The formula to calculate the % functionality is: % = Weighted score/(100*5)*100.

	Tenderers who fail to meet the minimum threshold shall be declared non-responsive and subsequently rejected. The detail functionality criteria is attached to the Tender Data as Annexure1. Bidders must submit all with this bid relevant information and supporting documentation for the functionality evaluation
C.2.7	The arrangements details for the compulsory clarification meeting are stated under Part T1.1: Tender Notice and Invitation to Tender. Tenderers must complete and sign the attendance register at the clarification meeting in the name of the tendering entity.
C2.8	Should it be necessary for a bidder to obtain clarity on any matter arising from or referred to in this tender document, please refer queries, in writing, to the contact person listed below. Under no circumstances may any other employee within the SANParks be approached for any information. Any such action may result to disqualification of a response submitted in competition to the tender process. Enquiries should reference specific page and or paragraph numbers, where appropriate. • All questions/enquiries must be forwarded in writing not later than **2 December 2022**. Questions/enquiries received after **11:00** on **2 December 2022** will not be considered. Name: Garret Kobe Capacity: Manager SCM: Infrastructure and Special Projects. Address: PO Box 787, PRETORIA, 0001 Tel: 012 426 5132 Fax: 086 416 2121 E-mail: Garret.kobe@sanparks.org
C.2.12	No alternative proposals will be accepted.
C.2.13.2	Electronic tender offers will not be accepted.
C.2.13.3	Parts of each tender offer communicated on paper shall be submitted as an original, plus Nil copies.
C.2.13.7	The employer's address for delivery of tender offers and identification details to be shown on each tender offer package are: **Location of tender box:** South African National Parks Groenkloof **Physical address:** 643 Leyds Street, Muckleneuk, Pretoria, 0002 **Identification details:** Contract no: CI-GK-0132: The Design, Construction, Delivery, Commissioning and Maintenance of Solar PV Plants At Mata Mata And Nossob Camps in the Kgalagadi Transfrontier Park There is a tender register at the Security Office of the Entrance Gate. Please ensure that this register is completed when your deliver the tender document. If the tender document is couriered, please ensure that it is correctly marked as a tender to be deposited in the Tender Box.
C.2.15.9	Telephonic, facsimile or e-mailed tender offers will not be accepted.
C.2.15.1	The closing time for submission of tender offers is as per Notice and Invitation to Tender T1.1.
C.2.16	The tender offer validity period is 12 Weeks.
C.2.19	Access shall be provided for inspections, tests and analysis as may be required by the employer.
C.2.23	The tenderer is required to submit with his tender: • Authority for Signatory

	• Certificate of Attendance at Clarification Meeting • Compulsory Enterprise Questionnaire • Joint Venture / Consortium Disclosure Form & Agreement • Schedule of Work satisfactorily carried out by the Tenderer for Private clients or Organs of State • Schedule of Contracts awarded to the Tenderer by Organs of State • Certificate of Non-Collusive Tender • Invitation To Bid (From SBD 1) • Declaration of Interest (Form SBD 4) • Preference Points claimed in terms of the Preferential Procurement Regulations (Form SBD 6.1) • Declaration certificate for Local Production and content for Designated Sectors (Form SBD 6.2) • Declaration of Tenderer's Past Supply Chain Management Practises (Form SBD 8) • Certificate of Independent Tender Determination (Form SBD 9) • Proof of Contractor Registration issued by the Construction Industry Development Board. • Letter of Good Standing from Compensation Commissioner • Documents of Incorporation • Original and Valid Tax Compliance Status (TCS) as issued by the South African Revenue Services • Declaration Concerning Fulfilment of the Construction Regulations, 2014 • Proposed Subcontractors • Record of Addenda to Tender Documents • Signed acknowledgment of the Base Line Risk Assessment. • Form of Offer (Completed and Signed) • Bill of Quantities/Pricing Schedule (Completed) • Functionality information
C.3.4.1	The time and location for opening of the tender offers are: • **9 December 2022 @ 11:00 hrs.** • The tender box situated at South African National Parks: **Groenkloof, 643 Leyds Street, Muckleneuk, Pretoria, 0002** at the stated closing time.
C.3.11.1	**The procedure for the evaluation of responsive tenders is Method: Financial offer and preferences** The total number of tender evaluation points (T_{EV}) will be calculate in accordance with the following formula: $T_{EV} = N_{FO} + N_P$ where; N_{FO} is the number of tender evaluation points awarded for the financial offer made in accordance with; **80/20 preference point system for acquisition of goods or services for Rand value equal to or above R30 000 and up to R50 million** The following formula will be used to calculate the points out of 80 for price in respect of a tender with a Rand value equal to or above R30 000 and up to a Rand value of R50 million, inclusive of all applicable taxes:

$$PS = 80 \left[1 - \frac{Pt - P\,min}{P\,min}\right]$$

Where-

Ps = Points scored for price of tender under consideration;

Pt = Price of tender under consideration; and

Pmin = Price of lowest acceptable tender.

N_P is the number of tender evaluation points awarded for preferences claimed in accordance with;

Responsive tenderers who complete SBD 6.1 Preference Points Claim Form in terms of the Preferential Procurement Regulations and who are found to be eligible for the preference so claimed.

Preference points shall be scored in accordance with the Department: National Treasury's Revised Preferential Procurement Regulations and the Broad-based Black Economic Empowerment Act.

Preference points will be awarded to a tenderer for attaining the B-BBEE Status Level of Contribution in accordance with the table below:

B-BBEE Status Level of Contributor	**Number of points (80/20 system)**
1	20
2	18
3	14
4	12
5	8
6	6
7	4
8	2
Non-compliant contributor	0

Eligibility for preference points will be determined as follows:

a) Valuation of preference points is based on tenderers' scorecards in accordance with the Construction Sector Codes of Practice promulgated in Gazette 32305 on 5 June 2009.

b) The applicable code for this tender is the Amended Code of Good Practice (Generic Scorecard) unless in possession of a valid sector certificate

c) The only Verification Certificates that will be accepted are those issued by Verification Agencies accredited by South African National Accreditation System (SANAS) as contemplated in the B-BBEE Framework for accreditation and verification by all Verification Agencies promulgated in the Government Notice 810 of 31 July 2009.

d) The Verification Certificate must be current, meaning that it must have been issued more recently than 12 (twelve) months prior to the tender closing date.

e) If a tenderer has failed to submit an acceptable Verification Certificate, a period of 24 hours will be granted to re-submit a valid Verification Certificate.

f) Failure to submit any valid Verification Certificate will result in the award of 0 (zero) points for preference.

g) In the event of a joint venture or consortium, each member of such an association shall comply with the above requirements.

h) A trust, consortium or joint venture, will qualify for points for their B-BBEE status level as a legal entity, provided that the entity submits their B-BBEE status level certificate.

A trust, consortium or joint venture will qualify for points for their B-BBEE status level as an unincorporated entity, provided that the entity submits their consolidated B-BBEE scorecard as if

	they were a group structure and that such a consolidated B-BBEE scorecard is prepared for every separate tender.
C.3.13	Tender offers will only be accepted if: a) the tenderer is registered with the Construction Industry Development Board in an appropriate contractor grading designation; b) the tenderer or any of its directors is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector; c) the tenderer has not: i) abused the employer's supply chain management system; or ii) failed to perform on any previous contract and has been given a written notice to this effect; and e) has completed the Compulsory Enterprise Questionnaire, SBD4, 6.1, 6.2, 7.2, 8, 9 and the there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process. f) Has submitted the documentation listed in C2.23
C.3.17	Provide to the successful tenderer **one** copy of the signed contract document.

ANNEXURE 1: FUNCTIONALITY CRITERIA

Proposals received from prospective EPC contractors will be evaluated in terms of the following functionality criteria.

Evaluation * Values: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, and 5 = Excellent

No	Criteria description	Documents to be submitted	Weight (100)	Points	Points allocation
1	**Experience in relation to the number and value of recent projects hybrid/ photovoltaic installation/ construction (on-grid and off-grid): Total Weight Score = 100**				
	• Participation as a turnkey EPC contractor (responsible for the design, supply, installation and commissioning of hybrid/photovoltaic solutions/on-grid/off-grid/island system) in contracts within the last 5 (five) years, each with a value of at least R 5 million that have been successfully and substantially completed.	• Tenderers to: • Complete **Annexure 1** (Project Experience Form) for each project listed to provide relevant project details and contactable references. • The list must be supported by: • Appointment letter with project description, value & year of implementation • Completion certificate with project description, value & completion date.	20	5	• **The following scoring matrix will be used to evaluate this criterion:** • One to two relevant and referenced projects in the past 5 (five) years = 1 point; • Three (3) relevant and referenced projects in the past 5 (five) years = 2 points; • Four (4) relevant and referenced projects in the past 5 (five) years = 3 points; • Five (5) relevant and referenced projects in the past 5 (five) years = 4 points; and • Six (6) or more relevant and referenced projects in the past 5 (five) years = 5 points.
2	**Experience in relation to the size and technical specifications of recent projects Total Weight Score = 100**				
	• For the above or other contracts executed within the past five (5) years, a minimum turnkey installation/	• Tenderers to: • Complete **Annexure 1** (Project Experience Form) for each project listed to	20	5	• **NB: The following scoring matrix will be used to evaluate this criterion:** • Relevant and referenced experience in one (1) Hybrid/photovoltaic power plant/on-grid/off-

	construction experience in design, supply, installation and commissioning of project involving: • Hybrid/photovoltaic power plant/on-grid/off-grid/island system of 200kW or greater (off-grid);	provide relevant project details and contactable references. • The list must be supported by: Project description details with relevant information on size of plant.			grid/island system of 200kW and smaller projects = points; • Relevant and referenced experience in two (2) Hybrid/photovoltaic power plant/on-grid/off-grid/island system of 200kW = 2 points; • Relevant and referenced experience in three (3) Hybrid/photovoltaic power plant/on-grid/off-grid/island system of 200kW = 3 points • Relevant and referenced experience in four (4) Hybrid/photovoltaic power plant/on-grid/off-grid/island system of 200kW = 4 points • Relevant and referenced experience in five (5) Hybrid/photovoltaic power plant/on-grid/off-grid/island system of 200kW or greater = 5 points
3	**Qualifications and experience of key personnel accountable/ responsible for this project Total Weight Score = 150**				
	• The staff complement and organogram of the prospective EPC contractor/s highlighting experience of key personnel with relevant experience, skills and qualifications in relation to projects of this nature.	• Please provide the following information as an attachment: • Number of employees (average) for the past three years; • Typical project (being a grid tied off grid or hybrid in nature) specific organogram and composition of the team • The names, roles and responsibilities of key personnel (Attach **Curriculum Vitae o**f the key personnel with **clear**	30	5	• Scoring to evaluate this criterion will consider all information noted under the submission requirement and will be based on a scale of one (1) to five (5). • • Specific considerations will be given to the following: • Design, project execution and technical expertise, • Procurement expertise, • Construction expertise, and • Operate and maintain expertise; and • Administrative expertise. •

		areas for expertise, relevant experience and skill, and qualifications relevant to the objective/s of this project; copies of **professional registration certificates** must be attached) • The company must have a professional electrical engineer as part of the project team – it is compulsory and if not included will lead disqualification.			• 1 = The organogram and key personnel information lacking & limited and considered poor. • 2 = The organogram and key personnel information supports some capacity, but not all the needed skills & expertise, and considered fair. • 3 = The organogram and key personnel information supports adequate capacity, with skills & expertise to be able to implement the project and considered good. • 4 = The organogram and key personnel information supports good capacity, with skills & expertise to be able to implement the project and considered very good. • 5 = The organogram and key personnel information supports excellent capacity, with skills & expertise to be able to implement the project and considered excellent.
4	**Methodology and approach to the project** **Total Weight Score = 150**				
	• Provide the methodology & implementation plan with brief and high-level descriptions of the following areas: • the methodology and approach to the design, supply, installation and commissioning of a Hybrid/photovoltaic power plant/on-grid/off-grid/island system of 200 kW or greater; • the prospective EPC contractor/s understanding of	• Methodology description to implement the project must be provided based on the project as opposed to a textbook description. Maximum of 15 pages and addressing the elements as listed under the criteria description. • This information may include references to	30	5	• 1 = Poor methodology description and not addressing the project requirements, but theoretical. • 2 = Fair methodology description, but not addressing the project requirements in full. • 3 = Good methodology description addressing the project requirements, but some superficial. • 4 = Very methodology description addressing the project requirements with the necessary detail. • 5 = Excellent addressing the project requirements in full and with detail.

	the supply chain for solar photovoltaic projects in South Africa with a focus to increase the local content where possible, including but not limited to the types of equipment and services that will be required; and • Approach Health, Safety, Environmental, and Quality Management • De-commissioning of plant elements and replacement – responsible waste management	existing / past projects successfully delivered. Please also append information relating to Health, Safety, Environmental, and Quality Management methodologies, policies and certifications and waste management of redundant elements (solar panels/batteries). • Please include the system design information sheet			

Annex C (CIDB)
Standard conditions of tender

C.1 General

C.1.1 Actions

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

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

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

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

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

C.1.2 Tender Documents

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

C.1.3 Interpretation

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

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

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

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

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

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

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

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

C.1.4 Communication and employer's agent

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

C.1.5 Cancellation and Re-Invitation of Tenders

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

a) due to changed circumstances, there is no longer a need for the engineering and construction works specified in the invitation;

b) funds are no longer available to cover the total envisaged expenditure; or

c) no acceptable tenders are received.

d) there is a material irregularity in the tender process.

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

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

C.1.6 Procurement procedures

C.1.6.1 General

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

C.1.6.2 Competitive negotiation procedure

C.1.6.2.1 Where the tender data require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of C.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of C.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

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

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

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

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

C.1.6.3 Proposal procedure using the two stage-system

C.1.6.3.1 Option 1

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

C.1.6.3.2 Option 2

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

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

C.2 Tenderer's obligations

C.2.1 Eligibility

C.2.1.1 Submit a tender offer only if the tenderer satisfies the criteria stated in the tender data and the tenderer, or any of his principals, is not under any restriction to do business with employer.
C.2.1.2 Notify the employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the employer as the basis in a prior process to invite the tenderer to submit a tender offer and obtain the employer's written approval to do so prior to the closing time for tenders.

C.2.2 Cost of tendering

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

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

C.2.3 Check documents

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

C.2.4 Confidentiality and copyright of documents

Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a tender offer in response to the invitation.

C.2.5 Reference documents

Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are not attached but which are incorporated into the tender documents by reference.

C.2.6 Acknowledge addenda

Acknowledge receipt of addenda to the tender documents, which the employer may issue, and if necessary apply for an extension to the closing time stated in the tender data, in order to take the addenda into account.

C.2.7 Clarification meeting

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

C.2.8 Seek clarification

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

C.2.9 Insurance

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

C.2.10 Pricing the tender offer

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

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

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

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

C.2.11 Alterations to documents

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

C.2.12 Alternative tender offers

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

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

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

C.2.13 Submitting a tender offer

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

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

C.2.13.3 Submit the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the employer.
C.2.13.4 Sign the original and all copies of the tender offer where required in terms of the tender data. The employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.

C.2.13.5 Seal the original and each copy of the tender offer as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.

C.2.13.6 Where a two-envelope system is required in terms of the tender data, place and seal the returnable documents listed in the tender data in an envelope marked “financial proposal” and place the remaining returnable documents in an envelope marked “technical proposal”. Each envelope shall state on the outside the employer’s address and identification details stated in the tender data, as well as the tenderer's name and contact address.

C.2.13.7 Seal the original tender offer and copy packages together in an outer package that states on the outside only the employer's address and identification details as stated in the tender data.

C.2.13.8 Accept that the employer will not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.

C.2.13.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the tender data.

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

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

C.2.15 Closing time

C.2.15.1 Ensure that the employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Accept that proof of posting shall not be accepted as proof of delivery.

C.2.15.2 Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.

C.2.16 Tender offer validity

C.2.16.1 Hold the tender offer(s) valid for acceptance by the employer at any time during the validity period stated in the tender data after the closing time stated in the tender data.

C.2.16.2 If requested by the employer, consider extending the validity period stated in the tender data for an agreed additional period with or without any conditions attached to such extension.

C.2.16.3 Accept that a tender submission that has been submitted to the employer may only be withdrawn or substituted by giving the employer's agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted. If the validity period stated in

C.2.16 lapses before the employer evaluating tender, the contractor reserves the right to review the price based on Consumer Price Index (CPI).

C.2.16.4 Where a tender submission is to be substituted, a tenderer must submit a substitute tender in accordance with the requirements of C.2.13 with the packages clearly marked as "SUBSTITUTE".

C.2.17 Clarification of tender offer after submission

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

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

C.2.18 Provide other material

C.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment.
Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employer's request, the employer may regard the tender offer as non-responsive.

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

C.2.19 Inspections, tests and analysis

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

C.2.20 Submit securities, bonds and policies

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

C.2.21 Check final draft

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

C.2.22 Return of other tender documents

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

C.2.23 Certificates

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

C.3 The employer's undertakings

C.3.1 Respond to requests from the tenderer

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

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

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

C.3.2 Issue Addenda

If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date that tender documents are available until three (3) working days before the tender closing time stated in the Tender Data. If, as a result a tenderer applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, shall then notify all tenderers who collected tender documents.

C.3.3 Return late tender offers

Return tender offers received after the closing time stated in the Tender Data, unopened, (unless it is necessary to open a tender submission to obtain a forwarding address), to the tenderer concerned.

C.3.4 Opening of tender submissions

C.3.4.1 Unless the two-envelope system is to be followed, open valid tender submissions in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data. Tender submissions for which acceptable reasons for withdrawal have been submitted will not be opened.

C.3.4.2 Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the tender data, the name of each tenderer whose tender offer is opened and, where applicable, the total of his prices, number of points claimed for its BBBEE status level and time for completion for the main tender offer only.

C.3.4.3 Make available the record outlined in C.3.4.2 to all interested persons upon request.

C.3.5 Two-envelope system

C.3.5.1 Where stated in the tender data that a two-envelope system is to be followed, open only the technical proposal of valid tenders in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data and announce the name of each tenderer whose technical proposal is opened.

C.3.5.2 Evaluate functionality of the technical proposals offered by tenderers, then advise tenderers who remain in contention for the award of the contract of the time and place when the financial proposals will be opened. Open only the financial proposals of tenderers, who score in the functionality evaluation more than the minimum number of points for functionality stated in the tender data, and announce the score obtained for the technical proposals and the total price and any points claimed on BBBEE status level. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for functionality.

C.3.6 Non-disclosure

Not disclose to tenderers, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of tender offers, the final evaluation price and recommendations for the award of a contract, until after the award of the contract to the successful tenderer.

C.3.7 Grounds for rejection and disqualification

Determine whether there has been any effort by a tenderer to influence the processing of tender offers and instantly disqualify a tenderer (and his tender offer) if it is established that he engaged in corrupt or fraudulent practices.

C.3.8 Test for responsiveness

C.3.8.1 Determine, after opening and before detailed evaluation, whether each tender offer properly received:

a) complies with the requirements of these Conditions of Tender,
b) has been properly and fully completed and signed, and
c) is responsive to the other requirements of the tender documents.

C.3.8.2 A responsive tender is one that conforms to all the terms, conditions, and specifications of the tender documents without material deviation or qualification. A material deviation or qualification is one which, in the Employer*'s* opinion, would:

a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work*,*
b) significantly change the Employer*'s* or the tenderer's risks and responsibilities under the contract, or
c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

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

C.3.9 Arithmetical errors, omissions and discrepancies

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

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

a) the gross misplacement of the decimal point in any unit rate;
b) omissions made in completing the pricing schedule or bills of quantities; or
c) arithmetic errors in:

(i) line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or
(ii) the summation of the prices.

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

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

a) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.

b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

C.3.10 Clarification of a tender offer

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

C.3.11 Evaluation of tender offers

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

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

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

The activities associated with evaluating tender offers are as follows:

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

C.3.11.1 General

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

C.3.12 Insurance provided by the employer

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

C.3.13 Acceptance of tender offer

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

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

C.3.14 Prepare contract documents

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

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

C.3.15 Complete adjudicator's contract

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

C.3.16 Registration of the award

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

C.3.17 Provide copies of the contracts

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

C.3.18 Provide written reasons for actions taken

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

Part T2: Returnable Schedules

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK
CONTRACT No. CI-GK-0132

T2.1: List of Returnable Documents

The complete tender document as received from the employer, together with all additional documentation as requested, must be submitted. No documentation must be removed from the tender document.

The tenderer must complete the following returnable documents:

1 Returnable Schedules required only for tender evaluation purposes

Resolution of board of directors / members / partners
Resolution of Board of Directors / Members / Sole Proprietor/ Partners of Partnership (if applicable)
Special Resolution of Joint Venture Partners
Compulsory Enterprise Questionnaire
Record of Addenda to Tender Documents
Proposed Amendments and Qualifications
Schedule of Subcontractors
Capacity of Tenderer
Site inspection certificate
Health and Safety Specification acknowledgement receipt
Functionality Information (Project Experience Form)

2 Other documents that must be submitted for tender evaluation purposes

Proof of Contractor Registration issued by the Construction Industry Development Board - Compulsory

Proof of registration of Closed Corporation or Company or other legal entities applicable to tender - Certified copy

An original and valid B-BBEE Status Level verification Certificate or certified copy there of

Letter of intent for a Construction Guarantee – Compulsory

National Treasury Central Supplier Database (CSD) Registration Report – Compulsory

Tax Compliance Status (TCS) as issued by the South African Revenue Services – Original

3 Returnable Schedules that will be incorporated into the contract and are compulsory to be completed

Form SBD 1: Invitation to Bid

Form SBD 4: Declaration of Interest

Form SBD 6.1: Preference points claim form in terms of the preferential procurement regulations, 2017

Form SBD 6.2: Declaration certificate for Local Production and content for Designated Sectors

Form SBD 8: Declaration of Bidder's Past Supply Chain Management Practices

From SBD 9: Certificate of Independent Bid determination

4 Other documents that will be incorporated into the contract:

Health and Safety Specification for General Construction Activities.

Code of Conduct for outside organisations working in a National Park.

Environmental Management Plan for General Construction Activities.

5 C1.1 Offer and Acceptance (the offer portion of C1.1)

6 C1.2 Contract Data (Part 2)

7 C2.2 Bills of Quantities/ Pricing Schedule

8 DOCUMENTATION FOR FUNCTIONALITY EVALUATION (CV'S, PLANT & EQUIPMENT LIST AND PREVIOUS CONTRACTS INFORMATION)

This returnable schedule needs to be completed if the tenderer is a company or other legal person.

Resolution of Board of Directors / Members / Partners

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

_____
_____
(*legally correct full name and registration number, if applicable, of the Enterprise)*

Held at _____ (*place)*

On _____ *(date)*

RESOLVED that:

1. The Enterprise submits a Tender to the South African National Parks in respect of the following project:
   _____
   _____
   (*project description as per Tender Document)*

   Tender Number: _____*(Tender Number as per Tender Document)*

2. *Mr/Mrs/Ms: _____

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

   and who will sign as follows: : _____

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

	Name	**Capacity**	**Signature**
1			
2			
3			
4			
5			
6			

NOTE:

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

ENTERPRISE STAMP

This returnable schedule needs to be completed if the tenderer is a joint venture. This form must be completed by each partner of the joint venture. The name of the principal partner must be stated under Point 2.

Resolution of Board of Directors / Members / Sole Proprietor/ Partners of Partnership (i.e. of each legal person to comprise the Joint Venture Partnership)

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

_____

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

Held at _____ (*place)*

On _____ *(date)*

RESOLVED that:

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

   _____

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

   to the South African National Parks in respect of the following project:

   _____

   _____
   (*Project description as per Tender Document)*

   Tender Number: _____(*Tender Number as per Tender Document)*

2. The Principal Partner of the Joint Venture will be
   _____

   _____

   (*Legally correct full name and registration number, if applicable, of the Principal Partner of Joint Venture)*

3. *Mr/Mrs/Ms: _____

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

   and who will sign as follows: _____

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

4. The Enterprise accepts joint and several liability with the parties listed under item 1 above for the due fulfilment of the obligations of the joint venture deriving from, and in any way connected with, the Contract to be entered into with the South African National Parks in respect of the project described under item 1 above.

5. The Enterprise chooses as its *domicilium citandi et executandi* for all purposes arising from this joint venture agreement and the Contract with the South African National Parks in respect of the project under item 1 above:

Physical address: _____

_____

_____

_____ (code)

Postal Address: _____

_____

_____

_____ (code)

Telephone number: _____ (code)

Fax number: _____ (code)

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

NOTE:

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

ENTERPRISE STAMP

This returnable schedule needs to be completed if the tenderer is a joint venture.

Special Resolution of Joint Venture Partners

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

6. _____

_____

7. _____

_____

8. _____

_____

9. _____

_____

10. _____

_____

11. _____

_____

12. _____

_____

13. _____

_____

Held at _____ (*place)*

On _____ *(date)*

RESOLVED that:

A. The above-mentioned Enterprises submit a tender in joint venture partnership to the South African National Parks in respect of the following project:

_____

_____

(*Project description as per Tender Document)*

Tender Number: _____(*Tender Number as per Tender Document)*

B. Mr/Mrs/Ms: _____

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

and who will sign as follows: _____

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

C. The Enterprises constituting the Joint Venture, notwithstanding its composition, shall conduct all business under the name and style of: _____

D. The Enterprises to the Joint Venture accept joint and several liability for the due fulfilment of the obligations of the Joint Venture deriving from, and in any way connected with, the contract entered into with the South African National Parks in respect of the project described under item A above.

E. Any of the Enterprises to the Joint Venture intending to terminate the Joint Venture agreement, for whatever reason, shall give the South African National Parks 30 day's written notice of such intention. Notwithstanding such decision to terminate, the Enterprises shall remain jointly and severally liable to the South African National Parks for the due fulfilment of the obligations of the Joint Venture as mentioned under item D above.

F. No Enterprise to the Joint Venture shall, without the prior written consent of the other Enterprises to the Joint Venture and of the South African National Parks, cede any of its rights or assign any of its obligations under the Joint Venture agreement in relation to the contract with the South African National Parks referred to herein.

G. The Enterprises choose as the *domicilium citandi et executandi* of the Joint Venture for all purposes arising from the Joint Venture agreement and the contract with the South African National Parks in respect of the project under item A above:

Physical address: _____

_____

_____

_____ (code)

Postal Address: _____

_____

_____

_____ (code)

Telephone number: _____ (code)

Fax number: _____ (code)

	Name	**Capacity**	**Signature**
1			
2			
3			
4			
5			
6			
7			
8			

	Name	Capacity	Signature
9			
10			
11			
12			
13			
14			
15			

Note:

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

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK CONTRACT No. CI-GK-0132

Compulsory Enterprise Questionnaire

The following particulars must be furnished. In the case of a joint venture, separate enterprise questionnaires in respect of each partner must be completed and submitted.

Section 1: Name of enterprise: . . . .

Section 2: VAT registration number, if any: . . . .

Section 3: CIDB registration number, if any: . . . .

Section 4: Particulars of sole proprietors and partners in partnerships

Name*	Identity number*	Personal income tax number*

* Complete only if sole proprietor or partnership and attach separate page if more than 3 partners

Section 5: Particulars of companies and close corporations

Company registration number . . . .

Close corporation number . . . .

Tax reference number . . . .

Section 6: Record in the service of the state

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

- a member of any municipal council
- a member of any provincial legislature
- a member of the National Assembly or the National Council of Province
- a member of the board of directors of any municipal entity
- an official of any municipality or municipal entity
- an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999)
- a member of an accounting authority of any national or provincial public entity
- an employee of Parliament or a provincial legislature
- an employee, director or board member of or otherwise employed by or contracted to the South African National Parks, or had or has any contractual relationships of any kind with the South African National Parks.

If any of the above boxes are marked, disclose the following:

Name of sole proprietor, partner, director, manager, principal shareholder or stakeholder	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 months

Contractor	Witness for Contractor	Employer	Witness for Employer

* insert separate page if necessary

Section 7: Record of spouses, children and parents in the service of the state

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

☐ a member of any municipal council

☐ a member of any provincial legislature

☐ a member of the National Assembly or the National Council of Province

☐ a member of the board of directors of any municipal entity

☐ an official of any municipality or municipal entity

☐ an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999)

☐ a member of an accounting authority of any national or provincial public entity

● an employee of Parliament or a provincial legislature

☐ an employee, director or board member of or otherwise employed by or contracted to the South African National Parks, or had or has any contractual relationships of any kind with the South African National Parks.

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

*insert separate page if necessary

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

i) Authorizes the Employer to obtain a tax clearance certificate from the South African Revenue Services that my / our tax matters are in order;

ii) Confirms that the neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004;

iii) Confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption;

iv) Confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest; and

iv) Confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

Name	Position	Signed

Name of Tenderer	Date

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK CONTRACT No. CI-GK-0132

Record of Addenda to tender documents

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

	Date	Title or Details
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Name	Position	Signed

Name of Tenderer	Date

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK CONTRACT No. CI-GK-0132

Proposed Amendments and Qualifications

The Tenderer should record any deviations or qualifications he may wish to make to the tender documents in this Returnable Schedule.

Page	Clause or item	Proposal

Name	Position	Signed

Name of Tenderer	Date

Capacity of Tenderer

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

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

Machinery	**Plant**	**Workshops**

Contractor	**Witness for Contractor**	**Employer**	**Witness for Employer**

1.1 QUALIFICATIONS AND EXPERIENCE OF PROPOSED SITE SUPERVISION TEAM FOR THE PROJECT

Tenderer to provide name(s), key qualifications and experience of site supervision team that will supervise the project on behalf of the Contractor.

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

2.1 Current projects (NB: Letter of Intent/ Appointment must be attached):

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

2.2 Previous projects (NB: Certificate of Completion must be attached):

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

ANNEXURE 1: PROJECT EXPERIENCE FORM (FUNCTIONALITY)

Please complete the following project experience form for each of the projects listed in relation to the functionality section of the tender. This form must be completed for each of the projects listed and may therefore be duplicated and will be provided in soft copy. Completed forms must be attached in the tender response.

Project Name:	
Client/Purchases details:	
Company name:	
Physical address:	
Contact person:	
Telephone no.:	
E-mail address:	
Project description	
Role in contract. If party is a Joint Venture, specify participation in the total contract amount	
List of key technology and equipment suppliers (Eg. Invertors, charge controllers, batteries, PV modules, mounting structures, monitoring system, etc.)	

Scope of work description: (Preparation of engineering, procurement, construction specifications, design, site supervision)

Project value (indicate currency if not in Rands)	
Contract start date:	
Contract completion date:	

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK

CONTRACT No. CI-GK-0132

Site Inspection Certificate

This is to certify that I,	
Representing Company	
Position	
Visited the site on	

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

Name Tenderer's Representative	Position	Signed

Name of Tenderer	Date

Name of Employer's Representative	Signature	Date

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK CONTRACT No. CI-GK-0132

HEALTH AND SAFETY SPECIFICATION ACKNOWLEDGEMENT RECEIPT

Contractor's Acknowledgement:

I,_____ representing

_____ (Contractors), have satisfied myself with the content of this Health and Safety Specification and have made the relevant provision under my Preliminary & General Section C6 for any and all costs involved to ensure compliance of this Specification and shall we be the successful contractor, we shall ensure that our employees and contractors on site comply with the requirements of these documents, our safety documentation and health and safety legislation

.

Signature of Contractor Date

Comments:

_____

_____

_____

_____

_____

_____

SBD 4

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

Any person (natural or juristic) may make an offer or offers in terms of this invitation to bid. In line with the principles of transparency, accountability, impartiality, and ethics as enshrined in the Constitution of the Republic of South Africa and further expressed in various pieces of legislation, it is required for the bidder to make this declaration in respect of the details required hereunder.
Where a person/s are listed in the Register for Tender Defaulters and / or the List of Restricted Suppliers, that person will automatically be disqualified from the bid process.

2. BIDDER'S DECLARATION

2.1 Is the bidder, or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest1 in the enterprise, employed by the state?

YES/NO

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

Full Name	**Identity Number**	**Name of State institution**

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

Contractor	Witness for Contractor	Employer	Witness for Employer

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

2.2.1 If so, furnish particulars:

……

……

2.3 Does the bidder or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are bidding for this contract? **YES/NO**

2.3.1 If so, furnish particulars:

……

……

3 DECLARATION

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

3.1 I have read and I understand the contents of this disclosure;

3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;

3.3 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium2 will not be construed as collusive bidding.

3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.

3.5 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.

3.6 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.

3.7 I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition

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

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

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 1, 2 and 3 ABOVE IS CORRECT.
I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 6 OF PFMA SCM INSTRUCTION 03 OF 2021/22 ON PREVENTING AND COMBATING ABUSE IN THE SUPPLY CHAIN MANAGEMENT SYSTEM SHOULD THIS DECLARATION PROVE TO BE FALSE.

…….……..	...……
Signature	Date
……	……
Position	Name of bidder

SBD 6.1

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2017

This preference form must form part of all bids invited. It contains general information and serves as a claim form for preference points for Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution

NB: BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017.

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to all bids:

- 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 The value of this bid is estimated to not exceed R50 000 000 (all applicable taxes included) and therefore the 80/20 preference point system shall be applicable.

1.3 Points for this bid shall be awarded for:

(a) Price; and

(b) B-BBEE Status Level of Contributor.

(c) Quality

1.4 The maximum points for this bid are allocated as follows:

	POINTS
PRICE	80
B-BBEE STATUS LEVEL OF CONTRIBUTOR	20
Total points for Price and B-BBEE must not exceed	**100**

1.5 Failure on the part of a bidder to submit proof of B-BBEE Status level of contributor together with the bid, will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

1.6 The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

2. DEFINITIONS

(a) **"B-BBEE"** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;

(b) "**B-BBEE status level of contributor"** means the B-BBEE status of an entity in terms of a code of good practice on black economic empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;

(c) **"bid"** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the provision of goods or services, through price quotations, advertised competitive bidding processes or proposals;

(d) **"Broad-Based Black Economic Empowerment Act"** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);

(e) **"EME"** means an Exempted Micro Enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

(f) **"functionality"** means the ability of a tenderer to provide goods or services in accordance with specifications as set out in the tender documents.

(g) **"prices"** includes all applicable taxes less all unconditional discounts;

(h) **"proof of B-BBEE status level of contributor"** means:

1) B-BBEE Status level certificate issued by an authorized body or person;

2) A sworn affidavit as prescribed by the B-BBEE Codes of Good Practice;

3) Any other requirement prescribed in terms of the B-BBEE Act;

(i) **"QSE"** means a qualifying small business enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

(j) **"rand value"** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;

3. POINTS AWARDED FOR PRICE

3.1 THE 80/20 OR 90/10 PREFERENCE POINT SYSTEMS

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

80/20 **or** **90/10**

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

Where

Ps = Points scored for price of bid under consideration

Pt = Price of bid under consideration

Pmin = Price of lowest acceptable bid

4. POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTOR

4.1 In terms of Regulation 6 (2) and 7 (2) of the Preferential Procurement Regulations, preference points must be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table below:

B-BBEE Status Level of Contributor	Number of points (80/20 system)
1	20
2	18
3	14
4	12
5	8
6	6
7	4
8	2
Non-compliant contributor	0

5. BID DECLARATION

5.1 Bidders who claim points in respect of B-BBEE Status Level of Contribution must complete the following:

6. B-BBEE STATUS LEVEL OF CONTRIBUTOR CLAIMED IN TERMS OF PARAGRAPHS 1.4 AND 4.1

6.1 B-BBEE Status Level of Contributor: . = ……(maximum 20 points)

(Points claimed in respect of paragraph 7.1 must be in accordance with the table reflected in paragraph 4.1 and must be substantiated by relevant proof of B-BBEE status level of contributor.

7. SUB-CONTRACTING

7.1 Will any portion of the contract be sub-contracted?

(***Tick applicable box***)

YES		NO	

7.1.1 If yes, indicate:

i) What percentage of the contract will be subcontracted.....……%

ii) The name of the sub-contractor……..

iii) The B-BBEE status level of the sub-contractor.....……..

iv) Whether the sub-contractor is an EME or QSE

(Tick applicable box)

YES		NO	

v) Specify, by ticking the appropriate box, if subcontracting with an enterprise in terms of Preferential Procurement Regulations,2017:

Designated Group: An EME or QSE which is at last 51% owned by:	EME √	QSE √
Black people		
Black people who are youth		
Black people who are women		
Black people with disabilities		
Black people living in rural or underdeveloped areas or townships		
Cooperative owned by black people		
Black people who are military veterans		
OR		
Any EME		
Any QSE		

8. **DECLARATION WITH REGARD TO COMPANY/FIRM**

8.1 Name of company/firm:……

8.2 VAT registration number:……

8.3 Company registration number:……

8.4 TYPE OF COMPANY/ FIRM

- □ Partnership/Joint Venture / Consortium
- □ One person business/sole propriety
- □ Close corporation
- □ Company
- □ (Pty) Limited

[TICK APPLICABLE BOX]

8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

……
……
……

8.6 COMPANY CLASSIFICATION

- □ Manufacturer
- □ Supplier
- □ Professional service provider
- □ Other service providers, e.g. transporter, etc.

[*TICK APPLICABLE BOX*]

8.7 Total number of years the company/firm has been in business:……

8.8 I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBE status level of contributor indicated in paragraphs 1.4 and 6.1 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we 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 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;

iv) If the B-BBEE status level of contributor has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have –

(a) disqualify the person from the bidding 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 bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury 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.

WITNESSES

1. ……..

2. …….

……
SIGNATURE(S) OF BIDDERS(S)

DATE: ……..

ADDRESS ……..
……..
……..

SBD 6.2

DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT FOR DESIGNATED SECTORS

This Standard Bidding Document (SBD) must form part of all bids invited. It contains general information and serves as a declaration form for local content (local production and local content are used interchangeably).

Before completing this declaration, bidders must study the General Conditions, Definitions, Directives applicable in respect of Local Content as prescribed in the Preferential Procurement Regulations, 2017, the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:2011 (Edition 1) and the Guidance on the Calculation of Local Content together with the Local Content Declaration Templates [Annex C (Local Content Declaration: Summary Schedule), D (Imported Content Declaration: Supporting Schedule to Annex C) and E (Local Content Declaration: Supporting Schedule to Annex C)].

1. General Conditions

1.1. Preferential Procurement Regulations, 2017 (Regulation 8) make provision for the promotion of local production and content.

1.2. Regulation 8.(2) prescribes that in the case of designated sectors, organs of state must advertise such tenders with the specific bidding condition that only locally produced or manufactured goods, with a stipulated minimum threshold for local production and content will be considered.

1.3. Where necessary, for tenders referred to in paragraph 1.2 above, a two stage bidding process may be followed, where the first stage involves a minimum threshold for local production and content and the second stage price and B-BBEE.

1.4. A person awarded a contract in relation to a designated sector, may not sub-contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.

1.5. The local content (LC) expressed as a percentage of the bid price must be calculated in accordance with the SABS approved technical specification number SATS 1286: 2011 as follows:

$$LC = [1 - x / y] * 100$$

Where
x is the imported content in Rand
y is the bid price in Rand excluding value added tax (VAT)

Prices referred to in the determination of x must be converted to Rand (ZAR) by using the exchange rate published by South African Reserve Bank (SARB) on the date of advertisement of the bid as indicated in paragraph 3.1 below.

The SABS approved technical specification number SATS 1286:2011 is accessible on http:/www.thedti.gov.za/industrial development/ip.jsp at no cost.

1.6. A bid may be disqualified if this Declaration Certificate and the Annex C (Local Content Declaration: Summary Schedule) are not submitted as part of the bid documentation;

2. The stipulated minimum threshold(s) for local production and content (refer to Annex A of SATS 1286:2011) for this bid is/are as follows:

Designated Sector Circular/Instruction Note #	Product Description	Product Type/ Activity/ Component	Application / Physical Properties	Stipulated Minimum Threshold	Status of Circulars / Instruction Notes
Circular No. 02 of 2016/2017: Solar Photovoltaic System and Components	**Solar PV Components**	Laminated PV Modules	The local process will include tabbing & stringing of cells, encapsulation and lamination; Final assembly and testing in compliance with IEC Standards	15%	**Active**
		Module Frame	All aluminium PV Module Frames, PV mounting structures/racks, clamps, brackets, foundation components and fasteners are to be manufactured from locally produced extruded, rolled, cast or forged products.	65%	
		DC Combiner Boxes	Enclosures must be made from SMC and moulded in South Africa	65%	
		Mounting Structure	All aluminium PV Module Frames, PV mounting structures/racks, clamps, brackets, foundation components and fasteners are to be manufactured from locally produced extruded, rolled, cast or forged products.	90%	
		Inverter	Must be assembled locally	40%	

3. Does any portion of the goods or services offered have any imported content?

(***Tick applicable box***)

YES		NO	

3..1 If yes, the rate(s) of exchange to be used in this bid to calculate the local content as prescribed in paragraph 1.5 of the general conditions must be the rate(s) published by SARB for the specific currency on the date of advertisement of the bid.

The relevant rates of exchange information is accessible on www.resbank.co.za

Indicate the rate(s) of exchange against the appropriate currency in the table below (refer to Annex A of SATS 1286:2011):

Currency	Rates of exchange
US Dollar	
Pound Sterling	

Euro	
Yen	
Other	

NB: Bidders must submit proof of the SARB rate (s) of exchange used.

4. Where, after the award of a bid, challenges are experienced in meeting the stipulated minimum threshold for local content the dti must be informed accordingly in order for the dti to verify and in consultation with the AO/AA provide directives in this regard.

LOCAL CONTENT DECLARATION
(REFER TO ANNEX B OF SATS 1286:2011)

LOCAL CONTENT DECLARATION BY CHIEF FINANCIAL OFFICER OR OTHER LEGALLY RESPONSIBLE PERSON NOMINATED IN WRITING BY THE CHIEF EXECUTIVE OR SENIOR MEMBER/PERSON WITH MANAGEMENT RESPONSIBILITY (CLOSE CORPORATION, PARTNERSHIP OR INDIVIDUAL)

IN RESPECT OF BID NO. CI-GK-0132

ISSUED BY: The South African National Parks (SANParks)
NB

1 The obligation to complete, duly sign and submit this declaration cannot be transferred to an external authorized representative, auditor or any other third party acting on behalf of the bidder.

2 Guidance on the Calculation of Local Content together with Local Content Declaration Templates (Annex C, D and E) is accessible on http://www.thedti.gov.za/industrial_development/ip.jsp. Bidders should first complete Declaration D. After completing Declaration D, bidders should complete Declaration E and then consolidate the information on Declaration C. **Declaration C should be submitted with the bid documentation at the closing date and time of the bid in order to substantiate the declaration made in paragraph (c) below.** Declarations D and E should be kept by the bidders for verification purposes for a period of at least 5 years. The successful bidder is required to continuously update Declarations C, D and E with the actual values for the duration of the contract.

I, the undersigned, ……..... (full names),
do hereby declare, in my capacity as …… ……..
of .....(name of bidder entity), the following:

(a) The facts contained herein are within my own personal knowledge.

(b) I have satisfied myself that:

(i) the goods/services/works to be delivered in terms of the above-specified bid comply with the minimum local content requirements as specified in the bid, and as measured in terms of SATS 1286:2011; and

(c) The local content percentage (%) indicated below has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 3.1 above and the information contained in Declaration D and E which has been consolidated in Declaration C:

Bid price, excluding VAT (y)	R
Imported content (x), as calculated in terms of SATS 1286:2011	R
Stipulated minimum threshold for local content (paragraph 3 above)	

Local content %, as calculated in terms of SATS 1286:2011	

If the bid is for more than one product, the local content percentages for each product contained in Declaration C shall be used instead of the table above.
The local content percentages for each product has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 3.1 above and the information contained in Declaration D and E.

(d) I accept that the Procurement Authority / Institution has the right to request that the local content be verified in terms of the requirements of SATS 1286:2011.

(e) I understand that the awarding of the bid is dependent on the accuracy of the information furnished in this application. I also understand that the submission of incorrect data, or data that are not verifiable as described in SATS 1286:2011, may result in the Procurement Authority / Institution imposing any or all of the remedies as provided for in Regulation 14 of the Preferential Procurement Regulations, 2017 promulgated under the Preferential Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

SIGNATURE:_____

WITNESS No. 1 _____ **DATE:** _____

WITNESS No. 2 _____ **DATE:** _____

DECLARATION OF BIDDER'S PAST SCM PRACTICES (SBD 8)

• Is the Bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? If Yes, furnish particulars as an attached schedule:	Yes	No
• Is the Bidder or any of its directors listed on the Register for Tender Defaulters in terms of Section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? If Yes, furnish particulars as an attached schedule:	Yes	No
• Was the Bidder or any of its directors convicted by a court of law (including a court outside of the Republic of South Africa) for fraud or corruption during the past five years? If Yes, furnish particulars as an attached schedule:	Yes	No
• Was any contract between the Bidder and any organ of state terminated during the past five years on account of failure to perform on or comply with the contract? If Yes, furnish particulars as an attached schedule:	Yes	No

The Database of Restricted Suppliers and Register for Tender Defaulters resides on the National Treasury's website (www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the Home Page.

CERTIFICATE OF INDEPENDENT BID DETERMINATION (SBD 9)

I, the undersigned, in submitting this Bid in response to the invitation for the Bid made by the SANParks, do hereby make the following statements that I certify to be true and complete in every respect:

• I have read and I understand the contents of this Certificate;	Yes	No
• I understand that the Bid will be disqualified if this Certificate is found not to be true and complete in every respect;	Yes	No
• I am authorised by the Bidder to sign this Certificate, and to submit the Bid, on behalf of the Bidder;	Yes	No
• Each person whose signature appears on the Bid has been authorised by the Bidder to determine the terms of, and to sign, the Bid on behalf of the Bidder;	Yes	No

For the purposes of this Certificate and the accompanying Bid, I understand that the word "competitor" shall include any individual or organisation, other than the Bidder, whether or not affiliated with the Bidder, who:

a) Has been requested to submit a Bid in response to this Bid invitation;
b) Could potentially submit a Bid in response to this Bid invitation, based on their qualifications, abilities or experience; and
c) Provides the same goods and services as the Bidder and/or is in the same line of business as the Bidder

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[3] will not be construed as collusive bidding.

In particular, without limiting the generality of paragraphs above, there has been no consultation, communication, agreement or arrangement with any competitor regarding: a) Prices; b) Geographical area where product or service will be rendered (market allocation); c) Methods, factors or formulas used to calculate prices; d) The intention or decision to submit or not to submit, a Bid; e) The submission of a Bid which does not meet the specifications and conditions of the Bid; or f) Bidding with the intention not to win the Bid.
In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this Bid invitation relates.
The terms of this 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.
I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to Bids and contracts, Bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of Section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation
[3] Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

STANDARD BIDDING DOCUMENTS DECLARATION

The following documents are deemed to form and be read and construed as part of this agreement even where integrated in this document:

Declaration of Interest (SBD4)
Preference points claimed (SBD6.1) – Original or certified copy of B-BBEE certificate or Sworn Affidavit
Local Content Declaration (SBD6.2)
Declaration of Bidder's past SCM practices (SBD8);
Certificate of Independent Bid Determination (SBD9)

The obligation to complete, duly sign and submit these declarations included in this SBD declaration pack cannot be transferred to an external authorised representative, auditor or any other third party acting on behalf of the legal entity.

I declare that I have had no participation in any collusive practices with any Bidder or any other person regarding this or any other procurement. I certify that the information furnished in these declarations (SBD4, SBD6.1, SBD8, SBD9) is correct and I accept that SANParks may reject the Offer or act against me should these declarations prove to be false. I confirm that I am duly authorised to sign this SBD declaration pack nominated in writing by the Chief Executive Officer or Senior Member/Person with management responsibility (Close Corporation, Partnership or Individual).

NAME (PRINT)	
CAPACITY	
SIGNATURE	
NAME OF FIRM	
DATE	

WITNESSES:

1 _____

2 _____

Date _____

2: The Contract

Part C1: Agreement and contract data

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK
CONTRACT No. CI-GK-0132

C1.1 Form of Offer and Acceptance

Offer

The employer, identified in the acceptance signature block, has solicited offers to enter into a contract for the procurement of:

CONTRACT No: CI-GK-0132: THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK

The tenderer, identified in the offer signature block, has examined the documents listed in the tender data and addenda thereto as listed in the returnable schedules, and by submitting this offer has accepted the conditions of tender.

By the representative of the tenderer, deemed to be duly authorized, signing this part of this form of offer and acceptance, the tenderer offers to perform all of the obligations and liabilities of the contractor under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the conditions of contract identified in the contract data.

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS:

. . . . . Rand (in words);

R .. . . (in figures)

This offer may be accepted by the employer by signing the acceptance part of this form of offer and acceptance and returning one copy of this form of offer to the tenderer before the end of the period of validity stated in the tender data, whereupon the tenderer becomes the party named as the contractor in the conditions of contract identified in the contract data.

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK
CONTRACT No. CI-GK-0132

Signature(s)		Date	
Name(s)			
Capacity			
For the Tenderer			
Name of tenderer (Company)			
Address of tenderer			
Name of witness			
Signature of witness		Date	

Acceptance

By signing this part of this form of offer and acceptance, the employer identified below accepts the tenderer's offer. In consideration thereof, the employer shall pay the contractor the amount due in accordance with the conditions of contract identified in the contract data. Acceptance of the tenderer's offer shall form an agreement between the employer and the tenderer upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract, are contained in:

Part C1: Agreements and contract data, (which includes this agreement)
Part C2: Pricing data
Part C3: Scope of work.
Part C4: Site information

and drawings and documents or parts thereof, which may be incorporated by reference into Parts 1 to 4 above.

Deviations from and amendments to the documents listed in the tender data and any addenda thereto as listed in the tender schedules as well as any changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance, are contained in the schedule of deviations attached to and forming part of this agreement. No amendments to or deviations from said documents are valid unless contained in this schedule.

The tenderer shall within two weeks after receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the employer's agent (whose details are given in the contract data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the contract data. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one signed and fully completed Form of Offer and Acceptance, including the schedule of deviations (if any). Unless the tenderer (now contractor**)** within five working days of the date of such receipt notifies the employer in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the parties.

Signature(s)		Date	
Name(s)			
Capacity			
For the Employer			
Name of Employer	South African National Parks		
Address of tenderer	643 Leyds Street Muckleneuk 0002 P O Box 787 Pretoria 0001		
Name of witness			
Signature of witness		Date	

Schedule of Deviations

Notes

1. The extent of deviations from the tender documents issued by the employer before the tender closing date is limited to those permitted in terms of the conditions of tender.
2. A tenderer's covering letter shall not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid, be the subject of agreements reached during the process of offer and acceptance, the outcome of such agreement shall be recorded here.
3. Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to the tender documents, and which it is agreed by the Parties becomes an obligation of the contract, shall also be recorded here.
4. Any change or addition to the tender documents arising from the above agreements and recorded here, shall also be incorporated into the final draft of the contract.

1 **Subject** . . . . . .

Details . . . . . .

. . . . . .

. . . . . .

. . . . . .

2 **Subject** . . . . . .

Details . . . . . .

. . . . . .

. . . . . .

. . . . . .

3 **Subject** . . . . . .

Details . . . . . .

. . . . . .

. . . . . .

. . . . . .

4 **Subject** . . . . . .

Details . . . . . .

. . . . . .

. . . . . .

. . . . . .

5 **Subject** . . . . . .

Details . . . . . .

. . . . . .

. . . . . .

. . . . . .

By the duly authorised representatives signing this agreement, the employer and the tenderer agree to and accept the foregoing schedule of deviations as the only deviations from and amendments to the documents listed in the tender data and addenda thereto as listed in the tender schedules, as well as any confirmation, clarification or changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance.

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

Contractor	Witness for Contractor	Employer	Witness for Employer

For the Tenderer:

Signature(s) . . . .

Name(s) . . . .

Capacity . . . .

(Name of organization/tenderer) . . . .

(Address of organization/tenderer) . . . .

. . . .

Name and signature of witness . . . . Date . . . .

. . . .

For the Employer:

Signature(s) . . . .

Name(s) . . . .

Capacity . . . .

(Name and address of organization) The South African National Parks

Name and signature of witness . . . . Date . . . .

. . . .

Confirmation of Receipt

The Tenderer, (now Contractor), identified in the Offer part of this Agreement hereby confirms receipt from the Employer, identified in the Acceptance part of this Agreement, of one fully completed original copy of this agreement, including the Schedule of Deviations (if any) today:

the.....(day)

of .....(month)

20.....(year)

at ..... (place)

For the Contractor:

Signature(s) . . . . . .

Name(s) . . . . . .

Capacity . . . . . .

Signature and name of witness:

Signature . . . . . .

Name . . . . . .

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK CONTRACT No. CI-GK-0132

C1.2 Part 1: Contract Data provided by the Employer

The General Conditions of Contract for Construction Works, Third Edition, 2015 published by the South African Institution of Civil Engineering, Private Bag X200, Halfway House, 1685, is applicable to this Contract and copies of these Conditions of Contract may be obtained from the South African Institution of Civil Engineering (Tel 011-805 5947) www.saice.org.za.

The General Conditions of Contract make several references to the Contract Data for specific data, which together with these conditions collectively describe the risks, liabilities and obligations of the contracting parties and the procedures for the administration of the Contract. The Contract Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the General Conditions of Contract.

Each item of data given below is cross-referenced to the clause in the General Conditions of Contract for Construction Works, Third Edition, 2015, to which it mainly applies.

The variations to the General Conditions of Contract are:

CLAUSE	DESCRIPTION / WORDING
1.1.1	The term "the Engineer" shall be taken to mean "the Employer's Agent" as defined in clause 1.1.1.16, where "the Engineer" is used in other documentation (for example SANS / SABS standardised specifications and particular specifications in this tender document – see also C3 Scope of Work, Construction, Specifications for further "mapping of definitions").
1.1.1.13	The Defects Liability Period is **24 (months)** months.
1.1.1.14	The time for achieving Practical Completion will be **24 weeks**; the time will include the 14 day period referred to in Clause 5.3.2 below, and inclusive of non-working days referred to in Clause 5.8.1 below, but exclusive of special non-working days (Clause 5.8.1). Work must commence within 14 days after the issuing of the Works Instruction.
1.1.1.15	The name of the Employer is: the **Chief Executive Officer**, **SOUTH AFRICAN NATIONAL PARKS** represented by **The General Manager: Infrastructure & Special Projects** and/or such other person or persons duly authorised thereto by the Employer in writing.
1.1.1.16	The name of the Employer's Agent is: **The General Manager: Infrastructure & Special Projects and/or such other person or persons duly authorised thereto by the Employer in writing.**
1.1.1.26	The Pricing Strategy is a Bidders **Re-measurement Contract**.
1.2.1.2	The Employer's address for receipt of communications and notices is: **Physical address:** South African National Parks Chief Executive Officer c/o The General Manager: Infrastructure & Special Projects. 643 Leyds Street Muckleneuk Pretoria 0002 **Postal Address:** Postal Address: PO Box 787 Pretoria 0001 Telephone: (012) 426 5260
1.2.1.2	The address of the Employer's Agent is:

CLAUSE	DESCRIPTION / WORDING
	Physical address: South African National Parks The General Manager: Infrastructure & Special Projects. 643 Leyds Street Muckleneuk Pretoria 0002 **Postal Address:** PO Box 787 Pretoria 0001 Telephone: (012) 426 5260
3.1.3	The Employer's Agent shall obtain the specific approval of the Employer before executing any of his functions or duties according to the following Clauses of the General Conditions of Contract: 1. Clause 3.2.1 Nomination of Employer's Agent's Representative 2. Clause 3.2.4 Employer's Agent's authority to delegate 3. Clause 5.8.1 Non-working times 4. Clause 5.11.1 Suspension of the Works 5. Clause 5.12.4 Acceleration instead of extension of time 6 Clause 6.3.2 Orders for variations to be in writing 7. Clause 10.1.1 Contractor's claim
5.3.1	The documentation to be submitted by the Contractor before commencement with Works execution are: (1) Health and Safety Plan (Refer to Clause 4.3) (2) Initial programme (Refer to Clause 5.6)- a program must be submitted (3) Insurance (Refer to Clause 8.6) (4) Occupational Health and Safety Agreement (C1.4 of the Contract Document) (5) Letter of Good Standing from the Compensation Commissioner (if not insured with a Licensed Compensation Insurer) (6) A signed Agreement between the Employer and the Contractor for the Works to be completed by the Contractor in terms of the provisions of Section 37(2) of the Occupational Health and Safety Act (Act No.85 of 1993) and the Construction Regulations promulgated thereunder (Refer to Clause 4.3). (7) Proof to the Employer, of payment, that the Contractor has paid all contributions required in terms of the Compensation for Occupational Injuries and Diseases Act, No. 130 of 1993 (Refer to Clause 4.3).
5.3.2	(a) The time to submit the documentation required before commencement with Works execution is **14 days**.
5.4.2	The access and possession of Site shall not be exclusive to the Contractor but shall be as set out elsewhere in the Contract.
5.8	Delete the words "between sunrise and sunset" in the first line and replace with "within normal working hours". Add the following: "Normal working hours shall be between 07h00 and17h00 (season dependant) on weekdays from Monday to Friday and from 07h00 until 13h00 on Saturdays. Note that there are restricted travelling times in the park. *No travelling is permitted* within Kgalagadi Transfrontier Park at night, the Contractor shall make provision for transporting his staff off site in good time. The park seasonal hours are; Winter: April - September 07:00 - 18:00 Summer: October - March 06:00 - 19:00
5.8.1	The non-working days is Sundays. The special non-working days are: (1) All gazetted public holidays falling outside the year end break.

<table>
<tr><th>CLAUSE</th><th>DESCRIPTION / WORDING</th></tr>
<tr><td></td><td>(2) The year end-break as determined by the South African Forum of Civil Engineering Contractors (www.safcec.org.za).

The special non-working days are:

Any statutory public holiday in terms of the Public Holidays Act, and, where such statutory public holiday falls on a Sunday, and the next Monday subsequently becomes a statutory public holiday in terms of the Public Holidays Act, then both the relevant Sunday and the relevant Monday shall be special non-working days under the contract;

And any proclaimed statutory day of mourning

And any proclaimed statutory election day which is proclaimed as a statutory public holiday

And all annual year-end shutdown periods as recommended by the South African Bargaining Council for the Civil Engineering Industry.</td></tr>
<tr><td>5.12.2.2</td><td>A delay caused by inclement weather conditions will be regarded as a delay only if, in the opinion of the Employer’s Agent, all progress on an item or items of work on the critical path of the working programme of the contractor has been brought to a halt. Delays on working days only (based on a five-day working week) will be taken into account for the extension of time, but the Contractor shall make provision in his programme of work for an expected delay of "n"" working days caused by normal rainy weather, for which he will not receive any extension of time, where “n” equals days per month.

<table>
<tr><th>Month</th><th>“n” Working days</th></tr>
<tr><td>January</td><td>2 days</td></tr>
<tr><td>February</td><td>2 days</td></tr>
<tr><td>March</td><td>1 days</td></tr>
<tr><td>April</td><td>1 days</td></tr>
<tr><td>May</td><td>0 days</td></tr>
<tr><td>June</td><td>0 days</td></tr>
<tr><td>July</td><td>0 days</td></tr>
<tr><td>August</td><td>0 days</td></tr>
<tr><td>September</td><td>0 days</td></tr>
<tr><td>October</td><td>1 days</td></tr>
<tr><td>November</td><td>1 days</td></tr>
<tr><td>December</td><td>2 days</td></tr>
</table>

Extension of time during working days will be granted to the degree to which actual delays, as defined above, exceed the number of "n" working days.

It shall be further noted that where the critical path is not affected, no extension of time for abnormal climatic conditions or for any other reason will be entertained.</td></tr>
<tr><td>5.13.1</td><td>The penalty for failing to complete the Works is R 6,800 per calendar day.</td></tr>
<tr><td>5.14.1</td><td>The requirements for achieving Practical Completion are when the works is fit for the intended purpose and occupation without danger or undue inconvenience to the employer.</td></tr>
<tr><td>5.16.3</td><td>The Contractor shall offer a Latent Defect Liability Period commencing from the date of Provisional Acceptance of 10 years for all civil and structural works and at least 5 years for all items of equipment.</td></tr>
<tr><td>6.2.1</td><td>The security to be provided by the Contractor shall be a performance guarantee of 10% of the Contract Sum. The performance guarantee shall contain the precise wording of the document included in Part C1.3 of the Contract Data: Form of Guarantee.</td></tr>
<tr><td>6.8.2</td><td>Contract Price Adjustment shall NOT be applicable.</td></tr>
<tr><td>6.8.4</td><td>Add the following to Clause 6.8.4:

Notwithstanding the above, in the event that a public holiday is proclaimed after 28 days before the closing date for Tenders, no costs other than those that can be claimed under Clause 5.12.3 shall be</td></tr>
</table>

CLAUSE	DESCRIPTION / WORDING
	added to the contract price.
6.10.1.5	The percentage advance on materials not yet built into the permanent Works is **80%**. Proof of ownership is required.
6.10.3	The limit on retention is **10%** total of the Contract Price (5% of cost payable at completion, and 5% after 12 month retention period – final completion). A guarantee in lieu of retention is not permitted.
8.6.1.1.2	The value of plant and materials supplied by the Employer to be included in the insurance sum is R0.
8.6.1.1.3	The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is **NULL.**
8.6.1.2	A Coupon Policy for Special Risks Insurance issued by the South African Special Risks Insurance Association is not required. Null
8.6.1.3	The limit of indemnity for liability insurance is **R10 000 000** for any single claim – the number of claims to be unlimited during the construction and Defects Liability Periods.
10.3.2	Amicable settlement in terms of Clause 10.4 shall be contemplated for all disputes prior to referring any dispute to adjudication or arbitration.
10.5.3	The number of Adjudication Board Members to be appointed is **one**.
10.7.1	The determination of disputes which are unresolved in terms of Clause 10.4.2 shall be by arbitration.

The additions to the General Conditions of Contract are:

Clause	Additions
A2	**Pro forma – Form of Offer and Acceptance** The Form of Offer to be used shall be the Form of Offer bound in this document, which is not necessarily the same as that attached to the published version of the General Conditions of Contract.
A3	**Pro forma - Deed of Guarantee** The Deed of Guarantee shall be in the form bound in this document, which is not necessarily the same as that attached to the published version of the General Conditions of Contract.

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK CONTRACT No. CI-GK-0132

Part 2: Contract Data provided by the Contractor

Clause	Additions
Clause 1.1.1.9:	The name of the Contractor is ……
Clause 1.2.1.2:	The address of the Contractor is Physical : ……..Postal :…….. Address: Address: …… …….. …… …….. …… …….. …… …….. Telephone : ……..… Fax: …….. Email :……...

C1.3 Form of Guarantee

WHEREAS THE CHIEF EXECUTIVE, SOUTH AFRICAN NATIONAL PARKS

(hereinafter referred to as "the Employer") entered into a Contract with . . . . . .

. . . . . .

-(hereinafter called "the Contractor") on the.. . . . . day of ... . 20…. for **CONTRACT No. CI-GK-0132**

for the

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK

AND WHEREAS it is provided by such Contract that the Contractor shall provide the Employer with security

by way of a guarantee for the due and faithful fulfilment of such Contract by the Contractor;

WHEREAS WE, ... (*name of Insurance Company/Bank)*

have at the request of the Contractor, agreed to give such guarantee;

NOW THEREFORE WE do hereby guarantee and bind ourselves jointly and severally as Guarantor and Co principal Debtors to the Employer under renunciation of the benefits of division and excussion for the due and faithful performance by the Contractor of all the terms and conditions of the said Contract, subject to the following conditions:

PSGA - 1 The Employer shall, without reference and/or notice to us, have complete liberty of action to act in any manner authorized and/or contemplated by the terms of the said Contract, and/or to agree to any modifications, variations, alterations, directions or extensions of the Due Completion Date of the Works under the said Contract, and that its rights under this guarantee shall in no way be prejudiced nor our liability hereunder be affected by reason of any steps which the Employer may take under such Contract, or of any modification, variation, alterations of the Due Completion Date which the Employer may make, give, concede or agree to under the said Contract.

PSGA - 2 This guarantee shall be limited to the payment of a sum of money.

PSGA - 3 The Employer shall be entitled, without reference to us, to release any guarantee held by it, and to give time to or compound or make any other arrangement with the Contractor.

PSGA - 4 This guarantee shall remain in full force and effect until the issue of the Certificate of Completion in terms of the Contract, unless we are advised in writing by the Employer before the issue of the said Certificate of his intention to institute claims, and the particulars thereof, in which event this guarantee shall remain in full force and effect until all such claims have been paid or liquidated.

PSGA - 5 Our total liability hereunder shall not exceed the sum of . . . . . .

. . . . . .(R . . . .)

PSGA - 6 The Guarantor reserves the right to withdraw from this guarantee by depositing the Guarantee Sum with the beneficiary, whereupon the Guarantor's liability hereunder shall cease.

PSGA - 7 We hereby choose our address for the serving of all notices for all purposes arising hereof as . . . . . .

. . . . . .

IN WITNESS WHEREOF this guarantee has been executed by us at . . . . . .

on this . . . . . day of. . . . . 20. . . . . .

As witnesses:

1. . . . . Signature

2. . . . . Duly authorized to sign on behalf of

. . . . . Address

. . . . . .

. . . . . .

C1.4: Pro-Forma – OHS Mandatory Form

TO BE COMPLETED AND SIGNED BY ALL MANDATARIES

OCCUPATIONAL HEALTH AND SAFETY ACT
NO. 85 OF 1993

Note: Section 1(1)(xxviii) of the Act defines a "Mandatory" as including "an Agent, a Contractor or a Subcontractor for Work."

The Employer and the Contractor hereby agree, in terms of the provisions of Section 37 (2) of the Occupational Health and Safety Act, Act No.85 of 1993, hereinafter referred to as "the Act", that the Contractor as an employer in its own right and in its capacity as Contractor for the execution of the works, shall have certain obligations and that the following arrangement shall apply between them to ensure compliance by the Contractor with the provisions of the Act, namely:-

i. The Contractor undertakes to acquaint the appropriate officials and the employees of the Contractor with all relevant provisions of the Act, and the regulations promulgated in terms of the Act, and

ii. The Contractor undertakes that all relevant duties, obligations and prohibitions imposed in terms of the Act and regulations will be fully complied with, and

iii. The Contractor hereby accepts sole liability for such due compliance with the relevant duties, obligations and prohibitions imposed by the Act and regulations in respect of the work included in the Contract, and

iv. The Contractor shall be obliged to report forthwith to the Employer any investigation, complaint, or criminal charge which may arise as a consequence of the provisions of the Act and regulations pursuant to work performed on behalf of the Employer, and shall, on written demand, provide full details in writing of such investigation, complaint or criminal charge.

Signed at ……on the …… day of …….. 20…..

WITNESS:

…….. .....
for and on behalf of ***Contractor***

WITNESS:

…… .....
For and on behalf of the **Chief Executive Officer**
South African National Parks

C1.5: Pro-Forma – Declaration of Ownership of Unused Materials

DECLARATION OF OWNERSHIP OF UNUSED MATERIAL

FOR

CERTIFICATE OF PAYMENT NO:

I/We, the undersigned, ...

.....(Name of Contractor)

hereby declare that the materials for which payment is claimed in terms of Clause 6.10.1.5 of the General Conditions of Contract are:

(a) as described

* (i) on the copy of Invoice No. ...…… annexed hereto

*(ii) as set out in detail below

.....

.....

.....

.....

*delete whichever is not applicable.

(b) located at

.....

.....

(c) totally owned by me/us and that no other party has any claim or right in respect of the above materials and that I am/we are free to pass ownership upon receipt of payment for such materials

(d) intended for incorporation into the permanent works of this Contract.

Signed at .....

on this …… day of …… 20……..

Witnesses:

1.

2.

Signature: ……

Capacity: ……

On behalf of: ……

Address: ……

……

……

Part C2: Pricing data

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK CONTRACT No. CI-GK-0132

C2.1: Pricing Instructions

1) The prices and rates in these Bills of Quantities are fully inclusive prices for the work described under the items. Such prices and rates cover all costs and expenses that may be required in and for the execution of the work described in accordance with the provisions of the Scope of Work, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the Contract Data, as well as overhead charges and profit. These prices will be used as a basis for assessment of payment for additional work that may have to be carried out.

2) It will be assumed that prices included in these Bills of Quantities are based on Acts, Ordinances, Regulations, By-laws, International Standards and National Standards that were published 28 days before the closing date for tenders. (Refer to www.stanza.org.za or www.iso.org for information on standards)

3) Where the Scope of Work requires detailed drawings and designs or other information to be provided, all costs associated therewith are deemed to have been provided for and included in the unit rates and sum amount tendered such items

4) An item against which no price is entered will be considered to be covered by the other prices or rates in the Bills of Quantities. A single lump sum will apply should a number of items be grouped together for pricing purposes.

5) The short descriptions of the items of payment given in these Bills of Quantities are only for the purposes of identifying the items. More details regarding the extent of the work entailed under each item appear in the Scope of Work.

Construction

6) Attention is drawn to Clause 6.7.1 of the General Conditions of Contract and the Contractor must not order the quantities of materials stated in the Bill of Quantities until he has confirmed from the construction drawings or measurement on Site that such quantities are in fact the correct quantities.

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK

CONTRACT No. CI-GK-0132

C2.2 Pricing Schedule.

PAGE INTENTIONALLY LEFT BLANK – PRICING SCHEDULE INCLUDED IN DOCUMENT TO BE ISSUED AT THE COMPULSORY SITE CLARIFICATION MEETING

PAGE INTENTIONALLY LEFT BLANK – PRICING SCHEDULE INCLUDED IN DOCUMENT TO BE ISSUED AT THE COMPULSORY SITE CLARIFICATION MEETING

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THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK
CONTRACT No. CI-GK-0132

Part C3: Scope of Work

SPECIFICATIONS FOR THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK

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1. DEFINITIONS

AC	Alternating Current
CCTV	Closed-Circuit Television
COSHH	Control of Substances Hazardous to Health
COLTO	Committee of Land Transport Officials
Contractor	Refers to same term as Bidder or EPC Contractor
Defect Liability Period	Means the period of 24 Months commencing on the date of Provisional Acceptance
DC	Direct Current
ECSA	Engineering Council of South Africa
EN	European Standards
EPC	Engineering, Procurement and Construction
Employer	The National Department of Tourism, the South African National Parks
Employer's Engineer	Any of the Employer's advisors
FAT	Facility Acceptance Tests
Final Acceptance	Means the stage of the Works when all of the following have occurred: – the Employer has issued a Certificate of Provisional Acceptance; – all delay penalties and/or liquidated damages have been paid to the Employer; – the Production Guarantees have been met or performance penalties and/or liquidated damages have been paid to the Employer; – all defects and/or deficiencies (including damages arising from such defects and/or deficiencies) in o the Works and Plants have been corrected to the Employers reasonable satisfaction; and – the Defects Liability Period has expired.
IEC	International Electro technical Commission
ISO	International Organisation for Standardization
Latent Defect	A material defect in design, workmanship or materials in the Plants or the Spare Parts that was existing prior to the expiry of the Defects Liability Period but was not reasonably capable of being Discovered by the Employer in the course of normal operation and maintenance of the Plants.
LV	Low Voltage (up to 1kV)
MCC	Motor Control Centre
MPAN	Meter Point Administration Number
MV	Medium Voltage (>1kV to 33kV)
NDT	National Department of Tourism
OEM	Original Equipment Manufacturer
OHS	Occupational Health and Safety
PID	Potential Induced Degradation
PoC	Point of Connection
Provisional Acceptance	Means the stage of the Works when the following has occurred:

	– The Contractor has provided the copies of the Operation and Maintenance Manual as specified; – The Contractor has provided the Spare Parts required to be provided; – The Acceptance Tests have been passed; – The Plants are capable of being operated safely under all anticipated or likely operational conditions; – The Plants are in a condition which allows the Employer to comply with all Laws relating to its operation; – All documents and other information required to be supplied prior to Provisional Acceptance have been supplied to the Employer; – All requirements from Eskom have been fulfilled for the operation of the Plants; – All consents to be obtained by the Contractor which are necessary for the operation of the Plants, – and to the full extent permitted by Law, have been transferred (to the extent necessary and/or permitted at Law) to the Employer; and – the Works are performed and complete other than minor outstanding work and defects which will not substantially affect the use of the Works for their intended purposes.
PV	Photovoltaic
PV Combiner Box	Also known as DC combiner box, is an electrical component housing where the wiring from array series strings are connected in parallel.
PVSyst	Project Design-modelling tool to estimate PV Plants production
SANParks	South African National Parks
SHE	Safety, Health and Environmental
STC	Standard Test Conditions
UPS	Uninterruptible Power Supply
UV	Ultra Violet

2. PROJECT BACKGROUND AND INTRODUCTION

The Kgalagadi Transfrontier Park is one of the most visited parks in South Africa. The two camps at Mata Mata and Nossob are reliant on diesel generators to produce electricity at a very expensive price of >R4/kWh and the pollution and noise levels are high. Furthermore, there is a blackout every night from 10pm to 5am daily which is counter-productive for the customers and staff in the Park. The installation of a solar plants will have many benefits including cost saving, elimination of noise and reduction of carbon footprint. Neither of the two camps are connected to the grid and rely entirely on diesel generators for the electricity supply as the introduction to ESKOM grid lines would be far too expensive.

Kgalagadi Transfrontier Park intends to appoint credible service providers for the installation of a PV solar system with battery backup to alleviate the dependence on generators for the generation of electricity at the Mata Mata and Nossob camps. Bids are sought from reputable contractors that have experience and capability in multi-disciplinary solar island (mini-grids) type projects. The scope of works would include design, installation, commissioning and maintenance of the solar systems

SANParks is pursuing the engineering, procurement and construction of two solar Photovoltaic (PV) Plants that will be located at the two sites indicated above. This document specifies the technical requirements of the Request for Proposals for the selected bidders.

The aim of this document is to ensure that the PV Plants are designed, constructed and operated to a suitably high standard as well as the longevity of the plants in terms of quality and maintenance. The bidder is responsible for the optimal design of the PV Plants. Flexibility is allowed as long as the proposed PV Plants comply with all the requisites contained in this Request for Proposals and meets the off-grid connection and performance requirements.

The EPC contractor is responsible for completing the detailed design based on these specifications herein (pages 40-42) and to build, test and commission the solar PV Plants as prescribed as a minimum in this document.

Should there be a difference between the Specifications and local requirements, the local requirements shall prevail unless otherwise confirmed by the Employer.

3. SCOPE OF WORKS

4. General

The scope of work for this turnkey EPC Contract comprises:

- The design, engineering, manufacturing, labour, materials, testing at works, insurance, packing, shipping and transportation to site, installation, testing and commissioning of Plants and equipment, associated training, acceptance testing and making good of any defects and warranty cover during the Defects Liability Period, retro fitting existing facilities at the PV Plants locations, if required including all and everything within the specified limits, to achieve the defined design and operating criteria and to provide fully operational solar PV Plants and
- Operation and maintenance of the Plants over an operational period of 5 (five) years from Provisional Acceptance with the operation and maintenance of the PV Plants during this period included in the EPC Contractor's scope, also see page 54 for guarantees.

The EPC Contractor shall be deemed to have included in its scope items not identified in the Specification but which are demonstrably necessary for the satisfactory execution of the PV Plants. No additional cost shall be allowed for any item which the Contractor has not considered but which is needed for the proper completion of the Works in every respect, so that the Works are designed, specified, manufactured, constructed, installed,

tested and commissioned for safe, efficient and reliable operation and minimum maintenance over the design life of the PV Plants.

Further obligations of the Contractor shall be full responsibility for all activities associated with health and safety, loss prevention, fire protection, security and environmental protection of the project during the detailed design and engineering, construction, commissioning, operation and maintenance.

5. Summary of main scope of supply

The main scope of supply shall include, but not be limited to the following (supply and fit)

6. Civil Works

- Preparatory works as outlined in Section 3.3.1
- Groundworks, foundations, piling works (if required), roads (access and internal) and surface drainage, sewerage and landscaping as required
- Site laydown area, storage area portable cabins, canteen and welfare facilities as necessary
- Enclosures (Buildings/containers) for mechanical and electrical equipment and storage of spare parts
- Construction and finishing of all buildings, ventilation and air conditioning and other M&E services such as fire detection and protection and
- Demarcation of each site including fencing, safety/security barriers in order to secure the works.

7. Mechanical works

- Mounting system for the PV modules
- Painting and corrosion protection system (if and where required)
- Complete structural steelwork, foundation bolts and plates, anchors, guides, lifting facilities and sundries
- Fire detection and protection systems (both active and passive)
- Temporary power and water supply for the construction and commissioning
- Permanent water system for module cleaning in line with SANParks requirements

8. Electrical equipment

- PV modules, inverters, combiner boxes complete with fuse, disconnectors and protection system;
- Battery storage system including charge controllers, off grid inverters and protection system;
- Transformers and associated protection and controls;
- DC cables, Low Voltage (400V) cables and communication cables and accessories;
- Interconnection to grid interconnection point as stated in Section 6.6 complete with all required switchgear, cabling, protection and controls;
- UPS supply and distribution systems including batteries, charger units, switchgear, inverters, cabling, protection and controls, as necessary;
- Integration with the existing systems and diesel generators including generator sets, switchgear, cabling, protection and controls;
- Reactive power compensation systems, harmonic filtration devices, fault or current limiting devices and other systems required to meet the requirements of the grid code and the demand loads;
- Protective relaying, operational and tariff metering systems and equipment;
- Cubicles, relay panels, marshalling boxes, enclosures and ancillary electrical equipment.
- Fault recording, diagnostic and alarm systems; and
- Other systems including small power, lighting, emergency lighting, communications, earthing and lightning protection systems.

9. Control and Instrumentation

- Plants performance monitoring equipment including meteorological stations as per this Specification;
- Secure communications network linking the solar equipment to the existing SCADA/wi-fi network system;
- Closed circuit television and perimeter security system;
- Fire alarms system/panel;
- Tariff metering panels and equipment; and
- All required control and instrumentation for safe, reliable and efficient operation of the Power Plants

10. EPC Contractor's Responsibilities

11. Preparatory Works

- No ground investigations have been carried out at the two sites and the Contractor shall undertake any site surveys, including topography, geotechnical, seismic conditions, meteorology, hydrological and route surveys necessary to establish the conditions that exist on the Plants locations or that may affect the design and construction of the PV Plants. Addendum A gives some information about the site conditions.
- The Contractor shall make itself aware of any above ground or buried obstructions or services that will affect the execution of the Works. If the Contractor wishes to relocate the existing services, the Contractor shall liaise with the affected parties to re-route the existing services or modify the design documentation.
- Any modifications to, or removals of, pipelines (surface or buried), cables, drainage systems or any other existing facilities, which are present on the sites as at the date upon which access to the sites is made available to the Contractor , may only be made with the prior approval of the Employer.
- Access to the Site will be possible using the existing access road but at times it may be required that the Contractor creates and maintains temporary roads for access to the Plants sites. All access roads between existing roads and the site shall be constructed by the Contractor to the SANParks standards. Access roads between the PV Plants and Temporary Areas shall be provided by the Contractor within the scope of the Works.
- The Contractor is responsible for all site preparation works, e.g. clearing, backfilling with compaction/consolidation, grading, levelling, earth moving, removal and disposal of spoil material etc. for the complete sites.
- The Contractor shall be responsible for providing all site facilities: temporary housing camp, Contractor's offices, Employer's and Employer's Engineer's offices, warehouses, storage areas, workshops for Site construction purposes, vehicles, mobile equipment, temporary power generators, fuel, water and electricity supplies required during construction.
- Temporary Areas may be used for construction activities, including site offices and storage, but are not to be used for construction of staff living accommodation.
- Once the Contractor has taken over the sites, the Contractor shall erect security fencing and gates and put in place any additional security measures to protect the sites and the equipment and personnel on the sites. Firefighting and first aid facilities shall be established from the commencement of site activities until completion of the Works.
- The Contractor is responsible for obtaining and all costs associated with the provision of construction power and water supplies and any other services such as telecommunications, sewage treatment and/or disposal, offices and accommodation required by the Contractor during the construction of the PV Plants.

12. Design and detailed Engineering

- The Contractor is responsible for the entire design and detailed engineering of the PV Plants and all associated cables and transmissions lines from the PV Plants sites. The design shall be to international best practice and fit for purpose. The design shall comply with this Specification and the National and International codes and standards. The Contractor shall obtain the approval of the Employer prior to proposing any modification to the design or supply of equipment or materials as shown in the Specification and the Contractor's proposal.
- The Contractor shall provide for review and approval, where required, all design information including design calculations that may be requested by the Employer or the Employer's Engineer. The Contractor shall provide the information in a manner that would allow any reasonable comments of the Employer and the Employer's Engineer to be incorporated without affecting the Project milestones.
- The Contractor is responsible for obtaining any and all information necessary to undertake the design, including liaison with the Employer, other bodies and contractors who may have new or existing facilities affected by the design. The Contractor shall provide full technical assistance and technical documentation that may be required for obtaining the consents needed for the erection and operation f the PV Plants.

13. Procurement and Inspection Services

- The Contractor is responsible for the purchase, expediting, inspection and delivery to site of all equipment and materials necessary to complete the works.
- To ensure that all equipment is delivered to site when required, the Contractor shall expedite the release of materials, and where necessary to maintain the project schedule, the Contractor shall arrange alternative transportation, if required. The Contractor is responsible for obtaining any customs clearance. The Contractor shall liaise with and obtain any approvals for shipment of materials with the relevant authorities. The Contractor shall provide a detailed procurement schedule stating the manufacturer's identity and place of manufacture, which shall not be modified without prior approval of the Employer.
- The Contractor shall provide to the Employer inspection and test plans. The Employer shall indicate which works inspections and tests the Employer and/or the Employer's Engineer would attend.

14. Construction

- The Contractor is responsible for all construction activities necessary to complete the works.
- The quality of construction shall be consistent with the design life of the PV Plants specified in this Specification subject only to the right of the Employer to itself retain and utilise such temporary facilities, upon completion of construction, the Contractor will be required to remove from the sites, all the buildings, rubbish, unused materials, storage tanks, temporary power distribution lines and all other temporary facilities. The Contractor will be required to fill and dress all holes and cavities made for its convenience and leave all areas in good order and condition.
- The Contractor shall make the maximum use of skilled and semi-skilled local labour during the construction phase in order to support the local labour market

15. Testing and Commissioning

- The Contractor is responsible for providing all equipment, services and personnel for testing and commissioning of the PV Plants.
- The EPC Contractor shall perform all testing and commissioning of the PV Plants in accordance with the requirements stated in Section 8, but not limited to those parameters stated only and all other tests that may be required to ensure safe and reliable equipment.

16. Quality Plan

- The Contractor shall prepare a quality plan for the PV Plants and obtain the Employer's approval of it.
- This quality plan shall cover all project phases: design, procurement, construction and commissioning.
- The project quality plan shall conform to the requirements. The Employer reserves the right to perform an audit of the Contractor's quality assurance system.

17. Health and Safety

- The Contractor is responsible for ensuring that all applicable health, safety and environmental (HSE) aspects are adequately addressed during the design and construction of the PV Plants. The design shall also include appropriate measures to ensure safe operation and maintenance with no adverse health effects on Plants personnel or neighbours.
- Prior to commencement of construction, the Contractor shall prepare a site specific health and safety plan that shall cover but not limited to the following:
    - Safety policy;
    - Company standards;
    - Project safety plan;
    - Hazard identification, prevention and control;
    - Fire Protection and Fire Fighting Procedures
    - Occupational health and safety;
    - Accident and emergency procedures;
    - Operating methods and procedures;
    - Auditing plan and procedures;
- Contractor shall be responsible for implementing and controlling safety procedures during all phases of the work in accordance with this plan. The Contractor shall actively monitor and report incidents (near-miss incidents), and accidents and adjust its safety plan, if needed The Contractor shall provide all safety equipment for use on the Project and ensure adequate training in the use thereof. Where such equipment is subject to statutory inspections, the Employer shall be provided with copies of the inspection reports and copies entered into the Health and Safety file.
- All lifting appliances, hoists and lifting gear shall be tested and inspected in strict conformity with local regulations. Records shall be available for inspection at any time. All scaffolds shall be periodically inspected and appropriate records maintained by the Contractor.

18. Defects Guarantee

- The Contractor shall guarantee that the Works and the Plants will be free from defects and Latent Defects.
- The Contractor shall offer a Defect Liability Period of 24 months, during which the Contractor shall:
    - Promptly notify the Employer of any and all defects or Latent Defects, omissions and/or damage it discovers in the Works and/or the Plants.
    - Inspect and report to the Employer regarding any defects or Latent Defects, omissions and/or damages, which the Contractor shall at its own cost repair, replace and/or make good in a manner that causes as little disruption as reasonably possible to the performance of the Work and/or operation of the Plants.
- The Contractor shall offer a Latent Defect Liability Period commencing from the date of Provisional Acceptance of 10 years for all civil and structural works and at least 5 years for all items of equipment.
- The Contractor shall perform a root cause analysis of any defect or Latent Defect which has been repaired, replaced or made good 3 or more times and identify and implement at its own cost any modification to the design as may be necessary to make good the Works and/or the Plant.
- At Provisional Acceptance, all guarantees and warranties from all manufacturers, agents and suppliers shall be passed through onto the Employer.

19. Project Management

- The Contractor shall also provide a comprehensive project management organisation for the overall project and comply with the Project Management requirements outlined in Section 4.
- The Contractor shall produce, maintain and monitor a programme covering all the activities of the Contract.
- The programme, included in the EPC Contract, shall include key events/Milestones relating to the design, manufacture, delivery, civils, construction, erection, commissioning and Tests on Completion.
- The Contractor shall provide progress reports that demonstrate the status of the PV Project and any issues that may affect the successful and timely completion of the PV Project.

20. Operation and Maintenance

- The Contractor shall be responsible for operation and maintenance (O&M) until 5 (five) years from Provisional Acceptance by the Employer.
- The Contract shall provide an operation and maintenance concept, which shall ensure the guaranteed availability of the PV plant. All required tools, equipment and facilities necessary for carrying out the operation and maintenance of the PV plant shall be provided.
- The Contractor is responsible for the spare parts and for replacing and replenishing the stock of the spare parts for the term of the O&M contract.
- The Contractor will be responsible for security provision on the PV Plants and shall be in charge (through a security company, if and as required by SANParks) of monitoring the security system 24 hours a day, 365 days per year.
- During this period, the Contractor shall be required to provide on the job training to Employer's workers in order for the Employer to take over the O&M of the plants after Final Acceptance.

21. Training

- The Contractor shall ensure that all staff working on the PV Plants have received proper job specific training, safety training and are qualified to conduct the works.
- The Contractor shall provide such training and equipment familiarisation for the Employer's and Operator's staff (including training regarding the grid interface equipment and procedures) as may reasonably be required. This training is for each of the systems and equipment used in the design of the PV Plants, together with "on the job" familiarisation training throughout the start-up and commissioning phases.
- Classroom training, if required shall be provided such that it is completed prior to "on the job" familiarisation during commissioning unless otherwise agreed with the Employer.

22. Maintenance Tool, Spare Parts and Consumables

- The Contractor shall supply all maintenance tools, jigs and equipment necessary for the operation and maintenance of the PV Plants, including any special vehicles such as forklift trucks necessary for moving or storing equipment on the sites.
- The Contractor shall provide all special tools, jigs and equipment referred to in the manuals for maintenance, testing and inspection for whole of the PV Plants.
- The Contractor shall provide all spares parts, replacement parts, tools and consumables necessary for discharging its responsibilities up to Final Acceptance. The Contractor is responsible for the provision at no cost to the Employer of all replacement of defective equipment during the Defects Liability Period.
- The Contractor shall provide all spares parts, replacement parts and tools required for the safe and reliable operation of the plant at Final Acceptance.

- The Contractor shall ensure sufficient Spare Parts and consumables are available on the sites to avoid delays to completion of the PV Plants.

23. Permits and Consents

- The Contractor shall be responsible for all Licences which means any permit, consent, approval, authorisation, agreement, no objection certificate, waiver or licence which must be obtained from any person (including both private persons and public sector entities) in order for the works to be performed and for any goods to be transported, imported or exported. The Contractor shall be responsible for making arrangements and permits for the provision of the services required at the sites during the construction period, including but not limited to, water, foul sewerage, electricity and telephones.
- The Contractor shall provide appropriate architectural treatment to the PV Plants and landscaping within the boundary such that detailed planning consent can be obtained from the local authority. To this end the Contractor shall submit its detailed design, in timely fashion as part of the design review/approval process.
- For all connections between the PV Plants and external works, for example 6.6kV Grid, the interface systems provided by the Contractor shall be approved by the relevant third parties, if required by law or regulation, the Contractor shall provide to the Employer the necessary documents and fulfilling the requirements, the Employer shall apply for the approval application.

24. Temporary Site Facilities

- The Contractor will provide and maintain all temporary site facilities required for itself. The temporary facilities shall be located within the boundary of the PV Plants. The provision of any additional area required by the Contractor outside of the PV Plants boundary, together with all associated costs, shall be the sole responsibility of the Contractor. The Contractor shall arrange for temporary power, water and sanitation for project staff and workers including Employer staff.
- The Contractor shall provide regular office cleaning services for the temporary facilities.
- On completion of the construction phase, all areas used for lay down and worker accommodation shall be returned to original as found condition.

25. PROJECT MANAGEMENT REQUIREMENTS

25.1. Role of the Contractor

- The Contractor shall be responsible for the management and control of all phases of the Works, including that of his Subcontractors.
- The Contractor shall submit with its proposals the CV's of the key personnel envisaged for the project, which shall be subject to the Employer's Approval, not to be unreasonably withheld.
- The Contractor shall provide a project manager who shall be responsible for reporting to the Employer for the complete scope of works covered by the Contract and shall be the single point of contact between the Contractor's management team and that of the Employer. The Contractor shall state a representative for each site, who shall be responsible for the Contractor's site planning activities.
- The Employer may at any time request to replace/remove any member of the Contractor's team from the project. Upon receiving such request, the Contractor shall replace/remove the team member immediately.
- The Contractor shall manage the Contract in terms of time, cost, resources and quality and shall respond to deficiencies or delays by establishing procedures for recovering the programme situation.
- The Contractor shall set up coding systems for milestones, programmes, work activities, documentation, file numbers etc. to be applied consistently for the duration of the works.

- The Contractor shall cooperate with all reasonable requests for meetings and information requests that may arise from the Employer.
- All of the Contractor's costs associated with the management of the Contract are deemed to be included within the Contract Price. This includes, but is not limited to, costs for all meetings, reports, submissions, inspections, testing and commissioning.
- The Contractor shall have made allowance in its price and schedule for:
    - Any additional project documents it may need to produce during the course of the works and which the Employer's Engineer (or appointed representative) may require for approval, review, audit or comment;
    - The development, preparation and submission of all additional project documents that are necessary for compliance with any local regulations (if applicable).

25.2. Vendor and Subcontractor selection control

- The Contractor shall provide details of the manufacturer and specifications for the key equipment in the proposal, including but not limited to PV modules, inverters, batteries, mounting structure, transformers, switchgears and monitoring systems. Where a specific manufacturer has not been selected a list of up to five potential suppliers shall be provided. The Employer shall approve these manufacturers and reserves the right to remove any of them from the list if they do not meet the required specifications.
- The Contractor may only subcontract elements of the work in accordance with the EPC Contract.
- The Contractor's letters of intent and orders to subcontractors shall quote the Employer's Contract reference and project name, and instruct the subcontractors to quote that reference, name and order number in all correspondence. All such letters of intent and orders shall clearly specify the required delivery dates and shall be endorsed to the effect that the Plants, goods or material is subject to progress and inspection by the Employer or its agents.
- The Contractor shall ensure that similar requirements are imposed on any Subcontractors to follow the relevant technical and contractual requirements as the main contract and have adequate controls covering programme management, resource deployment and quality assurance.

25.3. Procurement and Material management Requirements

The Contractor shall satisfy the following procurement and material management requirements:

- Related conceptual design documents shall be approved by the Employer before placing purchase order for any key equipment (PV modules, inverters, transformer, switchgear, battery bank, control and monitoring software) required for the works;
- All related specifications shall be submitted to the Employer for review;
- Factory Inspection and Test Plan shall be approved by the Employer before starting manufacturing of any key equipment;
- The Employer shall have the right to audit the manufacturing process of any item of key equipment by giving reasonable notice to the Contractor;
- The Employer shall have the right to attend any agreed manufacturing witness test or inspection as stated in the inspection and test plan;
- Any in-house or third party reports covering quality and progress information with regard to manufacturing of the key equipment shall be submitted to Employer in the monthly report;
- Material Receiving Inspection Report shall be prepared by Contractor and shall be submitted to
- Employer for information; and
- The Contractor shall invite the Employer to attend the receiving inspection of key equipment prior to release for installation.

25.4. Construction Schedule

- The Contractor shall develop a detailed Construction Schedule or Construction Programme covering the entire scope of the Works, from the start of engineering through to commercial operation.
- This Construction Schedule shall be in sufficient detail to enable the works to be progressed by the Contractor.
- Construction Schedule activities shall be on a time critical path format. The Construction Schedule shall show activities on a weekly basis and as a minimum include the following:
    - The order and interdependence of all activities;
    - All inspections and check points;

25.5. Key Contract dates

- Appropriate interfaces between contractors;
- All activities of the Employer which affect progress and/or affect required dates for completion of all or part of the works;
- Information in such detail as to allow review of major activities;
- Significant Milestones including milestones relating to the terms of payment;
- Detailed commissioning activities; and
- Detailed Tests on Completion activities

25.6. The Construction Schedule shall contain all the following phases:

- Engineering;
- Procurement;
- Inspection;
- Manufacture and fabrication;
- Construction and erection;
- Testing and pre-commissioning;
- Commissioning; and
- Performance testing.

If requested by the Employer, a more detailed Construction Schedule recording activities on a daily basis shall be provided.

The Contractor shall provide to the Employer, on a regular basis, planning data in a compatible format that may be used in the Employer's own in-house computer system.

A preliminary version of this Construction Schedule shall be provided with the bid, assuming that Notice to Proceed is issued on a date determined after appointment.

The detailed programme shall be issued to the Employer no later than *7* days after the Notice to Proceed date. Once submitted and agreed the initial data on the programme shall become a benchmark for monitoring and demonstrating project progress and this benchmark shall not be modified or re-forecast except with the explicit agreement of the Employer.

25.7. Progress Reporting

- Progress measurement at site shall be carried out on a weekly basis.

- The Contractor shall submit a detailed progress report for each month. The monthly report shall contain, but not be limited to:
    - A listing of late activities more than two weeks late; Explanations for late activities which are having, or are likely to have, impact on the project schedule; (Note, important issues, which could jeopardise the project schedule, shall be brought to the attention of the Employer immediately they occur, along with the proposed corrective actions);
    - Details of measures proposed to bring late activities back on schedule;
    - Outstanding interface data and measures proposed to expedite the issue of critical interface data;
    - Status report on milestones achieved and, in detail, the percentage completion of each incomplete milestone; and
    - Confirmation of the achievement of the completion date.
- In addition to the schedule related activities referred to above, the monthly progress report shall also include, but not be limited to, the following:
    - Executive summary;
    - Problem areas (and details of measures being taken to resolve problems);
    - A statement of the number of site personnel engaged in the work during the reporting period and, where relevant, details of erection equipment in use or held in readiness;
    - A statement of the number of accidents and near-miss incidents resulting in damage to equipment or Plants, and injury or death of personnel engaged in work on the Site, together with details of such accidents and incidents, and statement of corrective actions;
    - Document index marked up to show document status;
    - Purchasing schedule marked up to show status of procurement activities;
    - Quality non-conformances (Copies of those inspection and test reports which identify any deviations) and a statement of corrective actions;
    - A summary of inspections and tests that have been performed in reporting period and will be performed in the next reporting period, if any;
    - Copies of equipment quality reports which identify the need for corrective actions and evidence of the implementation of corrective actions, if any;
    - Progress on compilation of operating & maintenance manuals;
    - Colour photographs showing the progress of construction;
    - Update of manning histograms (showing planned and actual manning);
    - Update of progress 'S' curves (showing planned and actual progress);
    - Status of any variations to the Contract and cost report; and
    - Programme for the following months.
- The project master schedule shall be marked up on a monthly basis by the Contractor to indicate the progress achieved against each activity and submitted as part of the monthly progress report.

25.8. Progress Meetings

During the engineering and procurement phases, all progress meetings, and any other meetings deemed necessary to resolve technical and commercial problems, shall be held in the Kgalagadi Transfrontier Park, Pretoria or on Teams (final location to be agreed between the parties). Once construction activities commence, progress meetings will normally be held at the site.

The Contractor shall be represented at these meetings by the Contractor’s key personnel who are intimately familiar with the project and its current status and who have decision-making authority. They shall assist the Employer's personnel, in every way, to determine the actual status of the project and the balance of work to be completed in order to meet near term and long-term Milestone Schedule dates. The Contractor's invoiced progress shall agree with the actual progress realized on the Construction Schedule.

Further meetings between the parties will be held when considered necessary and at no extra cost to the Employer. The Contractor shall furnish such reports and program mark-ups as may be required for these meetings.

26. Project Documentation Requirements

26.1. General

The Contractor shall produce and provide all necessary drawings and documents to support the design, construction, erection, commissioning, operation and maintenance of the Plants, including all subcontractors' and vendors' documents. Additionally, the Contractor shall submit copies of all documentation submitted to third parties to satisfy any regulatory or legal requirements and any additional drawings and/or documentation necessary to meet the requirements of the Specification and may be required to be represented at any presentations to the local authorities.

The Contractor shall provide no later than *7* days after the Notice to Proceed date, a detailed schedule of documents to be produced indicating the documents and drawings to be submitted for approval, review and/or information. The document schedule shall indicate the planned dates of submission. This document is subject to approval by the Employer and any further documents requested by the Employer shall be included.

The schedule of documentation shall also indicate to the Employer those specific design, safety and related elements required for third party verification and, where possible, the proposed third party.

All project documentation shall be submitted in both hard-copy and electronic formats. Each document submission shall be accompanied by a suitable uniquely numbered transmittal notice which will indicate, as a minimum, the document number, revision, title and status of each document transmitted together with an indication of the purpose of the transmittal and the parties to which the documents are submitted.

The Contractor shall maintain an up to date drawing register, which shall list all drawings, submitted by the Contractor and shall contain the following information for each drawing:

- Drawing title, number and revision;
- Planned issue date for Employers approval;
- Actual issue date for Employers approval;
- Approval status;
- Planned issue date for site;
- Actual issue date for site; and
- Date and status of Employers Approval.

As-built drawings signed by the Professional Engineer shall be provided prior to Provisional Acceptance in compliance with all South African regulations and standards.

26.2. Document Format

All documentation shall be organised in a logical manner and all contents shall be properly indexed. A revision status record sheet at the front of each document shall facilitate recording of amendments in a logical manner. Revision indication and issue dates shall also appear on each amended sheet.
All drawings shall be provided in AUTOCAD or in other computer readable format (e.g. PDF).
All documentation supplied to the Employer must be written in English.

An approved title block shall appear on the lower right-hand corner of all drawings and shall include information essential for the identification, administration and interpretation of the drawing:

- Name of originator (Contractor, Subcontractor etc.);
- Name of Plants;
- Name of Employer;
- Originator’s drawing number; and
- Descriptive title.

All drawings shall carry revision boxes. These shall be indexed with revision letters from A to Z followed by AA, to ZZ etc. It is important that all revisions are indicated on the drawing and that the substance of each revision shall have all changes clouded. When drawings are revised, previous circles or designations shall be removed from drawings proper, but not from the revision box. All drawings shall be drawn, designed, checked, approved and signed by the Contractor before submittal.

All drawings shall be prepared using SI (Systeme Internationale d'Unites) metric units using one of the following scales 1:1, 1:2, 1:5, 1:10, 1:25, 1:50, 1:100, 1:200, 1:1000, or 1:2500. Third angle projection shall be used throughout. A figured scale at least 100mm long shall appear on all drawings.

General arrangement drawings shall all conform to or relate to a common site grid and coordinate system and shall be orientated so that site North is to the top of the paper.

Symbols shall comply with relevant international standards for construction drawing practice; Graphical symbols for general engineering and electrical power, telecommunications and electronics diagrams.

For the requirements for electrical diagrams, general reference is made to IEC 113 "Diagrams, Charts, Tables", and IEC 617 "Graphic Symbols for Diagrams".

26.3. Documents to be provided

The Contractor shall submit, as a minimum, the following documents:

Premobilisation documents

The following documents shall be provided prior to commencement of site works. Any Employer's comments shall be incorporated at the earliest:

- Detailed Construction Schedule;
- Construction Health and Safety Plan;
- Environment Management Plan;
- Traffic Management Plan;
- Quality Plan;
- Site security Plan;
- Site preparation plan;
- Waste management Plants;
- Project Organogram including project management procedures, CV of Project manager and identification of subcontractors; and
- Proposal for signage and notices.

During Construction

The Employer and Contractor shall agree on a definitive list of documents subject to Employer review but list shall cover as a minimum:

- Overall layout of the Plants showing the location of all buildings, inverter cabins, battery bank, switchgear (including control and relay panels), combiner boxes, modules and mounting structures, cable routes, fencing, meteorological station, lighting system, roads and terminal points;
- List of design codes to be followed;
- Copy of any additional soil investigations undertaken;
- Detail of all loadings, both actual and assumed, incorporated into the designs. Where an interpretation of codes of practice is necessary, e.g. for wind and seismic loading, the assessment and conclusion shall be clearly stated;
- Material data to include strength of materials and source of manufacture of all structural elements;
- Calculations for structural, civil, and building work;

- Foundation/civil drawings providing all necessary information to convey the civil works and building design for all Plants;
- Drainage system drawings (if applicable);
- Dimensions, loads and details of cable trenches/racks required;
- Structural connection of the foundations to the mounting structure
- Proposed transport and handling procedures for large/heavy components
- Equipment lists, specifications and type certification (where applicable);
- Electrical studies – Earthing, lightning, lighting, energy yield, and grid impact studies as applicable;
- Protection setting co-ordination studies;
- Single line diagrams of main electrical connections (SLD's);
- Flash Test results of all modules used in the PV Plants;
- Micro crack reports of PV modules;
- Detailed general arrangement and construction drawings for all major Plants items;
- Control system configuration block diagram;
- Quality procedures and works inspection schedules;
- Schedule of all ac and dc loads;
- Electrical principle diagrams including protection, synchronising and measurement;
- Electrical schematic diagrams, including power, control, indication, protection and alarms;
- Cable schedule, route drawing and trench cross-section;
- Site security system documents;
- Instrument specifications;
- Instrument lists, logic diagrams for control, alarm and sequence interlocks;
- Control System Architecture Diagrams
- Control System Interface Description
- Instrument Arrangement Drawings
- Any additional project documents it may need to produce during the course of the work and which the Employer's Engineer may require for approval, review, audit or comment;
- The development, preparation and submission of all required documentation to relevant authorities;
- Schedules of spares and consumable items;
- Records of construction activities;
- Erection procedures for all equipment and systems (information to be provided at least one week prior to such erection activities being carried out on the site) and
- Copies of unpriced purchase orders for all key equipment and unpriced sub-contracts for all engineering, construction and commissioning works (information to be within 7 days of the date of issue of the relevant purchase orders or sub-contracts).

For those documents subject to review and comment, the Contractor shall allow at least fourteen (14) calendar days for each approval by the Employer unless otherwise stated in the Contract. If the document submission is not in line with the approved document submission schedule, then the period for Employer approval shall be extended as requested by Employer.

Approval of the Contractor's drawings or calculations by the Employer shall not relieve the Contractor of any of his obligations to meet all the requirements of the Contract or relieve the Contractor of the responsibility for the correctness of such drawings. The Contractor shall make any changes that are necessary to make the work conform to the provisions and intent of the Contract.

For those documents requiring approval and/or approval by third parties, i.e. local authorities, the Contractor shall allow for a longer approval period.

Documents for Testing and Commissioning

Within two weeks of the completion of commissioning or factory testing, the Contractor shall submit a comprehensive commissioning report with signed check sheets. Hard copies as well as electronic copies of all

test certificates, reports and records covering manufacturing tests shall be submitted to the Employer at the conclusion of the FAT, if applicable or one month after shipment.

The Contractor shall submit copies of the test procedure to the Employer for approval not later than one month prior to the acceptance test.

Within one week of completion of the performance and acceptance tests the Contractor shall submit to the Employer hard copies and electronic copies of the test report.

The Contractor shall operate a system for maintaining all records and correspondence.

Documents Required at Provisional Acceptance

The Contractor shall submit the draft version of the following documents to the Employer for review not later than one month prior to the Provisional Acceptance.

- O&M Manual;
- Safety File;
- Quality File;
- Environmental File;
- Calibration certificates of meteorological sensors and meter; and
- Final copies of all documentation (including red marked as built drawings) submitted for design review.

Following comments from the Employer, the Contractor shall provide the final versions of the above documents at Provisional Acceptance.

The following documents shall also be provided at Provisional Acceptance:

- As-built drawings signed by the Professional Engineer in compliance with all South African regulations and standards
- The commissioning report including commissioning test results.

Record Documentation (As Built Documents)

At Provisional Acceptance, the Contractor shall provide a complete set of hand marked as-built drawings including all general arrangements, wiring diagrams, lists of set points and calibration data.

Documents submitted for record purposes shall accurately reflect the Plants in the “as built” condition and shall have been accurately updated to reflect any modifications that were carried out during the erection, commissioning and operational phase up to project completion.

All documentation shall comply with all legislations, regulations and standards in South Africa, and be duly signed by the Professional Engineer where applicable.

The Contractor shall pass to the Employer at Provisional Acceptance, final documentation including as built documentation for the works in accordance with the agreed documentation schedule.

Where applicable, the final documentation shall be updated as required during the defects liability period to take into account modifications that occur to the Plants and equipment to correct defective equipment or performance.

26.4. Operation and Maintenance Manuals

The manuals shall include all operating procedures and instructions, equipment supplier's operating instructions and all other information considered necessary for safe and successful operation. The manuals shall cover all Plants and equipment supplied.

The operation and maintenance manuals shall contain but not be limited to the following:

- A detailed system description of the main Plants and ancillary systems, including the design operating conditions and system control philosophy;
- Operating procedures (OP) of Plants normal start-up, operating and shut-down of the Plants.
- A detailed explanation of equipment safety interlocks and emergency shutdown systems, including recommended operating procedures for each alarm and shutdown for both main Plants and ancillary equipment;
- Emergency procedures and any procedures recommended to prevent Plants deterioration during prolonged non-operation;
- A maintenance procedure manual (MP) explaining the steps and procedures required to prepare and perform all maintenance on the Plants including details of the spares and special tools required to carry out the work;
- Throughout the operation and maintenance manual special safety precautions and procedures shall be explained for each operation;
- Fault diagnosis guidelines;
- A comprehensive preventive maintenance schedule outlining each maintenance operation and the frequency with which each operation shall be repeated
- Material specifications such as chemicals, filters, lubricants, plus standard catalogue references shall be provided for all equipment;
- Detailed instruction manuals covering all instruments and other hardware together with copies of all software to enable the Employer to maintain the Plants instrumentation and control systems and in particular to:
  - Identify faults
  - Make adjustments
  - Reconfigure
  - Reprogram
  - Alter control programming, logic, algorithms or settings
  - Retrieve Plants historical data from system storage media
- Detailed information about the spare parts required for the Plants including details of their dimensions, manufacturing standards and materials as well as ordering details and contact details of the supplier;
- Original equipment manufacturers' warranties;
- Copies of all test results;
- Comprehensive indexing and cross-referencing shall be included to ensure easy access to information as required. A master index covering all the separate parts of the manuals shall be included in each volume, in addition to the detailed index for the particular volume.
- First draft of the O&M Manuals shall be submitted to the Employer for review and comment at least [one month] prior to commissioning of the PV Plants. The Contractor shall revise and issue the final version of the O&M Manuals not later than [one] month after the date of issue of the Provisional Acceptance Certificate.

The Contractor shall submit hard copies and electronic copies of the final O&M manual to the Employer and the Employer's Engineer.

The Contractor shall revise and update the O&M manuals as necessary to incorporate new material or to make corrections and revisions during the course of the project and the operation of the PV Plants until the issue of the Final Acceptance Certificate.

The manuals format shall be on standard metric A4 sheets. Drawings and schedules shall be A3.

Where a drawing cannot be reduced to a suitable size for the manual, it shall be folded to A4 size and inserted into a "pocket" which is to be bound into the rear of the relevant section of the manual.

The Operating and maintenance (O&M) instruction manuals, including guidebooks, spare part catalogues and

supporting information materials, to be provided under this Contract shall be prepared in both clear simple and precise English to enable the Employer to operate and maintain the PV Plants efficiently.

26.5. Operation and Maintenance Services

The Contractor shall be responsible for the Operation and Maintenance (O&M) of the plant at least until Final Acceptance. The O&M Scope of works shall include but not be limited to the following:

- Operation of the PV plants on a 24 hour per day, 365 days per year basis including all activities related to operation, examination and other activities including:
  - Inspection and verification of the proper operation of all equipment;
  - Daily review of monitored data, which shall be available in real time;
  - Commissioning and conducting technical investigation and reporting (root cause analysis) on poor performing plant elements and hardware failures;
  - Operation, production and emission data recording;
  - Remote site monitoring (as required), analysis and troubleshooting during solar hours, three hundred and sixty five (365) days a year;
  - Monthly reporting on the operation and maintenance activities undertaken, plant performance, HSE, operating budget; and
  - Development of an annual operating and maintenance plan;
- Operation and Maintenance of the PV Plants under normal operation conditions, including amongst others:
  - Maintenance, including inspections as per the O&M Manual, its detailed procedures and the equipment manufacturers' guidelines and requirements;
  - Allocation of the human and material resources (such as equipment and tooling) needed to perform the preventive maintenance operations required;
  - Recording of all maintenance operations performed;
  - Corrective maintenance as required with a response time of 24 hours from the detection of a failure/anomaly;
  - Procure and manage inventory of spares and consumables
  - Cleaning of the PV modules (which shall be done at least twice within any twelve month period and promptly following each mud, sand or dust storms in addition to the twice a year cleaning).
  - Cleaning of all the solar radiation sensors installed at least every two weeks and promptly after remote discovery / detection of bird drop or similar on the glass dome of such sensors
  - Vegetation control of the Premises as and when necessary in order to avoid shadowing of the PV modules, to keep the premises in good condition, and to minimize the risk of fire; and
  - Maintenance of all buildings/containers within the PV plants.
- Quality, safety and environmental management including:
  - Audits to verify compliance with quality, environmental and safety standards;
  - Calibration of measurement tools and equipment;
  - Risk evaluations;
  - Development and implementation of emergency plans;
  - Personnel training to ensure proper qualifications;
  - Environmental monitoring and waste management.
- Management of any warranty or other claims associated with the Project.

27. SITE DATA

27.1. Geographical data

a. GPS COORDINATES OF THE CAMPS:
Mata Mata ($25^0 46' 15.39" S; 19^0 59' 58.03"$E) and Nossob ($25^0 25" 19.38" S; 20^0 35' 22.54."$ E)

Contractor	Witness for Contractor	Employer	Witness for Employer

b. DISTANCES

i. **UPINGTON TO TWEE RIVIEREN:** 265 km
ii. **JHB TO TWEE RIVIEREN:** 1090 km
iii. **TWEE RIVIEREN TO MATA MATA:** 148 km
iv. **MATA MATA TO NOSSOB:**136 km

c. ROAD CONDITIONS: Tar up to Twee Rivieren then gravel/sand in fair condition, only from Mata Mata to Nossob there is a very bumpy stretch.

d. Map showing the two sites relative to each other.

e. See Addendum A for more site photos.

f. General map for Kgalagadi

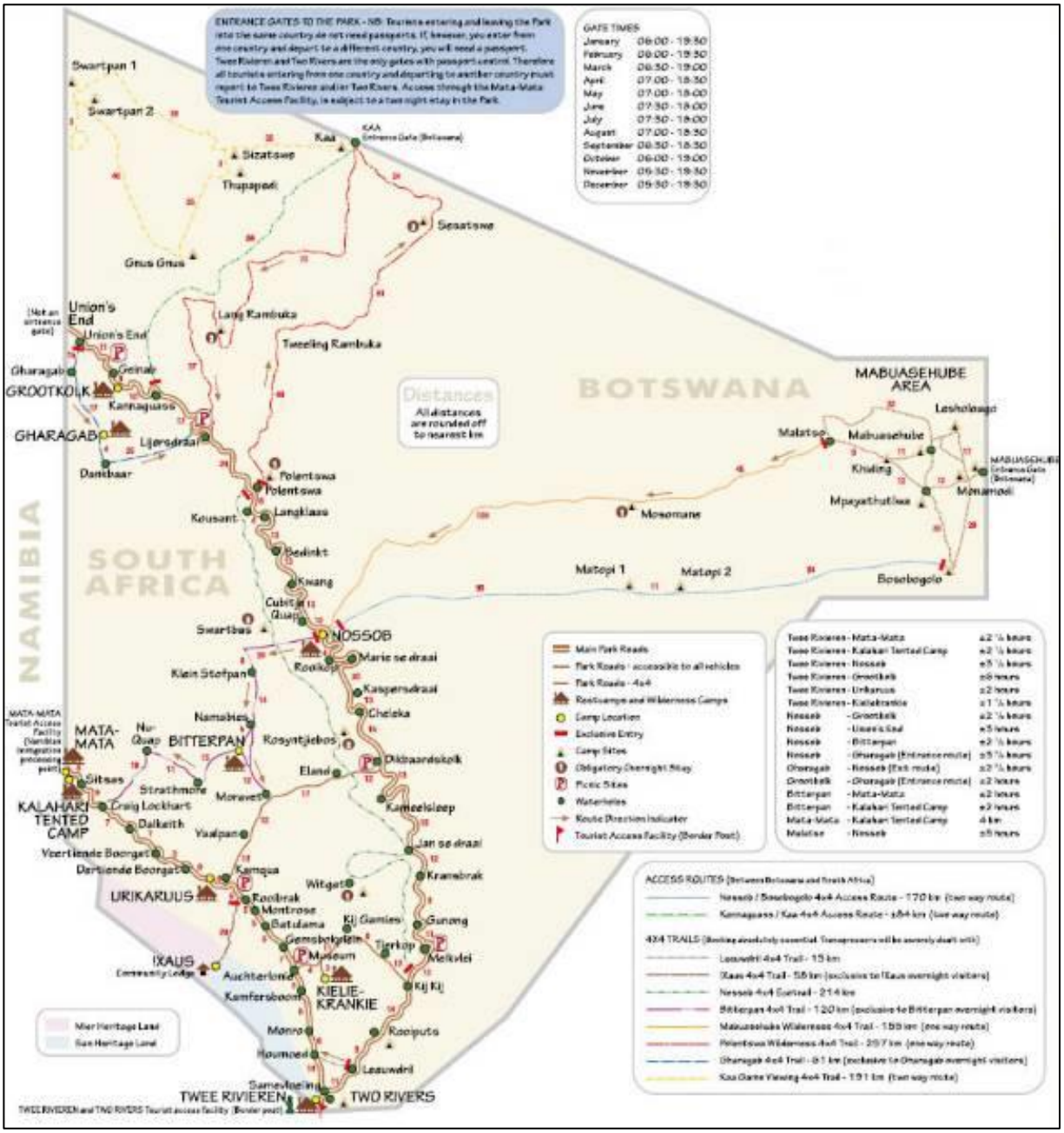

Figure 1: Kgalagadi Map

Contractor	Witness for Contractor	Employer	Witness for Employer

28. Geotechnical data

Some photos of the topography is included in Appendix A but is included for information only, and the Contractor shall be responsible for satisfying itself as to the geotechnical characteristics of the Site including transmission routes and as to the suitability of the Site for the Project and shall assume all risks related to geotechnical conditions. The Contractor shall identify any underground services to be avoided. All required costs related with underground conditions and removal of existing services shall be included in Contract price and scope of the Contractor.

29. Climate

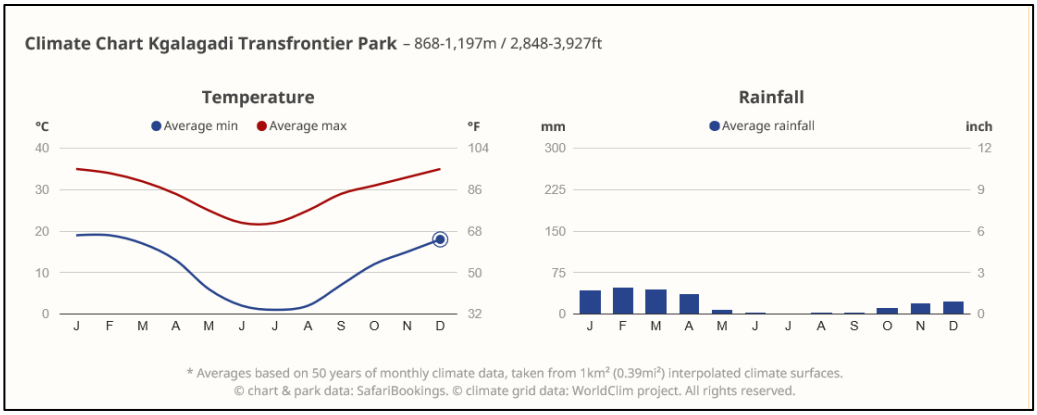

Figure 2: Kgalagadi Climate

The Contractor shall be responsible to satisfy itself of the information available and/or inform of any discrepancies with other sources of data; however, the information provided in this RfP shall be used for the purpose of responding to this RfP and for any calculations to be conducted for such purposes.

30. Demand Profile

The demand profiles for the two sites are shown in Appendix B. The contractor must gather demand information on site with suitable data loggers and design the system correctly according to the data.

31. DESIGN CONSIDERATIONS

31.1. Design life and components

The PV Plants design and component selection shall consider the following:

- PV Plants design life of 25 years subject to Plants operation (except the battery bank, which can be designed for a lower lifespan which shall be indicated in the proposal), and maintenance in accordance with the manufacturer's recommendations and normal degradation;
- Designed for high availability and reliability;
- Designed for the site specific climatic conditions, soil conditions, environment restrictions and existing demand profile;
- Designed according to all the applicable requirements and standards in South Africa, including but not limited to the SANS regulations and Eskom requirements, as well as good international practices; and

- Components to be new and unused and manufactured by reputable manufacturers with experience in at least 2 PV projects of similar size or as stated in this RfP.

31.2. Component specification and guarantees

The following minimum specifications and guarantees shall be provided for the **main** PV Plants components:

COMPONENT	MINIMUM GUARANTEE
Inverters	10 years, extendable to 15 or 20 years
Batteries (Lithium ion)	10 years or 10 000 cycles whichever comes first
Battery BMS equipment	10 years
Civils	10 years
Mounting structures	25 years
PV cables and MC4 connectors	25 years

Table 2: Component Specifications

31.3. Maintainability

The Contractor must provide access around all equipment in accordance with good utility practice, to allow effective inspection, maintenance and removal. Aisle ways adjacent to equipment and laydown areas shall be sufficient to facilitate all aspects of maintenance. The Contractor shall provide a suitable means of mechanical lifting and handling where required for equipment maintenance. All routine maintenance activities shall be achievable from permanent work platforms with suitable access and safety devices (such as handrails, thermal insulation from hot parts, etc.). Suitable means of mechanical lifting and handling where required for equipment maintenance shall be provided by the Contractor.

To minimise spares holding and enhance maintenance and operation, Plants items performing similar functions e.g. switchgear, modules, inverters, consumable items (indicating lamps, recorder charts, printer papers, ink cartridges), as far as practicable, shall be standardised and obtained from a minimum number of suppliers. Similarly the design of major Plants items shall be consistent to maximise inter-changeability of components.

In addition, the Contractor shall ensure that all parts and equipment incorporated into the Plants shall be supplied together with the part number of the original equipment manufacturer (OEM), and that such part numbers shall wherever possible be reflected on the parts themselves, on the drawings, and on the packaging of such items. All spares and equipment shall be suitable bar coded to ease identification and tracking.

Each device which has the capability of manual isolation for maintenance purposes (power supply, MCB's, isolators, earthing switches, power supply circuit breakers, control selector switches) shall be provided with means of locking out with a padlocking system. All padlocks, with 2 sets of keys, shall be supplied under the Contract.

31.4. PV plant availability and reliability

The PV Plants shall provide a high degree of reliability and availability. The design shall incorporate features consistent with the requirement for high reliability and availability, including but not limited to:

- Optimal use of solar, batteries and generator synchronization;
- Systems that can be sectioned and expanded
- Redundancy of equipment and replacement provisions

The PV Plants shall be designed for a minimum Annual Availability of over 98% from PV and batteries and at least 80% reduction in diesel consumption.

31.5. Software

Licences for the software systems will be purchased and made available with step-in rights for the future purchasers and operators of the Plants.

The Contractor shall provide all project specific software, firmware, and operating system developed for and applicable to the control and monitoring systems being provided. The software shall be completely documented by the Contractor and be provided on a non-proprietary basis.

Custom software required to adapt or customise the control and monitoring systems shall be provided by the Contractor. The Contractor shall supply licenses and duplicate software for operation of the PV Plants from remote locations as required by SANParks through using desk-top PCs or laptops.

31.6. System Concepts

The conceptual design of the PV Plants, including a reasonable level of detail in all the areas specified in the Minimum Functional Specifications below, shall form part of the bid submission.
The PV Plants shall be designed to ensure ease of maintenance and operation and shall be arranged to minimise the crossover of services, cables, piping and access ways. The Contractor shall ensure that sufficient laydown spaces and lifting devices are arranged where required.

The layout shall also take into full consideration of the health and safety and environmental requirements as stated in this RfP and the requirements of the planning permits, if any.

Additionally, the system design shall account for the following requirements:

31.7. Off grid systems/island systems

Off-grid PV systems are envisaged for the Mata Mata and Nossob camps. Currently, the demand in these two sites is met through two diesel generators in each site. The off-grid PV Plants shall be designed in order to meet the demand requirements of each of these Camps, noting that the existing diesel generators will remain as a back-up.

There are two typical topologies for off-grid PV systems, depending on how the generators and consumers are interconnected (see Figure below):

- AC coupling: generators and consumers are connected using an AC bus. This approach provides more flexibility on the amount of generators and storage capacity that can be added to the system, but requires a more complex control logic and, generally, more pieces of equipment (e.g. each DC generator and battery bank is connected to one inverter).
- DC coupling: the solar module and battery system are interconnected using a DC bus by a Solar Charge Controller. An inverter is then used to convert the DC power from the PV modules or the batteries in AC, in order to meet the demand.

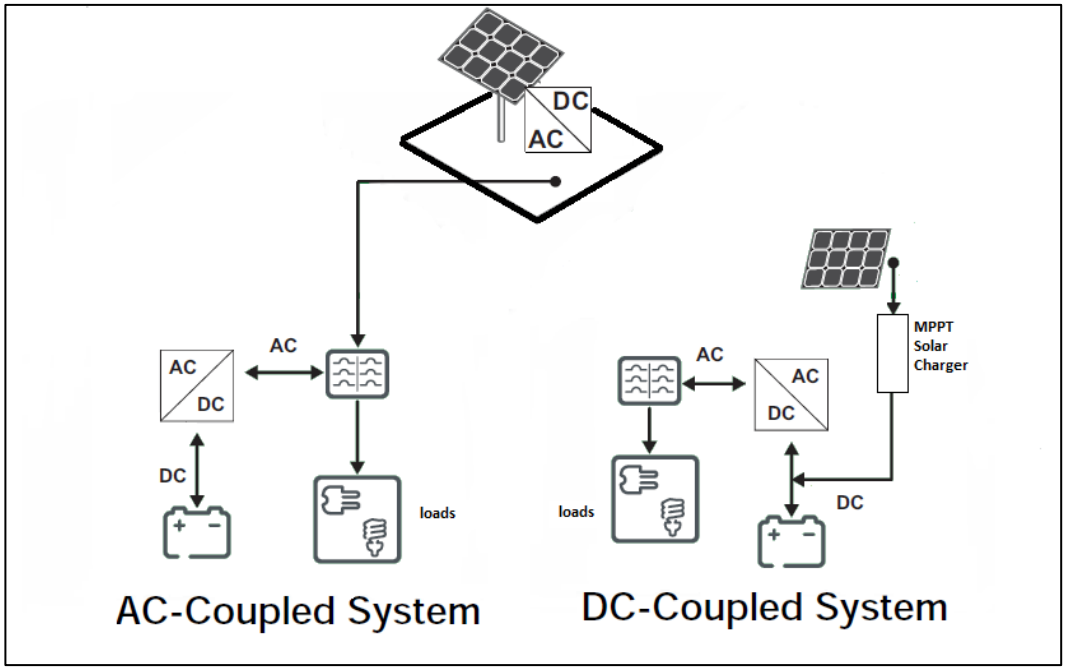

Figure 3: Topologies

Considering the requirements of this project, it is recommended that an AC Coupling approach is adopted.

The design for these two projects shall consider the following:

- Land area available
- Demand requirements as provided in Appendix B shall be met;
- Use of the back-up diesel generator is minimised. The system shall be designed such that, at maximum, this shall operate less than to deliver 20% of the energy demand.
- The size of the solar system and the battery banks is optimised in order to minimise the amount of dumping of solar energy due to lack of storage capacity. The amount of electricity dumped shall be below 35%;
- Capable of starting the existing diesel generators automatically when a certain threshold is reached in the levels of discharge of the battery bank (this shall be an option for Employer to enable/disable); and
- Capable of sending notifications via email and/or SMS to the Employer when a certain threshold is reached in the levels of discharge of the battery bank (this shall be an option for SANParks to enable/disable).

For both Mata Mata and Nossob, the PV Plants shall be interconnected to the existing demand at the point of connection where the diesel generators are currently interconnected with the demand, which is owned by SANParks. The voltage level at this point of connection is 400V. Further details on the existing equipment are provided in Appendix C such as generator plants.

The PV Plants interconnection shall be done in compliance with SANParks requirements and anyapplicable South African and/or international codes and standards.

Each PV Plant shall include a metering device at the point of connection, in line with the MinimumFunctional Specifications in this RFP.

31.8. Energy Yield Estimation

Industry standard modelling tools, such as PVSyst, Homer Software, Helioscope or equivalent, shall be used to

undertake the yield modelling for the PV systems.

The design shall take into account the solar resource data provided available in these software programs and linked to Meteonorm or similar.

The design shall account for potential shading (e.g. panels shading each other, from trees, fences, buildings, posts, poles and other structures) that may be, or become problematic is time.

The energy yield calculations at each of the project sites shall be presented in the bid submission and the following losses shall be considered in these calculations:

- Incidence angle loss;
- Low irradiation loss;
- Temperature loss;
- Shading loss (both mutual and from external objects);
- Soiling loss;
- Mismatch loss and power tolerance loss, if any;
- Cabling loss (AC and DC);
- Transformer loss;
- Inverter loss;
- System unavailability;
- Degradation; and
- Auxiliary consumption

The balance of systems must be selected and designed such that the auxiliary losses due to self- consumption or the PV Plant should not exceed a maximum of 1%.

The results shall be presented on a yearly basis and include (but not be limited to):

- Description of the losses considered;
- Total energy produced by the solar modules;
- Total energy produced by the diesel generator;
- Total energy dumped (due to lack of storage capacity and demand);
- Maximum achieved Depth of Discharge for the battery bank;
- Total demand (load consumption);

31.9. Terminal Points

- Employer will provide access to a water supply point in the proximity of the project site. The Contractor shall be responsible for its transport to site;
- The Contractor shall be responsible for its electricity consumption. Should the Contractor wish to connect onto Kgalagadi Transfrontier Park reticulation, the Contractor shall be responsible for all connections to the applicable specifications and standards, including metering and pay rates as per SANParks Tariff rates, which will be provided on request;
- The Contractor shall be responsible for the disposal of all of its waste. A waste site is dedicated for certain types of waste, especially non-hazardous, within Park, which can be used;
- The Contractor shall be responsible for the accommodation of workers.
- Transport shall be arranged by the Contractor in compliance with the gates opening and closing times, as well as the speed limits. Space for material and equipment would be provided;
- Employer confirms that no ESIA is required for the envisaged project size (<1 Ha). However, if any endangered species are found, these will need to be relocated;
- GSM network is available at all major camp sites but with limitations which have cost implications and the Contractor must inform themselves on all the aspects of the wifi networks and requirements for proper connectivity to the internet.

- The Contractor shall be responsible for all interfaces related to the PV Plants for the construction, commissioning, operations and maintenance of the Plants until Final Acceptance.
- The Contractor shall be responsible for liaising with the relevant authorities and the Employer, to determine the interface points and design, procure, install and commission all connecting equipment, facilities and services, including all software and communication requirements

32. General Technical Requirements

32.1. Units of measurements

SI units shall be used in all correspondence, documentation, calculations, drawings, measurements etc. If reference has to be made to non-standard items, the SI units shall be quoted followed by the non-standard units in brackets.

32.2. Standards and Codes

The Contractor must comply with all statutory and regulatory requirements of South Africa. All apparatus and material supplied, and all work carried out and matters arising in fulfilment of the Contract shall conform, at the Contractor's expense, in all respects to all the laws and regulations, bye-laws and requirements of national/local or other authorities which are applicable to the works, the relevant codes and standards, to versions ruling at the date of installation including but not limited to the following:

- Occupational Health and Safety Act (No 85 of 1993 and all amendments thereto)
- Construction Regulations of 2003 and any amendments thereto
- The Electricity Act 1984 (Act 41 of 1984) as amended
- The National Building Regulations and Building Standards Act 1977 (Act 103 of 1977) as emended
- All Environmental Laws and Regulations

Specific codes and standards are referenced in this Specification and shall govern in all cases where references to them are made. In the case of a conflict, the most stringent requirements shall apply. A list of applicable standards for solar PV projects has been provided here:

- General Specifications for the project, see Annexures B
- SANS 10400 Standardized Specifications for buildings works
- SANS 1200 for civil engineering works
- SANParks Technical Services standards relating to tourism infrastructure.
- SANParks Technical Services standards relating to administration infrastructure
- COLTO specifications for road works.
- The Occupational Health and Safety Act, Act 85 of 1993 (OHS Act)
- IEC 30364, Electrical Installations for Buildings
- IEC 60364-7-712, PV Power Supply Systems
- IEC 62109-1, Safety of power converters for the use in photovoltaic power systems
- IEC 62109-2, Requirements for inverters.
- IEC/TS 62548, PV arrays-design requirements.
- IEC 61730 Test for safety, Part1 and 2
- IEC61215 Design Qualification and Approval
- IEC 60364-7-712 Electrical installations of buildings - Part 7-712: Requirements for special installations or locations - Solar photovoltaic (PV) power supply systems.
- IEC 61683 Photovoltaic systems - Power conditioners - Procedure for measuring efficiency.
- IEC 62093 Balance-of-system components for photovoltaic systems - Design qualification natural environments.

- IEC 62116 Test procedure of islanding prevention measures for utility-interconnected photovoltaic inverters.
- IEC 62446 Grid connected photovoltaic systems - Minimum requirements for system documentation, commissioning tests and inspection.
- IEC 61194 Characteristic parameters of stand-alone photovoltaic (PV) systems.
- IEC 61702 Rating of direct coupled photovoltaic (PV) pumping systems.
- IEC/PAS 62111 Specifications for the use of renewable energies in rural decentralised electrification.
- IEC 60364-7-712 Electrical installations of buildings - Part 7-712: Requirements for special installations or locations - Solar photovoltaic (PV) power supply systems.
- IEC 61727 Photovoltaic (PV) systems - Characteristics of the utility interface.
- IEC 62446 Grid connected photovoltaic systems - Minimum requirements for system documentation, commissioning tests and inspection.
- IEEE Std 1526 IEEE Recommended Practice for Testing the Performance of Stand-Alone Photovoltaic Systems.
- IEC 62124 Photovoltaic Stand-Alone Systems - Design Qualification and Type Approval
- SANS 1200 for civil engineering works
- SANParks Technical Services standards relating to tourism infrastructure.
- SANS 10142-1, The wiring of premises Part 1: Low-voltage installations
- NRS 097-2-1, Grid Interconnection of Embedded Generation
- IEC/TS 62548, PV arrays-design requirements.
- Any other National, International and local bylaws applicable to the installation of Solar PV systems

The applicable standards and laws, which are mentioned within this document, are to be regarded as non-exhaustive and do not relieve the Contractor from its obligation to provide complete and fully functional systems and facilities. More codes and standards are listed in appropriate sections such as specific equipment,

32.3. Equipment Identification

The Kraftwerks Kennzeichnungs System (KKS) (or other internationally recognised systems, if agreed by the Employer) shall be used to identify the function of each equipment and systems**.**

The agreed system shall be used on all Contract documentation including drawings, specifications, instruction manuals, Plants nameplates and labels, and in all forms of communication with the Employer.

The Contractor shall provide details of the proposed system used to identify the function of equipment and system.

32.4. Nameplates and labels

The Contractor shall supply and install all labels, name, rating, instruction and warning plates necessary for the identification and safe operation of the PV Plants and these shall be fitted after completion of erection work and before commissioning.

All major equipment shall also be identified by name plates indicating manufacturer's name, type of equipment, serial number, construction year and main design data.

The Contractor must provide labels for:

- All instruments, control switches, push buttons, indication lights, breakers, etc.;
- All construction units and all separate construction units (cubicle, panel desk, box, etc...);
- All equipment inside cubicles, panels, boxes, etc...(including terminal blocks);

- All cables installed (power, instrument, control, telephone- and special cables);
- All wiring (cables and inside panel wiring) shall be labelled;
- Phases of power cables shall be identified by an approved colour code.

All equipment within panels and desks shall be individually identified.

Each circuit breaker panel, electrical control panel, relay panel etc. shall have a circuit designation label fixed to both the front and back. Additionally corridor type panels shall have circuit designation labels within the panels. In the case of withdrawable equipment, circuit labels shall be fitted to the fixed and moving portions.

Wall mounted signs shall be provided to indicate reduced headroom clearance, hazardous areas, areas where chemicals are handled, stored or processed, warning signs and others as required by the design review, HAZOP, Codes and Standards.

Labels/signage for safety, confined space identification, hazardous and dangerous goods including flammable and toxic gases, acids and alkalis shall be in accordance with COHSS requirements and relevant Standards.

Danger notices to be affixed to perimeter fencing at intervals as set down by legislation.

A consistent system of labelling shall be proposed by the Contractor for the approval of the Employer.

The proposed material, size and exact inscription as well as proposals for the arrangement shall be submitted to the Employer for approval.

The labels shall be written in English. Warning and safety notices shall be in English.

32.5. Signage

The full list and text of signage will be agreed with the Employer and shall include but not limited to the following signs and their positioning:

Signage	**Location**
No unauthorised vehicles beyond this point	Site entrances and gates
Warning –keep clear of structures during storms, icy conditions	Site entrances and gates
Keep gates closed	Both sides of gates
Speed limit	Main gate and road junctions
Directions	Road forks/cross roads
Warning these premises are alarmed	Appropriate locations
Danger HV	Appropriate locations
No access to unauthorised personnel	Appropriate locations
Fire assembly/emergency meeting point	Appropriate locations
Fire action instructions	Appropriate locations
Details of local Fire brigade, police and Ambulance	Appropriate locations
General no smoking signs	Appropriate locations
First Aid/Designated first aider	Appropriate locations
Artifical respiration guide	First aid stations
Internal parts remain energised	DC Junction boxes, cabinets and conduits
Warning live cables	DC Junction boxes, cabinets and conduits
Do not operate under load	Junction boxes, cabinets and beside switching devices incapable of

	operating under load
PV panels to be isolated from grid	Each Inverter
Warning Live voltage source	Switchgear
PV production disconnection switch	Main disconnecting switch between the Plants and the Grid (both injecting and incoming connection from grid).
Eye wash, emergency shower, no smoking etc	Battery room
Other operational signs as per site specific hazards	Appropriate locations

Table 3: Signage Requirements

32.6. Materials

Materials selected by the Contractor shall be proven to be eligible and sufficient for the complete life of the PV Plants.

Components of the PV Plants which are subject to abrasion or potential high rates of wear shall be selected from proven grades of high corrosion/erosion resistant materials (copper alloys, nickel alloys, stainless steels and titanium). Chromium plated parts shall not be used in any damp or corrosive atmosphere.

Where dissimilar metals are in contact or close proximity and corrosion may occur through electrolytic action or differences in electric potential (galvanic action), protection shall be afforded by electroplating, suitable gaskets, cathodic protection or other means.

The following materials shall not be incorporated in the Plants:

- High Alumina Cement;
- Cement containing added calcium chloride as a setting agent;
- Crocidolite, vermiculite, any other asbestos or products containing asbestos;
- Materials which are comprised of mineral fibres whether man made or naturally occurring which have a diameter of 3 microns or less, and/or a length of 200 microns or less or which contain fibres not sealed or otherwise stabilised to ensure that fibre migration is prevented. For clarification, interpretation of this clause will not preclude the use of Rockwool insulation products;
- Woodwool slabs used for permanent shuttering, formwork or in structural elements;
- Polyisocyanurate or polyurethane foam unless manufactured without the use of CFC's/HCFC's. Foam insulation manufactured using CFC's/HCFC's, other than in LPC composite panels;
- Any product which contains Montreal-listed CFC gases or uses them in manufacturing;
- Sea dredged aggregates which have been in contact with seawater;
- Concrete made with aggregates producing an alkali-silica reaction;
- Urea formaldehyde foam or materials that may release formaldehyde in quantities in excess of the limits set by the Health and Safety regulations;
- Calcium silicate bricks, blocks or tiles, or with more than 0.5% soluble sulphate content;
- Bitumen coated polythene as a damp proof course;
- Polytetrafluorethylene (PTFE) used as a coating in glass;
- Wood including plywood from any non-sustainable source (including tropical rainforests);
- All paints and primers shall be free from added lead and no calcium plumbate or red lead primers will be used;
- Lead or any materials containing lead which may be ingested inhaled or absorbed except where copper alloy fittings containing lead are specifically required in drinking water pipe work by any relevant statutory requirements or lead or linseed oil putty and fittings for copper pipe in plumbing systems;
- Other substances generally known to be deleterious at the time of use including but without limitation substances referred to as being hazardous to health and safety in "Hazardous Building Materials: a Guide to the Selection of Alternatives" edited by S R Curwell and C G March according to the current edition; and

- Any substance not in accordance with local standards, Eurocodes, American Standards or Codes of Practice and all applicable legislation current at date of construction.

32.7. Painting and Corrosion protection

Standards of surface preparation and painting which will give an expected life in excess of 15 years, with need for minor remedial work only during the intervening period, shall be used. The Contractor shall submit for the Employer's review a quality programme that shall include procedures for surface treatment, paint film thickness, adhesion tests and a maintenance schedule.

The Contractor shall ensure that precautions are taken in packing and crating, to avoid damage to the protective treatment during transportation to the site. Any damage to paintwork which occurs during transport shall be made good at Site. All steelwork surfaces shall be thoroughly cleaned prior to painting.

Paint shall be stored in dry covered conditions and shall not be used if it has been in storage for more than 3 months or not used for more than 6 months after the manufacture date.

Unless otherwise specified, galvanising shall be hot dip galvanising in accordance with South African applicable standards. Bolts, nuts and washers together with all other threaded components used as fasteners shall be finished with a centrifugal galvanised coating in accordance with this standard.

All drilling, punching, stamping, cutting and welding of parts together and removal of burrs shall be completed before articles are galvanised in accordance with South African applicable standards. Any
Site modifications of galvanised steelwork shall be made good with an approved cold galvanising system as approved by the Employer.

Details shall be provided of any special finishes including those on components manufactured from sheet aluminium or steel.

All ferrous metals shall be protected from corrosion in accordance with EN ISO 14713, EN ISO 12944 or equivalent local or internationally recognised standards. The exposure conditions to be used shall be entirely suitable for the type and intended purpose of each structure, taking full account of the PV Plants location.

Where the Contractor shall use a paint system for corrosion protection, the Contractor shall ensure that it shall be applied in full accordance with the manufacturers' recommendations and that each coat applied to any member shall be from the same manufacturer. The Contractor shall submit full details of its proposals for corrosion protection for Employer's consideration.

33. MINIMUM FUNCTIONAL REQUIREMENTS

33.1. General Electrical works

33.1.1. General Considerations

The Contractor shall be responsible for design, supply, installation and commissioning and testing of the electrical works to international and local standards and grid codes. All grid connection works shall comply with the utility standards.

The Contractor shall be responsible for the complete design of:

- The electrical auxiliary system including the numbers and ratings of the Plants items;
- The electrical protection system which shall be suitably graded to the 400V level;
- The mechanical interlocking system for maintenance purposes; and
- The synchronising and voltage selection scheme for both main and auxiliary systems and all other interfaces within the works.

The PV Plants shall be designed such that it satisfies all the necessary requirements of the *Grid Connection Code for Renewable Power Plants (RPPs) connected to the electricity transmission system (TS) or the Distribution System (DS) in South Africa,* as well as any other applicable South African and Eskom's codes and standards. In addition it shall be arranged to facilitate inspection, maintenance and repairs.

Outdoor equipment shall be designed so that water cannot collect at any point. Outdoor kiosks, cubicles and panels must be provided with sun/rain shades. Unless otherwise specified, the minimum equipment enclosure classifications for non-rotating electrical equipment shall be as follows:

- Indoors only in totally enclosed rooms with provision for limiting ingress of dust: IP31;
- Indoors, except as noted otherwise: IP54;
- Outdoors and indoors in areas subject to water spray, or heavy condensation: IPW55.

All reasonable precautions shall be taken in the design of equipment and of works to ensure the safety of personnel concerned with the operation and maintenance of works. The Contractor shall provide safety, isolation, locking and interlocking facilities. All electrical equipment shall be constructed such that all live conductors are effectively shielded from contact by personnel, unless access to such conductors is possible only by the removal of bolted covers using tools. Where access to electrical equipment is required during normal operation, hinged doors with lockable handles shall be provided. All live conductors, terminals and fittings within such cubicles and behind the doors shall be effectively shrouded to prevent accidental contact.

All switchgear, transformers (except where stated otherwise) and other main electrical equipment such as, battery chargers and inverters shall be capable of operating at its rated current continuously, without overheating at full load and shall take account of the temperature rise of the equipment from other sources and without assistance from forced cooled ventilation or air conditioning. Where the equipment relies on forced cooling or air conditioning, the level of redundancy of the cooling shall be at least N+1, where N is the number of units required to cover the 100 % cooling requirement.

Electrical equipment shall be constructed to withstand the specified maximum short circuit currents and duration without the temperature exceeding the value permitted for the related Class of insulation.

The equipment shall be considered as being operated at maximum permitted current prior to the inception of short circuit current.

All cubicles anti condensation heater supplies will be labelled at the appropriate terminal boxes and the heaters themselves with a 'Danger 240V AC' label.

All main switchboards, relay panels, control equipment etc. shall be provided with duplicate power supplies for control and alarm purposes. It shall not be possible to close any circuit breaker if its associated protection relays have operated and not been reset. UPS back-up batteries are to be provided only for the monitoring, communication and safety systems.

The Contractor shall perform electrical system studies as required to confirm the viability of the electrical design under steady state, outage and transient conditions.

34. PV modules

The PV modules shall be manufactured and installed in accordance with the relevant IEC standards and shall have the following valid certifications issued by reputable testing institutions according to IEC standards:

- IEC 61730 Test for electrical safety:
    - Part 1: Requirements for construction
    - Part 2: Requirements for testing

- IEC 61215 Design qualification and type approval

The modules shall be capable to withstand wind and static loads. The modules shall be capable of withstanding 5400Pa of load and IEC 61730 certification with 5400Pa loading shall be provided. In addition to the above, the modules shall be tested for Potential-Induced Degradation (PID) in accordance with the draft standard IEC 62804 by an independent third party.

In addition to the site climatic conditions, the PV modules selection shall consider the inverter and mounting structure proposed for the project. Manufacturer's requirements in relation to transportation, storage and installation shall be observed in order to comply with the manufacturer's warranty.

The final PV module selection shall be approved by the Employer.
PV modules shall meet the following minimum technical requirements:

Type	Mono-crystalline or Poly-crystalline
Nominal output at Standard Test Conditions (STC)	≥ 400Wp
Efficiency at Standard Test Conditions(STC)	≥ 21%
Maximum system Voltage	1000V
Operating temperature range	-40ºC to 85ºC
Temperature coefficient of power	-0.5%/ºC to -0.40%/ºC
Power tolerance	Average power tolerance shall be positive
Junction box and plug connectors	Minimum protection class IP65
Linear degradation	Up to 2.5% at the end of year 1 and up to 0.7% per year from year 2 to year 25
Flash test	Flash test reports (in excel format) for each module upon module delivery onsite.

Table 4: Minimum technical requirements for PV modules

The following additional requirements shall be fulfilled to mitigate risks, upon delivery of the modules:

- Count of the modules delivered;
- Review of the flash test data;
- Flash test and visual inspection of delivered modules;
- Micro crack report;
- Infra-red thermal imaging on 100% of the installed PV modules.
- The modules to be supplied for each PV Plants shall be of the same type and from one single manufacturer, conforming to the following requirements:
- Manufacturer has been manufacturing modules for more than 5 years;
- The envisaged factory has been manufacturing modules for more than 2 years;
- Manufacturer's capacity installed is in excess of 500MW;
- Have supplied modules to at least 3 different projects in the past 2 years with a minimum capacity if
- 1MWp per project;
- The PV Module manufacturing facilities should be certified according to:
    - ISO 9001- Quality Management Systems, and
    - ISO 14001 – Environmental Management Systems.
- Tier 1 certified

35. DC distribution

DC system installation shall comply with applicable sections of SANS 10142-1 and other relevant standards.

36. PV Combiner Boxes

Strings of PV modules are combined in parallel in a combiner box and shall be sized according to number of string inputs, power and voltage. The PV combiner box shall comply with following minimum technical requirements:

- Protection class IP 65 or above;
- Suitably rated double pole load break switch dis-connectors installed at each combiner box to enable isolation at the sub-array level (isolation of panels shall be provided with consideration of both –plant availability during maintenance and capital cost; the isolation arrangement shall be agreed with the Employer);
- Door switch interlock;
- Over-current protection (fuses with disconnect bases in each positive and negative string input);
- PV specific surge arrester type 2 shall be proved;
- Earthing bars connected to the PV Plants earthing system;
- Plants Ventilation lugs to be used to prevent condensation forming inside panels;
- Fully labelled and colour coded wiring.

All combiner boxes in the Plants shall be of the same model and shall be constructed and installed to the following standards:

- IEC 60439
- SANS 61000-6-2, SANS 61000-6-3; and
- SANS 10142;

37. DC Cables

Purpose designed double insulated PV cables and safety connectors shall be used for all DC connections. The DC cables shall have the following minimum technical requirements:

- Ultraviolet (UV) resistant (HD 605/A1) as well as resistant to ozone (EN 50396);
- Enhanced resistance to heat and fire and with low smoke emissions;
- DC voltage maximum rating of 1,000V;
- Halogen-free as per EN 50268-2.a

String cables running behind PV modules shall be secured to the module mounting frames. Where string cables must travel between rows, the cable should be buried in ducting which runs directly from PV mounting structure to PV combiner boxes.

DC cabling shall be mechanically protected where subject to damage when transitioning from above grade routing to below grade. Rigid non-metallic conduit PVC 40mm Heavy Duty or equivalent will be utilized for this purpose DC cables routed behind a PV array shall be capable of continuous operation at the highest system voltage specified with a maximum conductor temperature of 120°C. The draft “IEC 62930: Electric Cables for Photovoltaic Systems” standard may be used as a reference.

38. AC Distribution

38.1. AC LV Cables

AC Cables shall comply with at least the following:

- SANS 10198;
- SANS 10142: Part 1;
- SANS 1507

The low voltage cables shall be single core unarmoured cables suitable for evacuating the power from the PV Plants. The contractor is expected to provide a solution accordingly which shall include an appropriate earthing system and be suitable for the climatic conditions.

38.2. LV Switchgear

The LV switchgear shall:

- comply with the relevant South African and international standards including SANS 1973 and IEC 60439;
- be rated for a minimum short circuit withstand strength as appropriate to the system to which the plant is being integrated;
- Generally be of the withdrawable type and incorporate air insulated circuit breakers, moulded case circuit breakers (MCCBs) and contactor units as necessary. However, for cable feeders the outgoing cable will be required to be disconnected to allow the cubicle to be withdrawn. The switchgear shall be metal clad with a protection rating of at least IP42.

The terminals for the power circuits shall be provided with shrouding. Busbars shall be segregated from the rest of the switchgear. The Contractor shall provide shutters to cover each set of stationary contacts and shall be automatically operated on the withdrawal of the withdrawable unit, and shall include provision to lock the mechanism to prevent access to the contacts. The electrical system shall be suitably designed withstand the system fault levels. The switchboard shall have a short circuit withstand time of not less than one second.

LV protection relays shall have conventional relays/releases. Trip and alarm signals shall be hardwired to the DCS. Uncontrolled feeders up to 25A, shall be provided with MCB, 25A and above up to 630A, fused disconnector will be provided.
The Contractor shall provide all main switchboards, MCC, relay panels, control equipment etc. with duplicate power supplies for control and alarm purposes.

A two position (Switchgear/CCR) selector switch must be provided at the switchgear for all switchgear incomer circuit breakers and bus-section breakers, respectively for 'switchgear emergency control and isolated testing' / 'CCR remote control'.

Check-synchronising facilities must be provided as required. The switchgear main incomers, interconnectors and bus-section circuits shall be electrically interlocked to prevent the paralleling of two incoming supplies to a switchboard.

The Contractor shall provide all necessary interlocks.

39. Earthing and lightning Protection

The Contractor shall be responsible for the design supply and installation of the complete earthing system.

The earthing and lightning systems shall be designed to IEEE 80 and the calculations shall be submitted for approval.

The geotechnical assessments undertaken (refer to section 5.3) can be used to determine the earth mat design; however, the Contractor is ultimately responsible for the installed earth mat and shall conduct any additional surveys as required. Earth mat verification tests on completion of the installation, all designs and tests shall be to the approval of the Employer. Lightning and surge arrestors shall be provided as required from the results of insulation co-ordination studies.

The maximum resistance to earth of the Power Plants shall be determined to provide a safe installation by limiting step and touch potentials and earth potential rise. The resistance to earth of any part of the earthing system shall not exceed 1 ohm, which value shall be demonstrated during construction of the PV Plants.

The earthing conductors used shall be adequate to withstand for the maximum system fault current for one second.

The current density of the earth conductor shall be not greater than 200 A/mm2 for a 1 second short time current rating and 100 A/mm2 for a 3 second duration. Single connections between equipment and the earth system shall carry the total short circuit current, but the cross sectional area of branch connections may be reduced to take account of current distribution in two or more conductors. A distribution of 60% shall be assumed for this purpose, i.e the cross sectional area of branch connections may be reduced to 60% of the corresponding single conductor.

Metal parts of all equipment and structures, other than those forming part of an electrical circuit shall be connected directly to the main earth system via a single conductor. The arrangement of the mesh earth system shall be such so as to minimise the length of these single connections.

Earthing for high frequency coupling equipment and lightning arresters shall be via a copper rod driven directly into the ground at a position immediately adjacent to the equipment being earthed in addition to the normal earth connections. Transformers and switchboards or assemblies containing switchgear must be provided with two or more earth terminals and each shall be connected to the earthing system.

Connections to apparatus and structures shall be made clear of ground level, preferably to a vertical face and protected against electrolytic corrosion by the plating/tinning of the copper surface in contact with the apparatus or structure. They shall be made between clean surfaces and of sufficient size and pressure to carry the rated short circuit current without damage.

Joints in earth bars shall preferably be brazed or exothermally welded.
Where bolted joints are used in copper to copper connections, or copper to steel they shall have the joint faces tinned.

40. Monitoring System

The remote PV plant monitoring system shall incorporate all functions in real time necessary for PV Plants control and supervision, and shall be installed in accordance with the guidelines of IEC 61724 standard and the relevant Employers and Eskom's standards.

Any other control and surveillance systems (such as fire detection system and security system) shall also be connected to the PV plant monitoring system.

Data samples shall be taken every 30 seconds and processed data shall be provided at least on 15-minute basis. The system shall have a storage capacity of at least one year. The data shall be stored in a server hosted on site which shall be located in a kiosk or building. The Employer shall be able to access the PV plant server remotely via a web server or software.

All necessary communications systems shall be provided as part of the PV plants' installation, to enable the required level of monitoring.

All the monitoring equipment (including weather station) must be powered by UPS with at least 4 hours of uninterrupted power supply capacity. The status of the UPS devices (like batteries level, UPS temperature etc) must be monitored at all times by the monitoring system and alarms must be triggered in case of values exceeding specific ranges.

41. Data Logging

The PV Plants Monitoring system shall collect and store the following data required to verify the Plants' performance and energy output including but not limited to:

- Current, voltage, instantaneous DC power, and DC energy at string level;
- Current, voltage, instantaneous AC power, AC energy, frequency at each inverter;
- For off-grid systems:
  - Current, voltage, instantaneous DC power, DC energy charged and discharged at each battery bank;
  - Current, voltage, instantaneous AC power, AC energy, frequency at each diesel generator;
- Revenue meter readings and energy generated by the PV Plants;
- MPP tracking parameters, voltage and frequency set point, active and reactive power, power factor;
- Status and alarms of each inverter;
- Measured meteorological parameters recorded by the sensors (temperature, irradiation, humidity, wind speed, wind direction); and
- All alarms related to PV Plants switchgear and transformers.

Data Logger(s) shall collect data from inverter, combiner box, energy meter, weather station, etc and communicate the data to the server.

The upload frequency (number of times the data logger sends data to the server) will be adjustable on the data logger in a range from once per hour to four times per hour. The data logger shall have capacity to store the monitored data for at least two weeks if no communication with the server is possible.

42. Fault Monitoring

The PV plant monitoring system shall display the PV Plants' real time status. The system shall monitor all relevant alarms that require Operator intervention and generate an automatic alert to telemetry if a fault occurs. Additionally, configured recipients shall be notified by email.

A secure communications network must be installed and commissioned for the PV plant monitoring systems.

43. Interface with Telemetry

The PV Plants Monitoring system shall provide the following hard-wired (volt free) signals to the Employer's telemetry system:

- Fire alarm
- Intruder/security alarms
- System status

44. Weather Station

A fully installed pyranometer station that is integrated to the onsite monitoring equipment is required for each of the two project sites. The pyranometer will be located near the PV module arrays and in the plane of the arrays.

It shall be installed according to the OEM guidelines and that set forth in World Meteorological

Organisation best practices. The purpose of these stations will be to record the irradiance at the sites and is required to monitor the Plants' performance. The pyranometer is to be procured from a reputable hardware

provider and system installer

45. System Security

A surveillance system shall be provided for each PV Plants in line with the South African standards, including a system of closed circuit television cameras, which communicate with the PV Plants Monitoring system.

Intruder detection and surveillance equipment shall be provided to detect and deter unauthorised access to the PV Plants, while enabling access by authorised staff and visitors.

Installed security and surveillance equipment shall be manufactured by a well-established, reputable manufacturer, with a proven track record of providing the required type of systems.

The surveillance system shall cover the points of entry to the site and the following critical areas as a minimum:

- Site entrance gate;
- Plants interconnection station and the enclosure housing the control room and spare parts;
- Main road(s) leading to and within the PV Plants;
- Security fence.

CCTV cameras shall be suitably weatherproofed and include remote control facilities. These CCTV cameras shall be able to monitor the whole PV Plants perimeter without dead areas. Purpose-built poles must be provided to achieve suitable viewing positions for the cameras, where necessary.

The following system design requirements shall be met:

- night vision capability;
- pan, tilt and zoom capability;
- secure power supply;
- provision of sufficient cameras; and
- image recording and playback system.

The CCTV system shall be capable of being remotely monitored by both the Employer and any 3rd party responsible for security monitoring on the site.

46. PV Plants Metering

The PV Plants generation meter shall be provided, installed and commissioned at the Point of Connection to record the energy generation and parasitic load of the PV installation.

The PV Plants generation meter shall be fully accredited to measurement Class 1 or better, and shall comply with the NRS057 and other relevant standards, including but not limited to:

- SANS 62053: Electric meter equipment
- IEC61036 Alternating current static watt-hour meters for active energy
- SANS 474 Code and practice for electricity metering
- SANS IEC 6100: Electromagnetic compatibility
- Eskom's requirements

The meter shall include communications capabilities for remote reading (GSM by preference where the signal strength permits, refer to A.1) and shall record half-hourly data for both generation (forward) and parasitic (reverse) power flow. The half-hour data shall always be in SAST time format and shall be available to the Employer in industry-standard format on a day+1 basis.

47. Inverters

47.1. Grid tied inverters (for Ac coupled systems)

The grid connected inverter models selected for the Plants shall conform to the following European Directives:

- 2006/95/CE Electrical equipment designed for use within certain voltage limits
- 2004/108/CE Electromagnetic Compatibility

The inverters should also comply with the South African Grid Code for Renewable Power Plants in South Africa (Version 2.8 as issued by NERSA).

Plants' Inverters shall meet the following minimum technical requirements:

Inverter technology	The inverters are to be string inverters
Installation	Inverters to be installed indoors in strict accordance to the manufacturer's installation manual. Ensure adequate ventilation during operation.
CEC Efficiency	≥ 95%
Maximum system DC Voltage	1000V
Protection class	At least IP54 rating to electronics equipment of the inverter shall be selected. An IP43 protection shall be selected for the connection area.
Safety features	Each inverter shall be connected to the earthing protection system by an appropriate arrangement. A suitable double pole load break switch dis-connector must be installed at each inverter DC input.
Harmonic distortion	Compliant with South African Grid Code
Power factor and Low Voltage Ride Through (LVRT)	In accordance with South African Grid requirements
Other features	A display showing faults and performance values Remote monitoring and control capability Automatic synchronisation with the electrical network. Due regard shall be given to sites with manual or automatic Power Factor Correction and any possible conflict between the network and the inverters.

Table 5: Technical Requirements

A proven communication protocol compatible with the Plants' control system shall be provided.

Where applicable, the location and outward appearance of the inverters shall be agreed with the Employer for each Plants.
The inverters to be supplied for each Plant shall be of the same type with proven track record and be supplied by a single manufacturer conforming to the following requirements:

- Manufactured inverters for more than 5 years;
- Capacity installed is in excess of 1,000MW;
- Production capacity is in excess of 500MW/year;
- Have supplied inverters to at least 3 different projects in the past 2 years with a minimum capacity if 1MWp per project;
- The PV inverter manufacturing facilities should be certified according to:
  - ISO 9001- Quality Management Systems, and
  - ISO 14001 – Environmental Management Systems.

47.2. Off grid Inverters

Off-grid systems inverters can consist of one single inverter or a “modular” inverter, which is made up of individual components (e.g. inverters, battery chargers, controllers, instrumentation, etc) that operate in synchronization in a Master/Slave mode. For the avoidance of doubt, this section refers to the complete inverter, whether a single inverter or a “modular” inverter is selected.

The off grid inverter model selected for the Plants shall meet all relevant EU and IEC standards and regulations including but not limited to the following:

- EMC Directive EN61000-6-1, EN61000-6-3, EN61000-3-2;
- Low Voltage Directive EN 50178;
- Safety IEC 62109-1, IEC 62109-2;
- RMC marked and compliant AS 4777.2, AS 4777.3; and
- CE Declaration of Conformity.

If outdoor type inverters are used, these shall be a proven outdoor type with a minimum protection rating of IP54, designed for the local environment, designed to withstand -20 to +50 ºC of external ambient temperature, suitably mounted to prevent water ingress and shaded against direct sunlight.

If indoor inverters are used, the enclosure/container for inverters must have necessary ventilation to extract the heat dissipated from the electronics, inverters and any other installed equipment installed.

Cable entries into the enclosure/container shall be done in accordance with industry practices to ensure minimum wear of the cables and preventing any ingress of dust, moisture, insects or rodents.

Fire proof sealing material will be required.

PV array inverters shall meet the following minimum technical requirements:

- Adjusted to the chosen PV module configuration regarding size, voltage and parallel and serial connections of the modules;
- MPP tracking capability;
- Euro Efficiency ≥ 95%;
- Design life >20 year; and
- The inverters should be supplied with an Integrated Power Management System for monitoring the power production and system efficiency.

The inverter needs to be the synchronising and main control unit of the entire Plant. It needs to be responsible for securing the correct power quality on the network. The inverter must have an integrated charge controller to control the charging/discharging of the batteries when excess power is available for the network and when the stored energy is required to feed the demand.

The inverter shall also have the ability to integrate additional generating sources such as the existing diesel generators. When a certain threshold is reached in the levels of voltage, state-of-charge (SoC), charge state or load current of the battery bank, the inverter shall be capable of both (these shall be options for SANParks to enable/disable):

- Starting the existing diesel generators automatically; or
- Sending notifications via email and/or SMS to SANParks (for their staff to start the diesel generator).

The inverter size shall be designed / selected to ensure that the demand can be met at all times (generally, an oversizing multiplier of 1.2 – 1.3 is used for off-grid systems, however a more conservative multiplier of up to 1.5 is recommended due to the short period of data available -14 days in October- to model the demand).

The minimum PV field size is 200kWp.

The inverters shall meet the following minimum technical requirements:

- The efficiency of the battery inverter(s) shall be at least ≥95% when loaded resistively to between 50% and 100% if rated load capacity;
- The inverter shall be able to handle loads with a power factor from 0.6 to 1 lagging;
- Total Harmonic Distortion <5%
- No-load consumption / standby <30W/10W
- Charge Control: IUoU battery charging/3 stage charging with automatic full charge and equalization charge;
- Battery type compatibility: Flooded, Gel, AGM, VRLA (and, if possible, Li-Ion);
- Temperature compensated battery charge;
- AC coupling of energy sources preferable;
- Pure sinusoidal wave;
- Three phase operation and control;
- Different generator start options (including those explained above) and there should be a manual switch enabling the operation to turn the inverter on or off;
- Load depending generator control;
- Battery/Energy saving mode.

The inverter shall be electrically and mechanically protected against a reverse polarity supply connection.

In addition the inverter should:

- Shut down at DC over-voltage with an automatic trip reset;
- Be protected against over-current and short circuiting;
- Withstand an overload of 200% of full load for at least 60 seconds before tripping (the reset maybe automatic or manual);
- AC short-circuit protection;
- Battery deep discharge protection.

The inverter may have other protection features in addition to those specified above.

The inverter shall not cause significant conducted or radiated electromagnetic interference (e.m.i.) over the inverter's load range at a distance greater than 1m from the inverter.

A proven communication protocol compatible with the Employer's Plants control system shall be provided that serves all purposes; function-related communication, supportive communication and general diagnostics. The monitoring and communication system must include:

- Battery Monitor: to keep track of the battery status in terms of voltage, current, SOC and amp- hours in/out.
- Power Meter: to enable remote monitoring and diagnostics of the system.
- Automatic Generator Starter (refer to explanation above); and
- System Control Panel.

Each inverter shall be connected to the earthing protection system by an appropriate arrangement. A suitable double pole load break switch dis-connector must be installed at each inverter DC input.
All inverter units to be supplied for the Plants shall be of the same type with proven track record and be supplied by a single manufacturer conforming to the following requirements:

- Manufactured inverters for more than 5 years;
- Off Grid PV plant capacity installed is in excess of 1MW;
- Have supplied inverters to at least 3 different projects in the past 2 years with a minimum capacity of 50kWp per project;
- The PV inverter manufacturing facilities should be certified according to:
  - ISO 9001- Quality Management Systems, and
  - ISO 14001 – Environmental Management Systems.

48. Battery Bank

The batteries and battery bank installation for the Plants shall meet all relevant South African and IEC standards and regulations, including but not limited to the following:

- IEC 60896-21/22
- IEC 61427-1/2
- IEC 60086-4
- IEC 62485-2

49. General Requirements

The battery energy storage system shall comprise stationary batteries in series and parallel strings with sufficient number of cells to provide the rating specified. The battery bank rated output shall be that available at the outgoing terminals, after making due allowance for the resistance of inter-cell connections.

The batteries shall be of the Lithium ion type, suitable for the cycling demands of PV systems and requiring minimal maintenance during the operational life time as per IEC 60896.

The batteries shall be capable of providing the guaranteed output throughout the range of ambient conditions specified. The batteries shall be housed in a separate enclosure or containerised unit complete with the required control and monitoring equipment.
All battery stands shall be suitably protected against corrosion and the inter-cell connections shall be of low resistance and protected against corrosion.

50. System Performance and Life Cycle

The battery bank shall be designed to provide the rated power to the inverter and loads for the required discharge period over with a minimum continuous operational lifetime of 10 years. The energy storage capacity of the bank shall meet the daily energy requirements of the respective loads throughout a 24 hour period, taking into account the variable/intermittent charging abilities available from the solar and generators.

The batteries shall be discharged to a maximum Depth of Discharge of 90% and the voltage available at the terminals of the equipment being supplied shall not be less than the minimum operating voltage of the equipment. The battery bank must be able to supply a short time load of 150% of the maximum load demand.

The battery bank shall be designed to provide a minimum of 6000 continuous charge/discharge cycles at 80% Depth of Discharge (DoD) without the energy storage capacity degrading below 80% of the initial start of life value throughout a minimum service life of 10 years. Provision must be made for ease of accessibility in order to replace the batteries at the end of the product life cycle.

51. Project Specific Requirements

The size of the battery bank shall be selected with the aim that the system be capable of storing at least one-time the daily energy consumption on the worst-case scenario at a maximum depth of discharge of 80%, as provided in Appendix B. The battery bank should have at a minimum a storage capacity of:

- 770 kWh for Mata Mata
- 770 kWh for Nossob

While the maximum rate of charge and discharge will depend on the solution envisaged by the Contractor, the demand profile provided in Appendix B shall be analysed and the system shall be designed to allow for a maximum rate of charge and discharge in line with the inverter capacity and the overall system design without

compromising the number of cycles that the battery bank can deliver.

Subject to the overall design, it is operating voltage of the battery bank (and for each individual battery array) is according to the manufacturers' specifications.

The manufacturer shall be followed strictly in terms of the maximum number of battery arrays interconnected in parallel in DC, as well as the maximum number of "battery charging modules" that can be interconnected.

If a higher voltage is required, all applicable South African and international standards shall be followed and explained in the Contractor's proposals, as relevant during the design (including the design of the building or enclosure where the batteries will be located, as well as required protections), procurement, construction, commissioning and operation phases (including the applicable health and safety standards, which shall be taken into account and referred to in the construction procedure and O&M Manuals and procedures).

52. Control and Safety Requirements

Provision shall be made for the protection against short circuit between the individual battery cells along with a suitable earth fault detection and protection scheme. A spark-proof fuse shall be fitted close to the positive and negative terminals of the battery bank to provide suitable protection against cable faults. The fuses shall be appropriately rated to accommodate full load current and fault breaking capacity.

The batteries shall be suitable for operation on a floating charge system and the likelihood of dry-out minimized with a temperature controlled voltage management system. All batteries shall be fitted with protective covers over pole connections

The batteries shall be housed in a separate enclosure or containerised unit and arranged in tiers with sufficient spacing so as to permit access for inspection and testing. The battery enclosure shall be equipped with all the necessary monitoring and safety equipment required to ensure safe and reliable operation. The enclosure shall be equipped with appropriate ventilation systems and comply with specifications and relevant industry practice.

Unless otherwise specified, each battery bank enclosure shall be supplied with the following:

- Maintenance log book
- Operating and maintenance instructions
- First aid kit for fire, electrical and acid based injuries
- Personal protective equipment required for inspection and maintenance
- Appropriate safety and warning signs fixed and clearly visible

53. Installation and Testing

The batteries shall be shipped to site in appropriate enclosures and be properly secured.

The batteries shall be fully charged upon initial installation. The forming and initial charging is to be performed at the manufacturer's facility unless the necessary provision exists at site to allow for charge top-up.

Battery cell rated discharge and charge tests should be performed at the supplier's facility unless the necessary equipment is made available during on site commissioning. Results shall be compared to manufacturer data that relates battery state of charge to open circuit voltage.

54. General Civil and Structural Works.

All civil, building and structural elements and components shall be designed and detailed in accordance with the provisions of all current relevant and applicable SANS or the equivalent internationally recognised standards and codes referenced above. In Addendum A some site information is given.

55. Ground investigations and surveys

It will be the responsibility of the Contractor to undertake its own surveys and investigations (geotechnical, topographical, meteorological, etc.) which are considered necessary by the Contractor for the design and construction of the Power Plants.

56. Mounting structures

Fixed mounting structures with no moving parts shall be selected for the PV Plants.

The design and construction of the mounting system and foundations shall be as follows:

- The PV mounting structure elements shall be designed and detailed in accordance with the relevant SANS standards and codes or the equivalent internationally recognised standards and codes.
- The mounting structure shall be compatible with the PV modules to be installed
- Designed to withstand loading in accordance with relevant South African and International standards. Wind loading shall be as stated and is to be based on local conditions. Other dynamic loading such as seismic loading shall be included, if applicable.
- The foundations to the mounting structures shall be suitably designed in accordance with the geotechnical investigations.
- The clearance of the modules from the ground shall be not less than 600mm. The maximum height and design of the structures shall be in accordance with any planning or other statutory requirements.
- Inter-row distances must be in accordance to proper design parameters to prevent shading from other rows, yet wide enough to allow vehicle acces.
- All supporting elements including fasteners and associated components shall be stainless steel and resistant to local atmospheric corrosion to ensure that the design life of these elements meets or exceeds the design life of the PV Plants. Measurement of environmental parameters affecting corrosivity of atmospheres shall be taken into consideration. It is envisaged that aluminium shall be used as a method of preventing corrosion compliant with the relevant SANS.
- Below-ground structural elements (where applicable) shall be designed to meet or exceed the design life of the PV Plants. Due consideration shall be given but not limited to soil type, resistivity, pH, moisture content and extent and type of contamination, to ensure that the design life of these elements meets or exceeds the design life of the PV Plants.
- Foundation design shall account for any settlement criteria required by the relevant component manufacturers or to ensure integrity of the PV Plants.
- The mounting structure shall be connected to the earthing protection system by an appropriate arrangement.

57. Foundations

All foundations must be established in strict compliance with the relevant SANS. The foundation design is to be based on the geotechnical reports undertaken by the Employer, where recommendations will be based on site ground conditions.

Based on the preliminary information available for two of the sites, conventional strip or pads are the preferred solution for the foundations. Consideration will need to be given to providing pads with sufficient depth for stability and this may require additional pneumatic drilling given the near surface rock horizons.

Appropriately protected reinforcing steel shall be used and concrete of strength not <30MPa.

58. Fence

The perimeter fencing for each site shall be designed to comply with the Employer's requirements, which should

conform to but not limited to:

- Fencing shall be provided to encompass the entire PV Plant. Adequately sized entrance gates shall be provided into the fenced area for both vehicular and pedestrian movements.
- If required, fencing for transformers and HV equipment shall comply with the relevant SANS and/or statutory requirements. All fencing, gates, doors, and other similar metallic components surrounding the substation compound shall be adequately connected to an appropriate earthing system.

59. Earthworks

All earthworks shall be designed and executed in line with South African Standards (SANS 1200 or COLTO) and due consideration to be given to the Environmental and Health & Safety requirements in terms of excavation and also spoiling of access or unsuitable material.

All suitable material from excavations shall be re-used in road construction and/or landscaping.
Sufficient record, as detailed in the standards, of earthworks shall be kept and handed to the Employer for scrutiny and record purposes at each development stage.

60. Drainage

Careful consideration shall be given to drainage patterns, above and sub-soil.

The drainage design and construction shall include during and post construction management of the runoff and shall satisfy, but not be limited to, the South African Standards / Manuals (SANS 1200 or COLTO) and Legislation.

A maintenance plan shall be submitted for the Employer's perusal and approval prior to commencement of implementation.
Sufficient record, as detailed in the standards, of the drainage design and construction shall be kept and handed to the Employer for scrutiny and record purposes at each development stage.

61. Temporary Site Facilities

Temporary site facilities shall comply with South African Standards & Legislation, as well as Employer's requirements. The Contractor is to submit a layout and specification that complies with the standards for the Employer's approval prior to commencement of implementation.

62. Buildings

For the various sites, it is the responsibility of the Contractor to propose a suitable building(s) or enclosure(s) as required for the solution proposed for each location and as related to specific functional purposes set out in the bidder's technical solution.

For both sites it is envisioned that some buildings/enclosures would be required for housing the key equipment and spare parts. The Contractor can combine enclosures if it is desired to have a single building / enclosure / container to house both the power generation equipment and spare parts.

There are existing structures that house the electrical distribution boards, and in the case of Nossob also the generator, that may be utilised to house equipment but these will have to be upgraded to suitable standards.

A transportable container, prepared for such purpose and prefabricated before shipment, could be considered an acceptable solution meeting the specifications. An example of such a design is shown in Appendix C

All buildings / enclosures/ containers must be of a quality securing the protection of the equipment for a period

of not less than 25 years at site conditions. All equipment housed in buildings/enclosures/containers should be protected from all relevant environmental factors as required by the OEM specifications and will not affect the serviceable life of the equipment. The enclosure/ container must have the necessary ventilation to extract the heat dissipated from the electronics, inverters and any other installed equipment installed. The ventilation system must be designed to prevent animals, insects, dust and moisture from entering the building. The enclosure/ container must have a steel door (not container door) equipped with a secure locking system. Cable entries into the enclosure/ container shall be done according to applicable South African regulations (or in the absence of applicable regulations, in accordance with prudent industry standards)

63. Roads

The roads inside Kgalagadi are gravel roads and are in fair condition. The road between Mata Mata and Nossob is very bumpy. Should extra roads be required the following is applicable:

All roads shall be designed and constructed to South African Standards and guidelines (SANS 1200 or COLTO). An internal road width of at least 5 m and a perimeter road width of at least 3.5 m shall be considered. Turning radius shall accommodate the largest vehicle during construction and maintenance. The road alignment shall make adequate provision for construction of the equipment based as well as access to install the equipment. Laydown areas, road widening, embayment, etcetera may be considered in the design.

Gravel roads would be sufficient; however maintenance requirements shall be detailed carefully and submitted to the Employer for perusal and approval. The California bearing ratio (CBR) shall be established from the geotechnical investigation in order to evaluate the mechanical strength of the road subgrades and base courses.

Suitable materials from excavations may be re-used in road construction provided the material is deemed appropriate for load-bearing capacity.

Sufficient record, as detailed in the standards, of the roads design and construction shall be kept andhanded to the Employer for scrutiny and record purposes at each development stage.

64. Cable trenching and ducting

All trenching and ducting shall be designed and executed in line with South African Standards (SANS 1200 or COLTO, as later selected by the Employer) and due consideration to be given to the environmental and Health & Safety requirements in terms of excavation and also spoiling of access or unsuitable material.

65. Building Codes and Standards

Applicable standards include but are not limited to prudent industry best practices, OEM guidelines on equipment environmental requirements as well as the following standards listed below:

- The National Building Regulations and Building Standards Act 1977 (Act 103 of 1977) as amended;
- The latest issue of SABS 0142: “Code of Practice for the Wiring of Premises”;
- The Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended;
- The Electricity Act 1984 (Act 41 of 1984) as amended;
- COLTO;
- The following standards:
  - SANS 10400 National Building Regulations
  - SANS 10160 Basis Of Structural Design
  - SANS 10100 The Structural Use Of Concrete
  - SANS 10162 The Structural Use of Steel
  - SANS 204 Energy Efficiency In Buildings
  - SABS 1200 Standardized Specifications For Civil Engineering Construction
  - BS/EN 50272-2 Safety Requirements for secondary batteries and battery installations

- The latest requirements of the IEC and the British Standard Institute, where no SANS codes of practice exist. Some examples include:
  - BS EN – British Standard European Norm
  - BS EN 1991-1-4:2005 Eurocode 1. Actions on structures. General actions. Wind actions
  - BS EN 1991-1-6:2005 Eurocode 1. Actions on structures. General actions. Actions during execution
  - BS EN 1992-1-1-2004 Eurocode 2 Design of Concrete Structures general rules
  - BS EN 1993-1-1:2005 Eurocode 3 Design of steel structures. General rules and rules for buildings
  - BS EN 1993-1-3:2006 Eurocode 3. Design of steel structures. General rules. Supplementary rules for cold-formed members and sheeting
  - BS EN 1993-1-5:2006 Eurocode 3. Design of steel structures. Plated structural elements
  - BS EN 1993-1-8:2005 Eurocode 3. Design of steel structures. Design of joints
  - BS EN 1993-1-9:2005 Eurocode 3. Design of steel structures. Fatigue
  - BS EN 1993-1-10:2005 Eurocode 3. Design of steel structures. Material toughness and through thickness properties
  - BS EN 1993-5:2007 Eurocode 3. Design of steel structures. Piling
  - BS EN 1997-1:2004 Geotechnical design. General rules
  - BS EN 1997-2:2007 Eurocode 7. Geotechnical design. Ground investigation and testing
  - BS EN 1994-1-1:2004 - Designing composite steel / concrete load bearing

66. TESTING AND COMMISSIONING REQUIREMENTS

66.1. General

The PV Plants and materials shall be subject to inspection and testing during the course of, and on completion of, the manufacture and erection of the works to ensure compliance with this Specification, the requirements of the regulatory authorities, and to provide necessary operating data.

In summary this shall include, but not be limited to the following:

- Prior to commissioning:
  - Factory acceptance tests - Inspection and tests at manufacturer's works; and
  - On site tests - Inspection and tests during construction.
- During commissioning and prior to the issue of the Provisional Acceptance Certificate
  - Inspection and tests during initial commissioning (cold and hot commissioning);
  - Mechanical completion tests
  - Grid/network Compliance test, where applicable;
  - Acceptance Testing;

It will be expected that the PV Plants commissioning and Acceptance tests will follow the guidelines set forth in this Specification. The Contractor will be required to put forward a suggested testing protocol following these guidelines and to be agreed with the Employer. The Employer may call for additional tests it may consider necessary.

The Contractor shall provide a proposed inspection and test plan covering the construction works. The plan shall identify all inspection points and reporting actions and Employer witness and hold points at both at the site and manufacturers' works. Written notices shall be provided for all Inspections and Tests requiring the involvement of third parties. The Contractor shall be responsible for co-ordinating any Inspections and Tests required by third parties. The Employer shall have the right to be present during inspections, commissioning activities and tests of major equipment and systems in the manufacturer's works, as per the list of agreed witness points, and all equipment tests at site at no cost to the Employer. The Contractor shall make allowance for the

Employer's engineer and other technical advisor(s) to observe key inspections/tests and to receive copies of data and reports. Delays caused by the scheduling of third party tests/attendance shall not entitle the Contractor to any extension of time or additional costs.

All measuring equipment or special apparatus required for carrying out inspections and tests shall be provided by the Contractor at no extra cost to the Employer. To the maximum extent possible, the on- site tests will make use of the permanently installed instrumentation. This same instrumentation shall be suitable for use for the Acceptance tests.

If any portion of the works fails under test, such further tests which shall be considered necessary by the Employer to demonstrate compliance with the EPC Contract shall be carried out by the Contractor. The whole costs including costs incurred by the Employer in witnessing such additional tests, shall be borne by the Contractor.

Unless stated otherwise, all section of this report will be applicable to both grid tied and off grid systems for each project.

66.2. Test Sequence

The erection, commissioning, functional tests and appropriate third party tests and checks including factory tests, shall have been completed by the Contractor prior to the application to undertake the PV Plants Acceptance Tests.

Network Code compliance testing is to be undertaken as required by the Employer and as appropriate and convenient during the commissioning and testing period, but in any event, prior to the commencement of the Acceptance Tests.

If relevant to the project specifications, the air, water run-off and noise emission compliance tests shall be performed prior to the commencement of the Performance Guarantee Tests, or as agreed with the Employer and all relevant consenting Authorities.

On successful completion of the Performance Guarantee Test, the Employer shall issue the provisional Acceptance Certificate.

66.3. General Test Notification and Requirement

No later than 14 days' notice shall be given to the Employer of all inspection and tests in order that the Employer may be present to witness the tests. All inspections and testing shall be scheduled to commence during ordinary business hours, unless specifically agreed by the Employer.

In general the erection, commissioning and functional test requirements are to be notified during daily and weekly erection/commissioning meetings held at site, this shall include upcoming site inspections/test, where applicable. No section of the Works shall be covered up without carrying out any test or inspection required under the Contract. The Contractor, shall discuss and agree on the work which the Employer / Employer's Engineer shall be entitled to examine, inspect and/or witness before it is covered up consistent with the Specification.

66.4. Test Procedures and reporting requirements

The Contractor shall submit detailed specific test procedures and commissioning procedures for each test or series of tests described in the following sections and in accordance with the relevant codes and standards, for approval by the Employer no less than one month prior to the start of such testing.

The Employer shall respond with his comments to the procedures within 14 calendar days of receipt of the

procedures. The Contractor shall subsequently revise and resubmit the test procedure and resolve any issues in a timely manner such the test procedure is agreed, finalized and issued, as final, at least 14 calendar days prior to the scheduled commencement of the relevant tests. The test procedure and revisions shall be referenced in the test notification. These test procedures will be invaluable for SANParks staff to do fault finding when required.

The following information shall be included as a minimum in the test procedure:

- Objectives and scope of the test and definitions of the test boundary;
- Acceptance criteria;
- Health and Safety procedures and implications for all parties on site;
- Codes and standards to be used or referenced;
- Quality Assurance procedures proposed for testing;
- Test Duration and number of runs, starting and stopping criteria;
- Plants operating conditions, permissible modes of control and operational limits during the tests;
- Prerequisites and precautions for the conducting of the tests;
- Methods of data collection, identification of instrumentation to be used for tests, sampling requirements;
- Test schedules showing major activities planned for performing all required tests;
- Sample calculations demonstrating how tests results will be corrected;
- Test report requirements; and
- Copies of the Contractor's check sheets for the pre-commissioning, commissioning and testing of each Plants item or system.

The Contractor shall supply to the Employer the relevant test reports which shall include as a minimum but not be limited to the following information:

- Test procedure;
- Description of test conditions;
- Description of any deviations from the test procedure of unusual events which occurred during the tests;
- Summary of test results;
- Calculations with definition of terminology;
- Copy of raw data the Contractor has collected during the tests immediately following each series of tests, test data sheets;
- Copies of instrument calibration records; and
- All information reasonably necessary to evaluate the results.

Once the preliminary report is approved a final report shall be submitted to the Employer.

66.5. Factory acceptance/compliance Tests/Reports

All equipment supplied under the Contract shall be subjected to visual, dimensional, material, non-destructive, and functional and performance tests as applicable at the manufacturer's works.

The detailed testing procedures will be agreed with the Employer during the detailed design phase, but shall include and not limited to the following:

- Relevant substation hardware
- LV switchboards and RMUs
- Transformers
- Batteries
- Inverters
- Modules
- Equipment cabinets/ containers /small buildings and other relevant onsite structures prefabricated

66.6. Testing during Installations

During construction and erection period, the Contractor shall undertake all installation checks, preliminary mechanical and electrical checks, proving the integrity of all connections (mechanical and electrical), safety systems and verification that all Plants is functionally complete. Tests to demonstrate interactive operation of components within the system shall also be completed prior to first energisation.

The end of construction is reached when:

- All systems of the Plants are completely installed and according to the Contract;
- All electrical devices and instrumentation of the Plants are installed, connected and wire-tested;
- All systems are free from major deficiencies; and
- All systems are safe and ready to start commissioning.

Throughout construction, all incomplete work and deficiencies shall be recorded in a punch list. Any minor defects or pending work detected which do not affect the correct operation, production or performance yield of the PV Plants and the safety of persons or property shall be included as Punchlist Items, subject to approval by Employer.

On site testing shall include the following:

- Circuit Breakers
- AC and DC cabling
- Monitoring Equipment
- Weather station
- Battery bank
- Equipment cabinets/ containers /small buildings and other relevant onsite structures
- Voltage transformers
- Current Transformers
- Disconnect and earthing switches
- Surge Arrestors
- LV switchboards
- Transformers
- Distribution Boards
- Battery Charger
- Modules
- Inverters

66.7. Commissioning

The Contractor shall have the responsibility for all aspects of commissioning preparations and execution, including the provision of procedures, temporary facilities, consumables, utilities, labour, special tools, measurement equipment and spare parts etc.

The Contractor shall remain fully responsible for the operation, maintenance and cleaning of equipment as necessary throughout the commissioning and testing period up to the issue of the Provisional Acceptance Certificate.

The Employer’s operating and maintenance personnel, trained by the Contractor, may assist the Contractor during, commissioning, start-up and testing within the scope of the job descriptions of such personnel. The Contractor shall not rely on the availability of the Employer’s personnel during, commissioning, start-up and testing. Unavailability of the Employer’s personnel shall not entitle the Contractor to any extension of time or additional costs. The Contractor shall include sufficient resource to meet the programme.

The Contractor shall be responsible for the acts or omissions of the Employer's personnel, while under the direction, supervision and control of the Contractor, unless caused by the wilful misconduct of such Employer's personnel.

Once the component or system is charged, energized or otherwise made live, the Contractor shall conduct further tests to demonstrate that the system and its constituent components function collectively as designed and in accordance with all the applicable standards and the grid requirements.

When the Contractor has completed the commissioning of all local and remote/supervisory control functions, all functions shall be demonstrated to the Employer to have been commissioned, calibrated and tested.

Reports and videos of all commissioning steps shall be made available to the Employer.

67. Testing

67.1. General

The Testing shall include but is not limited to the following:

- Cold commissioning tests
  - Mechanical Completion;
  - Functional tests;
  - Electrical safety tests.
- Hot Commissioning tests
  - Monitoring system tests;
  - Inverter commissioning;
  - Battery bank commissioning.
- Grid code compliance test, if applicable.
- Provisional Acceptance (PA) tests
  - Plant installed capacity test;
  - Performance Ratio Tests (PR);
  - Battery Capacity Test (if applicable).
- Final Acceptance tests.

All test instrumentation shall be properly calibrated by the Contractor prior to testing and rechecked after testing. Valid calibration certificates shall be provided for all instrumentation used during the tests.

The Contractor shall make allowance for third parties to witness key tests and to receive copies of data and reports.

At the conclusion of the tests, the Contractor shall perform calculations to determine the performance relative to the Guarantee values and will issue a report covering the entire testing program. This report shall contain all raw data used in the calculations in sufficient detail to allow the Employer to repeat any calculation.

67.2. Mechanical completion

To confirm Mechanical Completion it has to be shown that the solar PV Plants is from the technical perspective in a "ready to operate" mode with all components installed and connected as per manufacturers' instructions and/or specifications. A detailed Mechanical Completion check list will be developed upon the appointment of the successful bidder. The envisaged scope of the visual inspection will consist of but is not limited to:

- The Plant is free from any defect other than minor defects not including those defects that have an adverse effect on the safety, operation and performance of the Plants;
- The component has been installed in accordance with the approved design;
- Usage of adequate materials;

- The readiness of the installation and of the calibration of all protection and signalling equipment:
- The availability of electrical drawings, safety manuals and usage hand books and factory tests reports or quality test reports from manufacturer, when applicable;
- Spare parts available on site;
- Labelling and identification of cables, fuses, panels, cubicles etc;
- The existence of the necessary protections against electrical shocks due to active parts insulation damage; (indirect contact)
- The existence of factory tests reports or quality test reports from manufacturer, when applicable.

Following the visual inspection, the punch list developed by the Contractor during the construction will be reviewed and revised accordingly and reasonable timelines of their rectification shall be agreed with the Employer.

67.3. Functional test

The functional tests shall be in accordance with IEC 62446 (Grid connected photovoltaic systems – Minimum requirements for system documentation, commissioning tests and inspection) as well as IEEE Std 1526 (IEEE Recommended Practice for Testing the Performance of Stand-Alone Photovoltaic Systems). Test requirements under IEC 62446 include open circuit voltage and short circuit current tests and is applicable to both the grid tied and off grid systems. These tests are described in more detail below.

67.4. Electrical safety tests

The Electrical safety tests shall include:

- Insulation test of all DC and LV AC cables
- LV system insulation test
- LV and LV protections and switchgear tests
- Earthing system resistance test

67.5. Monitoring system and pyronometers

The monitoring system and weather station shall be commissioned according to manufacturer specifications and industry best practice.

An onsite calibration must be performed by the Contractor prior to Provisional Acceptance PR test. For the weather station suitable equipment calibration certification would need to be provided.

A third party expert shall review the calibration certificates of each sensor and all related documentation like certifications and installation manuals.

67.6. Grid code compliance, where applicable

It is the Contractors obligation to ensure that the design and installation are in compliance with all applicable requirements and regulatory approvals including all applicable grid code compliance codes including:

- NRS 097-1
- NRS 097-2
- NRS 054
- NRS 048-7
- South African Distribution Code (all parts)
- South African Grid Code (all parts)
- Electricity Regulation Act, Act 4 of 2006 and Electricity Regulation Amendment Act, 2006

At its own cost, the Contractor will engage and ECSA registered Pr Eng to declare that the installation complies with all the grid interconnection and type testing requirements to ensure interconnection of the PV

Plants at the point of connection is allowed. The responsibility is on the Contractor to support and drive all required permitting and application process for grid interconnection and compliance.

The Contractor will ensure all required hardware that is to be specified to allow for grid interconnection is included in the bid offer. All required SLD's and layouts will be submitted as part of the design package in support of the grid interconnection application.

67.7. Acceptance tests

With respect to the grid tied and Off-grid plants the following Acceptance tests will be undertaken prior to Provisional Acceptance. With respect to the Off-grid projects; additional tests will be considered based on technical proposal from the Contractor and at the sole discretion of the Employer during EPC contract negotiations.

The Pre requisites for undertaking the Acceptance tests are as below:

- Modules are clean;
- Mechanical completion certificate has been issued and all the functional and electrical safety tests have been successful;
- Before the beginning of the testing, the clocks of the net meters and the data logger need to be synchronized.
- The pyranometers will record the solar irradiation on the inclined plane (at the same inclination of the modules). Complete measurement tolerance should be that associated to a secondary standard pyranometer and less that 2% on a daily time-step. In case one of the pyranometer is found malfunctioning or broken, irradiance values from the other pyranometer will be used up to the moment of pyranometer replacement (maximum 2 weeks). If the data acquired by the pyranometers are within an acceptable tolerance range, the average of the pyranometers' measurements will be considered.

67.8. Battery bank tests

The battery bank performance tests shall include all testing guidelines as put forward by the OEM and captured in relevant standards. This will include but is not limited to:

- Prove the fully charged battery bank capacity after a discharge test at C10 conditions meeting the required voltage or Depth of Discharge value at the end of the C10 discharge cycle as specified by the OEM.
- Verify accuracy of Battery bank Depth of Discharge measurement.
- Prove that Depth of Discharge would not drop below 80% in order to maintain a design discharge cycle life as specified by the OEM.
- If applicable, Battery bank inverter to meet OEM efficiency at variable load levels.

68. PERFORMANCE GUARANTEES

The Performance guarantees stated in this section shall be included in the final EPC contract. Additional guarantees may be required, which will be finalised in the EPC Contract.
The Contractor shall be liable to pay the Employer liquidated damages based on performance guarantees levels to be finalised in the EPC Contract. Generally, for each 5% of performance shortfall from the contractual level the Employer shall be entitled to liquidated damages in an amount of [1]% of the EPC
Contract price up to a maximum of 100% of the contract price.
The Contractor shall provide the following performance guarantees:

- Total installed capacity;
- Total capacity of Battery Bank;
- Plant Performance as per simulated and agreed upon in the contract on Acceptance (prior to taking over by the Employer);

- Plant Performance for each year until year 5 after handover.
- The performance will be measured at the point of connection for each PV Plant

68.1. EQUIPMENT GUARANTEE

The Contractor shall guarantee all the installed equipment for a period of 2 years without any costs to the Employer. After the 2 years period the manufacturer's warrantees will be valid and active which is extendable in consultation with the manufacturer and Contractor.

69. EPC PLANS

69.1. EPC Plans

The Contractor shall issue the following plans prior to Notice to Proceed, which will be applicable during the Projects' construction phase:

- Construction Environmental Management Plan
- Health and Safety Plan
- Project Construction Schedule
- Staffing Plan (Organisation Chart)
- Project Construction Management Plan
- Worker´s Grievance Mechanism
- Quality Plan
- Labour Accommodation Plan

These Plans shall be prepared in accordance with the standards of a Reasonable and Prudent Contractor, the applicable South African Laws, the requirements of this RFP as outlined below and the SANParks general documentation. The Plans will be updated during the course of the Works as required.

69.2. Health and Safety

SANParks has strict compliance requirements in terms of Health and Safety ("H&S"). The Contractor shall familiarise itself with, and ensure that all its activities comply with the Health & Safety Specifications and Baseline Risk Assessment, as contained in Appendix D. The Contractor shall further ensure compliance with the relevant health and safety legislation including in particular, but not limited to:

- Occupational Health and Safety Act No. 85 of 1993 ("OHS Act");
- Construction Regulations of 2003;
- The Project-specific Environmental Management Plan; and
- Health Act 63 of 1977 ("Health Act").
- The Contractor shall at all times take reasonable precautions to maintain the health and safety of the Contractor's personnel. The Contractor undertakes and warrants that it shall:
- Acquaint all its employees, agents and subcontractors with the provisions and requirements of the
- OHS Act, Health Act, SANParks Health & Safety Specifications and any other relevant legislation;
- Not endanger the health and safety of any of the employees of the Contractor and Employer and any other third party that is authorised to be present on site in terms of the Contract, in any way whilst carrying out the works and/or supplying the energy;
- Enforce safe work practices and that its employees, agents and subcontractors shall be made conversant with the contents of these practices;
- Within 6 weeks after execution of the EPC Contract, the Contractor shall provide a Site-specific Health and Safety Plan;
- Ensure that its employees, agents and contractors are provided with information, instruction, training and supervision as is necessary to enable them to undertake their duties safely and without risking their health;

- Monitor its employees, agents and subcontractors are informed of the hazards attached to the activities they are to undertake as well as the controls and/or precautionary measures that are to be taken and that they observe such controls and/or precautionary measures;
- Ensure that sufficient and suitable personal protective equipment and facilities are made available to its employees, agents and Subcontractors and that the aforementioned persons are suitably trained in the use, maintenance and limitations thereof. In addition, ensure that the aforementioned equipment and facilities are at all times serviceable, safe and in a hygienic condition;
- Contractor to provide documentary evidence of compliance with OHS Act;
- No work shall commence until the Contractor's Site Specific Health and Safety File has been approved by the Health and Safety Agent appointed for this project;
- Appoint the site supervisor to act as the responsible person on site in terms of the OHS Act;
- Appoint a Safety, Health and Environmental ("SHE") officer for the site, who is to ensure that all SHE policies are complied with; and
- Accepts that the Employer may appoint him as the "Principal Contractor" as defined in the Construction Regulations 2003 for the site and undertakes to enter into a delegation agreement.
- In collaboration with local health authorities the Contractor shall ensure that, during the activities of the Contractor on site, first aid facilities required by law are available at all times at the site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.

The Contractor shall send details of any accident or near miss as soon as practicable after its occurrence to the Employer. The Contractor shall maintain records and make reports concerning health, safety and welfare of persons and damage to property.

69.3. Quality Assurance

The Contractor and all relevant Subcontractors and testing companies shall employ a quality system accredited to the ISO9001 standard or equivalent which shall be used primarily to ensure delivery of the
Scope of Work according to good, reliable and reputable quality. The Contractor shall develop, implement and maintain a Project-specific quality plan (the "Quality Plan") covering all relevant stages of
Subcontractor and supplier selection, design, manufacture, factory testing, dispatch, acceptance of materials on site, installation, site testing & commissioning and handover. For each stage, the Quality Plan shall identify the relevant quality criteria and standards, along with their associated limits of tolerance. For all stages requiring work on site, quality management shall further adhere to the South African National Parks' Code of Conduct for working in a National Park. During implementation of each stage, the Quality Plan shall be the reference platform for acceptance.

The Quality Plan shall identify all relevant subcontractors by name, components supplied, and country of origin and whether each Subcontractor has been Quality Assurance Certified according to ISO 9001. If the subcontractor is not Quality Assurance Certified, confirmation will be required that the Subcontractor in question does have a quality assurance traceability system in place based on the relevant parts of ISO 9001.

The Contractor shall monitor that all relevant requirements for quality management are implemented by each Subcontractor to ensure a fully integrated and consistent quality management of the works.
For the duration of the Contract the Employer may require that Quality Assurance ("QA") audits of the Contractor's Quality Plan be performed in order to confirm that activities are being performed in accordance with the contracted standards. The audits will be carried out against the requirements of ISO 9001: 2008 Quality Management System Requirements.

69.4. Project specific Quality Plans

No later than 6 weeks after execution of the EPC Contract, the Contractor shall provide a Project-specific Quality Plan covering:

- Design: breakdown of design responsibility and interfaces between Contractor and Subcontractors, design procedures and verifications, monitoring of Subcontractors activities, list and submittal schedule of design documents, organisation of design review meetings;
- Procurement: list of suppliers, procedure for approval of purchase orders, acceptance criteria for delivery of components;
- Fabrication: procedures, qualification of welders and of welding procedures, Subcontractor monitoring, inspection plan (including Contractor's hold and witness points), factory acceptance tests, notification procedures, transmittal of documentation, including tests and FAT reports;
- Shipping procedures and follow-up;
- Construction and site inspection and quality control plan;
- Health and Safety, and Environmental aspects; and
- Methodology for handling non-conformances and mitigation scenarios for correction.

The Employer will review the Quality Plan and agree with the Contractor a program of verifications, inspections and audits to be carried out by the Employer or its representatives, independent of the Contractor's own monitoring activities. All non-conformities raised by the Employer are to be resolved prior to taking over the plant by the Employer.

The Contractor shall provide a schedule, updated monthly at equipment inspection and test dates. All other parts of the Quality Plan shall be updated on a regular basis to reflect the current progress. The Contractor shall prepare and maintain quality records detailing all materials used, quality assurance checks undertaken and testing and commissioning tests conducted, which shall be available for inspection by the Employer at all times.

70. Non conformances

All non-conformities raised by the Employer are to be resolved prior to Taking Over. Non-conforming items shall be reviewed, accepted or rejected, repaired or re-worked as appropriate in accordance with documented procedures. The relevant documented evidence of the corrective actions will be available for verification at the place of manufacture or construction.

The Contractor shall rectify and remove the causes of such objections and the inspection or test shall be repeated. Rejected material, equipment or workmanship shall not release the Contractor from any obligation under the Contract, nor shall any extension of time be allowed.

Any material or equipment which has failed to satisfy the acceptance criteria, shall, where practicable, be separated from the work in progress and in all cases shall be suitably identified with a distinctive label which will only be removed when corrective action is completed.

If a non-conformance report is issued or Plants rejected, the Contractor shall reimburse the Employer all costs, including hourly costs, travel, accommodation and disbursements incurred by the Employer for both attending discussions on remedial matters and any re-inspection that is deemed to be necessary.

71. Third party certification

If required, the Contractor shall arrange for either notified body or independent third party classification organisation to certify the design, materials and construction of the relevant equipment in its scope to comply with regulatory requirements. All costs associated with such certifications shall be borne by the Contractor.

The Contractor shall also be responsible for obtaining design or other approval of all such equipment from any relevant national or local organisations.

ANNEXURE A- SITE INFORMATION

SPECIFICATIONS FOR THE SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK

1) PV site location

a. Mata Mata PV site information

Access to Mata Mata site is:

- Upington to Twee Rivieren is 252km tar paved roads.
- From Twee Rivieren to Mata Mata 120km gravel / sand roads.
- At Mata Mata a stretch of ±200m sand where a 4x4 vehicle is needed to get material on site.
- Distance between Mata Mata and Nossob is 164km gravel / sand.

Site conditions: (No official geo profiles for specific site available.)

- Soil – Dune sand for at least 3m deep. (As per TLB test)
- No large trees in close vicinity.
- Site clearing would consist mostly Tree thorn scrub 1,5m high and grasses.
- ±1meter elevation difference between PV site and generator (Control) room.

Figure 4: Mata Mata Map

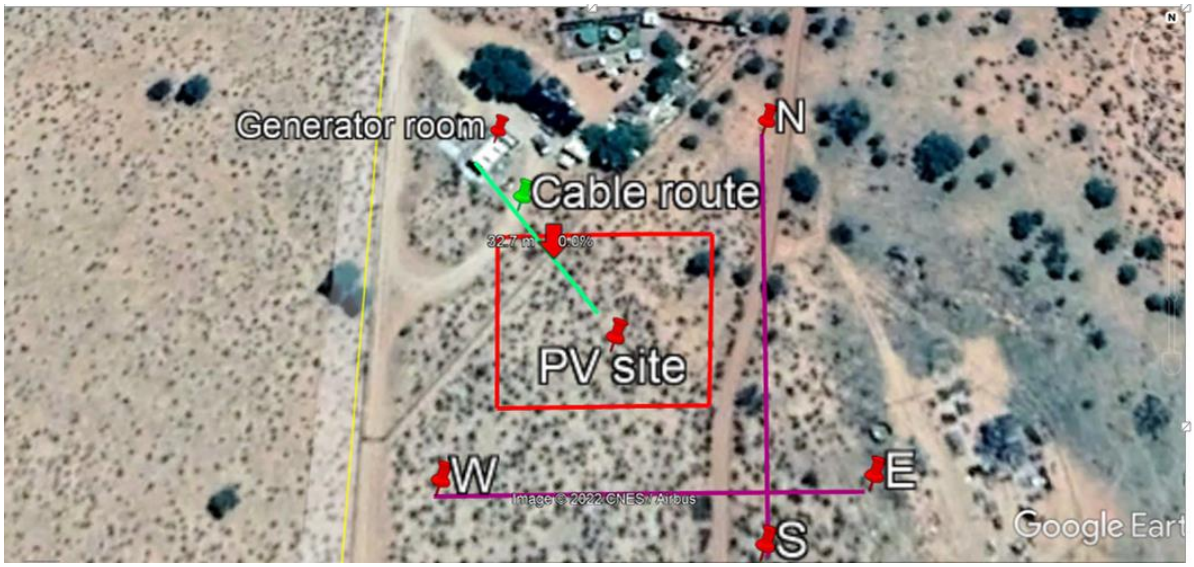

Figure 5: Mata Mata PV Location

b. Nossob PV site information

Access to Nossob site is:

- Upington to Twee Rivieren is 252km tar paved roads.
- From Twee Rivieren to Nossob 162km gravel / sand roads.
- At Nossob a stretch of ±900m sand where a 4x4 vehicle is needed to get material on site.
- Distance between Nossob and Mata Mata is 164km gravel sand.

Site conditions: (No official geo profiles for specific site available.)

- Soil – Dune sand for at least 3m deep. (As per TLB test)
- No large trees in close vicinity.
- Site clearing would consist mostly Tree thorn scrub 1,5m high and grasses.
- ± 1meter elevation difference between PV site and generator (Control) room.

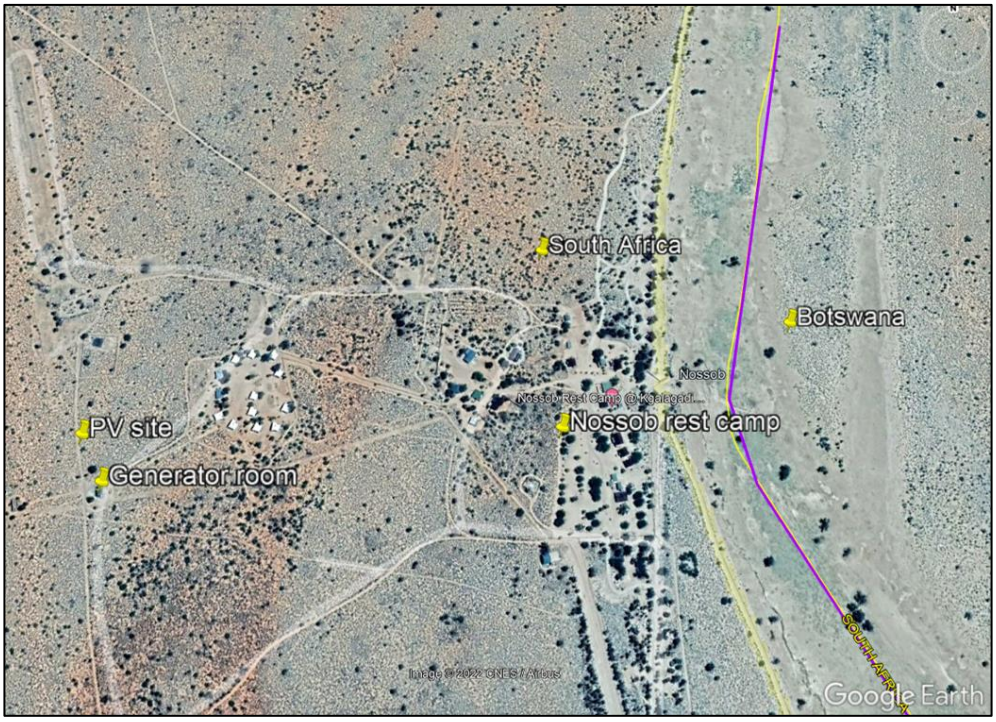

Figure 6: Nossob Map

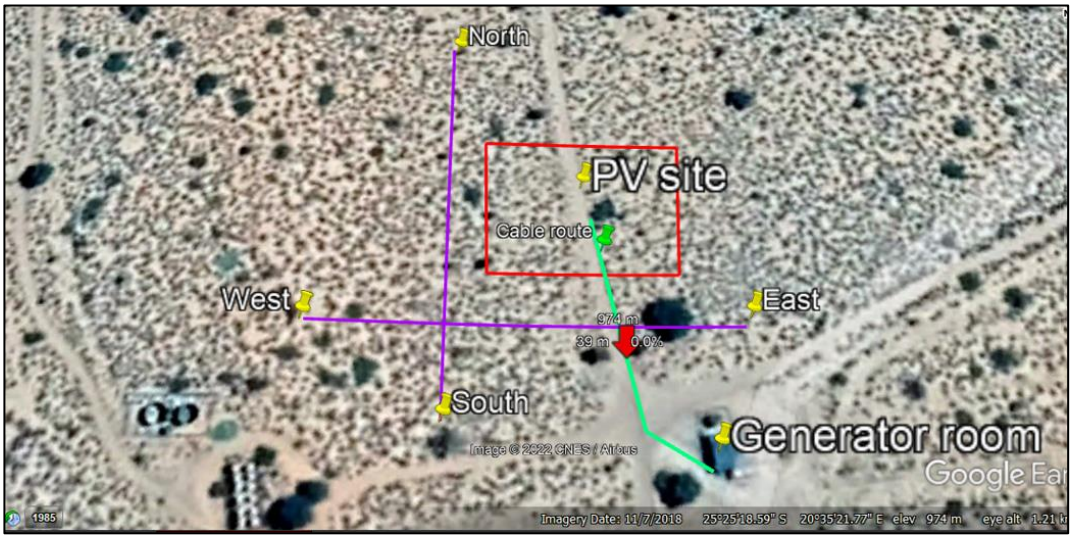

Figure 7: Nossob PV Site

ANNEXURE B- POWER DEMAND INFORMATION

1) Mata Mata

a. Power demand graph

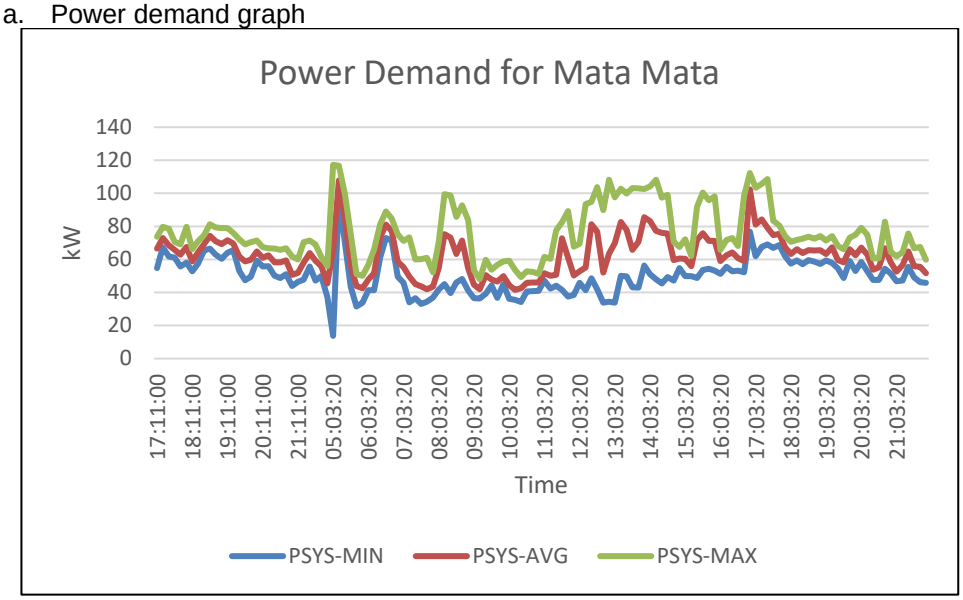

Figure 8: Mata Mata Power Demand Graph

b. Energy consumption shown for hourly slots (load shedding shown as zero)

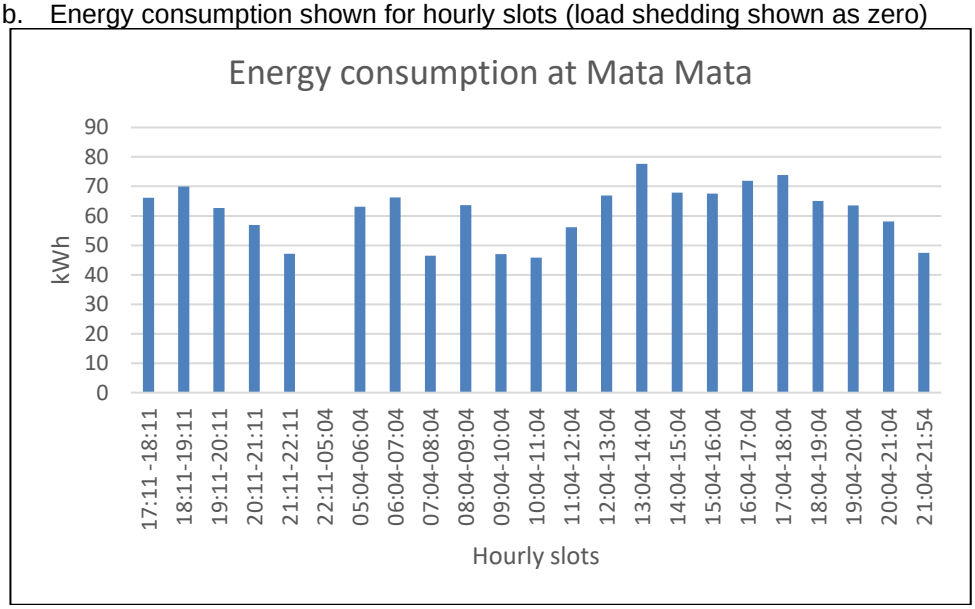

Figure 9: Mata Mata Energy Consumption

2) Nossob

a. Power demand graph

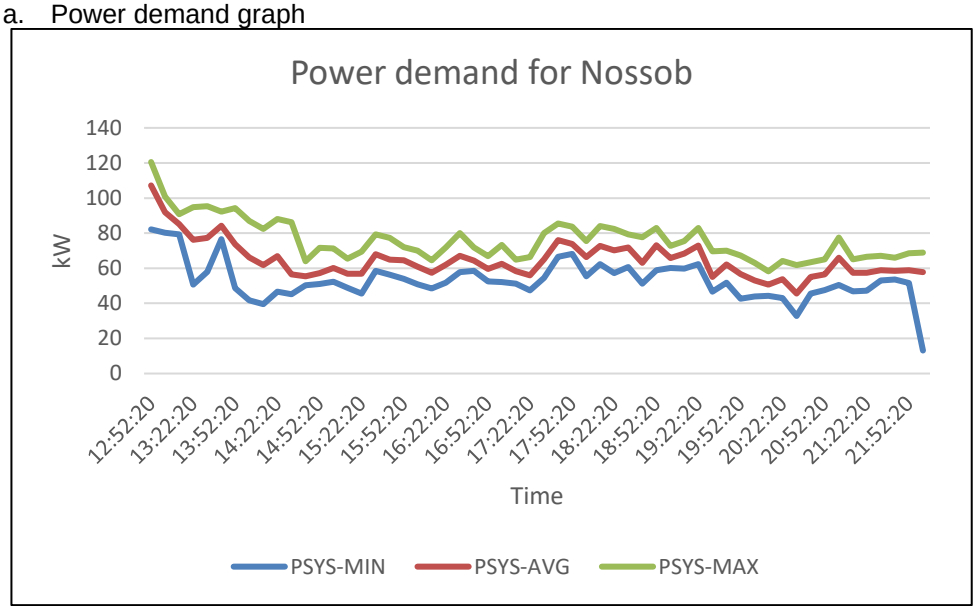

Figure 10: Nossob Power Demand Graph

b. Energy consumption shown for hourly slots

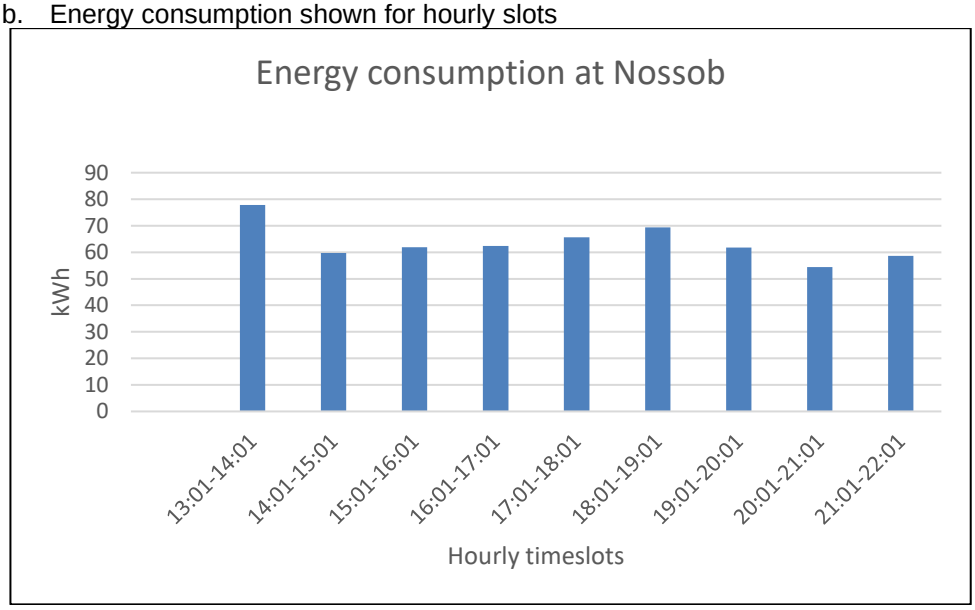

Figure 11: Nossob Energy Consumption

3) PV systems Summary, minimum design values

Location	PV	Battery	System Type	Battery Type
Mata Mata	200kWp	737kWh	AC Coupled	Li-ion
Nossob	200kWp	737kWh	AC Coupled	Li-ion

Table 6: PV System Summary

4) Possible System Layout.

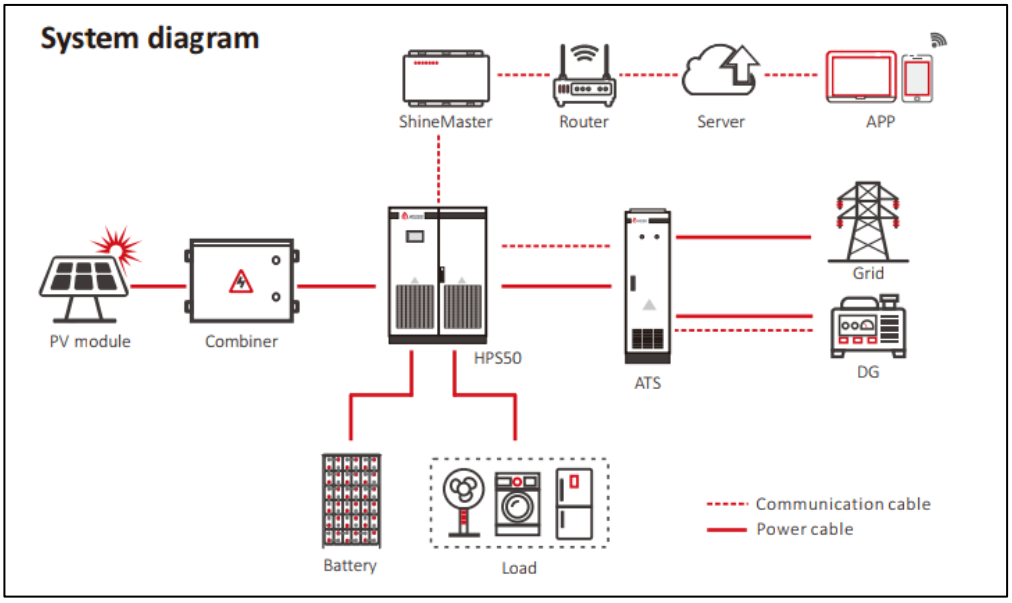

Figure 12: System Design

ANNEXURE C- GENERATOR INFORMATION

1) GENERATORS AND ENERGY ROOMS PRESENTLY IN USE

a. MATA MATA

Figure 13: Mata Mata Generator

The photo below shows the generator with the possible site for PV

Figure 14: Mata Mata Generator Location

The possible site for PV

Figure 15: Mata Mata PV Location

Inside the energy room behind the generator

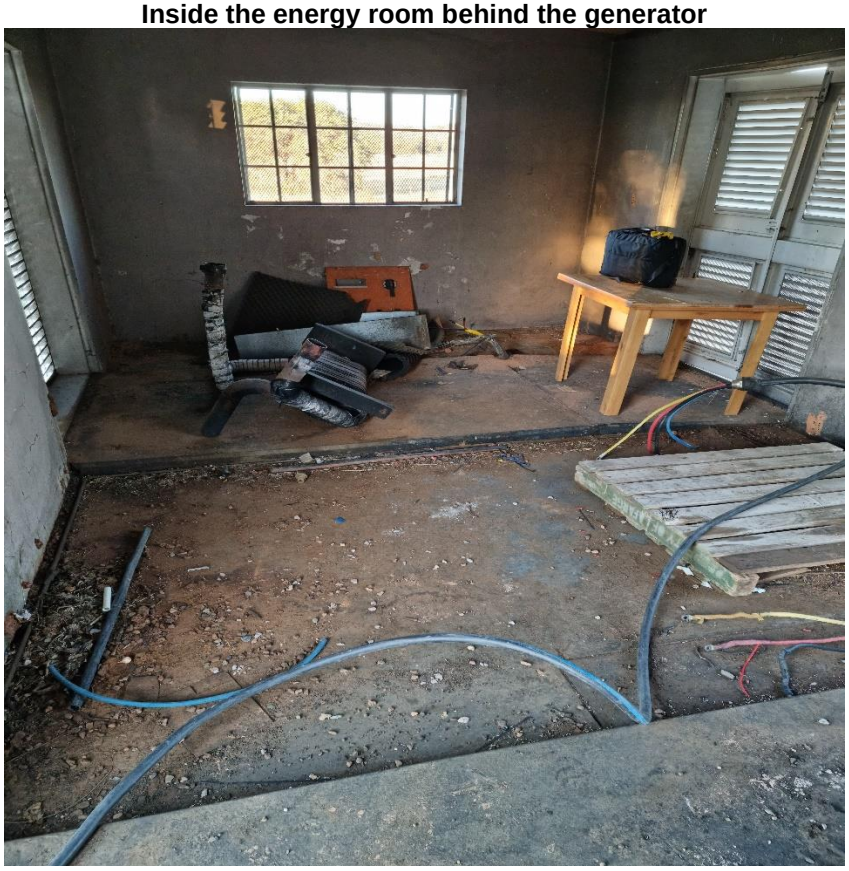

Figure 16: Mata Mata Energy Room

View from inside the energy room showing the generator and open field.

Figure 17: Mata Mata Energy Room with Generator

b. NOSSOB Generator data

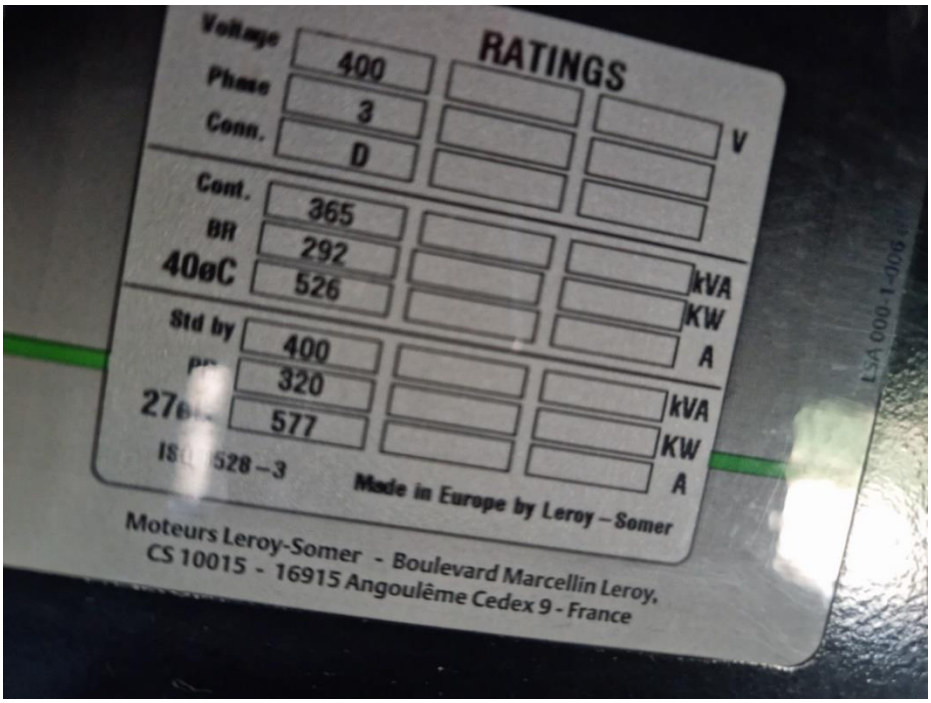

Figure 18: Nossob Generator

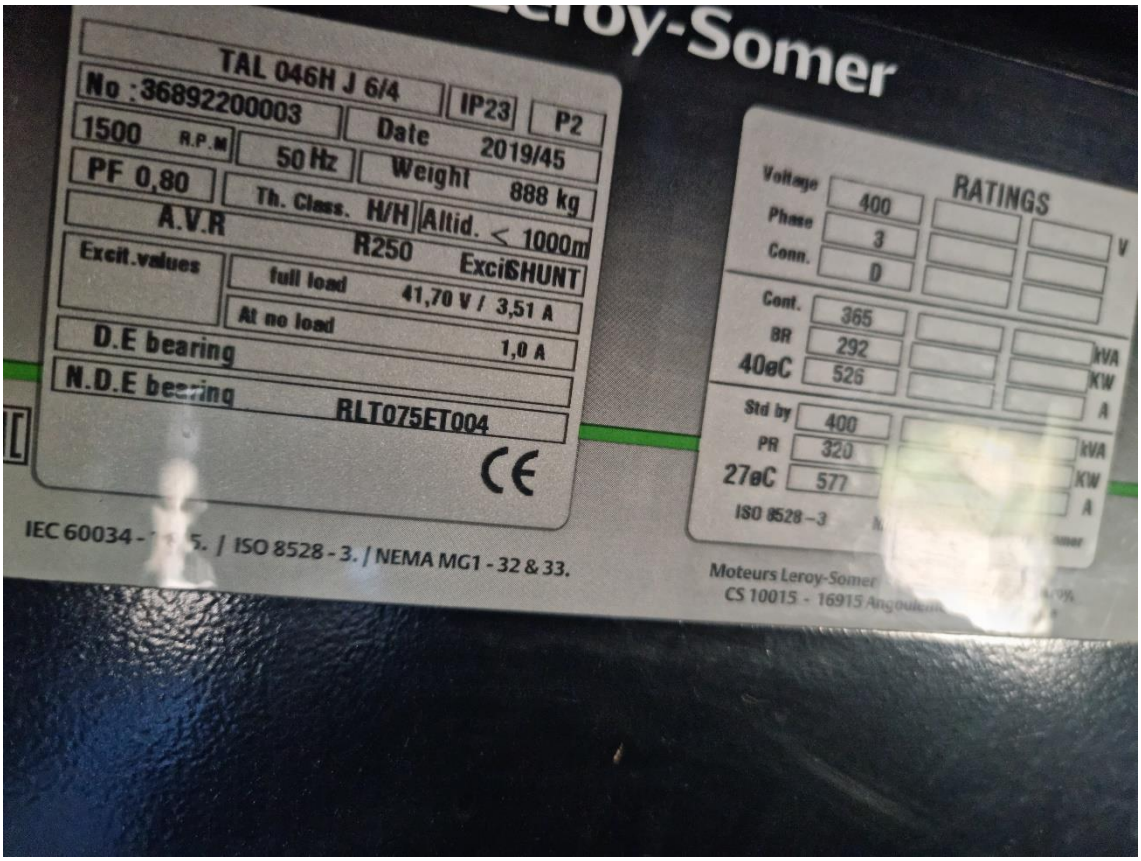

Figure 19: Nossob Generator Data

Energy room at Nossob where the generator is inside the room. It is big enough for all the solar equipment.

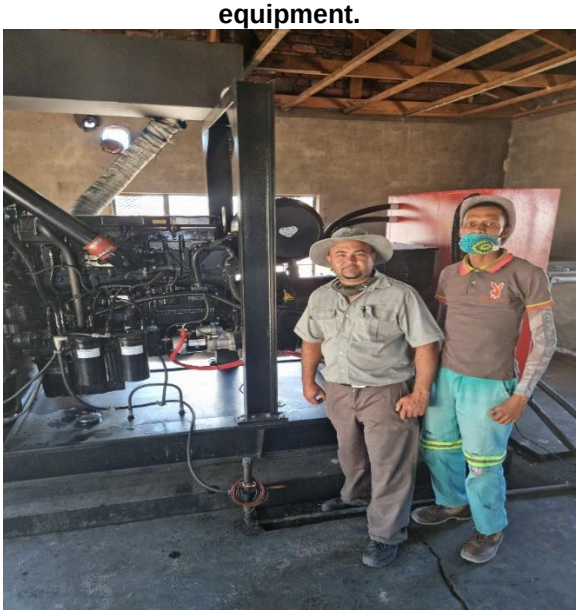

Figure 20: Nossob Energy Room

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK CONTRACT No. CI-GK-0132

C3.2 Annexes

3.2.1 PARTICULAR SPECIFICATIONS

ANNEXURE D - HEALTH AND SAFETY SPECIFICATIONS FOR SOUTH AFRICAN NATIONAL PARKS

ANNEXURE E - ENVIRONMENTAL MANAGEMENT PLAN

ANNEXURE F - CODE OF CONDUCT FOR WORKING IN THE SOUTH AFRICAN NATIONAL PARKS

Annexure D

Health and Safety Specifications for South African National Parks

THE DESIGN, CONSTRUCTION, DELIVERY, COMMISSIONING AND MAINTENANCE OF SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK

CONTRACT No. CI-GK-0132

South African NATIONAL PARKS

HEALTH & SAFETY SPECIFICATIONS FOR

THE SOLAR PV PLANTS AT MATA MATA AND NOSSOB CAMPS IN THE KGALAGADI TRANSFRONTIER PARK

CONTRACT NO: CI- GK-0132

Date: November 2022

Contact person: Zamakhosi Mkhonza

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South African NATIONAL PARKS

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9. HEALTH AND SAFETY SPECIFICATION ACKNOWLEDGEMENT RECEIPT

1. PURPOSE OF THE HEALTH AND SAFETY SPECIFICATION

This Health and Safety Specification has been prepared to comply with the requirements of the Construction Regulations 2014.

The purpose of this site-specific Health and Safety Specification is to comply with legal requirements and to provide health and safety information about specific project risks known by the Client, Designer and Client Agent to be applicable to this project. This document also provides minimum health and safety requirements, standards and expectations that the principal contractor and contractors must adhere to.

The Contractor must take into account all information in this specification and ensure that their tenders include adequate resource and competence to deal with the matters detailed herein so that all relevant contents are dealt with in a way which is in compliance with legislation and the ethical concerns for the safeguarding of employees, contractors and other persons affected by the construction activities.

The Health and Safety Specification will be implemented during construction of the works and any construction activity that the Client has control over.

This will also assist in ensuring that all the costs related to the compliance with Occupational Health Act 85 of 1993 and the Construction Regulations 2014, as well as this Health and Safety Specification, are taken into consideration at Tender stage.

No advice, approval of any document required by the Health and Safety Specification such as hazard identification and risk assessment action plans or any other form shall be construed as an acceptance by the Client of any obligation that absolves the Contractor from achieving the required level of performance and compliance with legal requirements.

Further, there is no acceptance of liability by the Client which may result from the Contractor failing to comply with the Health and Safety Specification unless the Client has issued an instruction to any requirement, i.e., the Contractor remains responsible for achieving the required performance levels.

2. IMPLEMENTATION OF THE HEALTH AND SAFETY SPECIFICATION

This Health and Safety Specification forms an integral part of the Contract, and Contractors shall make it an integral part of their Contracts with Sub Contractors and Suppliers. Contractors employed by the Client are to ensure that the provisions of the Health and Safety Specification are applied both on the site and in respect of all off site activities relating to the project, in particular in transport activities and project dedicated off site fabrication works.

The Contractor shall enforce the provisions of the Health and Safety Specification amongst all sub-contractors and suppliers for the project.

The Contractor shall sign the acknowledgment on the last page of this safety specification that he/she has familiarized him/herself with the content of the Health and Safety Specification and shall comply with all obligations in respect thereof.

The successful Contractor will be required to compile a Health and Safety Plan based on the requirements of the Occupational Health Act 85 of 1993 and these Specifications, which will need to be approved by Client prior to commencement with construction work.

3. APPLICATION AND INTERPRETATION

This document is to be read and understood in Conjunction with the following inter alia:

- Occupational Health and Safety Act (Act 85 of 1993)
- SABS codes and standards referred to by the Occupational Health and Safety Act
- Regulations as per the Occupational Health and Safety Act (Act 85 of 1993) with specific reference but not limited to:
    - General Safety Regulations (GN 928, 25 June 2003)
    - General Machinery Regulations (GN R1521, 5 August 1988)
    - Electrical Machinery Regulations (GN R250, 25 March 2011)
    - Electrical Installation Regulations (GN R242, 6 March 2009)
    - Driven Machinery Regulations (GN R1010, 18 July 2003)
    - Hazardous Chemical Substance Regulations (GN R930, 25 June 2003)
    - Hazardous Biological Agents Regulations (GN R 1390, 27 December 2001)
- Basic Conditions of Employment Act (Act 75 of 1997)
- SANParks Environmental Management Plan
- SANParks Code of Conduct of working in a National Park

4. DEFINITIONS

ALL REFERENCES TO CLIENT IN THIS HEALTH AND SAFETY SPECIFICATION ALSO REFER TO CLIENT AGENT, WHERE SO APPOINTED.

Definitions (as per the Construction Regulations 2014) applicable to this Health and Safety Specification:

"agent" means a competent person who acts as a representative for a client;

"angle of repose" means the steepest angle of a surface at which a mass of loose or fragmented material will remain stationary in a pile on the surface, rather than sliding or crumbling away;

"bulk mixing plant" means machinery, appliances or other similar devices that are assembled in such a manner so as to be able to mix materials in bulk for the purposes of using the mixed product for construction work;

"client" means any person for whom construction work is being performed;

"competent person" means a person who has, in respect of the work or task to be performed, the required knowledge, training and experience and, where applicable, qualifications, specific to that work or task: Provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualification Framework Act, 2000 (Act No.67 of 2000), those qualifications and that training must be regarded as the required qualifications and training; and is familiar with the Act and with
the applicable regulations made under the Act;

"construction manager" means a competent person responsible for the management of the physical construction processes and the coordination, administration and management of resources on a construction site;
"construction site" means a work place where construction work is being performed;

"construction supervisor" means a competent person responsible for supervising construction activities on a construction site;

"construction vehicle" means a vehicle used as a means of conveyance for transporting persons or material, or persons and material, on and off the construction site for the purposes of performing construction work;

"construction work" means any work in connection with-

- the construction, erection, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure; or
- the construction, erection, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system; or the moving of earth, clearing of land, the making of excavation, piling, or any similar civil engineering structure or type of work ;

"construction work permit" means a document issued in terms of regulation 3;

"contractor" means an employer who performs construction work;

"demolition work" means a method to dismantle, wreck, break, pull down or knock down of a structure or part thereof by way of manual labour, machinery, or the use of explosives;

"design" in relation to any structure, includes drawings, calculations, design details and specifications ;

"designer" means a competent person who-

- prepares a design;
- checks and approves a design;
- arranges for a person at work under his or her control to prepare a design, including an employee of that person where he or she is the employer; or
- designs temporary work, including its components;
- an architect or engineer contributing to, or having overall responsibility for a design;
- a building services engineer designing details for fixed plant;
- a surveyor specifying articles or drawing up specifications;
- a contractor carrying out design work as part of a design and building project; or
- an interior designer, shop-fitter or landscape architect;

"excavation work" means the making of any man-made cavity, trench, pit or depression formed by cutting, digging or scooping;

"explosive actuated fastening device" means a tool that is activated by an explosive charge and that is used for driving bolts, nails and similar objects for the purpose of providing fixing;

"fall arrest equipment" means equipment used to arrest a person in a fall, including personal equipment, a body harness, lanyards, deceleration devices, lifelines or similar equipment;

"fall prevention equipment" means equipment used to prevent persons from falling from a fall risk position, including personal equipment, a body harness, lanyards, lifelines or physical equipment such as guard-rails, screens, barricades, anchorages or similar equipment;

"fall protection plan" means a documented plan, which includes and provides for -

- all risks relating to working from a fall risk position, considering the nature of work undertaken;
- the procedures and methods to be applied in order to eliminate the risk of falling; and
- a rescue plan and procedures;

"fall risk" means any potential exposure to falling either from, off or into;

"health and safety file " means a file, or other record containing the information in writing required by these Regulations;

"health and safety plan" means a site, activity or project specific documented plan in accordance with the client's health and safety specification;

"health and safety specification" means a site, activity or project specific document prepared by the client pertaining to all health and safety requirements related to construction work;

"material hoist" means a hoist used to lower or raise material and equipment, excluding passengers;

"medical certificate of fitness" means a certificate contemplated in regulation 7(8);

"mobile plant" means any machinery, appliance or other similar device that is able to move independently, and is used for the purpose of performing construction work on a construction site;

"National Building Regulations" means the National Building Regulations made under the National Building Regulations and Building Standards Act, 1977 (Act No. 103 of 1977), and promulgated by Government Notice No. R. 2378 of 30 July 1990, as amended by Government Notices No's R. 432 of 8 March 1991, R. 919 of 30 July 1999 and R. 547 of 30 May 2008;

"person day" means one normal working shift of carrying out construction work by a person on a construction site;

"principal contractor" means an employer appointed by the client to perform construction work;

"Professional Engineer or Professional Certificated Engineer" means a person holding registration as either a Professional Engineer or Professional Certificated Engineer in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000);

"Professional Technologist" means a person holding registration as a Professional Engineering Technologist in terms of the Engineering Profession Act, 2000;

"provincial director" means the provincial director as defined in regulation 1 of the General Administrative Regulations, 2003;

"scaffold" means a temporary elevated platform and supporting structure used for providing access to and supporting workmen or materials or both;

"shoring" means a system used to support the sides of an excavation and which is intended to prevent the cave-in or the collapse of the sides of an excavation;

"structure" means-

- any building, steel or reinforced concrete structure (not being a building), railway line or siding, bridge, waterworks, reservoir, pipe or pipeline, cable, sewer, sewage works, fixed vessels, road, drainage works, earthworks, dam, wall, mast, tower, tower crane, bulk mixing plant, pylon, surface and underground tanks, earth retaining structure, or any structure designed to preserve or alter any natural feature, and any other similar structure;
- any falsework, scaffold or other structure designed or used to provide support or means of access during construction work; or
- any fixed plant in respect of construction work which includes installation, commissioning, decommissioning or dismantling and where any construction work involves a risk of a person falling;

"suspended platform" means a working platform suspended from supports by means of one or more separate ropes from each support;

"temporary works" means any falsework, formwork, support work, scaffold, shoring or other temporary structure designed to provide support or means of access during construction work;

"the Act" means the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993);

"tunneling" means the construction of any tunnel beneath the natural surface of the earth for a purpose other than the searching for or winning of a mineral.

5. GENERAL REQUIREMENTS

5.1 Duties of Principal Contractor / Contractor in terms of Construction Regulations 2014

A Principal Contractor must:

- provide and demonstrate to the client a suitable, sufficiently documented and coherent site-specific health and safety plan, based on the client's documented health and safety specifications, which plan must be applied from the date of commencement of and for the duration of the construction work and which must be reviewed and updated by the principal contractor as work progresses;
- open and keep on site a health and safety file, which must include all documentation required in terms of the Act and these Regulations, which must be made available on request to an inspector, the client, the client's agent or a contractor; and
- on appointing any other contractor, in order to ensure compliance with the provisions of the Act –
    - provide contractors who are tendering to perform construction work for the principal contractor, with the relevant sections of the health and safety specifications pertaining to the construction work which has to be performed.
    - ensure that potential contractors submitting tenders have made sufficient provision for health and safety measures during the construction process.
    - ensure that no contractor is appointed to perform construction work unless the principal contractor is reasonably satisfied that the contractor that he or she intends to appoint, has the necessary competencies and resources to perform the construction work safely.
    - ensure prior to work commencing on the site that every contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Injuries and Diseases Act, 1993.
    - appoint each contractor in writing for the part of the project on the construction site
    - take reasonable steps to ensure that each contractor's health and safety plan is implemented and maintained on the construction site.
    - ensure that the periodic site audits and document verification are conducted at intervals mutually agreed upon between the principal contractor and any contractor, but at least once every 30 days.
    - stop any contractor from executing construction work which is not in accordance with the client's health and safety specifications and the principal contractor's health and safety plan for the site or which poses a threat to the health and safety of persons;
- where changes are brought about to the design and construction, make available sufficient health and safety information and appropriate resources to the contractor to execute the work safely.
- discuss and negotiate with the contractor the contents of their health and safety plan and finally approve that plan for implementation.
- ensure that a copy of both the principal contractor and contractor's health and safety plan is available on request to an employee, an inspector, a contractor, the client or the client's agent;
- hand over a consolidated health and safety file to the client upon completion of the construction work, to include a record of all drawings, designs, materials used and other similar information concerning the completed structure.
- in addition to the documentation required in the health and safety file include and make available a comprehensive and updated list of all the contractors on site accountable to the principal contractor, the agreements between the parties and the type of work being done;
- ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.

A contractor must prior to performing any construction work -

- provide and demonstrate to the principal contractor a suitable and sufficiently documented health and safety plan, based on the relevant sections of the client's health and safety specification and provided by the principal contractor, which plan must be applied from the date of commencement of and for the duration of the construction work and which must be reviewed and updated by the contractor as work progresses;
- open and keep on site a health and safety file, which must include all documentation required in terms of the Act and these Regulations, and which must be made available on request to an inspector, the client, the client's agent or the principal contractor;
- before appointing another contractor to perform construction work be reasonably satisfied that the contractor that he or she intends to appoint has the necessary competencies and resources to perform the construction work safely;
- co-operate with the principal contractor as far as is necessary to enable each of them to comply with the provisions of the Act;
- as far as is reasonably practicable, promptly provide the principal contractor

with any information which might affect the health and safety of any person at work carrying out construction work on the site, any person who might be affected by the work of such a person at work, or which might justify a review of the health and safety plan.

Where a contractor appoints another contractor to perform construction work, the duties that apply to the principal contractor will apply to the contractor as if he or she were the principal contractor.

A principal contractor must take reasonable steps to ensure co-operation between all contractors appointed by the principal contractor to enable each of those contractors to comply with these Regulations.

No contractor may allow or permit any employee or person to enter any site, unless that employee or person has undergone health and safety induction training pertaining to the hazards prevalent on the site at the time of entry.

A contractor must ensure that all visitors to a construction site undergo health and safety induction pertaining to the hazards prevalent on the site and must ensure that such visitors have the necessary personal protective equipment.

A contractor must at all times keep on his or her construction site records of the health and safety induction training and such records must be made available on request to an inspector, the client, the client's agent or the principal contractor.

A contractor must ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3 (a template of which can be found in the Construction Regulations, 2014).

5.2 Management and Supervision of Construction Work

A principal contractor must, in writing, appoint one full-time competent person as the construction manager with the duty of managing all the construction work on a single site, including the duty of ensuring occupational health and safety compliance, and in the absence of the construction manager an alternate must be appointed by the principal contractor.

A principal contractor must upon having considered the size of the project, in writing appoint one or more assistant construction managers for different sections thereof: Provided that the designation of any such person does not relieve the construction manager of any personal accountability for failing in his or her management duties in terms of this regulation.

Where the construction manager has not appointed assistant construction managers, or, in the opinion of an inspector, a sufficient number of such assistant construction managers have not been appointed, that inspector must direct the construction manager in writing to appoint the number of assistant construction managers indicated by the inspector, and those assistant construction managers must be regarded as having been appointed.

No construction manager appointed in terms of the Regulations may manage any construction work on or in any construction site other than the site in respect of which he or she has been appointed.

A contractor must, after consultation with the client and having considered the size of the project, the degree of danger likely to be encountered or the accumulation of hazards or risks on the site, appoint a full-time or part-time construction health and safety officer in writing to assist in the control of all health and safety related aspects on the site: Provided that, where the question arises as to whether a construction health and safety officer is necessary, the decision of an inspector is decisive.

No contractor may appoint a construction health and safety officer to assist in the control of health and safety related aspects on the site unless he or she is reasonably satisfied that the construction health and safety officer that he or she intends to appoint is registered with a statutory body approved by the Chief Inspector and has necessary competencies and resources to assist the contractor

A construction manager must in writing appoint construction supervisors responsible for construction activities and ensuring occupational health and safety compliance on the construction site.

A contractor must, upon having considered the size of the project, in writing appoint one or more competent employees for different sections thereof to assist the construction supervisor, and every such employee has, to the extent clearly defined by the contractor in the letter of appointment, the same duties as the construction supervisor: Provided that the designation of such employee does not relieve the construction supervisor of any personal accountability for failing in his or her supervisory duties.

Where the contractor has not appointed such an employee, or, in the opinion of an inspector, a sufficient number of such employees have not been appointed, that inspector must instruct the employer to appoint the number of employees indicated by the inspector.

No construction supervisor appointed may supervise any construction work on or in any construction site other than the site in respect of which he or she has been appointed: Provided that if a sufficient number of competent employees have been appropriately designated on all the relevant construction sites, the appointed construction supervisor may supervise more than one site.

5.3 Notification of Intention to Commence Construction Work

The Contractor shall notify the Provincial Director of the Department of Labour of the intention to commence construction work at least 7 days prior to the works commencing if the intended construction work will:

- include excavation work
- Include work at height where there is a risk of falling
- Include the demolition of a structure, or
- Include the use of explosives to perform construction work.

If the construction work involves construction of a single storey dwelling for a client, and such client will be residing in such dwelling upon completion, the contractor must also notify the Provincial Director of the Department of Labour at least 7 days before the works commence.

This must be done on a form similar to an Annexure 2 (template of which can be found in the Construction Regulations, 2014). A copy of the notification letter to the Provincial Director shall be forwarded to the Client for record purposes.

5.4 Construction Work Permit

It must be noted that from August 2015 all projects that meet the following criteria will require a construction work permit to be applied for at least 30 days prior to the work being carried out:

- Exceeds 180 days
- Will involve more than 1800 person days of construction work
- Works contract is of a value equal to or exceeding thirteen million rand, or Construction Industry Grading Board (CIDB) grading level 6

It is the client's responsibility to apply for this permit from the Provincial Director and construction work may not commence until the permit has been issued by the Provincial Director.

A copy of this permit will be required to be kept in the principal contractors safety file, and the site specific number issued by the Provincial Director must be displayed at the site entrance.

5.5 Assignment of Contractor's Responsible Persons to Manage Health and Safety on Site

The Contractor shall submit management and supervisory appointments as well as any relevant appointments in writing (as stipulated by the Construction Regulations 2014 and the Occupational Safety and Health Act 1993), prior to commencement of work (refer to **Annexure B** at the end of this Health and Safety Specification).

5.6 Competency for Contractor's Responsible Persons

The Contractor's responsible persons shall be competent in health and safety and be familiar with the Occupational Health and Safety Act 1993, and applicable regulations. Valid proof of pertinent health and safety courses attended by such persons will be required to be presented to the Client.

5.7 Compensation of Occupational Injuries and Diseases Act 130 of 1993 (COIDA)

The successful Contractor shall submit to the Client a valid letter of good standing with the Compensation Insurer prior to appointment.

5.8 Occupational Health and Safety Policy

The Contractor shall submit their Health and Safety Policy, prior to construction commencement, signed by the Chief Executive Officer. The Policy must outline objectives and how they will be achieved and implemented within the operations.

5.9 Health and Safety Organogram

The Contractor shall submit an organogram, prior to construction commencement, outlining the Health and Safety Site Team that will be assigned to the project, if successful with the tender. In cases where appointments have not been made, the organogram shall reflect the position. The organogram shall be updated, when there is a change in the site team.

5.10 Risk Assessments

Baseline Risk Assessment

The Client shall cause a baseline risk assessment to be conducted by a competent person before the design process and tender process commence, and the assessed risks shall form part of the health and safety specifications.

The Contractor must, before commencement of any construction work, and during construction work, have risk assessments performed by a competent person appointed in writing, which risk assessments form part of the health and safety plan to be applied on the site and must include:

- The identification of the risks and hazards to which persons may be exposed to;
- An analysis and evaluation of the risks and hazards identified; based on a documented method
- A documented plan and applicable safe work procedures to mitigate, reduce or control the risks and hazards that have been identified;
- A monitoring plan; and
- A review plan

The Contractor must ensure that, as far as is reasonably practicable, ergonomic related hazards are analysed, evaluated and addressed in a risk assessment.

The Contractor must ensure that all employees under his control are informed, instructed and trained by a competent person regarding any hazard and the related work procedures and/or control measures **before any work commences** and thereafter **at the times determined in the risk assessment monitoring and review plan of the relevant site.**

The Principal Contractor must ensure that all contractors are informed regarding any hazard that is stipulated in the risk assessment **before any work commences** and thereafter **at the times determined in the risk assessment monitoring and review plan of the relevant site.**

The Contractor must consult with the health and safety committee or with a representative trade union or representative group of employees if no health and safety committee exists, on the monitoring and review of the risk assessments for the site.

The Contractor must ensure that copies of risk assessment for this site are available on site for inspection purposes by interested parties (inspector, the client, client's agent, any contractor, any employee, a representative trade union, a health and safety representative or safety committee member.

A Contractor must review the relevant risk assessment where changes are effected to the design and/or construction that result in a change to the risk profile, or when an incident has occurred.

Preventative measures must first address the elimination of the hazard or risk. Should PPE be required to reduce risk, the equipment or clothing to be used must be SABS approved

In general the Contractor must ensure that the Risk Assessment involves identifying the hazards present in a work activity on site. This is followed by an evaluation of the extent of the risk involved taking into account those precautions already being taken.

The following general principle should be followed when conducting a risk assessment:

- All relevant risks and/or hazards should be systematically addressed;
- The risk assessment should address what actually happens in the workplace during the work activity;
- All employees and those who may be affected must be considered, including maintenance staff, security guards, visitors and subcontractors;
- The risk assessment should highlight those groups and individuals who may be required to work alone or who have disabilities;
- The risk assessment process should take into account the existing safety measures and controls.
- The level of detail on a risk assessment should be appropriate to the level of risk.

5.11 Safe Work Procedures

Safe Work Procedures are to form part of the H&S Plan and **must be compiled for all the identified activities.**
The safe work procedures must address the following elements:

- The work method to be followed to conduct work safely
- Mitigation of identified risks
- Reducing and controlling risks and hazards that have been identified
- Responsibilities of competent persons
- Required personal protective equipment
- Correct equipment/tools/machinery to be used
- Reference to relevant registers to be completed
- Reference to applicable risk assessment

5.12 Health and Safety Representative(s)

The Contractor shall ensure that Health and Safety Representative(s) is/are elected and trained to carry out his / her functions. The appointment must be in writing. The Health and Safety Representative shall carry out regular inspections, keep records and report to the supervisor to take appropriate action. He / she shall attend Health and Safety Committee Meetings. The Health and Safety Representative shall be part of the team that will investigate incidents, accidents and non-conformances.

5.13 Health and Safety Committee

Where two or more health and safety representatives have been appointed on site, the Contractor shall ensure that monthly health and safety meetings are held with such representatives and minutes are kept on record. Meetings must be organized and chaired by the Contractor's Health and Safety Committee Chairperson. Minutes of these meetings must be available for the employees of the contractor to refer to.

5.14 Medical Certificate of Fitness

The contractor must ensure that their employees on site have a valid medical certificate of fitness, specific to the construction work being performed, issued by an occupational health practitioner in the form of an Annexure 3 template (refer to the Construction Regulations 2014 on the Department of Labour website for a sample of this form).

5.15 Health and Safety Training

The Contractor shall quarterly conduct a training needs analysis to ascertain what health and safety training is required. A plan of action should be devised and forwarded to the Client for records. Once the identified people have attended the training, the Contractor must provide the Client with copies of certificates obtained.

5.15.1 Induction

No Contractor may allow or permit any employee or person to enter site unless they have undergone health and safety induction training pertaining to the hazards prevalent on site at the time of entry. This includes visitors to site. The Contractor must ensure that visitors to site have the necessary protective equipment (PPE). A copy of attendance registers of all employees who attend inductions shall be kept.

5.15.2 Awareness

The Contractor shall conduct periodic toolbox talks on site, preferably weekly or before any hazardous work takes place. The talks shall cover the relevant activity and an attendance register must be signed by all attendees. This record of who attended and the content of the topic will be kept on the site health a safety file as evidence of training

5.16 Competency

After the Contractor has identified the training to be conducted as part of the competency requirement, and based on Risk Assessment, he shall send the relevant persons on appropriate courses and keep certificates of training for reference. Familiarity with the Health and Safety Act and Regulations is an integral part of the definition of competence.

5.17 General Record Keeping

The Contractor shall keep and maintain Health and Safety records to demonstrate compliance with the Health and Safety Specification and the Occupational Health and Safety Act. The contractor shall ensure that all records of incidents, spot fines, training etc. are kept on site. All documents shall be available for inspection by the Client, or the Department of Labour's Inspectors.

5.18 General Inspection, Monitoring and Reporting

The Contractor shall carry out inspections as required by **Annexure C** in this Health and Safety Specification, as well as by health and safety legislation.

5.19 Emergency Procedures

The Contractor shall submit a detailed Emergency Procedure for approval by the Client prior to commencement on site. The procedure shall detail the response plan including the following:

- List of key personnel;
- Details of emergency services;
- Actions or steps to be taken in the event of the emergency; and
- Information on hazardous materials / situations, including each material's hazardous potential impact or risk on the environment or human and measures to be taken in the event of an accident.

Emergency procedure(s) shall include, but shall not be limited to, fire, spills, accidents to employees, use of hazardous substances, dangers as a result of riot / service deliver protests / intimidation, etc. The Contractor shall advise the Client in writing of any on-site emergencies, together with a record of action taken, within 24 hours of the emergency occurring. A contact list of all service providers (Fire Department, Ambulance, Police, Medical and Hospital, etc.) must be maintained and available to site personnel.

5.20 First Aid Box and First Aid Equipment

The Contractor shall provide first aid box/es and appoint, in writing, First Aider(s) for this project in line with the results of the Contractor's risk assessment for the project, this health and safety specification as well as the provisions of the General Safety Regulations. The appointed First Aider(s) are to be sent for accredited first aid training before starting on site. Valid certificates are to be kept on site.

First Aid box/es must be adequately stocked at all time, accessible and be controlled by a qualified First Aider. If required by the Client, the Contractor shall have a stretcher on site to be used in case of a serious incident.

5.21 Accident / Incident Reporting and Investigation

The Contractor shall, in addition to the prescribed requirements of the Occupational Health and Safety Act and General Safety Regulations, investigate, record and report all Section 24 reportable incidents to the Client within 24 hours of the incident occurring. Incident investigations shall be conducted by the Contractor's appointed Accident Investigator – this Investigator must be a competent person or persons who have sufficient knowledge to carry out an investigation.

In the event of a fatality or a permanent disabling injury the Contractor must submit proof of reporting of incident to Department of Labour as well as proof of preventative measures to the Client. The Client reserves the right to conduct investigations into any incidents that they deem fit and the Contractor is required to provide full co-operation in this regard.

5.22 Hazards and Potential Situations

The Contractor shall immediately notify other Contractors of any hazardous or potentially hazardous situations, which may arise during performance of the activities.

5.23 Occupational Health and Safety Signage

The Contractor shall ascertain and provide adequate on site health and safety signage. This signage shall include, but shall not be limited to, Hard Hat / Helmet Area; Safety Shoes to be worn on site; Dust Masks to be worn in areas where there might be exposure to excessive dust; Ear Plugs / Muffs to be worn where there might be noise exposure over 85; Gloves; Safety Goggles; Safety Harness, Workers in Excavation, traffic management, etc. The Contractor shall be responsible to maintain the quality and replacement of signage.

5.24 Management of Contractors by Principal Contractor

The Principal Contractor shall ensure that all contractors under his control are complying with the respective Health and Safety Plans, as well as Health and Safety Legislation.

5.25 Stacking of Materials

In addition to the provisions for the stacking of articles in the General Safety Regulations, 2003, the contractor must ensure that –

- a competent person is appointed in writing with the duty of supervising all stacking and storage on a construction site;
- adequate storage areas are provided;
- there are demarcated storage areas; and
- storage areas are kept neat and under control.

5.26 Housekeeping and General Safeguarding on Construction Sites

A contractor must, in addition to compliance with the Environmental Regulations for Workplaces, 1987, promulgated by Government Notice No. R. 2281 of 16 October 1987, ensure that suitable housekeeping is continuously implemented on each construction site, including-

- the proper storage of materials and equipment;
- the removal of scrap, waste and debris at appropriate intervals;
- ensuring that materials required for use, are not placed on the site so as to obstruct means of access to and egress from workplaces and passageways;
- ensuring that materials which are no longer required for use, do not accumulate on and are removed from the site at appropriate intervals;
- ensuring that waste and debris are not disposed of from a high place with a chute, unless the chute complies with the requirements set out in the regulations;

- ensuring that construction sites in built-up areas adjacent to a public way are suitably and sufficiently fenced off and provided with controlled access points to prevent the entry of unauthorized persons; and
- ensuring that a catch platform or net is erected above an entrance or passageway or above a place where persons work or pass under, or fencing off the danger area if work is being performed above such entrance, passageway, or place so as to ensure that all persons are kept safe in the case of danger of possibility of persons being struck by falling objects.

5.27 Construction Vehicles and Mobile Plant

A contractor must ensure that all construction vehicles and mobile plant-

- are of an acceptable design and construction;
- are maintained in a good working order;
- are used in accordance with their design and the intention for which they were designed, having due regard to safety and health;
- are operated by a person who-
- has received appropriate training, is certified competent and in possession of proof of competency and is authorised in writing to operate those construction vehicles and mobile plant;
- has a medical certificate of fitness to operate those construction vehicles and mobile plant, issued by an occupational health practitioner in the form of Annexure 3.
- have safe and suitable means of access and egress;
- are properly organized and controlled in any work situation by providing adequate signalling or other control arrangements to guard against the dangers relating to the movement of vehicles and plant, in order to ensure their continued safe operation;
- are prevented from falling into excavations, water or any other area lower than the working surface by installing adequate edge protection, which may include guard-rails and crash barriers;
- are fitted with structures designed to protect the operator from falling material or from being crushed should the vehicle or mobile plant overturn;
- are equipped with an acoustic warning device which can be activated by the operator;
- are equipped with an automatic acoustic reversing alarm; and
- are inspected by the authorised operator or driver on a daily basis using a relevant checklist prior to use and that the findings of such inspection are recorded in a register kept in the construction vehicle or mobile plant.

A contractor must ensure that-

- no person rides or is required or permitted to ride on a construction vehicle or mobile plant otherwise than in a safe place provided thereon for that purpose;
- every construction site is organized in such a way that, as far as is reasonably practicable, pedestrians and vehicles can move safely and without risks to health;
- the traffic routes are suitable for the persons, construction vehicles or mobile plant using them, are sufficient in number, in suitable positions and of sufficient size;
- every traffic route is, where necessary, indicated by suitable signs;
- all construction vehicles and mobile plant left unattended at night, adjacent to a public road in normal use or adjacent to construction areas where work is in progress, have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, in order to identify the location of the vehicles or plant;
- all construction vehicles or mobile plant when not in use, have buckets, booms or similar appendages, fully lowered or blocked, controls in a neutral position, motors stopped, wheels chocked, brakes set and ignition secured;
- whenever visibility conditions warrant additional lighting, all mobile plant are equipped with at least two headlights and two taillights when in operation;
- tools, material and equipment are secured and separated by means of a physical barrier in order to prevent movement when transported in the same compartment with employees;
- vehicles used to transport employees have seats firmly secured and adequate for the number of employees to be carried; and
- all construction vehicles or mobile plant travelling, working or operating on public roads comply with the requirements of the National Road Traffic Act, 1996.

5.28 Electrical Installations and Machinery on Construction Sites

A contractor must, in addition to compliance with the Electrical Installation Regulations and the Electrical Machinery Regulations, ensure that –

- before construction commences and during the progress thereof, adequate steps are taken to ascertain the presence of and guard against danger to workers from any electrical cable or apparatus which is under, over or on the site;
- all parts of electrical installations and machinery are of adequate strength to withstand the working conditions on construction sites;
- the control of all temporary electrical installations on the construction site is designated to a competent person who has been appointed in writing for that purpose;
- all temporary electrical installations used by the contractor are inspected at least once a week by a competent person and the inspection findings are recorded in a register kept on the construction site; and

- all electrical machinery is inspected by the authorized operator or user on a daily basis using a relevant checklist prior to use and the inspection findings are recorded in a register kept on the construction site.

5.29 Use and Temporary Storage of Flammable Liquids on Construction Sites

A contactor must, in addition to compliance with the provisions for the use and storage of flammable liquids in the General Safety Regulations, 2003, ensure that –

- where flammable liquids are being used, applied or stored at the workplace concerned, it is done in a manner that does not cause a fire or explosion hazard, and that the workplace is effectively ventilated;
- no person smokes in any place in which flammable liquid is used or stored, and the contractor must affix a suitable and conspicuous notice at all entrances to any such areas prohibiting such smoking;
- an adequate amount of efficient fire-fighting equipment is installed in suitable locations around the flammable liquids store with the recognized symbolic signs;
- only the quantity of flammable liquid needed for work on one day is taken out of the store for use;
- all containers holding flammable liquids are kept tightly closed when not in actual use and, after their contents have been used up, are removed from the construction site and safely disposed of;
- where flammable liquids are decanted, the metal containers are bonded and earthed; and
- no flammable material, including cotton waste, paper, cleaning rags or similar material is stored together with flammable liquids

5.30 Water environments

Not applicable on this project

5.31 Fire precautions on Construction Sites

A contractor must, in addition to compliance with the Environmental Regulations for Workplaces, 1987, ensure that –

- all appropriate measures are taken to avoid the risk of fire;
- sufficient and suitable storage is provided for flammable liquids, solids and gases;
- smoking is prohibited and notices in this regard are prominently displayed in all places containing readily combustible or flammable materials;
- in confined spaces and other places in which flammable gases, vapours or dust can cause danger-
    - only suitably protected electrical installations and equipment, including portable lights, are used;
    - there are no flames or similar means of ignition;
    - there are conspicuous notices prohibiting smoking;
    - oily rags, waste and other substances liable to ignite are without delay removed to a safe place; and
    - adequate ventilation is provided;

- combustible materials do not accumulate on the construction site;
- welding, flame cutting and other hot work are done only after appropriate precautions have been taken to reduce the risk of fire;
- suitable and sufficient fire-extinguishing equipment is placed at strategic locations or as may be recommended by the Fire Chief or local authority concerned, and that such equipment is maintained in a good working order;
- the fire equipment contemplated above is inspected by a competent person, who has been appointed in writing for that purpose, in the manner indicated by the manufacturer thereof;
- a sufficient number of workers are trained in the use of fire- extinguishing equipment;
- where appropriate, suitable visual signs are provided to clearly indicate the escape routes in the case of a fire;
- the means of escape is kept clear at all times;
- there is an effective evacuation plan providing for all -
    - persons to be evacuated speedily without panic;
    - persons to be accounted for; and
    - plant and processes to be shut down; and
    - a siren is installed and sounded in the event of a fire.

5.32 Construction Employees' Facilities

A contractor must, in terms of the Construction Regulations 2014, provide:

- Shower facilities after consultation with the employees or employees representatives, or at least one shower facility for every 15 persons;
- at least one sanitary facility for each sex and for every 30 workers;
- changing facilities for each sex;
- and sheltered eating area.

A contractor must provide reasonable and suitable living accommodation for the workers at construction sites who are far removed from their homes and where adequate transportation between the site and their homes, or other suitable living accommodation, is not available.

Contractor	Witness for Contractor	Employer	Witness for Employer

5.33 Fall protection

The Contractor must:

- designate a competent person to be responsible for the preparation of a fall protection plan
- ensure that the fall protection plan contemplated above is implemented, amended where and when necessary and maintained as required; and
- take steps to ensure continued adherence to the fall protection plan.

A fall protection plan contemplated above must include-

- a risk assessment of all work carried out from a fall risk position and the procedures and methods used to address all the risks identified per location;
- the processes for the evaluation of the employees' medical fitness necessary to work at a fall risk position and the records thereof;
- a programme for the training of employees working from a fall risk position and the records thereof;
- the procedure addressing the inspection, testing and maintenance of all fall protection equipment; and
- a rescue plan detailing the necessary procedure, personnel and suitable equipment required to affect a rescue of a person in the event of a fall incident to ensure that the rescue procedure is implemented immediately following the incident.

A contractor must ensure that a construction manager appointed under regulation 8(1) is in possession of the most recently updated version of the fall protection plan.

A contractor must ensure that all unprotected openings in floors, edges, slabs, hatchways and stairways are adequately guarded, fenced or barricaded or that similar means are used to safeguard any person from falling through such openings;

Also that no person is required to work in a fall risk position, unless such work is performed safely as contemplated in above and fall prevention and fall arrest equipment are approved as suitable and of sufficient strength for the purpose for which they are being used, having regard to the work being carried out and the load, including any person, they are intended to bear; and securely attached to a structure or plant, and the structure of plant and the means of attachment thereto are suitable and of sufficient strength and stability for the purpose of safely supporting the equipment and person who could fall, and fall arrest equipment is used only where it is not reasonably practicable to use fall prevention equipment.

5.34 Temporary works

A contractor must appoint a temporary works designer in writing to design, inspect and approve the erected temporary works on site before use.

A contractor must ensure that all temporary works operations are carried out under the supervision of a competent person who has been appointed in writing for that purpose.

A contractor must ensure that-

- all temporary works structures are adequately erected, supported, braced and maintained by a competent person so that they are capable of supporting all anticipated vertical and lateral loads that may be applied to them, and that no loads are imposed onto the structure that the structure is not designed to withstand;
- all temporary works structures are done with close reference to the structural design drawings, and where any uncertainty exists the structural designer should be consulted;
- detailed activity specific drawings pertaining to the design of temporary works structures are kept on the site and are available on request to an inspector, other contractors, the client, the client's agent or any employee;
- all persons required to erect, move or dismantle temporary works structures are provided with adequate training and instruction to perform those operations safely;
- all equipment used in temporary works structure are carefully examined and checked for suitability by a competent person, before being used;
- all temporary works structures are inspected by a competent person immediately before, during and after the placement of concrete, after inclement weather or any other imposed load and at least on a daily basis until the temporary works structure has been removed and the results have been recorded in a register and made available on site;
- no person may cast concrete, until authorization in writing has been given by the competent person contemplated above;
- if, after erection, any temporary works structure is found to be damaged or weakened to such a degree that its integrity is affected, it is safely removed or reinforced immediately;
- adequate precautionary measures are taken in order to-
- secure any deck panels against displacement; and
- prevent any person from slipping on temporary works due to the application of release agents;
- as far as is reasonably practicable, the health of any person is not affected through the use of solvents or oils or any other similar substances;

- upon casting concrete, the temporary works structure is left in place until the concrete has acquired sufficient strength to safely support its own weight and any imposed load, and is not removed until authorization in writing has been given by the competent person
- the foundation conditions are suitable to withstand the loads caused by the temporary works structure and any imposed load in accordance with the temporary works design.
- provision is made for safe access by means of secured ladders or staircases for all work to be carried out above the foundation bearing level;
- a temporary works drawing or any other relevant document includes construction sequences and methods statement;
- the temporary works designer has been issued with the latest revision of any relevant structural design drawing;
- a temporary works design and drawing is used only for its intended purpose and for a specific portion of a construction site; and
- the temporary works drawings are approved by the temporary works designer before the erection of any temporary works.

No contractor may use a temporary works design and drawing for any work other than its intended purpose.

5.35 Excavation

A contractor must-

- ensure that all excavation work is carried out under the supervision of a competent person who has been appointed in writing for that purpose; and
- Evaluate, as far as is reasonably practicable, the stability of the ground before excavation work begins.

A contractor who performs excavation work-

- must take reasonable and sufficient steps in order to prevent, as far as is reasonably practicable, any person from being buried or trapped by a fall or dislodgement of material in an excavation;
- may not require or permit any person to work in an excavation which has not been adequately shored or braced: Provided that shoring and bracing may not be necessary where-
- the sides of the excavation are sloped to at least the maximum angle of repose measured relative to the horizontal plane; or
- such an excavation is in stable material: Provided that-
- permission has been given in writing by the appointed competent person contemplated above upon evaluation by him or her of the site conditions; and
- where any uncertainty pertaining to the stability of the soil still exists, the decision from a professional engineer or a professional technologist competent in excavations is decisive and such a decision must be noted in writing and signed by both the competent person and the professional engineer or technologist, as the case may be;
- must take steps to ensure that the shoring or bracing contemplated above is designed and constructed in a manner that renders it strong enough to support the sides of the excavation in question;
- must ensure that no load, material, plant or equipment is placed or moved near the edge of any excavation where it may cause its collapse and consequently endangers the safety of any person, unless precautions such as the provision of sufficient and suitable shoring or bracing are taken to prevent the sides from collapsing;
- must ensure that where the stability of an adjoining building, structure or road is likely to be affected by the making of an excavation, steps are taken to ensure the stability of such building, structure or road and the safety of persons;
- must cause convenient and safe means of access to be provided to every excavation in which persons are required to work, and such access may not be further than six meters from the point where any worker within the excavation is working;
- must ascertain, as far as is reasonably practicable, the location and nature of electricity, water, gas or other similar services which may in any way be affected by the work to be performed, and must before the commencement of excavation work that may affect any such service, take the steps that are necessary to render the circumstances safe for all persons involved;
    - must ensure that every excavation, including all bracing and shoring, is inspected-
    - daily, prior to the commencement of each shift;
    - after every blasting operation;
    - after an unexpected fall of ground;
    - after damage to supports; and
    - after rain,

by the competent person, in order to ensure the safety of the excavation and of persons, and those results must be recorded in a register kept on site and made available on request to an inspector, the client, the client's agent, any other contractor or any employee;

- must cause every excavation which is accessible to the public or which is adjacent to public roads or thoroughfares, or whereby the safety of persons may be endangered, to be –
    - adequately protected by a barrier or fence of at least one metre in height and as close to the excavation as is practicable; and
    - provided with warning illuminates or any other clearly visible boundary indicators at night or when visibility is poor, or have resort to any other suitable and sufficient precautionary measure where this is not practicable;
- must ensure that all precautionary measures stipulated for confined spaces as determined in the General Safety Regulations, 2003, are complied with by any person entering any excavation;
- must, where the excavation work involves the use of explosives, appoint a competent person in the use of explosives for excavation, and must ensure that a method statement is developed by that person in accordance with the applicable explosives legislation; and
- must cause warning signs to be positioned next to an excavation within which or where persons are working or carrying out inspections or tests.

5.36 Demolition Work

Not applicable on this project.

5.37 Tunnelling

Not applicable on this project.

5.38 Scaffolding

A contractor must appoint a competent person in writing who must ensure that all scaffolding work operations are carried out under his or her supervision and that all scaffold erectors, team leaders and inspectors are competent to carry out their work.

A contractor using access scaffolding must ensure that such scaffolding, when in use, complies with the safety standards incorporated for this purpose into these Regulations under section 44 of the Act.

5.39 Bulk mixing plant

A contractor must ensure that the operation of a bulk mixing plant is supervised by a competent person who has been appointed in writing and is –

- aware of all the dangers involved in the operation thereof; and
- conversant with the precautionary measures to be taken in the interest of health and safety.

No person supervising or operating a bulk mixing plant may authorize any other person to operate the plant, unless that person is competent to operate a bulk mixing plant.

A contractor must ensure that the placement and erection of a bulk mixing plant complies with the requirements set out by the manufacturer and that such plant is erected as designed.

A contractor must ensure that all devices to start and stop a bulk mixing plant are provided and that those devices are placed in an easily accessible position and constructed in a manner to prevent accidental starting.

A contractor must ensure that the machinery and plant selected is suitable for the mixing task and that all dangerous moving parts of a mixer are placed beyond the reach of persons by means of doors, covers or other similar means.

No person may remove or modify any guard or safety equipment relating to a bulk mixing plant, unless authorized to do so by the appointed person.

A contractor must ensure that all precautionary measures stipulated for confined spaces as determined in the General Safety Regulations, 2003, are complied with when entering any silo.

A contractor must ensure that a record is kept of all repairs or maintenance to a bulk mixing plant and that the record is available on site to an inspector, the client, the client's agent or any employee.

5.40 Rope Access Work

Not applicable on this project.

5.41 Hazardous Chemical Substances (HCS)

In addition to the requirements in the HCS Regulations, the principal contractor must provide proof in the Health and Safety Plan that:

- Material Safety Data Sheets (MSDS's) of the relevant materials / hazardous chemical substances are available prior to use by the contractor. All MSDS's shall be available for inspection by the agent at all times.

- Risk assessments are done at least once every 6 months.
- Exposure monitoring is done according to OESSM and by an Approved Inspection Authority (AIA) and that the medical surveillance programme is based on the outcomes of the exposure monitoring.
- How the relevant HCS's are being/going to be controlled by referring to:
    - Limiting the amount of HCS
    - Limiting the number of employees
    - Limiting the period of exposure
    - Substituting the HCS
    - Using engineering controls
    - Using appropriate written work procedures
- The correct PPE is being used.
- HCS are stored and transported according to SABS 072 and 0228.
- Training with regards to these regulations was given.

The Health and Safety plan should make reference to the disposal of hazardous waste on classified sites and the location thereof (where applicable).

The First Aider must be made aware of the MSDS and trained in how to treat HCS incidents appropriately.

5.42 Hazardous Biological Substances (HBS)

Because of the possible exposure of workers to raw sewage the H&S Plan shall include details of the following:

- The conducting of Risk Assessment specifically aimed at exposure to HBA which shall include the following
    - Nature and dose of HBA
    - Where HBA may be present and in what physical form
    - The nature of work or process
    - Steps in the event of failure of control measures
    - The effect of the HBA
    - The period of exposure
    - Control measures to be implemented

- Monitoring of exposure of workers shall be conducted to establish whether any worker is infected with an HBA associated with working or being exposed to raw sewage, in terms of the following:
    - By an occupational medical practitioner
    - Before entering the site to establish the workers baseline
    - During the period of the contract the risk assessment indicate possible exposure
    - After completion of the contract
- Medical surveillance should such be required after the above-mentioned by an occupational health practitioner.
- Indication on how all records of assessment, monitoring, etc. will be kept, taking into account that records have to be kept for a period of 40 years.
- How exposure to HBA is to be controlled
- The provision of personal protective equipment
- What information and training is to be provided to employees regarding the following:
    - The contents of these regulations
    - Potential risks to health
    - Control measures to be implemented
    - The correct use and maintenance of personal protective equipment
    - The results of the risk assessment.

5.43 Noise Induced Hearing Loss

Where noise is identified as a hazard the requirements of the NIHL regulations must be complied with and the following must be included / referred to in the Health and Safety Plan:

- Proof of training with regards to these regulations.
- Risk assessment done within 1 month of commencement of work.
- That monitoring carried out by an AIA and done according to SABS 083.
- Medical surveillance programme established and maintained for the necessary employees.
- Control of noise by referring to:
    - Engineering methods considered
    - Admin control (number of employees exposed) considered
    - Personal protective equipment considered/decided on
    - Describe how records are going to be kept for 40 years.

5.44 Explosives and Blasting

Not applicable on this project.

5.45 Personal Protective Equipment (PPE)

The Contractor shall carry out PPE or clothing needs analysis in accordance with his risk assessment, to determine the necessary PPE or clothing to be used during construction. The Contractor shall make provision and keep adequate quantities of SABS approved PPE or clothing on site at all times.

The Contractor must ensure that personnel are trained in the correct use of PPE to be used.

The Contractor must ensure that lost, stolen, worn out or damaged PPE is replaced as required and receipt signed for by employees on site.

5.46 Asbestos

Not applicable on this project.

Should asbestos be identified as a hazard whilst work is carried out, the following must be included in the health and safety plan:

- Notification to the Provincial Director in writing, prior to commencement of asbestos work.
- Proof of a structured medical surveillance programme, drawn up by an occupational medicine practitioner.
- Proof that an occupational health practitioner carried out an initial health evaluation within 14 days after commencement of work.
- Copies of the results of all assessments, exposure monitoring and the written inventory of the location of the asbestos at the workplace.
- Only proof that medical surveillance has been conducted and not the actual records itself since these areas of a confidential nature.
- How records are going to be kept safe for the stipulated period of 40 years.
- Proof that asbestos demolition (if applicable) is going to be done by a registered asbestos contractor and provide proof that a plan of work for such demolition is submitted to an Approved Asbestos Inspection Authority 30 days prior to commencement of the demolition.
- Provide proof that the plan of work was approved by the asbestos AIA and submitted to the provincial director 14 days prior to commencement of demolition work together with the approved standardised procedures for demolition work

5.47 Lead

Not applicable on this project.

Should lead be identified as a hazard whilst work is carried out, the following must be included in the health and safety plan:

- Proof that an occupational health practitioner carried out an initial health evaluation within 14 days after commencement of work.
- Copies of the results of all assessments, exposure monitoring and the written inventory of the location of the lead at the workplace.
- Only proof that medical surveillance has been conducted and not the actual records since these are of a confidential nature.
- How records are going to be kept safe for the stipulated period of 40 years.

5.48 Pressure Vessels (Including Gas Bottles)

Not applicable on this project.

5.49 Fire Extinguishers and Fire Fighting Equipment

The Contractor shall provide adequate, regularly serviced fire extinguishers located at strategic points on site. The Contractor shall keep spare serviced portable fire extinguishers. The Contractor shall have adequate persons trained or competent to use the Fire Fighting Equipment.

Safety signage shall be posted up in all areas where fire extinguishers are located.

5.50 Lifting Machinery and Tackle

Not applicable on this project.

5.51 Ladders and Ladder work

The Contractor shall ensure that all ladders are numbered and inspected regularly keeping record of inspections. It should be noted that Aluminium ladders are preferred to wooden ladders.

5.52 General Machinery

The Contractor shall comply with the Driven Machinery Regulations, which include inspecting machinery regularly, appointing a competent person to inspect and ensure maintenance, issuing PPE or clothing and training those that use machinery and enforce compliance.

5.53 Portable Electrical Tools

The Contractor shall ensure that use and storage of all explosive actuating fastening devices and portable electrical tools are in compliance with relevant legislation.
The Contractor shall consider that:

- A competent person undertakes routine inspections;
- Only authorised persons use the tools;
- There are safe working procedures applied;
- Awareness training is carried out and compliance is enforced at all times; and
- PPE and clothing is provided and maintained.

5.54 High Voltage Electrical Equipment

The Contractor shall ensure that, where the work is under, on or near high-voltage electrical equipment the Electrical Installation Regulations, together with safety instructions (Regulations of the Owner of the Equipment) are complied with. Such equipment includes:

- Eskom and the Local Authority equipment
- The Contractor's own power supply; and
- Electrical equipment being installed but not yet taken over from a Contractor by The Client.

5.55 Public Health and Safety

The Contractor shall ensure that each person working on or visiting a site, and the surrounding community, shall be made aware of the dangers likely to arise from on-site activities and the precautions to be observed to avoid or minimize those dangers. Appropriate health and safety signage shall be posted at all times.

5.56 Night Work

Not applicable on this project.

5.57 Lighting

Where poor or lack of illumination is identified as a hazard the lighting regulations must be complied with and the following must be included in the H&S Plan:

- How lighting will be ensured/ provided where daylight is not sufficient and /or after hours are worked.
- Planned maintenance programme for replacing luminaries.
- Proof of illumination levels of artificial illumination equipment.

5.58 Environmental Conditions and Flora and Fauna

The Contractor must be mindful of adverse weather conditions upon the health and safety of the workforce. This includes inclement weather, strong wind, heat stress, extreme cold, etc. The Contractor's risk assessment process must take into account the risks associated with such weather conditions. The same is true when working in an environment where there is a risk to employees' health and safety from presence of poisonous flora, or wildlife (including bees, snakes, etc.). The Contractor's risk assessment process must take these risks into account.

5.59 Occupational Health

Exposure of workers to occupational health hazards and risks are very common in any work environment, especially in construction. Occupational health hazards and risks exposure is a major problem and all Contractors are to ensure that proper health and hygiene measures are put in place to prevent exposure to these hazards and risks.

The occupational hazards and risks may enter the body in three ways:

- Inhalation through breathing e.g. cement dust;
- Ingestion through swallowing maybe through food intake;
- Absorption through the skin (pores) e.g. painting or use of thinners.

The contractor is required to ensure that all his personnel are medically fit prior to being allowed onto the work site.

All Contractors should ensure that Occupational Hygiene surveys are conducted as per the Occupational Health and Safety Act to ensure employees are not exposed to hazards. Risk Assessments should identify areas where surveys are to be conducted.

5.60 Suspended Platforms

Not applicable on this project.

5.61 Material Hoists

Not applicable on this project.

5.62 Explosive Actuated Fastening Device

Not applicable on this project

6. TRAINING, INSPECTIONS AND RECORDS

The Contractor must be aware of the following additional requirements:

What	When	Output
Awareness training (Toolbox Talks)	At least fortnightly and before hazardous work is carried out	Attendance Register
Health and Safety Committee Meetings	Monthly	Minutes signed by employer
Health and Safety Reports	Monthly	Report covering: a) Incidents / Accidents and investigation b) Non conformance c) Health and Safety Training d) HIRA Updates e) Internal & External Audits
General Inspections	As per Health and Safety Specifications & OHSA	Report of Health and Safety Specifications and OHSA compliance: a) Scaffolding b) Lifting Machinery c) Excavations d) Construction vehicle
General Inspections	Monthly	Covering: a) Fire Fighting Equipment b) Portable Electrical Equipment c) Hand Tools d) Ladders
Record Keeping	On-going	Covering: a) General Complaints b) Fines c) General Incidents d) MSDS e) Surveillance Medicals f) Inspection Registers g) Department of Labour Notices

ANNEXURE A

The contractor shall submit the info below in an Annexure 2 prior to construction commencement.

Item No.	Health and Safety Specification Requirement	OHSA Requirement	Submission date
1	Notification of Intention to Commence Construction	Construction Regulation 2014	At least 7 days before commencement on site
2	Construction Work Permit	Construction Regulation 2014	At least 30 days prior to project commencement
3	Assignment of Responsible Person to Manage Building Work Via Health and Safety Organogram	Construction Regulation 2014	Before commencement on site
4	Competency for Health and Safety Positions	Client / Client Agent requirement	Before commencement on site
5	Letter of Good Standing	Compensation of Occupational Injuries & Disease Act (COIDA) 130 of 1993	Before commencement on site
6	Occupational Health and Safety Policy	Client / Client Agent requirement	Before commencement on site
7	Risk Assessment, Safety Plan, Demolition Method Statement	Client / Client Agent requirement	Before commencement on site

ANNEXURE B: APPOINTMENTS

The Contractor shall make the following appointments:

No	Description	No	Description
1	Chief Executive Officer (OSHACT 16(1))	17	Material Hoist Inspector (CR19(8)(a))
2	Contract Director/Manager (OSHACT 16(2))	18	Material Hoist Operator (CR19(6))
3	Construction Manager (CR 8(1))	19	Bulk Mixing Plant Supervisor (CR20(1))
4	Construction Supervisor (CR 8(7))	20	Bulk Mixing Plant Operator (CR20(2))
5	Assistant Construction Supervisor (CR 8(8))	21	Controller of Explosive Actuated Fastening Devices (CR21(2)(g)(1))
6	Construction Safety Officer (CR 8(5))	22	Construction Vehicle and Mobile Plant Operator (CR23(1)(d)(i)
7	Construction risk assessor (CR 9(1))	23	Controller of Temporary Electrical Installations (CR24('c))
8	Fall Protection Competent Person (CR 10(1))	24	Stacking Supervisor (CR28(a))
9	Traffic Safety Officer	25	Fire Extinguishing Equipment Inspector (CR29(h))
10	Safety Representative (where > 20 employees on site)	26	Fire Fighters (CR29(i))
11	Temporary work Designer (CR 12(1))	27	First Aider (GSR 3)
12	Temporary work Supervisor (CR12(2))	28	Fall Protection Plan Developer (CR 10(1)(a))
13	Excavation Supervisor (CR13(1)(a))	29	Incident Investigator (OSHACT 9(2))
14	Demolition Supervisor (CR14(1))	30	Competent Person – Confined Spaces (GAR 5(1))
15	Scaffold Supervisor (CR16(1))	31	Health and Safety technical Committee (CR 31)
16	Suspended Platform Supervisor (CR17(1))	32	General Machinery Competent Person (GMR 2)

7. PROJECT DETAILS

PROJECT DIRECTORY:		
Client	**SANParks** **643 Leyds Street** **Muckleneuk** **Pretoria** **0001** Contact: Ms Antionet van Wyk	Tel: 012- 426 5126 email: antionet.vanwyk@sanparks.org
Client Agent	**Technical Services** **Kgalagadi Transfrontier Park** Contact: Mr Johan Kruger	Tel: 054-561 2022 email: johan.kruger@sanparks.org

PROJECT DETAILS:
Description of Works The Installation of Solar PV Plants, Kgalagadi Tranfrontier National Park for a period of three (06) Months: • The Solar PV Plants at Mata – Mata and Nossob Camps
Anticipated Construction Duration 6 Months Contract
Provisional Start Date January 2023
Completion Date July 2023

EXISTING ENVIRONMENT:	
Hazards particular to this project by virtue of location: **Wild Animals:** The sites are located in the Kgalagadi Transfrontier Park. A lookout for wildlife such as snakes, lion, cheetah and other dangerous animals are going to be required to protect the workers. **Members of public and children:** All necessary steps to be taken to protect them from any dangers associated with the construction works being undertaken. **Public Roads:** Use of roads network to be carefully planned to accommodate public, tenants and traffic	
Overhead, Above Ground and Underground Services crossing the site:	
Overhead:	Applicable
Underground:	Not Applicable
Ground Level:	Not Applicable
Services Drawings available	Not Applicable
Way leaves required:	Not Applicable
Permits required:	Applicable
Isolation required:	Not Applicable
Existing structures and surrounding land use (with a significant impact on Health and Safety): The Park is a protected area and existing infrastructure can be found in fenced off and wilderness areas. Caution should be taken when working in wilderness areas.	
Existing ground conditions and ground survey report: There is no Geo Tech report available.	

Existing Traffic Systems:	
Conditions:	Gravel/paved roads
Restrictions to access:	Applicable
Speed restrictions:	Normal road restrictions: 40km/h

PROJECT HEALTH AND SAFETY REQUIREMENTS:

Significant health and safety hazards identified by Designer and Client Agent:

Accommodation of Traffic (Management Plan): The Principal Contractor must supply a proper and comprehensive Traffic Management Plan for the various sites within this identification, ie. the Site camp and surrounds as well as the work area and surrounds.

Members of the Public: The works is in a very busy area. The Principal Contractor is responsible for the safety of the workers as well as the public. The Principal Contractor will have to have sufficient warning & information signage to assist with the information to the public. The Principal Contractor will be responsible to have sufficient directional signage and to have proper road traffic management in place.

Wild animals: There are baboons and probably snakes roaming the area and the principal Contractor will have to ensure that they or the workers do not get killed or hurt during the construction phase.

Normal construction hazards expected are as follow:

Compacting and filling / Compactors Operations
Confined Spaces
Excavations
Hand Tools
Members of public
Plant / Vehicle and Equipment Operations
Road Construction
Site Establishment
Snakes
Temporary Works
Traffic Management
Transportation of workers

NOTE: Please refer to the end of this Health and Safety Specification for the Baseline Risk Assessment of these risks.

ACTIVITIES REQUIRING APPROVED METHOD STATEMENTS

Road Traffic Management
Protection of Public

ACTIVITIES REQUIRING PERMITS

Permit to Dig / Permit to Enter Excavations:	Not applicable on this project
Permit to Work with Electricity:	Not applicable on this project
Confined Space Permit:	Not applicable on this project
Hot Works Permit:	Not applicable on this project
Permit to work under Power Lines:	Not applicable on this project

Blasting:	Not applicable on this project
Temporary Works:	Yes - Authorization in writing by competent person

GENERAL ARRANGEMENTS		
Restrictions on times:	Monday - Friday 08:00 to 17:00	Saturday 08:00-13:00
Access to site by Construction Vehicles:	Yes, principal contractor to manage	
Access to site by Construction workers & Visitors:	Visitors and personnel to report to site office	
Site camp location and set up:	Restrictions/requirements, storage areas and security to be advised in consultation with principal agent	
Ablution and Welfare:	Contractor to provide as per regulations	
Environmental Conditions:	Contractor must take into account that the Kgalagadi Transformer National Park is an echo sensitive conservation area and implement control measures to mitigate risk	
Induction Training:	All workers to receive induction training prior to commencement on site. Special reference to SANParks EMP and Code of Conduct	

PROTECTION OF SITE AGAINST UNUATHORIZED ACCESS BY PUBLIC

Excavation Fencing: Note that excavations accessible to public, or adjacent to public roads / through fares, must have (1) barrier / fence of at least 1m in height, and (2) warring illuminates at night or when visibility is poor, or have other suitable precautionary measures if both of these are not practicable. The entire site is to be fenced off with ready fencing. There needs to be access control as well as security personnel on site at all times.

Warning Notices: Construction site, Visitors to report to the site office. Pedestrian arrow signage towards the other side of the road, Fire Extinguisher, First Aid, Emergency Assembly area and Emergency telephone numbers. Reflective vests, safety boots and dust masks signage to be displayed.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

The Client requires the Contractor to ensure that employees (and other under his/her control) wear the following minimum PPE:

Overalls:	Yes, required
Safety Harnesses:	May be required
Hard Hats:	Yes, required
Safety Footwear:	Yes, required
Reflective Vests:	Yes, required
Goggles / Gloves / ear and respiratory protection	As per job function
Specialist equipment:	As per job function

HAZARDOUS SUBSTANCES	
The following materials and substances have, or may have, to be used in the works and are identified as potentially posing special health and / or safety hazards during the project. Appropriate measures will need to be specified for their control:	
Petrol	Cement
Diesel	Silicone
Bitumen	Other
Paint	

Baseline Risk Assessment

Steps in Operation	Ref No.	Hazard	Risk	Risk Rating			Controls Measures	Action to Mitigate
				P	F	S		
General Onsite Activities	A1	Access to Site	Pedestrian & people equipment interaction causing injury	4	2	12	Occupational Health and Safety Act 24(1)	Area to be secured and barricaded / fenced
			Dust Inhalation	3	1	4	Hazardous Chemical Substances Regulation (36)(37)(38)	Induction Training & PPE
			Unauthorised entry	3	2	8	Occupational Health and Safety Act 12(2)	Site Visit Register, signage, Permit for vehicle access
			Slip, trip and fall	3	2	8	Occupational Health and Safety Act 12(1)(b)(c)	Induction Training & PPE
	A2	Placing of office/ containers if lifting is involved	Heavy objects swinging out of control causing injury/damage	2	4	14	Driven Machinery 18(11)	Safe work area, Induction Training, Trained operator, Lifting Plan
			Crane/lifting tackle failure causing object to fall	2	4	14	General Machinery Regulations 7(a)9b)	Inspection Register, Trained operator
			Accidental collision with overhead power lines	2	4	14	General Machinery Regulations 7(a)(b)	Assign a flag man, determine safe work area
			Lifting machine/crane falling over	2	4	14	General Machinery Regulations 5(1)(2)	Assign a flag man, determine safe work area
	A3	Hand Loading and offloading of heavy machinery & equipment	Items rolling/slipping falling causing injury	4	2	12	General Machinery Regulations 2(1)	Induction training, PPE
			Incorrect Lifting procedure resulting in injury	3	2	8	General Machinery Regulations 3(2)	Induction training, Proper lifting procedure, PPE

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
	A4	Machine loading and offloading of heavy machinery & equipment	Failure of machinery causing injury	3	3	13	Driven Machinery 18(1)(a)(b)	Supervision
			Equipment falling	3	3	13	General Machinery Regulations 2(2)	PPE
			Collision of vehicles	3	3	13	General Machinery Regulations7(a)(b)	Flag men
	A5	Traffic	Equipment interaction	3	4	18	Construction Regulation 23(1)(d)(i)(ii)	Traffic management plan
			Pedestrian collision	3	4	18	Construction Regulation 23(2)(c)	Pedestrians Walkways
	A6	Lack of employees' facilities	Lack of drinking water, dehydration of workers	3	5	22	Construction Regulation 30(1)(a)	Provision of drinking water & Induction training
			Lack of sanitary facilities, unhygienic conditions	3	5	22	Construction Regulation 30(1)(b) and 30(2)	Provision of chemical toilets & proper housekeeping
	A7	Stacking & Storage	Fall, slip resulting in potential injury/damage	4	3	17	Construction Regulation 28(d)	Storage plan, induction training and restricted access
			Obstructing critical equipment and walkways	4	3	17	Construction Regulation 27 (a)(c)(g)	Storage plan, induction training and restricted access
			Flammable liquids catching fire	3	3	13	Construction Regulation 25(a)(b)(c)	Storage plan, induction training and firefighting equipment
			Hazardous storage of materials	3	3	13	Hazardous Chemical Regulation (25)9A (2)	Storage plan, regular inspections
	A8	Handling of chemicals and fuels	Exposure	3	3	13	Hazardous Chemical Regulation 9A (1) (a-p)	PPE
			Inhalation	3	3	13	Hazardous Chemical Substances Regulation (36)(37)(38)	
			Burns to Skin	3	3	13	Hazardous Chemical Substances Regulations 9A (2); Material Data Sheet	
	A9	Temporary Low voltage Electrical installation	Exposure to live wires-electrocution	2	5	19	Construction Regulation 24(a)(b)	Lockable DB box, Inspection register

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
			Faulty earth leakage	2	5	19	SANS 10142	Competent person to do installation & inspection
			Short circuit causing fire	2	4	14	Construction Regulation 24(b)	Weekly inspection, Induction Training & Firefighting equipment
	A10	Issue of PPE	Incorrect PPE	4	2	12	General Safety Regulation 2(1)	PPE Register
	A11	Usage of PPE	Incorrect use of PPE	4	2	12	General Safety Regulation 3(2)	PPE Register, Induction Training, supervision
			Negligence to use PPE	4	2	12	General Safety Regulation 5	PPE Register, Induction Training, supervision
	A12	Adverse storms	Struck by lightning	2	5	19	Induction Training Safe Operation Procedure	Proper warning system
	A13	Adverse heat	Dehydration, Sunburn, heat stroke	3	4	18	Induction Training Safe Operation Procedure	Proper drinking water, PPE
	A14	Working in excessive winds	Exposure to dust	3	4	18	Hazardous Chemical Substances Regulation (36)(37)(38)	PPE
	A15	House keeping	Objects lying around can result in slip/fall	4	2	12	Construction Regulation 27(a)(b)	Regular cleaning of site
			Unhygienic conditions	3	3	13	Construction Regulation 27(d)	Induction Training
			Pollution of area	3	2	8	Construction Regulation 27(e)	Proper waste bins and waste removal
	A16	Fire prevention	Open Fires	3	3	13	Construction Regulation 29(a)	SANParks EMP & Code of conduct
			Inadequate firefighting equipment	4	3	17	Construction Regulation 29(g)(h)	Inspection register, supervision
			Run-away fires	4	4	21	Emergency evacuation plan	SANParks EMP & Code of conduct
			Accidental Fires	3	4	18	Construction Regulation 29(a)(d)(iii)	Designated smoking areas

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
	A17	Environmental pollution	Pollution of ground, air, workspace	3	2	8	Environmental Regulation 6(d)	SANParks EMP & Code of conduct
			Littering	4	2	12	SANParks Environmental Management Plan	Induction Training, Provide proper trash bins
	A18	Working near hazardous animals including snakes, spiders & scorpions	Poisons bites/ attack by large animals	3	3	13	SANParks Environmental Management Plan	Induction Training, SANParks ranger where required, Proper treatment in first aid kit
	A19	Working in close proximity of water	Falling into water & drowning	3	4	18	Construction Regulation 26(1)(a)(b)	Safe work area, Induction Training, barricades
			Pollution of water body	3	4	18	SANParks Environmental Management Plan Construction Regulation 26(2)	Induction Training
Plant or vehicle & equipment	B1	Construction vehicles	Equipment Failure	4	4	21	Construction Regulation 23(1)(k)	Vehicle check list and regular maintenance
			Speeding/ Operation	3	4	18	Construction Regulation 23(2)(l)	Safe traffic route, imply penalties, traffic calming measures
			Potential accident/collision	4	4	21	General Machinery Regulations 7(a)	Induction Training, Reflective vests, safe work area
			Material/equipment fall from vehicle	4	4	21	Construction Regulations 23(1)(b)(g)(h)	Properly secure all goods
			Vehicle/plant not used for correct purpose	3	3	13	Construction Regulations 23(1)(b)(c)	Supervision, controlled access to vehicle/plant
	B2	Licencing of operators	Unauthorized operation of equipment	3	3	13	Construction Regulation 23(1)(d)(i)(ii)	Valid operator, restricted access to machinery, supervision
			Expired licenses	3	1	6	Construction Regulation 23(1)(d)(i)(ii)	Keep OHS file up to date
	B3	Parking of vehicles	Runaway vehicle	3	4	17	Safe Operation Procedures (SOP)	Vehicle check list, use stop block behind tyres
			Parking in unsafe areas	3	1	4	Construction Regulation 23(2)(i)(j)	Demarcate proper parking areas

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
Transportation	C1	Transportation of employees	Interaction with other vehicle-collision	4	4	21	Construction Regulation 23(1)(b)(j)	Supervisor
			Equipment not roadworthy	3	1	4		Vehicle checklist, vehicle must meet required standards
			Equipment not licensed	3	1	4	Construction Regulations 23(a)(b)	Supervision and monitor
			Operator of vehicle transporting employees not licensed and authorized	3	1	4	Construction Regulation 23(2)(i)(j)	Supervision and monitor if Driver has Valid PDP
			Vehicle not equipped to transport employees	3	1	4	Construction Regulation 23(d)(i)(j)	Vehicle checklist, vehicle must meet required standards
			Not Adhering traffic legislation	3	1	4	Construction Regulation 23(2)(j)	Supervision, implement fines
	C2	Transportation of material or equipment with people	Material/equipment fall from vehicle	4	4	21	Construction Regulation 23(g)(h)	Properly secure all goods
			Potential accident/collision	4	4	21	Construction Regulation 23(2)(g)(h)(j)	Induction Training, Reflective vests, safe work area
	C3	Towing a Trailer	Vehicle accident	4	4	21	Construction Regulations 23(e); Occupational Health and Safety Act 24(1)(c)(iii)(iv)	Awareness, trained operator
			Towing coupler failure	3	3	13	Construction Regulation 22(e)	Inspection Register
Hand Tools	D1	Injury Due to	Incorrect tools used	4	3	17	Hand tool register, Induction Training,	Supervision
			Defective tools, struck by flying debris	4	3	17	Safe Operation Procedure	Supervision PPE

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
	D2	Hand Drills	Clothing being grabbed by rotating drill	3	3	13	Safe Operation procedure Toolbox Talks Electrical Machinery Regulations 10(3)(4)	PPE, Supervision
			Unsecured work piece rotating with drill	3	3	13		PPE, Supervision
			Shaving flying into eyes	3	3	13		PPE, Supervision
			Accidental injury	4	3	17	Electrical Machinery Regulations 10(4)	PPE, Supervision
			Electrocution	3	5	22	Electrical Machinery Regulations 10(1)(a)(b)	Tool inspection register
	D3	Explosive actuated fastening device	Malfunction of equipment causing injury/damage	3	3	13	Explosive Regulations 15(a)(b)	Tool inspection register, inspect extension cord
			Accidental injury	3	3	13	Explosive Regulations 15(b)	PPE, Supervision
			Accidental discharge	3	3	13	Explosive Regulations 15(a)(b)	Safety mechanism working, Store in unloaded condition
Site Clearance	E1	Site/Bush Clearing	Moving machinery accident	4	3	17	Construction Regulation 23(2)(b)	Reflective vests, restricted access, induction training
			Injury due to hand tools	4	3	17	Safe Operation Procedures (SOP)	Induction Training, PPE, First Aider
			Snakes/ Spider bites	3	3	13	SANParks Environmental Management Plan	Induction Training, Proper First Aid treatment available
			Dangerous animals in vicinity	3	3	13	SANParks Environmental Management Plan	Induction training, armed rangers escort
			Electrical cables and other services in way of work area	3	4	17	Construction Regulation 24(c)	Properly mark & demarcate existing services

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
Site Clearance	E2	Tree felling	Injury from chainsaw	3	3	13	Safe Operation Procedures (SOP)	Trained operator, PPE
			Injury from falling tree	3	3	13		Safe work area, PPE
			Felling from height	3	3	13		Safety Harness, Fall Protection Plan, PPE
			Exposure to electrical cables	3	3	13	Electrical Installation Regulations (5)(1)(2)	Safe work area, PPE
	E3	Removal of waste	Moving machinery accident	4	4	22	Construction Regulation 23(1)(b)(c)	Reflective vests, restricted access, induction training
			Waste material falling of vehicle	3	3	13	Construction Regulations 23(h)	Secure load, stay within maximum vehicle load capacity
			Dust Inhalation	3	2	8	Hazardous Chemical Substances Regulation (36)(37)(38)	Induction Training & PPE
	E4	Demolition	Structure/rubble falling on person	3	3	13	Construction Regulation 14(1); 4(ii)	Induction Training, PPE, demarcate area
			Dust Inhalation	3	2	8	Hazardous Chemical Substances Regulation (36)(37)(38)	Induction Training & PPE
			Presence of lead	2	4	14	Lead Regulations (3)	PPE, Induction Training
			Presence of Asbestos	2	4	14	Asbestos Regulations (4)	PPE, Induction Training
			Hitting electrical cable - electrocution	3	5	22	Construction Regulation 24(a)	Induction training, Site map indicating existing services
			Hitting of gas line - explosion	3	5	22	Construction Regulation 14(1)(2)	Induction training, Site map indicating existing services

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
Excavation & backfilling	F1	Hand Digging of holes/trenches	Injury due to defective tools	4	3	18	Construction Regulation 13(a)	Hand tool register, Induction Training
			Injury due to improper work method	4	3	18		Induction training, supervision
			Trip/fall into holes	3	3	13		Demarcate area, induction training, PPE
	F2	Machine Digging of holes/trenches	Collapse of trench	3	3	13	Construction Regulation 14(4) (iii)	Excavation inspection register by component person daily
			Collapse of adjacent structure	3	3	13	Construction Regulation 11(1)(a)	Safeguard adjacent structures
			Malfunction of machinery	3	3	13	General Machinery Regulations 2(2)	Machinery Inspection Register
			Unauthorized driver	2	2	5	General Machinery Regulations 2(1)	Trained operator, supervision, restricted access to machinery
			Unnecessary Damage to environment	3	2	9	SANParks Environmental Management Plan	Induction Training, designated work area
	F3	Tipping of material	Material falling on to person	3	3	13	Construction Regulation 23(g)	PPE, Safe Work area, Flag men
			Malfunction of equipment causing injury/damage	3	3	13		
	F4	Hitting of electrical cable and services	Electrocution	3	5	22	Construction Regulation 24(a)(b)(c)	Induction training, Site map indicating existing services
	F5	Opening trenches	Risk of collapse	3	3	13	Construction Regulation 13(h)(l)	Stabilize trench, work permit, induction training
			Fall, slip into trench	4	3	17	General Safety Regulations 2(5)(6)	Barricade trench, PPE
	F6	Compaction	Personal Injury	3	3	13	General Safety Regulations 2(5)	PPE, Trained operator
			Collision of machinery	3	3	13	General Machinery Regulations 4(1)	Induction Training, Reflective vests, safe work area
			Dust Inhalation	3	2	8	Hazardous Chemical Substances Regulation (36)(37)(38)	Induction Training & PPE

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
Temporary Works	G1	Stop & Go Procedures - Moving Vehicles	injuries to employees involved in an accident whiles setting up and taking down Stop/Go procedure	4	4	21	Construction Regulation 12(3)(d)	Visibility jackets, radio communication
			Injuries to employees involved in an accident - in the midst of Stop/Go activity	4	4	21		
			Injuries to road users involved in an accident - approaching a Stop/Go activity	4	4	21	Construction Regulation 12(3)(d)	PPE, Competent person conduct work
			Injury during assembly/dismantling	3	3	13	Construction Regulation 12(3)(a)	Induction Training, PPE, Supervision
Installation of Pipes/cables	K1	Installation of sewer/water pipes in trenches	Fall, slip into trench	4	3	17	Electrical Installation Regulations (5)(1)(12)	Barricade trench, PPE
			Exposure to Hazardous biological agents	3	3	13	Hazardous Biological Agents Regulations 5(2)	Hazardous biological
			Pipe handling/lifting resulting in injury	3	3	13	Hazardous Biological Agents Regulations 5(2)	Hazardous biological
	K2	Installation of electrical cable in trench	Fall, slip into trench	4	3	17	Electrical Installation Regulations (2)(1)(2)	Barricade trench, PPE

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
Concrete	J1	Manual Mixing	Cable handling/lifting resulting in injury	3	3	13	Electrical Installation Regulations (2)(1)	Induction Training, PPE
			Cement dust inhalation	3	2	8	Hazardous Chemical Substances Regulations 9A (2)(2) Material Safety Data Sheet (MSDS)	Material Safety Data Sheet, PPE Supervision
			Hazardous substance contacts dry cement mix	3	3	13		PPE, Induction Training
			Spillage/pollution	3	3	13		PPE, Concrete mixing sheet
			Injury during mixing/cement burns	3	3	13		Induction Training, Supervisor, PPE
	J2	Concrete Mixer Machine	Poor ventilation causing ill health	3	2	8	General Safety Regulations 5(5)	PPE, Additional ventilation
			Accidental injury through flying objects	3	3	13	Hazardous Chemical Substances Regulations 10(3)	Induction Training, Supervision
			Spillage/Pollution	3	3	13		Induction Training, PPE
			Clothing/body parts getting caught in open pulley V -BELT	3	3	13		Induction Training, inspection register, moving parts covered with guard
	J3	Bulk Mixing Plant	Unauthorised operations	3	3	13	Construction Regulation	Competent Operator, Supervision Maintenance register, inspection register
			Malfunction of equipment causing injury/damages	3	3	13	Construction Regulation	PPE, Fall Protection Plan, Safe Work area

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
	J4	Road Construction	Risk of being struck by vehicle while working next to road	4	4	21	Occupational Health and Safety Act 24(3)(a)(b)	Traffic Management Plan, Road Signs, reflective vests, Flag man
			Failure of regulating traffic causing collisions	3	4	18		Competent person, supervision
			Injury from road users and public	4	4	21	Construction Regulations 23(1)(e)(j)	Restrict access to site, Signage
			Noise pollution	3	2	8	Noise Induced Hearing Loss Regulations 7(1)(a)(b)(c)(d)	PPE
			Inhalation of dust	3	2	8	Hazardous Chemical Substances Regulations 8(a)(b)(c)	PPE
	L4	Work on Water pipeline reticulation	Person coming into contact with liquid under pressure	3	3	13	Safe Work Procedure Hazardous Biological Agents Regulation 10(1)(a)(b); 2(a)(b)(c)	PPE
			Exposure to thread sealant	3	3	13		PPE
			Release of pressure during pressure test	2	2	5		PPE
	L5	Work on Sewer pipeline reticulation	Person coming into contact with hazardous biological agents	3	2	8	Safe Work Procedure Hazardous Biological Agents Regulation 10(1)(a)(b); 2(a)(b)(c)	PPE
			Explosion due to hazardous fumes	3	2	8		PPE, Induction Training
			Suspended pipe work, pipe falling on person	3	2	8		
			Person coming into contact with liquid under pressure	3	3	13		PPE
	L6	Medium Voltage reticulation	Electrocution	3	5	22	Construction Regulation 24(a)(b)(c)	Competent person to do installation & inspection
			Dangerous/unsafe cable Joints	3	3	13	Construction Regulation 24(d)(e)	Supervision
			Accidental switch on while work in progress	3	5	22		Apply lockout procedure before doing connections
			Short circuit can blow up when switching	3	5	22		PPE

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
	L7	Exposure to mechanical components	Injury from moving parts	3	3	13	Occupational Health and Safety Act 24(1)(a)(c)	
			Electrocution	3	3	13		
			Explosions	3	3	13		
	L8	Water & Sewerage Treatment	Chemical Exposure				Hazardous Chemical Substances Regulations 4(a)(b)(d)(f)(g) Material Date Sheet	Sampling
			Slip and fall					
			Exposure to UV lights					
	L9	High Voltage reticulation > 1000V	Discharge of cable	3	5	22	Electrical Installation Regulations 9(1) General Machinery Regulations 2(1)(2)(3)(i)	Correct measuring equipment
			Electrocution	3	5	22	Construction Regulation 24(a)(b)(c)	Competent person to do installation & inspection
			Dangerous/unsafe cable Joints	3	3	13	Electrical Installation Regulations 2(1)(2)(3)	Supervision
			Accidental switch on while work in progress	3	5	22		Apply lockout procedure before doing connections
			Short circuit can blow up when switching	3	5	22		PPE
	L10	Exposure to plant material with reedbed construction	Allergic reaction					

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
Metalwork	M1	Welding and flame cutting	Unsafe flame cutting/ welding equipment	3	5	22	General Safety Regulations 9(1)(a)(b)(d) General Safety Regulations 9(4)(a)(b)(i)(ii)	Flame cutting equipment to be fitted with flashback arrestors, supervision
			Employees not competent to perform duty	3	3	13		Supervision
			Unsafe storage	3	3	13		Proper storage facility
			Injury / burns to person	3	3	13	Occupational Health and Safety Act 24(1)(a)(c)	Burn shield in First Air Box
			Accidental fire	3	3	13		Firefighting equipment
	M2	Steel fixing	Injuries from tie wire	3	3	13	Construction Regulations 10(4)(b)(c)(i)(ii)	PPE, Induction Training
			Fall from heights	3	3	13		PPE, Fall Protection Plan
			Falling components	3	3	13		PPE, safe work area, catch nets
			Back injuries from manual handling	3	3	13	Construction Regulations 10(4)(b)(c)(i)	PPE, limit lifting weight
			Steel structure collapsing	3	3	13		PPE, Supervision

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures		Action to Mitigate
Installation of Pipes/cables/ Batteries/ connection works	N1	Installation and tubing of pipes to distribute power	Fall, slip into trench	4	3	17	Electrical Installation Regulations (5)(1)(12)		Barricade trench, PPE
			Exposure to Hazardous biological agents	3	3	13	Hazardous Biological Agents Regulations 5(2)		Hazardous biological
			Pipe handling/lifting resulting in injury	3	3	13	Hazardous Biological Agents Regulations 5(2)		Hazardous biological
	N2	Installation of electrical cable supply	Fall, slip into trench	4	3	17	Electrical Installation Regulations (2)(1)(2)		Barricade trench, PPE
			Cable handling/lifting resulting in injury	3	3	13	Electrical Installation Regulations (2)(1)		Induction Training, PPE

LIKELIHOOD RATING	DESCRIPTION	FREQUENCY
5 - Almost certain	Expected to occur in most circumstances	Recurring event e.g. More than once per month.
4 - Likely	The event will probably occur	Event that may occur frequently once per year
3 - Possible	Might occur occasionally	Event that may occur. Once in 3 years
2 - Unlikely	Could happen some time	Event that is unlikely to occur. Once in 10 years
1 - Rare	May happen only in exceptional circumstances	Event that is very unlikely to occur

IMPACTS				
CONSEQUENCE RATING	**ENVIRONMENTAL**	**SAFETY**	**HEALTH**	**FINANCIAL IMPACT**
5 - Critical	Permanent environmental damage to an extensive area	Fatality. Permanent disabling injuries.	Life threatening or permanently disabling illness.	>R 500 000
4 - Major	Long term environmental damage extending to a large area requiring high level intervention	Severe irreversible damage to one or more persons. Lost Time Injury greater than 10 days.	Severe and irreversible health effects or disabling illness.	R100 000 –R499 000
3 - Moderate	Short term environmental damage requiring some intervention	Reversible injury or moderate irreversible impairment. Less than 10 days lost time	Severe but reversible health effects. Results in a lost time illness of less than 10 days.	R10 000 - R99 999
2 - Minor	Short term environmental damage affecting a small area easily remediated	Medically treated injury. Does not lead to restricted duties.	Reversible health effects of concern that results in medical treatment but does not lead to restricted duties.	R1 000 – R9 999
1 - Insignificant	Minimal environmental damage affecting a very small area immediately remediated	Single minor injury to one person. First aid or no treatment required. No lost time.	Reversible health effects of minor concern only requiring minor medical treatment.	R0 - R1 000

LIKELIHOOD							
CONSEQUENCE			1	2	3	4	5
			RARE	UNLIKELY	POSSIBLE	LIKELY	ALMOST CERTAIN
	1	INSIGNIFICANT	1	2	3	4	5
	2	MINOR	2	4	6	8	10
	3	MODERATE	3	6	9	12	15
	4	MAJOR	4	8	12	16	20
	5	CRITICAL	5	10	15	20	25

Risk rating	Risk magnitude	Response
16 - 25	High	Immediate action required to reduce risk. Introduce hard barriers and adequate controls to reduce risk. Control hazards/ Monitor regularly. Ensure the risk has been eliminated so far as is reasonably practicable
9 - 15	Moderate	Urgent attention to improve controls & reduce inherent risks. Monitor systems controls, implement controls, or minimised in accordance with the hierarchy of controls so far as is to reduce the risk.
0 - 8	Low	Tolerable risk level. Carry out activity following review and implementation of effective risk controls in accordance with the hierarchy of controls. Ongoing monitoring and management required by employees and line supervisors to use safe working procedure

DEFINITIONS		Probability (1 - 5)		Determining your prioritisation rating (A/P)		
Hazard	Is a condition, activity, object or substance that has the ability to cause harm.	**1**	Highly improbable	**%**	**Prioritization indicator**	**Action**
Risk	Is the chance or likelihood of a hazard causing harm or damage.	**2**	Less than even chance	1% - 20%	E	Monitor the situation
Probability	The likelihood of a specific outcome/consequence	**3**	Improbable	21% - 40%	D	Within six months
Frequency	A measure of the rate of occurrences of an event expressed as the number of occurrences at a given time	**4**	Probable	41% - 60%	C	Within one month
Severity	Degree or harm of the outcome/consequence	**5**	Inevitable	61% - 80%	B	Within one week
This HIRA does not necessarily cover all hazards associated with the operation / equipment. It is designed as a guide to compliment the Operational Specific HIRA, which must be carried out for each task forming part of an operation.				81% - 100%	A	Immediate

Frequency (1 - 5)		Severity (1 - 15)					
1	Hazard arise 2 yearly	**1**	Superficial injuries, minor cuts and bruises, nuisance and irritations (e.g. eye irritations & headaches), ill health leading to temporary discomfort.	**6**	Laceration, burns, concussion, serious sprains, minor fractures, deafness, dermatitis, asthma, work related upper limb disorder, ill health leading to permanent minor disablement.	**11**	Amputation, major fractures, poisoning, multiple injuries, fatal injuries, Occupational cancer, other severely life shortening diseases, acute fatal diseases.
2	Hazard arise yearly	**2**		**7**		**12**	
3	Hazard arise every month	**3**		**8**		**13**	
4	Hazard arise every week	**4**		**9**		**14**	
5	Hazard permanently present	**5**		**10**		**15**	

Contractor	Witness for Contractor	Employer	Witness for Employer

INITIALS	SURNAME	DESIGNATION	CONTACT DETAILS	HIRA TRAINING	SIGNATURE	DATE
M	Reinhardt	**Regional:** Project Manager	082 796 9986	Yes		
J	Jacobs	**Manager:** Roads Infrastructure	082 796 9986	Yes		
R	Mulder	**Programme Manager:** Green Energy	083 470 1901	No		
C	Jonker	**Senior Manager:** Technical Services	012 426 5303	Yes		
J	Kruger	**Manager:** Park Technical Services	054 561 2022	Yes		
Z	Mkhonza	**OHS:** Coordinator Compliance	012 426 5199	Yes		

Annexure E

Environmental Management Plan

Environmental Management Plan

General construction activities in parks

Park: **Kgalagadi Tranfrontier Park**

Project: **The Solar PV Plants at Mata-Mata and Nossob Camps in Kgalagadi Transfrontier Park**

Prepared by:

South African National Parks
P.O. Box 787
PRETORIA
0001

Part 1

1. ENVIRONMENTAL MANAGEMENT PLAN

A. DECLARATION

I the undersigned in my capacity as designated below to hereby undertake to ensure that the conditions and recommendations in terms of the Environmental Management Plan (EMP) for the renovation, upgrading, and construction activities in a National Park are implemented and assume responsibility and accountability in this respect.

I further understand that officials from SANParks may during any phase of the project, conduct an inspection of the development in order to ensure compliance with the conditions and recommendations in the EMP.

EMPLOYER

Name: _____

Signature: _____

Date: _____

CONTRACTOR

Name: _____

Signature: _____

Date: _____

Part 1

1. ENVIRONMENTAL MANAGEMENT PLAN

1.1 GENERAL

Definition of an "**Environmental Management Plan**":
A plan or programme that seeks to achieve a required end state and describes how activities, that have or could have an adverse impact on the environment, will be mitigated, controlled, and monitored.

The EMP will address the environmental impacts during the design, construction and operational phases of a project. Due regard must be given to environmental protection during the entire project. In order to achieve this a number of environmental specifications/recommendations are made. These are aimed at ensuring that the contractor maintains adequate control over the project in order to:

- Minimise the extent of impact during construction.
- Ensure appropriate restoration of areas affected by construction.
- Prevent long term environmental degradation.

The contractor must be made aware of the environmental obligations that are stipulated in this document, and declares himself/herself to be conversant of all relevant environmental legislation. The contractor should also be aware that the Park Manager / Environmental Control Officer will monitor the implementation of the procedures.

1.2 OBJECTIVES OF THE EMP

The EMP has the following goals:

- Identifying those construction activities that may have a detrimental impact on the environment;
- Detailing the mitigation measures that will need to be taken, and the procedures for their implementation;
- Establishing the reporting system to be undertaken during the construction.

The EMP also serves to highlight specific requirements that will be monitored during the development and should the environmental impacts not have been satisfactory prevented or mitigated, corrective action will have to be taken. The document should, therefore, be seen as a guideline that will assist in minimising the potential environmental impact of activities.

Definition of "**mitigation measures**":
Mitigation seeks to find better ways of doing things, by the implementation of practical measures to reduce, limit, and eliminate adverse impacts or enhance project benefits and protect public and individual rights.

The EMP also defines the arrangements that will be put in place to ensure that the mitigation measures are implemented by including recommendations of the roles and responsibilities of the project proponent, environmental management team and contractors.

1.3 COMPONENTS OF THE "EMP"

1.3.1 Introduction

This EMP adopted a precautionary approach, or in the case of management recommendations, a philosophy of 'best practice'. Mitigation measures may then be of a more generic nature without compromising its importance to be implemented.

Therefore the purpose of this EMP is to draft and maintain a detailed management plan that, if put into practise, will effectively prevent/minimise environmental degradation.

1.3.2 The EMP in Context

This EMP will form part of a project tender and contract. Pre-construction and construction phase mitigation guidelines and clauses should be written into the construction contract documents as specifications. The contents of this EMP shall be deemed to be included in the rates tendered to execute and complete the works.

1.3.3 Flexibility

The EMP is a dynamic and flexible document subject to review and updating. During the implementation of a project

there is always the possibility that unforeseen issues could arise, this EMP should therefore be revised where necessary to mitigate unanticipated impacts.

1.3.4 EMP Implementation Period

The EMP will focus on and operate during the whole implementation / construction period and maintenance phase of the projects.

1.3.5 Roles and Responsibilities

Supervision and monitoring are fundamental to the successful implementation of an EMP. Therefore, it is vital that monitoring of the extent to which the mitigation measures of this EMP, are adhered to by consultants and contractors, takes place.

All of the issues described and discussed in this document will require monitoring, and it will be the responsibility of SANParks to undertake this monitoring according to the specifications of this EMP.

- To draft and implement a monitoring programme to assess compliance with the EMP.
- To appoint an Environmental Control Officer (ECO) during the Construction Phases.
- To undertake the monitoring of operations during the operational phase. Any problems that are identified or encountered must be reported to SANParks management so that appropriate action may be taken to rectify the situation.

1.3.5.1 Appointment of an Environmental Control Officer

The position of Environmental Control Officer has been created to ensure that the mitigation measures and other requirements set forth in the EMP are adhered to.

It is recommended that SANParks appoint an Environmental Control Officer (ECO) during the construction phase of the project. The ECO can be a Section Ranger.

The following guidelines apply to the functions of an ECO:

- The ECO should have the ability to understand the contents of the Environmental Management Plan (EMP) and explain it to the contractor, the site staff, the supervisors and any other relevant personnel or I&AP's.
- The ECO would have to be on site on a regular basis – preferably daily to supervise environmental actions associated with construction activities.
- The ECO should be able to understand, interpret, monitor, audit and implement the EMP. This is his most important function.
- The ECO must then give feedback of the audits to SANParks and Contractors. This must be in the form of a written report .
- The ECO must ensure that the contractor understands what is to be done to rectify and address any problems that have arisen from the audit.

1.3.6 Feedback to Park Manager and ECO

Reporting to the Park Manager and ECO should take place during site meetings – in the case of potential "fatal flaws"/crises developing due to implementation of the project, reporting should be done immediately and the potentially adverse activities immediately halted in order that corrective action can be taken.

Reporting on the status of implementation of the EMP and the results of the environmental monitoring programme must be recorded and summarised in a monthly report by the ECO and submitted to the Park Manager.

1.3.7 Failure to comply with EMP

Outlined below are a number of steps, relating to increasing severity of environmental problems, which will be implemented. The principle is to keep as many issues within the first few steps as possible.

- **Step 1**

The ECO discusses the problem with the contractor or guilty party, and they work out a solution together. The ECO records the discussion and the solution implemented.

- **Step 2**

The ECO or SANParks observes a more serious infringement, and notifies the guilty party in writing, with a deadline by which the problem must be rectified. All costs will be borne by the contractor.

- **Step 3**

The ECO shall order the contractor to suspend part, or all, the works. The suspension will be enforced until such time as the offending party(ies), procedure or equipment is corrected and/or remedial measures put in place if required. No extension of time will be granted for such delays and all cost will be borne by the contractor.

- **Step 4**

Breach of contract - One of the possible consequences of this is the removal of a contractor and/or equipment from the park and/or the termination of the contract, whether a construction contract or an employment contract. Such measures will not replace any legal proceedings that SANParks may institute against the contractor.

Part 2

2. DESCRIPTION OF MITIGATION MEASURES

This section of the report serves to prescribe mitigation measures to reduce, limit, eliminate or compensate for impacts, to acceptable/insignificant levels. In setting mitigation measures, the practical implications of executing these measures must be borne in mind. With early planning, both the cost and the impacts can be minimised.

The stipulations of this report should be conveyed to contractors prior to the commencement of construction.

2.1 PRE-CONSTRUCTION MANAGEMENT PLAN

The pre-construction or planning management plan is to be used as a guide during the planning, design and detailing of the development components. This part of the plan is to be referenced by all involved in decision making during the planning and design phases.

2.1.1 EMP TRAINING

Mitigation / Management Action	Responsible Agent
The Contractor shall arrange for Environmental and Heritage Awareness Training programmes for the personnel on site, to the satisfaction of the Park Manager and ECO, and familiarise his/her/its employees with the contents of this EMP, either in written format or verbally.	ECO & Contractor

2.1.2 CONTRACT AREAS

Mitigation / Management Action	Responsible Agent
The ECO must indicate/point out to contractors the areas that they will have in their possession for the duration of the contract (this shall include access roads to be used, construction lay-down areas, materials storage and delivery requirements, contractors' offices, operational demarcation etc.). Aspects pertaining to temporary housing for persons involved in the project shall also be included. A material delivery and storage area should be demarcated. The facility must be planned and laid out in such a way that the total footprint area is minimised.	ECO & Contractor

2.1.3 SENSITIVE ECOLOGY

Mitigation / Management Action	Responsible Agent
Prior to the commencement of construction, the proposed site/s and roads, must be inspected by SANParks Scientific Services (where necessary), in order to: • Confirm the absence of Red Data Book Species; • Relocate, demarcate or recommend conservation / preservation measures for any identified ecologically "sensitive" and/or protected species and areas, and • Point out and/or demarcate all ecologically "sensitive" areas to the contractors (e.g. red data habitats & species, rivers, streams, drainage lines, wetlands, sensitive soils, steep slopes and areas susceptible to erosion).	SANParks, ECO & Contractor

2.1.4 HERITAGE AREAS

Mitigation / Management Action	Responsible Agent
In known archaeological sensitive areas the South African Heritage Resources Agency (SAHRA) must inspect all above-mentioned contract areas, in order to: • Confirm the absence of archaeological sites and/or artefacts;	SANParks, ECO & Contractor

• Relocate, demarcate or recommend further conservation / preservation actions and measures for any identified archaeologically "sensitive" area and/or artefacts prior to the commencing of any work at these sites, and • Point out and/or demarcate all archaeologically "sensitive" areas to the contractors.	

2.1.5 ROADS

Mitigation / Management Action	Responsible Agent
The final alignment of the access routes and internal camp roads shall be planned in conjunction with the Park Manager, SANParks Scientific Services, Section Ranger and ECO and once finalised only the agreed roads must be used.	ECO & Contractor
Roads must be planned to deviate around significant trees and Red Data Species marked out in an approved manner by the ECO.	ECO & Contractor

2.1.6 SITE ESTABLISHMENT

Mitigation / Management Action	Responsible Agent
Construction camps and staff accommodation facilities on the site will be required to be established in appropriate locations prior to the commencement of construction, preferably within already disturbed areas. After completion of the contract, these areas will be required to be rehabilitated.	ECO & Contractor
Site Plan: Before construction can begin, the Contractor shall submit a site layout plan to the ECO for approval, including: • Site access (including entry and exit points). • All material and equipment storage areas (including storage areas for hazardous substances such as fuel and chemicals). • Construction offices and other structures. • Security requirements (including temporary and permanent fencing, and lighting) and accommodation areas for security staff. • Solid waste collection facilities and waste treatment facilities for litter, kitchen refuse, sewage and workshop-derived effluents. • Storm water control measures. • Provision of potable water and temporary ablution facilities. • Only designated areas may be used for the storage of materials, machinery, equipment and site offices. The site offices should not be sited in close proximity to steep areas, as this will increase soil erosion. Preferred locations would be disturbed areas along routes. Offices (and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles) must be located as far away as possible from any watercourse. Regardless of the chosen site, the Contractor's intended mitigation measures shall be indicated on the plan.	Contractor
Throughout the period of construction, the contractor shall restrict all activities to within the designated areas on the construction layout plan. Any relaxation or modification of the construction layout plan is to be approved by the ECO.	ECO & Contractor
Site Camps: The following restrictions or constraints should be placed on the site camp, and construction staff in general: • The use of rivers and streams for washing of clothes. • The use of welding equipment, oxy-acetylene torches and other bare flames where veld fires constitute a hazard. • Indiscriminate disposal of rubbish or construction wastes or rubble. • Littering of the site. • Spillage of potential pollutants, such as petroleum products. • Collection of firewood. • Poaching of any description. • Use of surrounding veld as toilets. • Burning of wastes and cleared vegetation. • No concrete structures allowed, if the site camp is within the Park boundaries.	ECO & Contractor

Vegetation clearing: The natural vegetation encountered on the site is to be conserved and left as intact as possible. Only trees and shrubs directly affected by the works, and such others as may be approved by the ECO in writing, may be felled or cleared. A firebreak shall be cleared and maintained around the perimeter of the site camp/s and office sites where necessary.	ECO & Contractor
Water for human consumption: Water for human consumption should be available at the site offices and at other convenient locations on site.	ECO & Contractor
Sewage Treatment: Sanitary arrangements should be to the satisfaction of the Park Manager and ECO. In no other ablution facilities are available, chemical toilets must be supplied (1 per 15 persons) and must be regularly cleaned and maintained by the contractor. The positioning of the chemical toilets is to be done in consultation with the ECO. The Contractor should arrange for regular emptying of toilets and will be entirely responsible for enforcing their use and for maintaining such latrines in a clean, orderly and sanitary condition to the satisfaction of the ECO. If necessary, the ablution facilities must be screened from the public view. In remote areas where chemical toilets may not be a viable option, agreement must be reached on alternatives before construction starts.	ECO & Contractor
Cooking Fuel: The Contractor shall provide adequate facilities for his staff so that they are not encouraged to supplement their comforts on site by accessing what can be taken from the natural surroundings. Collection of firewood is not permitted.	ECO & Contractor
Waste Management: Solid waste shall be stored in an appointed area within the site camp in covered drums for collection and disposal. Disposal of solid waste shall be at an approved landfill site – this must be agreed to with the Park Manager. During the construction period, the facilities shall be maintained in a neat and tidy condition, and the site is to be kept free of litter. At all places of work, the Contractor shall provide litter collection facilities for later safe disposal at approved waste disposal sites.	ECO & Contractor

2.1.7 MATERIALS HANDLING, USE AND STORAGE

Mitigation / Management Action	Responsible Agent
The Contractor's management and maintenance of his plant and machinery will be strictly monitored according to the criteria given below, regardless of whether it is serviced on the site (i.e. at the place of construction activity or at a formalised workshop) or not.	ECO & Contractor
Safety: All the necessary handling and safety equipment required for the safe use of petrochemicals and oils shall be provided by the Contractor to, and used or worn by the staff whose duty it is to manage and maintain the Contractor's and his subcontractor's and supplier's plant, machinery and equipment. Contractor must comply with the Occupational Health and Safety Act (Act 85 of 1993) and Construction Regulations, 2003 as this governs what the contractor has to do/provide for his staff.	ECO & Contractor
Hazardous Material Storage: Petrochemicals, oils and identified hazardous substances shall only be stored under controlled conditions. All hazardous materials will be stored in a secured, appointed area that is fenced and has restricted entry. Storage of hazardous products shall only take place using suitable containers approved by the ECO. In addition, hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure.	ECO & Contractor
Fuels and Gas Storage: Fuel should be stored in a secure area in a steel tank supplied and maintained by the contractor according to safety procedures. Gas welding cylinders and LPG cylinders should be stored in a secure, well-ventilated area. The contractor must supply sufficient fire fighting equipment in event of an accident and strictly no smoking will be allowed where fuel is stored and used.	ECO & Contractor

2.1.8 WATER SUPPLY

Mitigation / Management Action	Responsible Agent
Water supply pipelines will be according to contract specifications, following the most direct, yet most ecologically responsible route agreed to with the engineer and as per contract documentation.	ECO & Contractor
Point out to contractors where they can obtain water (e.g. water for mixing of cement as well as for drinking). Contractors shall not make use of/collect water from any other source than those pointed out to them as suitable for use by them.	ECO

2.1.9 LIQUID WASTE

Mitigation / Management Action	Responsible Agent
Under the General Authorisations in terms of Section 39 of the National Water Act (Act No. 36 of 1998), DWAF does not permit the construction of wastewater disposal sites (such as septic tank systems) within the 100 year flood line of any watercourse, or alternatively, within 100 metres of the edge of a water resource.	SANParks
The treatment and disposal of effluent will comply with all applicable legislation and the relevant permit regarding the disposal of purified effluent into the natural environment will have to be obtained from DWAF if so required during construction and operations.	SANParks
The design, installation and operation of septic tanks and soak-aways will conform to Water Act, including all the regulations made under section 26 of the National Water Act.	SANParks

2.2 CONSTRUCTION MANAGEMENT PLAN

The Construction Management Plan forms part of the contract documentation. The plan must be read in conjunction with the contract documents including the relevant Bill of Quantities and Specifications.

2.2.1 VEHICULAR ACCESS AND MOVEMENT OF CONSTRUCTION VEHICLES

Mitigation / Management Action	Responsible Agent
During construction, use should be made of existing access routes to construction areas where possible. Construct approved vehicle turning areas, avoiding selected ecological sensitive areas or species, and have turning area routes approved by the ECO. Temporary access roads must be rehabilitated after usage as per prior agreement between the Park Manager and Contractor.	ECO & Contractor

2.2.2 MOVEMENT OF CONSTRUCTION PERSONNEL, LABOURERS AND EQUIPMENT

Mitigation / Management Action	Responsible Agent
The Contractor must ensure that all construction personnel, labourers and equipment remain within the demarcated construction sites at all times. Where construction personnel and/or equipment wish to move outside the boundaries of the site, the contractor/ labourers must obtain permission from the ECO.	ECO & Contractor

2.2.3 VEGETATION CLEARING

Mitigation / Management Action	Responsible Agent
The extent of all construction site footprints will be minimised and limited to existing and / or already disturbed areas wherever possible.	ECO & Contractor
The areas needing to be cleared and the degree of clearing required will be determined and demarcated in consultation with the ECO before clearing begins.	ECO & Contractor
The Contractor may not deface, paint or otherwise mark and / or damage natural features / vegetation on the site, unless agreed beforehand with the ECO. Any features / vegetation defaced by the Contractor will be restored to the satisfaction of the ECO.	ECO & Contractor
The ECO must be present during vegetation clearing.	ECO

Plant Search and Rescue: • Plant search and rescue (i.e. the location and removal of specified plant species, without unnecessary damage, and their transfer to a specified location) and the collection of seed, shall be conducted by the ECO prior to the onset of any site clearing operations, should the ecologist/ SANParks Scientific Services indicate this to be necessary. • Sensitive areas and/or species that have been selected for conservation by the ecologist / SANParks Scientific Services, Park Manager or ECO, shall be demarcated with danger tape. No activity shall take place at these areas. • De-stumping shall only occur at the request of the ECO. Where roots can act as erosion protection, trees should be cut as close as possible to the ground level. • During the clearing of woody vegetation no basal cover or grass and topsoil shall be removed and damage to this layer shall be minimised as far as possible.	ECO & Contractor
Vegetation Removal and Trimming in Watercourses: No heavy machinery shall be permitted within watercourses for any purpose, except emergency procedures, without the prior approval of the ECO. Clearing of vegetation shall be conducted by hand. All cleared and trimmed vegetation shall be removed from any watercourse to prevent flooding/snagging hazards being created.	ECO & Contractor
Rehabilitation: The Park Manager, ECO, and Contractor must agree on rehabilitation of areas. The Contractor shall be held responsible for rehabilitation for all areas disturbed during construction. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for, or from, road construction has to be stored temporarily or otherwise within the road reserve, or at designated or instructed areas outside the road reserve. This responsibility shall extend until expiry of the Defects Liability Period.	ECO & Contractor

2.2.4 PROTECTION OF FAUNA

Mitigation / Management Action	Responsible Agent
• Under no circumstances shall any animals be handled, removed, killed or be interfered with by the Contractor, his employees, his subcontractors or his subcontractors' employees. • The Contractor and his employees shall not bring any domesticated animals onto the site. • The Contractor shall ensure that the work site be kept clean, tidy and free of rubbish that would attract animals. • No poaching of fauna and flora shall be tolerated by the Contractor or his personnel on Site or elsewhere.	ECO & Contractor

2.2.5 HERITAGE AND/OR ARCHAEOLOGICAL SITES

Mitigation / Management Action	Responsible Agent
Historical and Archaeological Sites: If any artefact on site is uncovered, work in the immediate vicinity shall be stopped immediately. The Contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery thereof inform the ECO of such discovery. The South African Heritage Resources Agency (SAHRA) or the National Monuments Council shall be contacted such that an archaeological consultant can be appointed to excavate and record the site. Work may only resume once clearance is given in writing by the archaeologist. No stones/rock or any material may be removed from any site in the park without approval by the ECO, and after confirmation that materials do not form part of a cultural site.	ECO & Contractor

2.2.6 SOIL MANAGEMENT

Mitigation / Management Action	Responsible Agent
Topsoil: The Contractor is required to strip topsoil together with grass / groundcover from all areas where permanent or temporary structures are located, construction related activities occur,	ECO & Contractor

and access roads are to be constructed, etc. This must be read together with the contract specifications & conditions. Topsoil must be stockpiled for later use.	
Topsoil is to be handled twice only - once to strip and stockpile, and secondly to replace, level, shape and scarify.	ECO & Contractor
Topsoil stockpiles are not to exceed 1.5 m in height and should be protected to prevent erosion where needed.	ECO & Contractor
Topsoil stockpiles are to be maintained in a weed free condition. The ECO can assist with guidance as to which plants are weeds and require removal.	ECO & Contractor
Topsoil is to be replaced by direct return where feasible (i.e. replaced immediately on the area where construction is complete), rather than stockpiling it for extended periods.	ECO & Contractor
Spoil Material: The location of spoil stockpile sites shall be agreed upon by the ECO prior to the onset of any operations that will generate spoil materials. No spoil material shall be dumped outside the defined site. The Contractor shall ensure that the material does not blow or wash away. If the spoil material is in danger of being washed or blown away, the contractor shall cover it with a suitable material, such as hessian or plastic.	ECO & Contractor

2.2.7 EROSION CONTROL

Mitigation / Management Action	Responsible Agent
The Contractor shall protect all areas susceptible to erosion and shall take measures, to the approval of the ECO. The Contractor shall not allow erosion to develop on a large scale before effecting repairs and all erosion damage shall be repaired as soon as possible.	ECO & Contractor
The specifics of erosion protection work will vary from situation to situation. These specifics should be cleared with the Park Manager and/or ECO and comply with the contract specifications.	ECO & Contractor
Where required, cut-off trenches can be installed to divert substantial run-off and prevent erosion.	ECO & Contractor
During construction, areas susceptible to erosion must be protected by installing temporary or permanent drainage works and energy dispersion mechanisms and could include – to be agreed to by SANParks and Contractor and with considerations of implications on costs: • Vegetation, • Mitre drains (afleivore), • Benches (grondwalle), • Benches consisting of sandbags, • Packing branches and rocks in small gullies and disturbed areas.	ECO & Contractor
Storm water drainage measures are required on site to control runoff and prevent erosion.	ECO & Contractor

2.2.8 SLOPE PROTECTION

Mitigation / Management Action	Responsible Agent
Cut and fill slopes shall be shaped and trimmed to approximate the natural condition and contours as closely as possible and, where possible, be undulating. Levels incongruous to the surrounding landscape, shall be reshaped as per contract specifications.	ECO & Contractor
Slopes that need protection shall be identified by the ECO and the specifications needed must be established using the latest approved methods and technology.	ECO & Contractor

2.2.9 ACCESS ROADS

Mitigation / Management Action	Responsible Agent
Construction staff may only use authorised paths and roads.	ECO & Contractor
The proclaimed speed limit in the Park must be strictly adhered to.	ECO & Contractor
ECO will monitor the conduct of drivers and report any negative impact to the contactor immediately.	ECO & Contractor

Construction roads must follow existing roads and tracks and should not be wider than necessary with a maximum width of 3 m. Should a wider road be required, this will require the approval of the ECO.	ECO & Contractor
If two-way traffic movement is to take place, passing bays are to be used where specified by the ECO to prevent access / detours into the surrounding areas. The drivers delivering construction materials to site are to be made aware of this. They may not drive off the road in order to allow another vehicle to pass.	ECO & Contractor
Continual use of dirt access roads by heavy machinery and increased transport loads means they will have to be carefully monitored and regularly graded as soon as potholes or rutting occurs.	ECO & Contractor
Upon completion of the construction period, the Contractor will ensure that the access roads are returned to a state no worse than prior to construction commencing.	ECO & Contractor

2.2.10 EXCAVATION, BACKFILLING AND TRENCHING

Mitigation / Management Action	Responsible Agent
Where at all possible, excavations must not stand open longer than 2 days, and should preferably be opened and closed on the same day. They should not be permitted to stand open longer than a week under any circumstances. Excavations must be marked with tape to clearly demarcate the area and warn against access.	ECO & Contractor
Excavations must not be undertaken until such time that all required materials / services etc. are available on-site, to facilitate immediate laying of such services or the construction of subsurface infrastructure.	ECO & Contractor
Any such excavations should ideally be undertaken within the confines of an established construction site - i.e. a site that is either protected with a peripheral fence, or a site that has a regular / continual human presence. Failing this, regular daily inspections are essential.	ECO & Contractor
If need be, spread the rocks in as natural looking manner as possible in the veld.	ECO & Contractor
Excess rocks and sand as a result of excavation activities is not to be dumped along next to construction site – rocks to be spread in a natural looking manner in the surrounding area.	ECO & Contractor
Removed soil is to be used to backfill areas where required (i.e. such as existing and un-rehabilitated gravel pits).	ECO & Contractor
Excavated material is to be stockpiled along the trench within the working servitude, unless otherwise authorised.	ECO & Contractor
Deficiency of backfill material will not be made up by excavation within the protected area. Where backfill material is deficient, it must be made up by importation from an approved borrow pit area.	ECO & Contractor

2.2.11 LEVELLING

Mitigation / Management Action	Responsible Agent
Excess sand and soil resulting from levelling activities of the work area should be stored in low heaps either on the access road or already disturbed area.	Contractor
Excess topsoil is to be spread evenly over the area in a manner that blends in with the natural topography.	ECO & Contractor
Once heavy machinery has cleared the bulk of these material stockpiles, the disturbed areas should be levelled and cleared of any foreign material manually e.g. with spades. It is unacceptable to leave foreign material behind with the knowledge that it will become hidden amongst the rejuvenating vegetation with time.	ECO & Contractor

2.2.12 SAND EXTRACTION

Mitigation / Management Action	Responsible Agent
This is a specialised and potentially environmentally impacting activity, which must be undertaken with the approval and overall management of the Park.	Contractor / SANParks
Regular inspections must be undertaken by the local Section Ranger and ECO to monitor and audit the effects and impacts of such removals.	ECO & Contractor

On completion of the sand-winning activity, the river bed will be rehabilitated to the satisfaction of the ECO and Section Ranger.	ECO & Contractor

2.2.13 STOCKPILING, HANDLING AND STORAGE OF BUILDING MATERIALS

Mitigation / Management Action	Responsible Agent
Stockpiles and storage yards will be demarcated in areas already disturbed or where they will cause minimal disturbance.	ECO & Contractor
Clearly indicate which activities are to take place in which areas within the site e.g. the mixing of cement, stockpiling of materials etc. Limit these activities to single sites only. This may not always be possible for example for heaps of topsoil, but should definitely be the case for other building materials.	ECO & Contractor
Stockpiles of expensive materials such as cement bags should be such that they can easily be removed from the site over weekends or during rainy weather.	Contractor
Specific sites should be allocated for construction waste e.g. empty cement bags, discarded planks, etc. A low temporary fence may be erected around such a site in order to contain the waste and assist the effective removal thereof from the site.	ECO & Contractor
Old cement mixing bags will be placed in wind and spill proof containers as soon as they are empty. The Contractor will not allow closed, open or empty bags to lie around the site.	ECO & Contractor
The Contractor will ensure that all operations that involve the use of cement and concrete are carefully controlled.	ECO & Contractor
Concrete mixing may only take place in the construction camp or in agreed specific areas on site.	ECO & Contractor
Concrete may not be mixed directly on the ground. No mixed concrete may be deposited directly onto the ground prior to placing. A board or other suitable platform / surface is to be provided onto which the mixed concrete can be deposited whilst it waits placing.	ECO & Contractor
All visible remains of excess concrete will be deposited in a designated area awaiting removal to an approved landfill site.	ECO & Contractor

2.2.14 SERVICING AND RE-FUELLING OF CONSTRUCTION EQUIPMENT

Mitigation / Management Action	Responsible Agent
All maintenance and repair work will be carried out at the main construction camp within an area designated for this purpose, equipped with necessary pollution containment measures.	ECO & Contractor
The ground under the servicing and refuelling areas must be protected against pollution caused by spills and / or tank overfills (bunded / lined).	ECO & Contractor
The Contractor may only change oil or lubricant at agreed and designated locations, except if there is a breakdown or emergency repair, and then any accidental spillages must be cleaned up / removed immediately.	ECO & Contractor
In such instances the Contractor will ensure that he has drip trays available to collect any oil or fluid.	ECO & Contractor
Construction vehicles are to be maintained in an acceptable state of repair. No vehicles or equipment with leaks or causing spills will be permitted to operate at any of the construction sites. These will be sent immediately back to the maintenance yard for repair.	ECO & Contractor
All equipment that leaks must be repaired immediately or must be removed from site.	ECO & Contractor
Fuels required during construction must be stored in a central depot at the construction camp. This storage area should be located on a slab and be contained within a bund capable of containing at least the volume of one of the containers.	ECO & Contractor
Temporary fuel storage tanks and transfer areas also need to be located on an impervious surface adequately bunded to contain accidental spills. Appropriate run-off containment measures must be in place.	Contractor

2.2.15 SOLID WASTE MANAGEMENT

Mitigation / Management Action	Responsible Agent
An adequate number of 'scavenger proof' refuse bins must be provided at the construction sites and at the construction camps.	ECO & Contractor

These bins must be provided with lids and an external closing mechanism to prevent their contents blowing out and must be scavenger-proof to prevent baboons and other animals that may be attracted to the waste.	ECO & Contractor
The Contractor will ensure that all personnel immediately deposit waste in the waste bins provided.	ECO & Contractor
All refuse and solid waste generated at all work sites will be stored in appropriate scavenger proof containment vessels at the relevant site and removed to the main construction camp, where the waste will be sorted and stored within a fenced waste storage area.	ECO & Contractor
All waste must be transported in an appropriate manner (e.g. plastic rubbish bags).	ECO & Contractor
The Contactor may not dispose of any waste and / or construction debris by burning, or by burying.	ECO & Contractor
Discard all construction waste at a registered waste management facility / landfill site, particularly those wastes or products that could impact on surface or groundwater quality by leaching into or coming into contact with water.	ECO & Contractor
The contractor will maintain 'good housekeeping' practises as ensure that all work sites and construction camp are kept tidy and litter free.	ECO & Contractor

2.2.15 LIQUID WASTE MANAGEMENT

Mitigation / Management Action	Responsible Agent
The Contractor must take reasonable precautions to prevent the pollution of the ground and / or water resources on and adjacent to the site as a result of his activities.	Contractor
The Contractor may discharge 'clean' silt laden water overland and allow this water to filter into the ground. However, he must ensure that he does not cause erosion as a result of any overland discharge.	ECO & Contractor
No natural watercourse is to be used for the cleaning of tools or any other apparatus. This includes for purposes of bathing, or the washing of clothes etc.	ECO & Contractor
All washing operations will take place off-site at a location where wastewater can be disposed of in an acceptable manner.	ECO & Contractor
Trucks delivering concrete may not be washed on site or anywhere inside the park.	ECO & Contractor
No spills may be hosed down into a storm water drain or sewer, or into the surrounding natural environment.	ECO & Contractor
Adequate ablution facilities are to be provided at each construction site, conveniently located near to work areas to avoid localised water pollution from camp sewerage.	ECO & Contractor
All soil contaminated, for example by leaking machines, refuelling spills etc. is to be excavated to the depth of contaminant penetration, placed in 200 litre drums and removed to an appropriate landfill site.	ECO & Contractor

2.2.16 HAZARDOUS MATERIALS

Mitigation / Management Action	Responsible Agent
The Contractor must comply with all national, regional and local legislation with regard to the storage, transport, use and disposal of petroleum, chemical, harmful and hazardous substances and materials.	Contractor
The Contractor will furthermore be responsible for the training and education of all personnel on site who will be handling the material about its proper use, handling and disposal.	Contractor
The Contractor will be responsible for establishing an emergency procedure for dealing with spills or releases of petroleum.	Contractor
Storage of all hazardous material is to be safe, tamper proof and under strict control.	ECO & Contractor
Petroleum, chemical, harmful and hazardous waste throughout the site must be stored in appropriate, well maintained containers.	Contractor
Exercise extreme care with the handling of diesel and other toxic solvents so that spillage is minimised.	ECO & Contractor
Any accidental chemical / fuel spills to be corrected immediately.	ECO & Contractor

Timber products should be treated off-site prior to use in construction.	ECO & Contractor
Periodic on-site application of timber treatment products (for maintenance purposes) should take place with due care for the nature of the product (toxicity) and for potential spillages that may occur. Areas where timber is to be treated should have secondary containment measures instituted, such as the placement of a plastic layer (some form of covering) over soils, beneath the timber structures to prevent contamination of the soil surface.	ECO & Contractor

2.2.17 RUN-OFF FROM CONSTRUCTION CAMPS

Mitigation / Management Action	Responsible Agent
The Contractor must ensure that rainwater containing pollutants does not run-off into natural areas and thus result in a pollution threat.	ECO/Contractor
A drainage diversion system is to be installed to divert runoff from areas of potential pollution, e.g. batching area, vehicle maintenance area, workshops, chemical and fuel stores, etc.	ECO/Contractor

2.2.18 FIRE

Mitigation / Management Action	Responsible Agent
The Contractor must take all the necessary precautions to ensure that fires are not started as a result of activities on site.	Contractor
No fuels or chemicals may be stored under trees.	ECO/Contractor
Gas and liquid fuel may not be stored in the same storage area.	ECO/Contractor
The Contractor must ensure that there is adequate fire-fighting equipment at the fuel stores.	ECO/Contractor
No open fires for heating or cooking will be permitted on site, unless otherwise agreed and then only in designated areas.	Contractor
The Contractor will supply all living quarters, site offices, kitchen areas, workshop areas, material stores and any other areas identified with suitable, tested and approved fire fighting equipment.	Contractor
The construction site must be protected against fire, and a sufficient fire break must be constructed, on advice by the Section Ranger, around each construction site and the construction camp where necessary..	ECO/Contractor

2.2.19 DUST

Mitigation / Management Action	Responsible Agent
The Contractor shall take precautions to the satisfaction of the ECO to limit the production of dust and damage caused by dust.	ECO/Contractor

2.2.20 NOISE

Mitigation / Management Action	Responsible Agent
Machinery and vehicle silencer units are to be maintained in good working order. Offending machinery and / or vehicles will be banned from use on site until they have been repaired.	Contractor
Noise levels must be kept within acceptable limits for a protected area, and must not be of such nature as to detract from the natural experience of other visitors to the protected area.	Contractor
The contractor shall take into consideration that the project areas are located within a natural environment and that noise could be a major disturbance/nuisance for the fauna and visitors to the park. Project management should endeavour to keep noise generating activities associated with construction activities to a minimum and within working hours.	Contractor

2.2.21 VISUAL

Mitigation / Management Action	Responsible Agent
Security lighting must be placed such that it is not a nuisance to residents and visitors to the area. Shields may be required to prevent lights from being visible from other parts of the protected area.	ECO/Contractor
Care will be taken when positioning the lights to ensure the least visual impact, while still providing a safe work environment for construction staff.	ECO/Contractor
Should any construction activities take place where Park tourists can see the construction activities, then clear signboards must be erected to inform the tourists of the activity taking place. SANParks to provide boards. Contractor to erect boards as required.	Contractor
The Contractor shall not establish any activities which, in the opinion of the ECO, are likely to adversely affect the scenic quality of the area. The ECO may direct the Contractor to refrain from such activities or to take ameliorative actions to reduce the adverse effects of such activities.	ECO/Contractor
No painting or marking of natural features shall take place. Marking for surveying and other purposes shall only be done with pegs and beacons.	ECO/Contractor
All packed rock and exposed rock cuttings shall be treated in order to blend their colour with the colours of the natural weathered rocks of the adjacent environment.	ECO/Contractor

2.2.22 SITE CLEAN-UP AND REHABILITATION

Mitigation / Management Action	Responsible Agent
The Contractor must ensure that all temporary structures, materials, waste and facilities used for construction activities are removed upon completion of the project.	Contractor / ECO
Fully rehabilitate (e.g. clear and clean area, rake, pack branches etc.) all disturbed areas and protect them from erosion.	Contractor / ECO
Only indigenous plants which are able to establish easily and will need less maintenance because they have already adapted to the local conditions should be considered.	Contractor / ECO
Before final decisions about the choice of plant species are taken the Section Ranger should be approached for their advice.	Contractor / ECO

2.3 MONITORING OF EMP IMPLEMENTATION

The correct and successful implementation of impact mitigation measures in order to reduce adverse impacts on environmental conditions needs to be ensured by a proper monitoring programme.

Monitoring of the general implementation of/adherence to the EMP, shall be the responsibility of the ECO. Reporting on adherence/compliance to stipulations as communicated to contractors, shall take place during scheduled site meetings.

2.3.1 Monitoring Form:

A list of environmental issues addressed in the EMP is drawn up. A tick box monitoring form is compiled which makes provision for compliance or non-compliance to the EMP requirements for each environmental issue. This monitoring form makes room for a brief description of the non-compliance(s). The issues identified on the monitoring form must be discussed in detail with the contractor and the Park Manager. A reasonable date of completion of the remedial action must be jointly agreed upon, between the contractor, ECO and Park Manager. This monitoring form must be signed by all parties and a copy be provided to the Park Manager.

The following Monitoring Form may serve as an **example** or point of departure.

Name: Ref: Date:	
Project:	

ENVIRONMENTAL MONITORING CHECKLIST (NC = NON-COMPLIANCE, C = COMPLIANCE, NA = NOT APPLICABLE)					
Item		**Rating**	**Item**		**Rating**
1.	Vehicular access and movement of construction vehicles		**13.**	Stockpiling, handling and storage of building materials	
2.	Movement of construction personnel, labourers and equipment		**14.**	Servicing and re-fuelling of construction equipment	
3.	Vegetation clearing		**15.**	Liquid waste management	
4.	Protection of fauna		**16.**	Hazardous materials	
5.	Cultural and/or archaeological sites		**17.**	Run-off from construction camps	
6.	Soil management		**18.**	Fire	
7.	Erosion control		**19.**	Dust	
8.	Slope protection		**20.**	Noise	
9.	Access roads		**21.**	Visual	
10.	Excavation, backfilling and trenching		**22.**	Site clean-up and rehabilitation	
11.	Levelling				
12.	Sand extraction				
			A.	**Others**	
Remedial Action on Non-compliance: (Action and Time Plan)					

Close out: Environmental Control Officer _____ Name _____ Date	**Response required by:** Contractor _____ Name _____ Date

Comments:

Records:

☐ PARK MANAGER ☐ CONTRACTOR ☐ PROJECT MANAGER

Annexure F

Code of Conduct for working in the South African National Parks

SOUTH AFRICAN NATIONAL PARKS

CODE OF CONDUCT FOR WORKING IN A NATIONAL PARK

OUTSIDE ORGANISATIONS WORKING TEMPORARILY IN A NATIONAL PARK

CODE OF CONDUCT FOR PERSONNEL FROM OTHER ORGANISATIONS TEMPORARILY WORKING IN NATIONAL PARKS

1. INTRODUCTION

You will presently begin an important task in a national park, which is an area controlled by South African National Parks (SANParks). For obvious reasons your task must be completed in the shortest possible time and to accomplish this, there has to be co-operation at all levels between yourselves and personnel from SANParks.

In the past, you and your sub-ordinates worked in uncontrolled areas, but you are presently in a controlled area and furthermore in a national park.

As the name implies, the main objective with a national park is the protection, conservation and utilization of our heritage, in such a way to allow future generations to enjoy, appreciate and admire nature in its unspoiled state. This great endeavour can only be achieved if every individual who works in a national park admits to and accepts nature conservation as part of their heritage (daily life). Certain procedures were followed in the past to accomplish your tasks, but now you must accept that adaptations will have to be made to complete your task in a national park without disturbing the natural environment.

You will also be subjected to certain necessary restrictions during your stay and operations in a national park. Certain expectations will be made in accordance with your work commitments. Restrictions will be kept to a minimum, those that are enforced must please be respected and seen in a positive light to promote co-operation and to prevent any unpleasantness.

Depending on where you are resident while working in a national park, you are requested to discuss any problems you may encounter, with the Park Manager, (*Section Ranger or the person in charge of Visitor Services*). You can be assured that these officials will do everything in their power to ensure that you have a pleasant and productive stay in the national park.

Please study and commit yourself to the attached Code of Conduct.

Any uncertainties must be cleared up with a SANParks' official.

We wish you a pleasant and productive stay in our national parks.

2. PRINCIPLES WITH RESPECT TO BEHAVIOUR AND DISCIPLINE

All persons resident or working in a national park, are subject to the National Environmental Management Protected Areas Act 57 of 2003.

The following principles should be complied with at all times in a national park:

2.1 No prospecting or mining is allowed on any land forming part of a national park or protected area.

2.2 No person, except an employee authorised by SANParks may:

2.2.1 Enter or reside in a national park without permission;

2.2.2 Be in possession of an unsealed weapon, explosives, traps or poison in the park or convey the same into a park;

2.2.3 Hunt or kill an animal, collect, damage or destroy a bird's nest or it's eggs;

2.2.4 Purposely or negligently cause a veld fire or damage any object of geological, archaeological, historical, ethnological or of any other scientific value to SANParks;

2.2.5 Bring any animal or pet into a national park or allow domestic animals to stray into a national park, if found it will be confiscated and destroyed by an official;

2.2.6 Remove any animal (dead or alive) or parts thereof from the park (unless lawfully brought into the park);

2.2.7 Cut down trees or remove plants from a park or in any way damage any tree, plant or seeds;

2.2.8 Feed animals in national parks;

2.2.9 Drive a vehicle without a licence or allow a minor to drive a vehicle under his control;

2.2.10 Spend the night anywhere in a national park, (other than in a designated area) except in a rest camp or private home, without the permission of SANParks;

2.2.11 Enter a national park in an:
- Unlicensed (or unregistered) vehicles;
- Enter or use any closed road (no entry);

2.2.12 Vehicles may not be driven recklessly or negligently in a national park.

2.2.13 All drivers must consider other drivers and all animals.

2.2.14 No person under the influence of alcohol or drugs may drive a vehicle in a national park or be in the driver's seat of a vehicle with the engine running.

2.2.15 Without special permission, no person may organize or perform public entertainment or fund-raising campaigns.

2.2.16 Angling in rivers or dams is prohibited.

2.2.17 Angling, where permitted, is only allowed from sunrise to sunset.

2.2.18 Swimming is prohibited at designated angling areas.

2.2.19 No person may damage property or endanger property belonging to SANParks.

2.2.20 No person may use a radio or musical instruments in such a way as to cause a disturbance to others.

2.2.21 No person may dispose of any article or rubble other than in containers provided by SANParks.

2.2.22 No person may remove sand, stone or wood without the permission of SANParks.

2.2.23 Unless issued with an official late permit, no one may travel from a rest camp or entry gate after gate closing times. Permits are issued by the Park Manager or designated person after acceptance of a legitimate motivation.

2.2.24 The proclaimed speed limit in a national park must be strictly adhered to, except if and when concessionary speed limits have been approved.

3. RESPONSIBILITIES TOWARDS NATURE CONSERVATION

3.1 Antiquities or objects of historical value which you may discover during your operation in a national park, are and remain the property of SANParks. These items must be handed the Park Manager or designated person as soon as possible. Any person found possession of such articles, either to keep or sell, will be liable to prosecution.

3.1 No firewood may be collected or removed without the permission of a Nature Conservation official. Under no circumstances will permission be granted to remove firewood from the park unless proof of sale from one of the shops can be produced.

3.2 Stone, sand and/or soil may not be remove from any area, unless permission has been granted by the Park Manager or designated person. These products may only be removed from sites specified by the Park Manager.

3.3 On request, the Park Manager or local Section Ranger will point out to the foreman, the sites allowed for removal of stone, sand and/or water for building or other purposes. No water may be taken from existing boreholes unless the Park Manager or designated person gives permission.

3.4 The removal, cutting down or damage to any living plant in a national park is illegal and may only be done with permission. Where the construction of roads, buildings etc. necessitates the destroying of indigenous trees, shrubs or plants, it must be kept to an absolute minimum.

3.5 Gravel pits must, where at all possible, not be visible from any road. After construction, these gravel pits must be rehabilitated as per contract document and/or Environmental Management Plan.

3.6 No animals may be killed in the park.

3.7 Other than SANParks employees, personnel resident in a park, but not employed by SANParks, may only kill an animal in an emergency, to protect a life or property or when specifically authorized to do so by SANParks. A report of all animals killed and the circumstance surrounding if, must be sent to the Park Manager or designated person as soon as possible.

NB: Snakes may only be killed in residences, rest camps and living quarters if it cannot be captured and removed by a knowledgeable person. Under no circumstances may poisonous or non-poisonous snakes be killed in the bush or elsewhere. Residents in a park are encouraged to study the poisonous and non-poisonous snake species for their own protection.

4. FIREARMS

Only authorized persons are allowed to possess firearms in a park. Firearms will only be allowed in exceptional circumstances, where an employee may need it in the execution of his duties and will be subject to certain strict conditions.

5. LITTER

All residents and work teams are expected to have proper respect towards the scenic beauty of a national park and not litter tins, paper etc. as well as construction debris, where new roads, bridges, dams or buildings are being constructed. It is the duty of the contractor and/or his supervisors to ensure that after completion of the projects, all litter is carted away. Under no circumstances may this litter be dumped in the bush or anywhere else. It is your responsibility to find out from the Park Manager or designated person if and where litter may be dumped. Littering is a serious offence and perpetrators can be prosecuted.

NB: After completion of any project, a contractor is required to obtain a report from the Park Manager declaring his satisfaction with the condition of the terrain and immediate surroundings.

6. PETS

No dogs or other pets are allowed in a national park without written permission of the Executive Director: Parks.

7. PERSONNEL RELATIONS

7.1 Park Managers or any designated person are officials of the SANParks and are responsible for the enforcement of the Protected Areas Act 57, 2003 in their respective parks. To uphold the organisation's authority, they have to be aware of all activities and especially extraordinary activities in their park. It is therefore not only a matter of courtesy but of necessity to report all activities to the Park Manager. It is very important that all new building activities, the construction of new roads, etc., be reported by the supervisor to the Park Manager. It is just as important to report the use of firebreak roads as well as unscheduled night trips to the Park Manager.

7.2 No person residing or working in a rest camp may leave the rest camp gate after gate closing times, without the Park Manager's or designated person's permission.

8. TRAVELLING TIMES AND TRANSPORT MATTERS

8.1 All private and official trips within a national park, must be undertaken during daylight hours and permission to travel after-hours will only be given in emergencies, by the Park Manager or designated person.

8.2 No person (employee or visitor) may transport passengers on the back of an open vehicle within a national park, unless in the execution of official duties.

9. ROAD RULES AND SPEED LIMITS

9.1 **Road Rules**

All personnel, whether in an official or private capacity, must ensure that their driving sets an example to other drivers. Although all people working in a park with the necessary approval, may drive at a faster speed than the tourists, they must do this as unobtrusively as possible by approaching another vehicle at a decreased speed, passing it and then accelerating slowly to the required speed. As soon as an oncoming vehicle is in sight, speed must once again be decreased until the vehicle is out of sight.

9.2 **Speed limit for personnel**

All employees of SANParks, as well as employees from outside organisations with written consent working in a national park, may travel at a maximum speed of 50 km/h during the day and 50km/h at night regardless of the speed limit. These speed limits are applicable to all official trips and may only be exceeded in emergencies. Personnel and/or their spouses may also drive at 50 km/h during the day, whilst in their private vehicles en route to the entrance gate closest to their residence. During private trips in the rest of the park, the designated speed limit has to be adhered to as well as in all the rest camps and personnel villages.

Please take note that all transgressors of this privilege will be prosecuted in the same way as tourists who disregard the speed limit.

10. CONTROL AT ENTRANCE AND RESTCAMP GATES

When entering or leaving an entrance gate of a national park, you must identify yourself to the tourist officer in charge. No one may leave a rest camp after hours unless the Park Manager or designated person has granted permission and any one arriving after hours at a rest camp must report to the Park Manager or designated person.

11. ENTRANCE TO NO-ENTRY ROADS

Fire-break and patrol roads

Please take note that no one may drive along a fire-break or patrol road with a no-entry sign in their private capacity or along any road which has been closed in any way. Only the Park Manager or designated person may give permission to do so. When a fire-break or patrol road has to be used officially the Park Manager or designated person must preferable be given prior notice of the date and the route. If it is not possible to notify him, it must be done immediately on completion of the trip.

12. GUEST PRIVILEGES

Arrangements regarding guests must be made by the site supervisor with the Park Manager or designated person.

Only immediate family members (parents and children) will be allowed free access to a national park with the permission of the Park Manager or designated person.

13. GENERAL DISCIPLINE

It is the responsibility of every supervisor in a park to ensure that the following rules and regulations are brought to the attention of every employee under their supervision and to see that it is adhered to.

13.1 Every employee residing in living quarters in a rest camp or on a designated site must:

13.1.1 Obey all reasonable and lawful rules given by the Park Manager or designated person;
13.1.2 Reside only in specific quarters/designated site reserved for them;
13.1.3 Maintain cleanliness and sanitation in his place of residence.

13.2 No person residing, working or officially present in a park, is allowed to:

13.2.1 Accommodate any unauthorized person, assist him or give him permission to enter or live in any designated living areas;
13.2.2 Behave in such a way as to be detrimental to maintaining discipline, order for health in such living areas;

13.3 Without written permission from the Park Manager or designated person;

13.3.1 Keep live animals or poultry;
13.3.2 Excavate or have excavations made
13.3.3 Build or make any alterations to existing building;

13.4 In any way, either directly or indirectly, hinder any employee, Security Officer, Ranger or anyone authorised by the Park Manager, in the execution of their duties; inspections or any investigations deemed necessary or

purposely hinder, obstruct, mislead or refuse to divulge information when requested to, or refuse to assist in any way or heed legitimate request or command.

13.5 Purposely disturb the peace by making a noise, shouting, screaming, arguing, causing violence or acting violently or improperly.

13.6 Enter or leave a Park or living quarters other than through the official gates.

13.7 Gamble in any way.

13.8 Defecate in a place or manner as to offend any other person.

13.9 Dispose of rubble or leftovers in any place other than in bins provided.

13.10 Aimlessly loiter or hang around near or in a rest camp or personnel accommodation at any time.

13.11 Introduce, brew or be in possession of alcohol.

13.12 Be in possession of habit forming drugs.

13.13 Be in possession of any fresh meat, especially raw venison or other animal products and, if required legally, it may not be transported out of the park without the necessary veterinary permits.

13.14 Hitch-hike in a national park.

13.15 Possess a firearm or any dangerous weapon without the necessary permission or permit.

13.16 Where work teams reside and work in the field, wander away from the work site or living quarters.

13.17 Temporary work teams (supervisors excluded) are not allowed to receive visitors in a national park.

13.18 It is the contractor's responsibility to ascertain the rules and regulations laid down by SANParks.

14. MALARIA AND MALARIA CONTROL

Some of the national parks, e.g. Kruger National Park and Mapungubwe National Park are in an endemic malaria area and the residents are constantly exposed to the disease and must be aware of the fact.

Malaria is a potentially dangerous disease and if not treated timeously and correctly, can be fatal. It is therefore extremely important that all residents, their children and their employees take adequate preventative measure to protect themselves from disease. Malaria is a disease caused by small parasites, which destroy red blood corpuscles of an affected person. Parasites are transmitted from person to person by the *Anopheles* mosquitoes. Various types of malaria occur of which *plasmodium falciparum* is the most common and also the most dangerous.

The possibility of contracting the disease can be reduced by avoiding mosquito bites and taking prophylactics which prevent the development of parasites in the body. Please contact the local physician for precautionary measures or if you think you have malaria.

END