SOUTH AFRICAN NATIONAL PARKS

THE INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK

CONTRACT NO: CI-GK-0175

TENDER DOCUMENT

MARCH 2025

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

NAME OF TENDERER: _____

THE INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK

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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 indistinct, 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

Contractor	Witness for Contractor	Employer	Witness for Employer

Part T1: Tendering procedures

Contractor	Witness for Contractor	Employer	Witness for Employer

THE INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK

CONTRACT NO: CI-GK-0175

T1.1: Tender Notice and Invitation to Tender (SBD1)

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF SOUTH AFRICAN NATIONAL PARKS					
BID NUMBER:	CI-GK-0175	**CLOSING DATE:**	11 April 2025	**CLOSING TIME:**	11:00
DESCRIPTION:	THE INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK.				

BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT

Location of tender box:	Reception, Main Rest Camp, Addo Elephant National
Physical address:	Addo Main Rest Camp, Addo Elephant National Park (off the R355 road).
Identification details:	Contract: CI-GK-0175 – THE INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK.

South African National Parks invites tenders for THE INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK IN THE EASTERN CAPE PROVINCE**.**

ELIGIBILITY

1. CIDB Grading:

a) Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contactor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25 (7A) of the Construction Industry Development Regulations, for a **6 EP / 6 EB** or higher class of construction work, are eligible to submit tenders.

b) Joint ventures are eligible to submit tenders provided that:

(i) Every member of the joint venture is registered with the CIDB.
(ii) The lead partner has a contractor grading designation in the **6 EP / 6 EB** class of the construction work; or not lower than one level below the required grading designation in the class of construction works under consideration and possess the required recognition status.
(iii) 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 of **6 EP / 6 EB** class of construction work or a value determined in accordance with the Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.

c) Only tenderers who comply with the following are eligible to submit tenders:

(i) Have the required and valid CIDB grading stated.
(ii) Achieved the minimum score for Functionality.
(iii) Tenderer is not listed in the Register of Tender Defaulters and prohibited from doing business with the public sector.
(iv) The tenderer has not abused the Employer's supply chain management system
(v) The tenderer has not failed to perform on any previous contract with the employer.

2. Mandatory Requirement

It is required to comply with the following mandatory requirement -

- Registration as Installation Electrician or Master Installation Electrician with the Department of Labour (DoL) in terms of Regulation 11 (2) of the Electrical Installation Regulations under the OHS Act of 1993.
- Proof of Registration of Electrical Contractor in terms of Regulation 6(4) of the Electrical Installation Regulations, valid for the period of construction.

3. Functionality Criteria:

Tenderers are required to score a minimum of 28 **points** out of a possible 4**0 points** (i.e. 70 %) in order to be responsive: Tender Data, of the proposed functionality criteria and point system for evaluation. Refer to Clause **C3.11** in the Tender Data.

The physical address for collection of tender documents is:

Addo Interpretive Centre, Main Rest Camp,
Addo Elephant National Park (off the R355 road).
Eastern Cape Province

Tender documents will ONLY be available at the compulsory clarification meeting.
A non-refundable tender deposit of **R 300-00** payable in cash is required on collection of the tender documents.

There will be no EFT facilities available – **CASH ONLY**

Queries relating to the issue of these documents may be addressed to:
All Queries: Mr Garret Kobe Tel No: (012) 426 5132
Email: garret.kobe@sanparks.org

A compulsory clarification meeting with representatives of the Employer will take place at the **Interpretive Centre, Addo Elephant National Park on 25 March 2025 starting at 11:00.** The Tenderer shall inspect and examine the Site and its surroundings and shall satisfy himself before submitting his 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 he may require and in general shall himself obtain all necessary information as to risk, contingencies and other circumstances which may influence or affect his tender.

The tenderer 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 11 April 2025 at 11h00. E-mail and late tenders will not be accepted.

Tenders may only be submitted on the tender documentation that is issued. 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	G Kobe		**CONTACT PERSON**	F Marais
TELEPHONE NUMBER	012 426 5132		**TELEPHONE NUMBER**	021 741 2563
E-MAIL ADDRESS	garret.kobe@sanparks.org		**E-MAIL ADDRESS**	francois.marais@sanparks.org
SUPPLIER INFORMATION				
NAME OF BIDDER				
POSTAL ADDRESS				
STREET ADDRESS				
TELEPHONE NUMBER	CODE		NUMBER	
CELL PHONE NUMBER				
FACSIMILE NUMBER	CODE		NUMBER	
E-MAIL ADDRESS				
VAT REGISTRATION NUMBER				
SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:		**OR** CENTRAL SUPPLIER DATABASE No:	MAAA
ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS / SERVICES / WORKS OFFERED?	☐Yes ☐No [IF YES ENCLOSE PROOF]		ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS / SERVICES / WORKS OFFERED?	☐Yes ☐No [IF YES, ANSWER THE QUESTIONAIRE BELOW]

QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS

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

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

PART B
TERMS AND CONDITIONS FOR BIDDING

1. BID SUBMISSION:
1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.
1.2. **ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED– (NOT TO BE RE-TYPED) OR IN THE MANNER PRESCRIBED IN THE BID DOCUMENT.**
1.3. THIS BID IS SUBJECT TO THE PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022,
1.4. 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)**
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. SANParks is committed to protecting your privacy and ensuring that personal information collected is used properly, lawfully and transparently.

THE INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK.

CONTRACT NO: CI-GK-0175

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.** (see www.cidb.org.za) 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	Tender Data
C 1.1	The Employer is the South African National Parks.
C 1.2	The tender documents issued by the employer comprises: **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 - Form of Guarantee C1.4 - Pro-Forma – Declaration of Ownership of Unused Materials **Part C2: Pricing data** C2.1 - Pricing instructions C2.2 - Day Work Schedule C2.2 - Bill of Quantities **Part C3: Scope of work** C3 - Scope of work. **Part C4: Site information** C4 - Site information **Part C5: Drawings** C5 - Drawings

Clause number	Tender Data
C 1.4	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 4 April 2025 at 12:00.** Questions / enquiries received after **12:00 on 4 April 2025** will not be considered. Name: Garret Kobe Capacity: Manager SCM: Infrastructure and Special Projects Address: PO Box 787, PRETORIA, 0001 Tel: 012 426 5132 E-mail: Garret.kobe@sanparks.org The language for communications is English.
C 2.1	Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor designation grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25 (7A) of the Construction Industry Development Regulations, for a **6 EP / 6 EB** or higher class construction work, are eligible to 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 submission, are eligible to have their tenders evaluated: Joint Venture 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 **6 EP / 6 EB** class of construction work; or not lower than one level below the required grading designation in the class of construction works under consideration and possess the required recognition status. 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 **6 EP / 6 EB** class of construction work or a value determined in accordance with Regulation 25 (1B) of 25(7A) of the Construction Industry Development Regulations.
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.
C 2.12	No alternative tender offers will be considered
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 0 (nil) copies.
C 2.13.7	The employer's details and address for delivery of tender offers and identification details that are to be shown on each tender offer package are: **Location of tender box:** Addo Reception, Main Rest Camp, **Physical address:** Addo Elephant National Park (off the R355 road) **Identification details**: CONTRACT No: CI-GK-0175 – THE INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK.

Clause number	Tender Data
C 2.15.1	The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender.
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 the following documents: 1) Compulsory Enterprise Questionnaire (Completed and Signed) (**Compulsory**). 2) Site Inspection Certificate (Completed and signed by SANParks representative) (**Compulsory**). 3) Form of Offer (Completed and Signed) (**Compulsory**). 4) Bill of Quantities (Completed) (**Compulsory**). 5) Letter of Good Standing from Compensation Commissioner (**Compulsory**). 6) Preference Points claimed in terms of the Preferential Procurement Regulations 2022 (Form SBD 6.1) (Completed and Signed) (**Compulsory**). 7) An original and valid B-BBEE sworn affidavit, SANAS or DTIC certificate, or certified copy thereof. For Joint Ventures, a SANAS certificate in the name of the JV must be provided (**Compulsory, if claiming points for specific goals).** 8) Resolution of Board of Directors (Authority for Signatory). 9) Proof of National Treasury Central Supplier Data Base (CSD) registration. 10) Invitation To Bid (From SBD 1) (Completed and Signed). 11) Declaration of Interest (Form SBD 4) (Completed and Signed). 12) Proof of Contractor Registration issued by the Construction Industry Development Board (CIDB). 13) Proof of registration of Closed Corporation, Company or other legal entities. 14) Letter of intent for construction guarantee (FSCA registered institutions only). 15) Record of Addenda to tender documents, if applicable (Completed and Signed). 16) Joint Venture / Joint Venture signed agreement / Consortium Disclosure Form (Where applicable). 17) A valid Tax Compliance Status Verification PIN issued by the South African Revenue Services. 18) Proposed Subcontractors. 19) Signed acknowledgment of the “Health and Safety Specification Acknowledgement Receipt” in the name of the document in the tender. 20) Signed acknowledgement of the “Environmental Management Plan/Programme Receipt” in the name of the document in the tender.
C 3.4.1	The time and location for opening of the tender offers are: Date and Time: **11 April 2025 at 11:00** Place: Addo Board Room, Main Rest Camp, Addo Elephant National Park. *[Tender Box location is at the Reception]*
C 3.11	**Evaluation of tender offers** **The procedure for the evaluation of responsive tenders is –** • Mandatory Requirements, • Functionality, and • Price and Specific Goals.

Clause number	Tender Data

1) Mandatory Requirement

The following mandatory compliance for an Electrical Competent Person is required.

Electrical Competent Person:

It is required that at least one "project employed person" that form part of the workforce intended to construct, and or perform electrical works in whatever capacity needs to suitably qualified and comply with the following –

- Registration as Installation Electrician or Master Installation Electrician with the Department of Labour (DoL) in terms of Regulation 11 (2) of the Electrical Installation Regulations under the OHS Act of 1993.
- Proof of Registration of Electrical Contractor in terms of Regulation 6(4) of the Electrical Installation Regulations, valid for the period of construction.

2) Functionality Criteria

The Functionality criteria and scoring are described below. A tender that fails to obtain the minimum qualification score for functionality is not an acceptable tender.

Tenderers are required to demonstrate the ability to undertake the work and to provide proof of experience, expertise, plant, and equipment to undertake work of this nature.

Tenderers are required to score a minimum of **28 points out of a possible 40 points** (70%) in order to be responsive. Tenderers who fail to meet the minimum threshold shall be declared non-responsive and subsequently rejected. The onus rests with the tenderer to supply sufficient information to allow for the proper scoring, evaluation and award of points.

Where insufficient information is provided, zero points will be awarded for such criterion. The quality criteria and maximum score in respect of each of the criteria as follows:

The following functionality criteria apply:

No.	ITEM	MAX. POINTS
1.	**Relevant Project Experience and Capability** (items 1.1 to 1.2)	**20**
1.1	**Refences:** Provide favourable letters of reference from clients for the number of completed Solar PV installations exceeding a value of R5m (Five million Rand). For multiple projects done for the same client, list each of the projects that exceeds the threshold value. Scoring: Two (2) points each per reference letter, up to a maximum of ten (10) points.	10
1.2	**Completed and ongoing Solar PV and Energy related projects**: **(i) Projects in progress**: Provide copies of Letters of Appointment for all Solar PV and Renewable energy related projects in progress where the total implementation work undertaken, each exceeded a value of R5m (Five million rand) per installation, respectively.	

Clause number	Tender Data		
		(ii) Completed projects: Provide copies of Appointment Letters and Completion Certificates for all Solar PV and Renewable energy related projects where the total implementation work undertaken, each exceeded a value of R5m (Five million rand) per installation respectively, which were completed during the last 5 years. Scoring (add up the following): • **Projects in Progress: (**Letter of Appointment): Two (2) points each per Letter of Appointment, up to a maximum of four (4) points. [4] • **Projects Completed: (**Letter of Appointment & Completion Certificate): Two (2) point each per Letter of appointment and Completion Certificate (same project), up to a maximum of 6 points. [6]	10
	2.	**Establishment & resources** (items 2.1)	**10**
	2.1	**Company in operation**: **(iii)** Number of years that the practice has been in operation. Scoring: Two (2) point for every three (3) years, up to a maximum of ten (10) points.	10
	3.	**Preliminary Programme** (items 3.1)	**10**
	3.1	In order to demonstrate Project Management/Implementation experience on a typical Solar PV installation, the tenderer shall submit as part of the tender returnable documentation the following: • Typical program showing key dates and events, including the critical path, for the full implementation of a 630 kWp Solar PV system. Scoring: Scoring is based on the level of detail presented on the documentation provided for each of the categories, which should demonstrate the level of experience. (i) Basic & generic Programme without detail & no clear timeframes – maximum two (2) points. [2] (ii) Programme including some solar plant installation elements & timeframes – maximum five (5) points. [5] (iii) Detailed Programme supporting solar plant installation experience showing all installation time frames and critical path – ten (10) points. [10]	10
		TOTAL POINTS FOR FUNCTIONALITY:	**40**

Clause number	Tender Data
	Tenderer to submit a list of past and current projects for functionality information – information must clearly state project information and Contractor to submit "Letter of Award" for current projects, and "Letter of Award" together with Completion Certificates" for completed projects, Functionality points will only be awarded on letter(s) submitted. Project details shall include telephone contact details of either the client and/or the engineer for the project. Should the key personnel not be available at the time of appointment for any reasonable reason, the Contractor will submit to the Client and Architect /Engineer, his proposed change in key personnel which will have to be approved. The Client and Architect/Engineer may on their discretion reject personnel proposed by the Contractor at such time. It is the responsibility of the tenderer to submit authentic supporting documentation. Tenderers will be disqualified and reported if found to have submitted fraudulent information. **3) PRICE AND SPECIFIC GOALS** The following price and preference point system is applicable to this tender: The 80/20 system for requirements with a Rand value above R30,000 but not exceeding R 50 million (all applicable taxes included) is applicable. Points for this bid shall be awarded as follows: (a) Price; and (b) Specific Goals The maximum points for this bid are allocated as follows: Price: 80 Specific Goals: Preference Points: 20 Total Points for Price and Specific Goals must not exceed 100. The employer 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 employer. **Scoring financial offers: The 80/20 preference points system for acquisition of services, works or goods.** **PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022** **(a) POINTS AWARDED FOR PRICE** The total number of tender evaluation points (T_{EV}) will be calculated 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 a Rand value not exceeding R50 million.**

Clause number	Tender Data

The following formula will be used to calculate the points out of 80 for price in respect of a tender with a Rand value not exceeding 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.

(b) POINTS AWARDED FOR SPECIFIC GOALS

SANParks has identified the following specific goals to advance the categories of persons as part of its procurement processes.

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

THE SPECIFIC GOALS ALLOCATED POINTS IN TERMS OF THIS TENDER	Number of points allocated (80/20 system)
1) Percentage black ownership	
Persons historically disadvantaged on the basis of race with 100% black ownership, **OR**	**12**
Persons historically disadvantaged on the basis of race with 75% - 99% black ownership, **OR**	**10**
Persons historically disadvantaged on the basis of race with 60% - 74% black ownership, **OR**	**8**
Persons historically disadvantaged on the basis of race with 51% - 59% black ownership, **OR**	**6**
Persons historically disadvantaged on the basis of race with 0 – 50% black ownership,	**4**
2) Qualifying Small Enterprises	
Qualifying Small Enterprises (annual turn-over between R10 million & R50 million)	**4**
3) Locality	
To Qualify, the bidder must include verifiable proof of business address in the Easter Cape Province, older than two years.	**4**
TOTAL MAXIMUM POINTS CLAIMED BY THE SERVICE PROVIDER:	**20**

The following will be accepted as proof:

1) **Black ownership**
Bidders to submit valid B-BBEE certificate or sworn affidavit clearly indicating the percentage Black ownership.

Clause number	Tender Data
	2) Exempted Micro or Qualifying Small Enterprises Bidders to submit valid B-BBEE certificate or sworn affidavit clearly indicating the type of enterprise. **3) Locality** To qualify, the bidder must provide / include verifiable proof of business address in one of the criteria, older than 2 years: • Rental/Lease agreement in the name of the bidding company to include rental/lease period (start & end date) with proof of payment for the month prior to closing of the tender, OR, • Ownership of business premises – municipal / Eskom services account in the name of the bidding company to confirm 2-year business address. *NB: Bidders who are not located in the Eastern Cape Province, and who are not QSE's may still tender, but will not claim points for specific goals. Failure to provide the afore-mentioned documentation, will result in an allocation of zero points for specific goals.*
C 3.13	Tender offers will only be accepted with the following additional requirements: a) 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. b) 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. c) Has completed the Compulsory Enterprise Questionnaire, SBD1, 4, 6.1, 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. d) Has submitted the documentation listed in C.2.23
C 3.17	The number of paper copies of the signed contract to be provided by the Employer is one.

Annexure C

Standard Conditions of Tender

(As per Construction Industry Development Board, Government Gazette No 42622, 8 August 2019)

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 fulfil 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 comply with requirements.

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

C.2.3 Check documents

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

C.2.4 Confidentiality and copyright of documents

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

C.2.5 Reference documents

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

C.2.6 Acknowledge addenda

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

C.2.7 Clarification meeting

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

C.2.8 Seek clarification

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

C.2.9 Insurance

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

C.2.10 Pricing the tender offer

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

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

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

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

C.2.11 Alterations to documents

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

C.2.12 Alternative tender offers

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

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

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

C.2.13 Submitting a tender offer

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

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

C.2.13.3 Submit the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the employer.
C.2.13.4 Sign the original and all copies of the tender offer where required in terms of the tender data. The employer will hold all authorised 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.

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.

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,

b) preventing participating in the employer's procurement;

c) 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.

d) has the legal capacity to enter into the contract.

e) 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.

f) complies with the legal requirements, if any, stated in the tender data; and

g) 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

Contractor	Witness for Contractor	Employer	Witness for Employer

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 for tender completeness purposes and are COMPULSORY

Compulsory Enterprise Questionnaire.

Site inspection certificate.

Health and Safety Specifications Acknowledgement.

Letter of good standing from the Compensation Commissioner.

Letter of intent for a Construction Guarantee (FSCA registered institutions only).

2. Other documents required only for tender evaluation purposes

A valid Tax verification pin as issued by the South African Revenue Services.

An original and valid B-BBEE sworn affidavit, DTIC or SANAS certificate, or certified copy thereof [for JV's, only SANAS certificates are acceptable].

Capacity of Tenderer.

Documentation for Functionality evaluation.

3. Other documents that will be incorporated into the contract

Resolution of board of directors / members / partners (Authority of Signature).

Special Resolution of Joint Venture Partners – if applicable.

Record of Addenda to Tender Documents – if applicable.

Proposed Amendments and Qualifications – if applicable.

SBD 1: Invitation to Bid.

SBD 4: Declaration of interest.

SBD 6.1: Preference points claim form in terms of preferential procurement regulations 2022.

Proof of active Contractor Registration issued by the Construction Industry Development Board.

Clarification Meeting Information.

Health and Safety Specifications.

Code of conduct for implementing a project for SANParks.

Environmental Management Plan for General Construction Activities.

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

5. C1.2 Contract Data (Part 2).

6. C2.2 Bills of Quantities (As per tender document, completed in black ink) **[COMPULSORY].**

7. DOCUMENTATION FOR FUNCTIONALITY EVALUATION (Previous contracts information).

T2.2 Returnable Schedules

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 all 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:

3. 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)*

4. 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)*

5. *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.

6. 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.

7. 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 all 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.

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)*

1. _____
   _____
2. _____
   _____
3. _____
   _____
4. _____
   _____
5. _____
   _____
6. _____
   _____
7. _____
   _____
8. _____
   _____

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 days 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)

No	Name	Capacity	Signature
1			
2			
3			
4			
5			
6			
7			
8			

No	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*

1. 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: . . . . . .

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: SBD1 issued by National Treasury must be completed for each tender and be attached as a tender requirement.

Section 7: SBD4 issued by National Treasury must be completed for each tender and be attached as a tender requirement.

Section 8: SBD6 issued by National Treasury must be completed for each tender and be attached as a tender requirement.

Section 9: 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

* Insert separate page if necessary

Section 10: 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.

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

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) Authorises the Employer to obtain a tax clearance certificate from the South African Revenue Services that it is 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

Enterprise name	Date

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

2. 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).*

No.	Date	Title or Details
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Name	Position	Signed

Name of Tenderer	Date

3. 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

THE INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK.

CONTRACT NO: CI-GK-0175

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	**Name/s of employee**	**Number of employees**	**Permanent employed (Yes/No)**	**Categories of employees**	**Name of Employee/s**	**Number of employees**	**Permanent employed (Yes/No)**
Carpenter				General worker			
Bricklayer							
Plasterer							
Plumber							
Tiler							
Painter							
Thatcher							
Electrician							

Machinery	**Plant**	**Workshops**

2. 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.
Attach additional documents as proof.

ITEM	DESCRIPTION
Site Agent (Provide copy of CV)	
Name of Person	
No of years' experience	
Field/s of experience	
Permanent employment (Yes/No)	
Site Foreman (Provide copy of CV)	
Name of Person	
No of years' experience	
Field/s of experience	
Permanent employment (Yes/No)	

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

3.1. Current projects: (Attach additional documents as proof)

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								

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

3.2. Previous projects: (Attach additional documents as proof)

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									

THE INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK.

CONTRACT NO: CI-GK-0175

4. 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.

I have attended the Clarification Meeting at **Addo Elephant National Park** and listened to the explanations regarding the works. I declare that read the Clarification Meeting document, signed it and include it herewith.

Name Tenderer's Representative	Position	Signed

Name of Tenderer	Date

Name of Employer's Representative	Signature	Date

THE INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK.

CONTRACT NO: CI-GK-0175

5. 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 Baseline Risk Assessment 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:

_____

_____

_____

_____

_____

_____

THE INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK.

CONTRACT NO: CI-GK-0175

6. ENVIRONMENTAL MANAGEMENT PLAN ACKNOWLEDGEMENT RECEIPT

Contractor's Acknowledgement:

I, _____ representing

_____ (Contractor/s), have satisfied myself with the content of this Environmental Management Plan and have made the relevant provision under my Preliminary & General Section for any and all costs involved to ensure compliance of this Programme and shall we be the successful contractor, we shall ensure that our employees and contractors on site comply with the requirements of this document and the Code of Conduct when working in a national park.

_____ _____

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**

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

2.2.1 If so, furnish particulars:

……

……

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

2.3 Does the bidder or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are bidding for this contract?

YES/NO

2.3.1 If so, furnish particulars:

……

……

……

3 DECLARATION

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

3.1 I have read, and I understand the contents of this disclosure.

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

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

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

3.5 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.

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.

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 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 2022

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

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

1. GENERAL CONDITIONS

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

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

1.2 The lowest/ highest acceptable tender will be used to determine the accurate system once tenders are received

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

(a) Price; and

(b) Specific Goals.

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

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	80
SPECIFIC GOALS	20
Total points for Price and SPECIFIC GOALS	**100**

1.5 Failure on the part of a tenderer to submit proof or documentation required in terms of this tender to claim points for specific goals with the tender, will be interpreted to mean that preference points for specific goals are not claimed.

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

2. DEFINITIONS

(a) **"tender"** means a written offer in the form determined by an organ of state in response to an invitation to provide goods or services through price quotations, competitive tendering process or any other method envisaged in legislation.

(b) **"price"** means an amount of money tendered for goods or services and includes all applicable taxes less all unconditional discounts.

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

(d) **"tender for income-generating contracts"** means a written offer in the form determined by an organ of state in response to an invitation for the origination of income-generating contracts through any method envisaged in legislation that will result in a legal agreement between the organ of state and a third party that produces revenue for the organ of state, and includes, but is not limited to, leasing and disposal of assets and concession contracts, excluding direct sales and disposal of assets through public auctions; and

(e) **"the Act"** means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

3.1.1 THE 80/20 PREFERENCE POINT SYSTEMS

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

80/20

$$Ps = 80\left(1 - \frac{Pt - P\,min}{P\,min}\right)$$

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

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

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

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

(b) any other invitation for tender, that either the 80/20 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system, then the organ of state must indicate the points allocated for specific goals for both the 80/20 preference point system.

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

Note to tenderers: *The service provider must indicate how they claim points for each preference point system. Points will be allocated according to the points claimed in the table below.*

THE SPECIFIC GOALS ALLOCATED POINTS IN TERMS OF THIS TENDER	Number of points allocated (80/20 system)	Number of points claimed (80/20 system) (To be completed by the service provider)
1. Percentage black ownership		
Persons historically disadvantaged on the basis of race with 100% black ownership, **OR**	**12**	
Persons historically disadvantaged on the basis of race with 75% - 99% black ownership, **OR**	**10**	
Persons historically disadvantaged on the basis of race with 60% - 74% black ownership, **OR**	**8**	
Persons historically disadvantaged on the basis of race with 51% - 59% black ownership, **OR**	**6**	
Persons historically disadvantaged on the basis of race with 0 – 50% black ownership	**4**	
2. Qualifying Small Enterprises		
Qualifying Small Enterprises (annual turn-over between R10 million & R50 million)	**4**	
3. Qualifying Small Enterprises		
To qualify, the bidder must include verifiable proof of business address in the **Easter Cape Province**, older than two years.	**4**	
TOTAL MAXIMUM POINTS CLAIMED BY THE SERVICE PROVIDER:	**20**	

The following will be accepted as proof:

1. **Black ownership -**
   - Bidders to submit a valid B-BBEE certificate or sworn affidavit clearly indicating the percentage.

2. **Qualifying Small Enterprises -**
   - Bidders to submit a valid B-BBEE certificate or sworn affidavit clearly indicating the type of enterprise.

3. **Locality**
   To qualify, the bidder must provide / include verifiable proof of business address in one of the criteria, older than 2 years:

   - Rental/Lease agreement in the name of the bidding company to include rental/lease period (start & end date) with proof of payment for the month prior to closing of the tender,

     OR,

   - Ownership of business premises – municipal / Eskom services account in the name of the bidding company to confirm 2-year business address.

NB: Bidders who are not located in the Eastern Cape Province, and who are not QSE's may still tender, but will not claim points for specific goals. Failure to provide the afore-mentioned documentation, will result in an allocation of zero points for specific goals.

DECLARATION WITH REGARD TO COMPANY / FIRM

a. Name of company / firm……..

b. Company registration number: ……...

c. TYPE OF COMPANY / FIRM [TICK APPLICABLE BOX]

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

d. I, the undersigned, who is duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the specific goals as advised in the tender, qualifies the company/ firm for the preference(s) shown and I acknowledge that:

i) The information furnished is true and correct.

ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form.

iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct.

iv) If the specific goals have been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have –

(a) disqualify the person from the tendering process.

(b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct.

(c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation.

(d) recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied, and

(e) forward the matter for criminal prosecution, if deemed necessary.

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:

Tender Notice and Invitation to Tender (SBD1)
Declaration of Interest (SBD4)
Preference points claimed (SBD6.1) – Original or certified copy of B-BBEE certificate or Sworn Affidavit

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) 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: _____

C: The Contract

Part C1: Agreement and Contract Data

Contractor	Witness for Contractor	Employer	Witness for Employer

THE INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK.

CONTRACT NO: CI-GK-0175

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-0175 THE INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL 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 authorised, signing this part of this form of offer and acceptance, the tenderer offers to perform all of the obligations and liabilities of the contractor under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the conditions of contract identified in the contract data.

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF 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 a copy of this acceptance form to the tenderer, whereupon the tenderer becomes the party named as the contractor in the conditions of contract identified in the contract data.

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

ACCEPTANCE (NB: TO BE COMPLETED BY SANParks NOT THE TENDERER)

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 securities, 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 fully completed signed acceptance form, 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

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.

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 INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK.

CONTRACT NO: CI-GK-0175

C1.2 Contract Data

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	Variation
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 **12 (twelve)** months.
1.1.1.14	The time for achieving Practical Completion is **8 (eight) months**, excluding 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).
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: BVi Consulting Engineers, or their successors duly appointed by the Employer.
1.1.1.26	The Pricing Strategy is a **Re-measurement Contract**.
1.2.1.2	The Employer's address for receipt of communications and notices is: **Physical address:** South African National Parks The General Manager: Infrastructure & Special Projects. 643 Leyds Street Muckleneuk Pretoria 0002 **Postal Address:** Postal Address: PO Box 787 Pretoria 0001 Telephone: (012) 426 5126

Clause	Variation
1.2.1.2	The address of the Employer's Agent is: Physical address: BVi Consulting Engineers, Block 2, Edison Square, C/o Edison Way & Century Avenue CENTURY CITY, 7441 Postal Address: BVi Consulting Engineers, P.O. Box 89, CENTURY CITY, 7441 E-mail: gernoth@bviwc.co.za Telephone: +27 21 527 7000
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 for each work order issued. (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	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 the parks access gates are locked after hours, and the Contractor shall make provision for transporting his staff off site in good time. The park seasonal hours are: Winter: April - September 07:00 - 17:00 Summer: October - March 06:00 - 18:00

<table>
<tr><th>Clause</th><th>Variation</th></tr>
<tr><td>5.8.1</td><td>The non-working days are Saturday and Sundays.

The special non-working days are:
(1) All gazetted public holidays falling outside the year end break.
(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>2 days</td></tr>
<tr><td>April</td><td>2 days</td></tr>
<tr><td>May</td><td>3 days</td></tr>
<tr><td>June</td><td>4 days</td></tr>
<tr><td>July</td><td>4 days</td></tr>
<tr><td>August</td><td>3 days</td></tr>
<tr><td>September</td><td>3 days</td></tr>
<tr><td>October</td><td>2 days</td></tr>
<tr><td>November</td><td>2 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 6,650 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 latent defects period is 5 Years, commencing on the day after the date of certification of Practical Completion.</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>
</table>

Clause	Variation
6.8.4	*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 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 **R100 000 (One hundred thousand rand).**
8.6.1.2	A Coupon Policy for Special Risks Insurance issued by the South African Special Risks Insurance Association is not required.
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.

Part 2: Contract Data completed by the Contractor (COMPULSORY COMPLETION)

Clause	Item and data
1.2	The name of the **Contractor** is. . . . . . The address of the **Contractor** is: Telephone: . . . . . . Facsimile: . . . . . . Cell phone: . . . . . . Address (physical): . . . . Address (postal): . . . . Email: . . . . .

C1.3 Construction 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-0175**

for the

INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL 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 excursion for the due and faithful performance by the Contractor of all the terms and conditions of the said Contract, subject to the following conditions:

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.
2. This guarantee shall be limited to the payment of a sum of money.
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.
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.
5. Our total liability hereunder shall not exceed the sum of . . . . . .

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

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.

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 – 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.

(c) 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

C2.1 Pricing Instructions

C2.2 Day Work Schedule

C2.3 Bill of Quantities

Contractor	Witness for Contractor	Employer	Witness for Employer

C2.1 Pricing Instructions

1) The measurement and payment clause of the SANS 1200 Standardised Specification and the Standard and Particular Specifications shall be deemed to form part of and included in the Pricing Instruction.

2) The units of measurement described in the Bills of Quantities are metric units. Abbreviations used in these Bills of Quantities are as follows:

%	=	percent
h	=	hour
ha	=	hectare
kg	=	kilogram
kl	=	kilolitre
km	=	kilometre
km-pass	=	kilometre-pass
kPa	=	kilopascal
kW	=	kilowatt
l	=	litre
m	=	metre
mm	=	millimetre
m^2	=	square metre
m^2-pass	=	square metre-pass
m^3	=	cubic metre
m^3-km	=	cubic metre-kilometre
MN	=	meganewton
MN.m	=	meganewton-metre
MPa	=	megapascal
No.	=	number
Prov sum	=	Provisional sum
PC sum	=	Prime Cost sum
R/only	=	Rate only
sum	=	lump sum
t	=	ton (1000 kg)
W/day	=	Work day

3) Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance is made for waste.

4) The quantities set out in the Bills of Quantities are the estimated quantities for the Contract Works, but the Contractor will be required to undertake whatever quantities may be directed by the Engineer from time to time. The Contract Price for the completed contract shall be computed from the actual quantities of work done, valued at the relevant unit rates and prices.

5) 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.

6) 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).

7) 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

8) 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.

9) The quantities set out in these Bills of Quantities are approximate and do not necessarily represent the actual amount of work to be done. The quantities of work accepted and certified for payment will be used for determining payments due and not the quantities given in the Bills of Quantities.

10) Reasonable compensation will be received where no pay item appears in respect of work required in the Bills of Quantities in terms of the Contract and which is not covered in any other pay item.

11) 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.

12) Descriptions in the Bills of Quantities are abbreviated and comply generally with those in the SANS 1200 Standardised Specification.

Construction –

13) 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.

C2.2 Day Work Schedule

C2.2.1 GENERAL

Tenderers must complete this list which shall be used for the assessment of value of the work which the Engineer instructed in writing that must be done on a day work bases, all in agreement with Clause 6.5 of the General Conditions of Contract for Construction Works 2015. All the rates are fixed and shall be binding until and with the issuing of the final approval certificate, except for statutory increases announced from time to time, only if this Contract is subject to contract price adjustment as specified in Clause 6.8.2 of the Contract Data.

C2.2.2 LABOUR COSTS

Rates for labour as listed below shall include all the allowances as specified in the General Conditions of Contract for Construction Works 2015. If these rates differ from similar rates tendered in the bill of quantities, the rates in the tendered bill of quantities will apply.

Overtime costs attached to this contract shall be paid in the same relation as to that which the employees are actually paid.

Only the net working hours will be measured under dayworks, and it will be held that the Contractor has made provision in his rates for possible interruptions and standing time.

DESCRIPTION	UNIT	RATE
Unskilled Labourer	hour	
Semi-skilled Labourer	hour	
Skilled Labourer	hour	
Pipe Layer	hour	
Bricklayer	hour	
Steel Fixer	hour	
Foreman/Section Leader	hour	
General Foreman	hour	
Surveyor	hour	

∗ Where there are discrepancies in the rates tendered for similar items in the above table and items listed in the bill of quantities, the rates in the bill of quantities shall govern.

* All labour not specified above and not listed additionally by the Contractor, will be regarded as “Skilled Labour”.

C2.2.3 EQUIPMENT COSTS

Full comprehensive hourly rates, which also include the cost of the operators and other equipment, must be listed below. Rates must also include all the costs of consumable items, maintenance, depreciation, tools and all other coincidences that shall be necessary to operate the equipment for the purpose it is designed for. If these rates differ from similar rates tendered in the bill of quantities, the rates in the tendered bill of quantities will apply.

The rates must also include all the overhead costs, profits, site supervision, insurance, holidays with payment, travelling costs (or travelling allowances) and residence allowances of operators and any other allowances that is applicable. No further percentage allowances shall be applicable on equipment. The Tenderer must list under each heading the fabrication and specification of the equipment available.

The Contractor will be paid the actual net cost of plant hired by him for dayworks and in addition will be paid a percentage allowance on the net cost of such hire which allowance will cover the Contractors overhead costs and profit.

DESCRIPTION	UNIT	RATE
1. Digger-Loader (TLB)		
	Hour Hour	
2. Excavators		
	Hour Hour	
3. Trucks (m^3 specified)		
	Hour Hour	
4. Tractors & Trailers		
	Hour Hour	
5. Concrete Mixers (litres specified)		
	Hour Hour	
6. Plate Compactors		
	Hour Hour	
7. Rammer / Jumping Jack Compactors		
	Hour Hour	
8. Breakers		
	Hour Hour	
9. Compressors		
	Hour Hour	

10. Drills (electrical / battery operated)		

	Hour Hour	
11. Generators		
	Hour Hour	
10. Other Equipment - specify		
	Hour Hour Hour Hour	

∗ *Where there are discrepancies in the rates tendered for similar items in the above table and items listed in the bill of quantities, the rates in the bill of quantities shall govern.*

C2.3 Bill of Quantities

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Part C3: Scope of Work

C3.1 Description of the Works

C3.2 Engineering

C3.3 Procurement

C3.4 Construction

C3.5 Management

C3.6 Annexes

3.6.1 Project Specifications

- PART A: Description of the Service & Design Standards
- PART B: Standard Specifications
- PART C: Particular (Project) Specifications & Schedules

3.6.2 Particular Specifications

- ANNEXURE A: OHS Specifications & Baseline Risk Assessment
- ANNEXURE B: Environmental Management Plan
- ANNEXURE C: Code of Conduct for Working in a National Park

Status

Should any requirement or provision in the parts of the Scope of Work conflict with any requirement of any Standardised Specification, Particular Specification or any drawings, the order of precedence, unless otherwise specified, is:

BoQ
Drawings
Scope of Work (Parts C3.1, C3.4, C3.5 and C3.6)
Standardised Specifications

C3.1 Description of the Works

C3.1.1 Employer's objectives

SANParks developed a Green Energy Strategy in 2021. The strategy involves mainly three major technological and social adjustment and/or changes, namely:

(i) Energy saving on the demand side,
(ii) Improved efficiency in production with the renewable sector expanding and improving rapidly,
(iii) Replacement of fossil fuels by various sources of renewable energy

The implementation of the proposed grid-tied Solar PV system at the Main Camp of the Addo Elephant National Park is a response to the Strategy. Many others will follow will this be successfully implemented.

C3.1.2 Locality

The Addo Elephant National Park (AENP) is situated in the Eastern Cape, with the Park's Main Rest Camp approximately 70 km northeast of Port Elizabeth. The entrance to the Main Rest Camp is situated off the R342 road, linking Addo town in the south and Patterson in the north-east of the Addo Elephant National Park.

C3.1.3 Scope of the Works

The construction of the Grid-Tied Solar PV System at Addo Elephant National Park will provide a sustainable energy solution, reducing reliance on fossil fuels and minimizing the camp's carbon footprint. The scope includes site preparation, solar PV installation, electrical integration, backup power solutions, monitoring systems, testing, and maintenance, ensuring a robust and efficient renewable energy source.

C3.1.3.1 Site preparation & Civil Works -

- Site clearing and levelling for solar PV installation.
- Construction of storm water and subsurface drainage systems.
- Erection of security fencing (2.1m high) around the facility.
- Earthworks, cut & fill operations for equipment foundations.
- Installation of access roads for equipment transport and maintenance.

C3.1.3.2 Solar PV System Installation -

- Installation of a 630 kWp solar PV array with monocrystalline PERC modules.
- Mounting solar panels on galvanized steel structures with an optimized tilt angle.
- String configuration and electrical layout to maximize energy efficiency.
- Installation of combiner boxes for improved system protection and monitoring.

C3.1.3.3 Electrical Installation –

- Installation of five (5) x 110 kW grid-tied inverters with MPPT tracking.
- Setup of a 660-kW connection enclosure to integrate the solar PV system with the existing grid.
- Cabling and wiring installation for both DC (solar panels to inverters) and AC (inverters to grid connection).
- Implementation of inverter protection enclosures, including slabs and overhead covers.
- Modifications to existing electrical infrastructure to accommodate the new system.
- Connection to Eskom grid in compliance with South African Grid Codes.

C3.1.3.4 Backup Power & Load Management –

- Integration of the existing 300 kVA and 400 kVA emergency generators with the solar PV system.
- Installation of on-delay timers and contactors to manage large loads and prevent high demand spikes.
- Testing of generator synchronization to ensure seamless backup power supply.

C3.1.3.5 Monitoring & Control System –

- Installation of metering and monitoring systems for real-time performance tracking.
- Remote-access control features for monitoring system efficiency.
- Installation of protection devices such as surge protectors, circuit breakers, and residual current devices.

C3.1.3.6 Testing & Commissioning –

- System performance testing to evaluate load balancing, voltage regulation, and synchronization with Eskom grid.
- Commissioning and certification to ensure regulatory compliance.
- Final approval and handover to SANParks.

C3.1.3.7 Post-Construction & Maintenance –

- 12-month maintenance period, including regular inspections, inverter firmware updates, and panel cleaning.
- Ongoing performance evaluation for operational optimization.

C3.1.3.8 Project Timeline –

Estimated duration: 8 months

- Pre-Construction & Procurement: 4-6 weeks.
- Construction & Installation: 5-6 months.
- Commissioning & Testing: 2-3 weeks.

C3.2 Engineering

C3.2.1 Design

(a) The Employer is responsible for the design of the permanent Works as reflected in the Contract Documents, unless otherwise stated.
(b) The contractor is responsible for the design of the temporary Works such as traffic accommodation signage, signalling and their compatibility with the Permanent Works.
(c) The Contractor shall apply all details necessary to assist the Engineer in the compilation of the as-built drawings.

C3.2.2 Employer's design

The Employer's design is contained in the Tender Documentation and Drawings. Amendments to the design, if necessary, will be issued during the construction phase.

C3.2.3 Design brief

Where the Contractor is to supply the design of designated parts of the permanent Works or temporary Works, he shall supply full working drawings supported by a professional engineer's design certificate.

C3.2.4 Drawings

The Contractor shall use only the dimensions stated in figures on the Drawings in setting out the Works, and dimensions shall not be scaled from the Drawings, unless required by the Engineer. The Engineer will, at the request of the Contractor in accordance with the provisions of the Conditions of Contract, provide such dimensions as may have been omitted from the Drawings.

The Contractor shall ensure that accurate as-built records are kept of all infrastructure installed or relocated during the contract. The position of all underground infrastructure shall be given by either co-ordinates or stake value and offset. Where necessary, levels shall also be given. A marked-up set of drawings shall also be kept and updated by the Contractor. This information shall be supplied to the Engineer's Representative on a regular basis.

All information in possession of the Contractor, required by the Engineer and/or the Engineer's Representative to complete the as-built / record drawings, must be submitted to the Engineer's Representative before a Certificate of Completion will be issued.

The Drawings prepared by the Employer for the permanent Works applicable to the contract are issued with this tender document. The Employer reserves the right to issue and/or amended additional drawings during the Contract.

The drawings listed below are issued with the tender document in order to give an overview of the project. Additional construction drawings will, in terms of the General Conditions of Contract, be issued to the Contractor by the Engineer / Employer on the commencement date and from time to time as required.

Drawing Number	Title
35212.00-101-01_Rev.B	General Services Layout
35212.00-312-01_Rev.T0	Bulk Supply Infrastructure: Single Line Diagram
35212.00-401-01_Rev.T0	Reticulation Layout (1)
35212.00-401-02_Rev.T0	Reticulation Layout (2)

C3.3 Procurement

C3.3.1 Preferential Procurement

The works shall be executed in accordance with the conditions associated with the granting of preferences detailed in Form SBD 6.1: Preference Points Claim Form in Terms of the Preferential Procurement Regulations 2022, where preferences are granted in respect of B-BBEE contribution. In particular, the Contractor may not sub-contract more than 25% of the value of the contract to sub-contractors that do not have an equal or higher B-BBEE status level than the Contractor, unless the sub-contractors are exempted micro enterprises that have the capability and ability to execute the sub-contract works.

C3.3.2 Scope of Mandatory Subcontract Work

No mandatory subcontract work is envisaged under this contract.

C3.3.3 Subcontractors

C3.3.3.1 Procedure for the selection of sub-contractors / suppliers

Where monetary allowances for provisional sums or prime cost items have been provided in the Bills of Quantities, and where the work is to be executed / supplied by sub-contractors / suppliers, then the following selection process shall be followed in respect of the required sub-contractors / suppliers:

The Contractor shall invite three quotations from suitably qualified sub-contractors / suppliers, the selection of which shall be in consultation with, and to the approval of the Engineer, for the required work or items.

The evaluation of the quotation received must include a preference points system as described in 5.11 of the Tender Data.

C3.3.3.2 Attendance on subcontractors

Approval given in terms of subcontracting shall not relieve the Contractor of any responsibility, duty or obligation imposed upon him by the Contract, and the Contractor shall in particular be and remain solely liable and responsible for all acts, omissions, negligence or breaches of contract on the part of the assignee or any of his employees, and for all acts, omissions or negligence of any Sub- Contractor or any of his employees.

C3.4 Construction

C3.4.1 Standard Specifications

SANS 1200 Standard Specifications, the Standard and Particular Specifications are applicable to this contract. It shall however be noted that reference is made in certain of the specifications to other standardised specifications which may or may not be included in this document. Where such specifications are not included, they shall however be deemed to be included in the Contract documents.

C3.4.2 Project and Particular Specifications

The following Project and Particular Specifications shall apply to this contract and are Annexed to the Contract –

PART A – Description of the Service & Design Standards
PART B - Standard Specifications
PART C – Particular Project Specifications

ANNEXURE A – Health and Safety Specifications for South African National Parks
ANNEXURE B – Environmental Management Plan
ANNEXURE C - Code of Conduct for Working in the South African National Parks

C3.4.3 Variations and Additions to the Standard and Particular Specifications

Variations and additions to the SANS 1200 Standard Specifications are listed above in C3.4.1 and the Particular Specifications of C3.4.2 are attached in Part A & B and the Annexures.

C3.4.4 Known services

The Contractor shall make himself acquainted with all existing works. Under no circumstances shall the Contractor alter or in any way interfere with the existing works or underground services unless authorised by the Engineer.

Where existing works are of such a nature that the Engineer may require them to be moved by the Contractor, the cost of such work will be paid for at scheduled rates or on day works, plant and materials basis. The Contractor will be held responsible for damages to any existing works and any damages caused shall be made good at his own cost without delay.

The Contractor is to exercise care when the proposed work is to cross an existing service, or work is to be performed close to an existing service. Prior to commencement of the relevant portion of the proposed works the Contractor with the Engineer or his duly appointed representative shall also perform a visual inspection of the area in question. This inspection will not waive the Contractor of his obligations with respect care of the works referenced in the General Conditions of Contract.

C3.4.5 Damage to services

Damage that occurs to unknown services during construction will be paid by the Employer.

However, all services that have been located and exposed, and are subsequently damaged by the Contractor or his subcontractor, shall be reinstated to the same state as it was before the damage occurred at the time and cost of the Contractor.

C3.4.6 Reinstatement of services and structures damaged during construction

The Contractor shall inform the Engineer immediately when a service or structure is damaged. The extent of the damage and a proposal how to reinstate the service or structure shall be submitted to the Engineer on a sketch with dimensions and time frames.

The Contractor shall not be allowed to reinstate any service or structure unless indicated so by the Engineer. The Contractor shall render all reasonable assistance to the service or structure owner with the reinstatement of the service or the structure if required.

The Contractor shall be liable to reinstate the service or structure to its original state or for the full cost thereof if reinstated by others.

C3.4.7 Services and facilities provided by the employer

C3.4.7.1 Water and Power Supply

Water is available for construction at the identified construction site, but access to these point needs to be approved prior to start of works. The cost of supply and transporting of water must be included in the contractor's rates.

The Contractor shall make his own arrangements for the supply of electricity that he may require for the execution of the works and the costs of any connections, additional reticulation and the supply of electricity shall be borne by the Contractor.

C3.4.7.2 Fuel

There is a fuelling station on site at the Addo Elephant National Park available for purchasing fuel.

C3.4.8 Services and Facilities provided by the Contractor

C3.4.8.1 Facilities provided by the Contractor

The Contractor shall provide, maintain and remove his own facilities to the satisfaction of the Engineer. The Contractor shall provide the area around his office, stores and sheds (i.e. the "Camp") with adequate security fences to ensure that unauthorised persons do not enter the camp area and security personnel should he deem it necessary.

The tendered sums as scheduled by the Contractor, whether grouped or individually, shall include all costs for the installation, maintenance and removal of the fencing as specified, in addition to all other facilities specified and as required by the Contractor for his own purposes.

C3.4.8.2 Location of Contractors Camp Site

The location of the Contractor's camp shall be pointed out at the tender briefing meeting.

The Contractor shall note that the site is within a popular public amenity. The Contractor shall comply with all SANParks and Local Authority regulations including those relating to health and fire. The Contractor shall ensure that all camp facilities, including those for fuelling, comply with all such regulations. Should the contract include the end of year builders' holidays, the camp shall be dis-established prior to end of year close-down and re-established at start up the following year. Provision for this is made in the Bill of Quantities.

The Contractor must note that the site camp is within the Addo Main Rest Camp of the Addo Elephant National Park boundaries and certain wild animals will be present in the area, i.e. baboons. This must be taken into account when planning the site camp. The camp site shall be properly and neatly fenced using temporary fencing with secure access control. The Contractor shall be responsible for providing and maintaining his own security arrangements for the duration of the Contract.

On completion of the Works, or when ordered by the Engineer, the Contractor shall remove all temporary buildings and latrines and restore the Site to a clean and sanitary condition to the satisfaction of the Engineer and rehabilitate the area in accordance with the EMP.

Access to the site will be in a controlled manner. People visiting the site will have to sign in and out on a daily basis.

C3.4.8.3 Ablution Facilities

Ablution facilities are not available on site. The Contractor shall therefore make the necessary arrangement to provide these facilities. Chemical serviced toilets shall be the minimum acceptable standard as indicated in the EMP. These must be placed in a position to be approved by the Engineer. The facilities must be to the Engineer's approval and must be maintained in a clean and sanitary condition.

C3.4.8.4 Housing for Contractors Employees

No housing is available nor shall be allowed on site for the Contractor's employees. It is the sole responsibility of the

Contractor, at his own cost, to house his employees and transport them to and from the site.

C3.4.9 Facilities for the Engineer

C3.4.9.1 Office accommodation

No office facilities are required for the Engineer.

C3.4.9.2 Site instruction book and Site diary

The Contractor shall keep a triplicate book for site instructions on the Site at all times and provide a Site diary for daily completion by the Contractor.

C3.4.10 Other facilities and services

C3.4.10.1 Waste Disposal

The Contractor shall make arrangements for solid and liquid waste disposal with SANParks. Disposal will take place at an approved Site.

C3.4.10.2 Telephone Facilities

The Contractor shall be responsible for arranging his own telephone facilities and shall be responsible for all costs relating thereto.

C3.4.11 Notice boards, signs, barricades and advertisements

All notices, signs and barricades may be used only if approved by the Engineer. The Contractor shall be responsible for their supply, erection, maintenance and ultimate removal and shall make provision for this in his tendered rates.

The Engineer shall have the right to instruct the Contractor to move any sign or notice to another position, or to remove it from the Site of the Works if in his opinion it is unsatisfactory, inconvenient or dangerous.

C3.4.12 Dealing with water

The Contractor shall make provision and allow for all dewatering and temporary management of stormwater. All costs for this operation for the duration of the contract shall be deemed to be included in the Fixed and Value related charges.

C3.4.13 Dealing with high winds

The site is situated in a region where high winds and seasonal rain can be expected and with strong south-easterly winds during the summer months.

All heaps of materials either forming part of the excavations or imported for use in construction shall be kept covered during high winds to prevent contamination of surrounding in-situ soils.

C3.4.14 Alterations, additions, extensions and modifications to existing works.

The Contractor shall within 20 days or 10% of the construction period after taking possession of the site (whichever is the lesser), satisfy himself that the dimensional accuracy, alignment, levels and setting out of existing structures or components thereof are compatible with the proposed works and shall notify the Engineer of any areas of dissatisfaction.

C3.4.15 Wayleaves, Permissions and Permits

The Contractor shall be responsible for obtaining all of the necessary wayleaves, permissions or permits applicable to working near any existing services or other infrastructure on Site, and shall ensure that any wayleaves, permissions or permits obtained by the Employer's Agent prior to the award of the contract are transferred into the Contractor's name.

The Contractor shall abide by any conditions imposed by such wayleaves, permissions or permits.

The Contractor shall ensure that all wayleaves, permissions and permits are kept on site and are available for inspection by the relevant service authorities on demand.

The Contractor shall also ensure that any wayleaves in respect of electricity services are renewed timeously every three months.

C3.4.16 Construction in restricted areas

All working space will be deemed restricted. The construction method used in these restricted areas largely depends on the Contractor's Plant. Notwithstanding, measurement and payment will be strictly according to the specified cross-sections and dimensions irrespective of the method used, and the rates and prices tendered will be deemed to include full compensation for any difficulties encountered by the Contractor while working in restricted areas. No extra payment or any claim for payment due to these difficulties will be considered.

C3.4.17 Spoiling areas

Spoiling area will be made available with in the park boundaries. Rates to include all hauling.

C3.5 Management

C3.5.1 Particular specifications

The Particular Specifications listed in Clause 3.6 of the Scope of Works apply to this Contract.

C3.5.2 Construction Programme and Methods

The Contractor must submit a program for each works order and time related items will only be paid in correlation to the approved program.

The programme to be submitted by the Contractor in terms of the General Conditions of Contract shall be in the form of a bar chart with a horizontal time scale and shall clearly show all significant activities, the duration of all activities, the interdependencies (if any) of activities and the critical path of the overall programme, clearly related to the items or groups of items in the Bill of Quantities and indicating the quantity of work that will be completed each month and shall ideally be drawn up using a commercially available computer programme. The programme shall take account of and include -

a) All special non-working days,

b) Allowance for inclement weather as provided for in Clause 5.12.2.2 of Contract Data,

c) Known physical conditions or artificial obstructions,

d) Searching for, dealing with and carrying out alterations to existing services, and

e) The accommodation and safeguarding of public access and traffic.

The Engineer can, in consultation with the Contractor, review and adjust the programme during the course of the contract to ensure that the annual budget is met.

C3.5.3 Sequence of the works

The Contractor shall include the sequence of works in the tender programme submitted with his tender offer. In determining the sequence of the works and in preparation of his Project Programme, the Contractor shall consider the following:

a) Excavations shall remain open for the shortest possible time.

b) Least disruption to vehicular traffic on the park's road network.

c) During the December builders holiday all equipment and materials shall be removed from the work areas. The contractors camp site, unless authorized by the Engineer, during this period, shall be dismantled and removed from site for the period in question. The camp shall be re-established from the third week of January onwards. No open excavations shall be allowed during this period.

d) The sequence of works shall be programmed to ensure that during the December builders the large influx of tourist traffic over this period is not disrupted. The maximum allowable time for a STOP/GO traffic management system will be ten (10) minutes, where it is deemed necessary.

C3.5.4 Methods and procedures

The Contractor shall advise in his tender the methods and procedures that he proposes in performing the works. These methods and procedures shall not be deemed as terms of the Contract. The Contractor is also allowed to change his methods and procedures as he sees fit subject to the change being approved by the Engineer. Methods and procedures will not vary the specification and cannot be used to provide qualifications to the proposed agreement. The intention of the method statement is to provide the Engineer and the Employer with information as to how he proposes to perform the said works.

a) Normal working hours -
Normal working hours shall be between 07h00 until 18h00 (season dependant) on weekdays from Monday to Friday and from 07h00 until 13h00 on Saturdays. Note that the parks access gates are locked after hours and the Contractor shall make provision for transporting his staff off site in good time.

Work on other days or at other times shall only be allowed after agreement of the Employer and written approval has been granted by the Engineer.

b) Interference with the public -
The Contractor shall ensure that none of his staff interfere in any way with the public visiting the park and shall be courteous at all times.

c) The maximum speed for all vehicles in the park is 40km/h, all construction vehicles must adhere to the limit.

Any person ignoring this shall be removed permanently from site, all at the expense of the Contractor.

C3.5.5 Site usage

The Contractor's employees shall not be allowed to stay on site except for the duration of a working day. The only persons to be allowed on site for the duration of a calendar day shall be the site guard(s) or any personnel required to ensure proper traffic accommodation and control.

Access to the site will be in a controlled manner. People visiting the site will have to sign in and out on a daily basis.

C3.5.6 Recording of weather

The Contractor shall be responsible for keeping accurate records of weather conditions in the Daily Site Diary, to use as substantiation of any claim for extension of time in accordance with GCC, Clause 10.1

The Contractor will inform the Engineer when he is unable to proceed with the works in accordance with the approved contract program. Subject to the approval of the Engineer, the rainfall and other relevant notes will be noted in the Daily Site Diary for the applicable day/s. After the event the Contractor shall provide a revised contract program motivating if the delay affects his schedule to the extent that he will need to motivate for an extension of time in accordance with the relevant GCC Clause 10.1.

The Engineer, together with the Employer, shall be responsible for granting the extension of time.

C3.5.7 Management meetings

Monthly Progress Meetings shall be held with the first meeting called the Site Handover meeting. The Contractor will be supplied with an appropriate agenda for the progress meetings and the meetings shall be chaired by the Engineer or his duly appointed representative.

The Contractor shall arrange for the Contractor's Project Manager and the Contractor's Technical Supervisor to attend these meetings when called for by the Engineer.

The Engineer or his duly appointed representative shall be responsible for issuing of the minutes.

C3.5.8 Payment certificates

The monthly payment certificate to be submitted by the Contractor in terms of the General Conditions shall be prepared by the Contractor at his own cost, strictly in accordance with the standard payment certificate prescribed by the Engineer, in digital electronic computer format. The Contractor shall, together with a copy of the digital electronic computer file of the statement, submit two (2) A4 size paper copies of the statement.

For the purposes of the Engineer's payment certificate, the Contractor shall subsequently be responsible, at his own cost, for making such adjustments to his statement as may be required by the Engineer for the purposes of accurately reflecting the actual quantities and amounts which the Engineer deems to be due and payable to the Contractor in the payment certificate.

The Contractor shall, at his own cost, make the said adjustments to the statement and return it to the Engineer within three (3) normal workings days from the date on which the Engineer communicated to the Contractor the adjustments required. The Contractor shall submit to the Engineer two (2) sets of A4 size paper copies of such adjusted statement, together with a copy of the electronic digital computer file thereof.

Any delay by the Contractor in making the said adjustments and submitting to the Engineer the requisite copies of the adjusted statement for the purposes of the Engineer's payment certificate will be added to the times allowed to the

Engineer in terms of the General Conditions to submit the signed payment certificate to the Employer and the Contractor and shall also be added to the period in which the Employer is required to make payment to the Contractor.

Payment for particular items scheduled shall conform to the applicable payment clauses of the Pricing Data, Project Specifications and the Particular Specifications.

Where retention money is applicable to a Contract, the retention money shall be deducted on the invoice from the total amount for work done and then the Value Added Tax (VAT) added to calculate the total amount payable on the invoice.

If penalties are payable, they will be deducted prior to the addition of VAT but after the calculation of retention.

C3.5.9 Finishing and Tidying

As the works proceed the work areas shall be progressively and systematically finished off and tidied. Spoil, rubble and other materials shall not be allowed to accumulate.

The contractor shall recover all excess materials used in the works and remove from the park.

C3.5.10 Occupational Health and Safety Act

In terms of the provisions of Section 37(2) of the Occupational Health and Safety Act, Act No. 85 of 1993 (the Act) the Contractor as an employer in its own right and in its capacity as principal contractor for the execution of the works, shall have certain obligations and the following arrangement shall apply between the Contractor and the Employer to ensure compliance by the Contractor with the provisions of the Act:

a) The Contractor undertakes to acquaint the appropriate officials and employees of the Contractor with all relevant provisions of the Act and the Construction Regulations 2014 promulgated in terms of the Act, and

b) The Contractor undertakes that all relevant duties, obligations and prohibitions imposed by the Act and the Construction Regulations 2014 shall be fully complied with, and

d) 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 or Construction Regulations 2014 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, and

d) The Contractor shall when called upon to do so, enter into and execute an agreement as provided for under Section 37(2) of the Act. The agreement in the relevant form shall be submitted to the Employer together with a letter of good standing from the Compensation Commissioner within fourteen days after receipt of the Letter of Acceptance. The site will not be handed over to the Contractor until the Employer has received the completed Agreement and the letter of good standing.

C3.5.11 Accommodation of Traffic

The Contractor shall maintain close liaison with the SANParks's Addo Elephant National Park management regarding the proposed works on vehicular access on the park's road network.

It is a condition of this contract that no road closures will be allowed, and that traffic is accommodated at all times and all signage for roadworks is provided, in accordance with the Drawings and the requirements of Volume 2 Chapter 13 of the June 1999 edition of the South African Road Signs Manual.

The Contractor shall make the best possible effort to minimise the extent of roadway required for construction and where a STOP/GO system is in place the maximum delay shall be 10 minutes.

During the end of year builder's break, all roads shall be opened to full width and all traffic control signage removed.

C3.5.12 Safety and Security

The Contractor shall be responsible for the safety and security of his personnel, materials on site and the works in general at all times. The Contractor shall therefore acquaint himself with the current situation in the areas (by liaising with the local police if necessary), and shall provide all security measures, including the employment of accredited security services, as he deems necessary to comply with the requirements of this clause.

The Contractor shall ensure that the general public is at all times protected from the works where the normal use by the public of, and access to roadways, and all other public areas is not available due to the construction works. Adequate notices and signage of such temporary closures and alternative routes shall be provided.

C3.5.13 Environmental Care

The Contractor shall refer to the SANParks Environmental Management Plan which forms part of the Contract Specifications.

The Contractor's attention is drawn to the extreme environmentally sensitive nature of the site. It is the specific requirement of this Contract that the Contractor shall at all times adhere strictly to the Environmental Management Plan that forms part of the project specification.

No constructional activities of any kind shall be permitted without the express prior written authority of the Engineer. Such written authority shall only be given after the Contractor has provided full details and work methods of the constructional activity he proposes, and his staffs have completed the awareness programme.

SANParks shall nominate an Environmental Officer for the whole or part of the contract period to monitor the Contractor's compliance with his specified obligations with regard to the Environmental Management Plan.

C3.6 Annexes

CONTENTS

3.6.1 PROJECT SPECIFICATIONS

PART A - Description of the Service & Design Standards

PART B - Standard Specifications

PART C - Particular Project Specifications & Schedules

3.6.2 PARTICULAR SPECIFICATIONS

ANNEXURE A - Health and Safety Specifications for South African National Parks

ANNEXURE B - Environmental Management Plan

ANNEXURE C - Code of Conduct for Working in the South African National Parks

C3.6.1 PROJECT SPECIFICATIONS

PART A: DESCRIPTION OF THE SERVICE & DESIGN STANDARDS

1. DESCRIPTION OF THE SERVICE

1.1 OVERVIEW

This section includes the specific requirements for the solar PV equipment, materials, installation, start-up, commissioning and maintenance for various systems for the SANParks in the Eastern Cape Province, South Africa.

The contractor is responsible for all aspects of the projects including final construction designs and specifications, Small Scale Embedded Generation (SSEG) applications and approval, permits and environmental approvals, procurement, supply, delivery, installation, testing, commissioning, warranty as well as O&M and performance guarantees over a period of three years from completion of each task order.

The *Contractor* is responsible for:

- design, detailed drawings, design sign-offs, as-built sign-offs and certifications;
- completing and submitting the SSEG application and obtaining approval from the supply authority;
- purchasing, transportation and offloading of all equipment and materials;
- construction, erection, installation, assembling;
- testing, commissioning and performance testing;
- preparing operations & maintenance manuals;
- identifying and remedying defects for a defects period of 36 months after Task Order Completion or the end of the service period (completion), as applicable;
- O&M services for 36 months following completion of any installation.

Conceptual System design is based on the use of 550 W poly-crystalline modules. 550 W modules are proposed for locations with more extensive and unobstructed areas. Conceptual designs envision the use of, inter alia, SMA / Goodwe / SolarEdge / Sungrow / Sunsynk (or electricity supply authority approved equivalent) inverters in conjunction with, inter alia, SMA / Goodwe / SolarEdge / Sungrow / Sunsynk (or electricity supply authority approved equivalent) DC power optimizers at sites where shading from adjacent buildings occurs. Conventional string inverters (inter alia, SMA / Goodwe / SolarEdge / Sungrow / Sunsynk, or approved equivalent) are envisioned at Sites where significant shading is not likely. The *Contractor* will be responsible for the performance of the installed system over the stated period.

Operations and Maintenance:

The *Contractor* shall be responsible for the effective day-to-day monitoring, operating and maintaining of the PV system for 36 months after completion of each task order. See schedule for minimum requirements on Preventative and Corrective Maintenance over the period.

The *Contractor* is responsible for all sub-contracts, electrical sub-contractors, in terms of the delivery, performance and storage requirements at the site and is to allow for this in their offer.

1.2 PURPOSE / CLIENT'S OBJECTIVES

SANParks developed a Green Energy Strategy in 2021. The strategy involves mainly three major technological and social adjustment and/or changes, namely:

1. Energy saving on the demand side,
2. Improved efficiency in production with the renewable sector expanding and improving rapidly,
3. Replacement of fossil fuels by various sources of renewable energy.

The implementation of the proposed grid-tied Solar PV system at the Main Camp of the Addo Elephant National Park is a response to the Strategy. Many others will follow will this be successfully implemented.

The solar PV systems will be grid-tied systems and will reduce the purchase of grid electricity from Eskom. The savings from avoided electricity purchases will provide the financial returns necessary to justify additional capital and operating costs of the systems.

1.3 ABBREVIATIONS AND ADDITIONAL DEFINED TERMS

For the purposes of the Works Definition, the following general definitions apply:

The Works – means all Engineering, Procurement and Construction and related activities described in this Works Information to deliver a defect-free and operating Solar Photovoltaic (PV) and/or Battery Energy Storage and/or Electrical Vehicle Charging Station System with a design lifetime of 25 years and installed capacity typically as per identified building.

PV System – means a collection of equipment comprised of solar photovoltaic modules, inverters and associated hardware at a given site. The functional and operating unit consisting of the materials, equipment and activities in the works able to generate and export electricity. Each Installation shall comprise 2 Task Orders: one for installation and another for the maintenance period of 3 years. The Solar PV system remains the full responsibility of the *Contractor* until Completion of both Task Orders.

Completion of any installation occurs in two stages:

Task Order Completion – means the works (installation) have passed completion testing and the Facility is accepted for the purposes of Commercial Operation. The term service defects period and O&M Period for each installation begins.

Engineer – means the *Client*'s technical representative.

1.4 START UP AND MANAGEMENT

1.4.1 Meetings

The contractor will be required to attend and participate in project meetings from time to time which will take place at the offices of the Addo Elephant National Park, recorded by the *Engineer*, and keeping records of any pertinent discussions.

1.4.2 Workshops and training

Upon completion of the systems, the *Contractor* will provide a 1-day training workshop for the *Client* which will cover the system safety, operation, and regular maintenance. Training will be specific to the systems installed and will include a visit to each site. The *Contractor* is required to develop and effect a training programme for Facilities Maintenance staff for the duration of the O&M Period.

1.4.3 Documentation

To the extent possible, *Client* will provide all requested drawings and documentation to the *Contractor* relevant to each of the Sites. This may include electrical, architectural, and / or structural as-built drawings, as well as schedule and project management information

.

1.4.4 Communication

Communication between the *Client* and the *Contractor* shall be to or from the *Client*'s agent only, and in a form that can be readily read, copied and recorded. Communications shall be in the English language. The *Client* shall not take any responsibility for non-receipt of communications from or by the *Contractor*.

The Contractor will hold a biweekly meeting with *Client* to share relevant updates about project safety, schedule, setbacks, and coordinate the same with the *Client*. All information discussed in, or pertaining to this meeting will be forwarded to the *Client* and *Client*'s *Engineer* on a regular basis. The *Engineer* will keep record of the meeting.

1.4.5 Contractor's supervision and key people

The *Contractor* shall ensure that a site representative competent to administer and control the service is continuously in the Working Areas during the execution of the service. The *Contractor* shall inform the *Client* of the name of the site representative, and any instruction given to the site representative by the *Client* is deemed to be given to the *Contractor*.

1.4.6 Accounts and records

The *Contractor* shall submit original valid tax invoices satisfying the requirements of the Service Information one week after receiving a payment certificate from the *Client*. Where the *Contractor* does not submit the tax invoices within the time required, the period within which payment is made and the time allowed are extended by the length of time from the date that the *Contractor* should have submitted the tax invoices to the date that the tax invoices are submitted.

The *Contractor* cooperates with the *Client* in the preparation of the final account by timeously supplying all relevant documents on request, upon the later of the end of the service period and the latest Task Completion Date:

- The *Client* submits the final account to the *Contractor* within 13 (thirteen) weeks;
- The *Contractor* gives written acceptance of the final account within 9 (nine) weeks of receipt thereof. On acceptance the *Client* issues the final payment certificate within 1 (one) week of the date of acceptance to the *Contractor*;
- If the *Contractor* disputes the correctness of the final account and such dispute is not resolved within the 9 (nine) week period (or such an extended period as the *Client* may allow on a request from the *Contractor*), the final payment certificate in terms of that final account is issued by the *Client* within 1 (one) week of the end of such period;
- The amount certified in the final payment certificate separately includes the gross amount of the final account and the amounts previously certified during the execution of the service;
- The *Client* concurrently issues with the final payment certificate, a statement to both the *Client* and *Contractor* showing the total amount of tax certified;
- The *Client* pays to the *Contractor* the amount certified for payment in the final payment certificate within 4 (four) weeks of the date of issue of the final payment certificate, subject to the *Contractor* giving the *Client* a tax invoice for the amount due;
- Where the final payment certificate reflects an amount in favour of the *Client*, the *Contractor* pays the amount certified within 1 (one) week of the date of issue of the final payment certificate, subject to the *Client* giving the *Contractor* a tax invoice for the amount due.

1.5 PROCUREMENT

1.5.1 People and Employment

The *Contractor* shall develop the detailed design in full compliance with local and international standards related to electrical works and specifically PV works (where local codes are insufficient). A list of minimum applicable standards is provided in this tender document. The *Contractor* assumes full liability for the design. The PV facility shall have a design life of 25 years.

The Chief Designer shall be named in the list of Key People and shall demonstrate at least 5 years of PV design related experience.

The *Contractor* shall submit his designs to the *Client*'s *Engineer* for review and comment prior to procurement and construction of the PV System.

1.5.2 Plant and Materials

The *Contractor* is responsible for procurement of all equipment and materials that will be required to construct and operate the Systems. The equipment and materials may include PV modules, module racking equipment and associated hardware, module power optimizers, solar inverters, electrical cabling and conduit, string combiner boxes, meteorological instrumentation and communications equipment, weather protection, and all other ancillary equipment. Equipment shall be procured and delivered to Addo Elephant National Park on insured freight. The *Contractor* is responsible for any applicable import duties that should be paid. The *Contractor* is responsible for approving receipt of equipment, storing equipment prior to Works and for transporting equipment to the Site.

The *Contractor* shall ensure that all materials used on site are transported, handled and stored in accordance with the manufacturer's recommendations. Material or equipment damaged shall be rejected and replaced with undamaged material at the *Contractor*'s expense. Repair of damaged material will not generally be permitted. Rates are to include for preventing damage and protecting equipment and materials through all stages of construction and commissioning.

1.5.3 Spares and vendor data requirements

The *Contractor* shall be responsible for the procurement, transportation, offloading and care and custody of all equipment, materials and consumables as well as procuring of services required to complete the Works.

In addition, the *Contractor* shall procure (and maintain for the duration of the O&M period) spare parts sufficient to maintain a Facility adequately. The *Contractor* shall ensure that spare parts inventory is fully stocked at the end of the O&M period.

1.5.4 Marking of plant and materials

The erection and installation of the plant is to be carried out by skilled artisans, experienced in this type of work and under the personal supervision of the *Contractor*'s site foreman, whose qualifications and experience to supervise this work

must be acceptable to the *Engineer*. The plant, when erected and installed, shall be of neat and workmanlike appearance, solidly and evenly supported, true to line and level, plumb and in proper working order. The drilling and grouting of all structural bolts, channels, etc. will be the responsibility of the *Contractor* under this contract.

Before handing over the Plant, the *Contractor* is to ensure that every component is operating satisfactorily. The Contract will not be deemed to have been completed until the *Engineer* is fully satisfied in this regard.

1.5.5 Subcontracting Arrangements

As per the conditions of contract.

1.5.6 Program of Work

A detailed programme as described in section 5 of the Scope shall be provided by the Contractor.

1.5.7 Off-Loading, Stacking and Liability for Breakages

The *Contractor* will be required, at his own expense, to make all arrangements for off-loading and carefully stacking all plant and materials delivered under this contract on the Site of the Works. The off-loading and stacking shall be carried out strictly in accordance with the requirements of the *Engineer* so as to permit a thorough and careful examination and testing of all items for breakages, fractures, etc.

Plant and materials shall be stored on site at the cost of the *Contractor* who shall be fully responsible for its protection against theft or damage by water, weather, fire and any interference until such time as it is erected and installed, put into satisfactory operation and accepted by the *Client* as complete.

1.5.8 Handling during off-loading, storage and installation

It is the responsibility of the *Contractor* for the appropriate handling during off-loading, storage and installation of all components according to the specification of the manufacturer. Damages due to improper handling shall be covered by the expense of the *Contractor*.

1.5.9 Storage

Facilities for extended storage on site for plant and materials may not always be available and the *Contractor* shall therefore make his own arrangements for any off-site storage, which may be required for plant, and materials, which become available before delivery to the Site and installation thereof can be commenced.
No additional payment will be allowed for off-site storage.

1.5.10 Inspections, Testing and Commissioning

All plant and materials will be carefully examined upon delivery at the site and all items showing defects or damage of any description shall be laid aside as not being in accordance with the requirements of the contract and these shall be removed and replaced by the *Contractor* at his own cost.
On completion of the installation at each Site, the *Contractor* shall test and commission the installation to provide the following information as a minimum:

Visual inspections including, but not limited to the following:

- Broken or cracked module glass;
- Broken or loose module mounting mechanisms;
- Signs of delamination or water infiltration;
- Broken, damaged or discoloured cells;
- Loose electrical connections.

Electrical testing in accordance with the latest edition of SANS 10142 as well as demonstration to the *Engineer* and verification of the following:

- Correct operation of anti-islanding feature;
- Correct operation of fireman's switch drop-out;
- Isolation between DC and AC side of system;
- Verification of module output.

Undertake tests to prove that the individual PV modules are providing the correct output for the correct irradiance conditions at time of commissioning. Allow for verification at alternative times if installation is likely to be commissioned during winter.

1.5.11 Preparing Post Completion Maintenance Contracts

The *Contractor* will provide all necessary operations and maintenance services for a period of three (3) years following commissioning of the Systems as part of this Contract. The *Contractor* will guarantee the performance of the Solar PV Systems during this 3-year Guarantee Period using a PV system Performance Ratio approach. The *Contractor* shall issue payment for liquidated damages if the PV Systems fail to meet Performance Guarantees.

1.5.12 *Contractor*'s Equipment

The *Contractor* is required to furnish all equipment necessary for the successful completion of construction and commissioning of Systems. This includes but is not limited to site mobilization, procurement of tools, implements and equipment needed to transport materials to the Sites and complete construction of Systems.

The *Contractor* is required to furnish and calibrate equipment and systems necessary for the demonstration of system performance at commissioning and assessment of performance ratio for a period of three years following plant start-up.

1.6 EXECUTION OF THE SERVICE

1.6.1 DESIGN - Parts of the works which the *Contractor* is to design

The *Contractor* is responsible for producing final design drawings for construction of the PV Systems. All final design and construction drawings shall be signed/sealed by an Engineering Council of South Africa (ECSA) registered Professional Engineer.

The *Contractor* is responsible for the design of the following elements:

- Detailed System layout drawings showing location, orientation, and tilt of PV modules on each of the Sites and areas and allocation of modules to strings, and locations of inverters and other system electrical equipment and relevant building electrical equipment;
- Detailed System layout drawings of BESS and EV charging station installations including all building work, HVAC installations and fire protection installations;
- Detailed System electrical single line diagrams showing configuration of PV modules, DC optimizers, cable sizes, strings, string combiner boxes, inverters, detailed building electrical tie in, grounding / earthing, and location of bi-directional meters;
- Detailed drawings on electrical equipment mounting;
- Calculations demonstrating system electrical loading is kept within applicable limits at each Site;
- Calculations demonstrating that Systems and supporting structures can withstand peak wind speed pressures at relevant height and locations;
- Calculations demonstrating that structures can support additional loading from Systems.
- Present Financial Model with relevant calculations.

This contract covers the supply, installation, testing, commissioning, System operation and maintenance during the Guarantee Period, and subsequent training of SANParks Staff.

The *Contractor* shall provide all materials, equipment, labour and services necessary for the complete and efficient operation of the installation in accordance with the intent of the specification.

The work shall be carried out strictly in accordance with the Occupational Health and Safety Act (1993) as amended, Local Authority Bye-Laws and Regulations and/or requirements of the Supply Authorities as well as the particular health and safety requirements of The Addo Elephant National Park, SANParks

In addition, all local and national statutory requirements are to be met including applications and submissions to the relevant departments as required for successful completion.

Requirements for the Financial Model

As part of the design of a specific Solar PV system, the *Contractor* shall also present the financial model.

The Bidder is required to provide 4 (four) inputs:

a. The installed capacity of the PV Facility (kWp);
b. The tendered lump sum Price for the works (ZAR);
c. The tendered O&M Price for the first three years (ZAR);

d. The Guaranteed 3-year average Performance Ratio using Global Horizontal Irradiation (GHI) as reference. This PR shall include the *Contractor*'s expectation of unscheduled unavailability and degradation. The model applies a fixed assumed rate of degradation thereafter.

General Requirements at All Sites

- Supply and installation of mounted PV arrays, grid-tied solar inverters, associated electrical distribution boards (if required) and electrical cabling, DC string combiner boxes;
- The *Contractor* shall serve as the liaison with the Addo Elephant National Park Electricity Services Department (or any other local authority electrical department, as determined by the location of the installation and specific requirements of such authority in respect of SSEG) and oversee submission of all necessary documentation in order to obtain approval for the Small-Scale Embedded Generation (SSEG) systems and subsequent paralleling with the grid;
- Supply and installation of all cables and wire ways outlined in the conceptual diagrams necessary to connect PV modules through to inverters and inverters to the building's existing electrical distribution systems;
- The *Contractor* shall ensure that existing electrical supply buses and distribution boards have sufficient AC electrical capacity to accept the PV system's maximum rated output, or make provisions for additional capacity or connections elsewhere;
- Modifications to the existing main electrical distribution boards should be made without service disruption during regular working hours;
- Supply and installation of all meteorological instrumentation and monitoring equipment necessary to assess system performance on continuous basis. Note that meteorological instrumentation may be shared between multiple nearby sites, the *Contractor* shall determine the number of total installations necessary to monitor and meet desired performance guarantees;
- Assist *Client* with system integration into remote metering system where applicable;
- Supervision of specialist sub-contractors;
- Testing and commissioning, including certificates of compliance for the entire installation, including infrared testing of all electrical distribution boards upon commissioning as well as 6 months after Works completion, including report and rectification of any terminations requiring attention.

For each of the sites, indicative PV module layout drawings have been provided, however, the tenderer shall review the drawings and perform a survey of the site during the costing process and shall include for any particular system requirements that are applicable to that particular site. Tenderer's proposed system layout may vary from the conceptual design drawings supplied as long as Tenderer's proposed system capacity is equal to or greater than what is reflected in the conceptual layouts.

Tenderer will be responsible for developing final system designs factoring in the following elements at a minimum:

- The preferred layout for the PV array that allows for the required array capacity in relation to building orientation, shading, etc
- The preferred mounting/fixing design and hardware necessary to secure the PV systems on each building making allowance for the structural capacity of the building and the maximum wind loading expected on each sub-array.
- The optimized position of individual strings with respect to shading and string length in order to keep the output as high as possible where conventional string inverters are to be used
- Anticipated annual yield of each System in kWh AC
- Anticipated maximum power output of the system
- The PV type and array design shall be chosen to maximize output & system efficiency within the restrictions imposed by the particular site.

Mounting and Fixing of PV Modules

The mounting design will be approved by the Client's Engineer to ensure acceptable integration into the overall system, sub-structure, and weather proofing layers. To this extent, shop drawings of the mounting equipment are to be submitted as part of the tender. All support equipment fixed to the structure shall be by made using proprietary fixings agreed with the structural engineer.

Electrical Connection

To enable the energy generated from the Systems to be utilised, the outputs from the PV system shall be fed to grid-tied inverters. Due to possible shading losses, it is preferred that the system utilize conventional string inverters or inter alia, SMA / Goodwe / SolarEdge / Sungrow / Sunsynk (or approved equivalent) inverters coupled with DC power optimizers

(or approved equivalent) as opposed to larger, “central” inverters.
The DC output from each system is to be converted to 3 phase LV (230/400 V) and connected to the Site’s existing electrical distribution system.

Suitably sized interconnecting cabling and associated containment shall be provided from the PV array to the optimizers (if used), from the optimizers to the grid-tied inverters, from the grid-tied inverters to the AC Combiner Panels and from the AC Combiner Panels to the building’s distribution board(s). This work shall be performed in compliance with applicable codes and standards.

The system shall be designed to be grid tied and to back feed power to the electrical grid when System output exceeds cumulative load at the Site. As such, the System will be designed and interconnected in accordance with all requirements specified by the Addo Elephant National Park (or other municipality as determined by the location of the project site) or Eskom that apply to Small Scale Embedded Generators (SSEG). The Contractor is responsible for obtaining necessary approvals from the Eskom.

The system is to be designed and installed in such a way that it is possible to remove any source circuit without disconnecting the grounded or grounding system conductor or any other circuits.
A central disconnect switch as stipulated by NRS 097 is required at the entrance to the building in order to disconnect the array from the building supply. This forms part of the scope of this tender.

Design Standards

The system and its components shall be designed to the appropriate standards, including but not limited to the following codes:

- Electricity Regulation Act (Act 4 of 2006);
- Occupational Health and Safety Act (Act 85 of 1993);
- NERSA licensing requirements of consistent approach for utilities;
- Distribution Grid Code (all parts);
- The South African Power Plant Grid Code (all parts);
- Electricity Supply By-law;
- Approved Photovoltaic (PV) Inverter List
- Embedded Generation Schematic Drawings Guideline
- Requirements for Small-scale Embedded Generation
- Standard for the Interconnection of Embedded Generation
- Eskom DST 34-1765 Distribution standard for the interconnection of embedded generation;
- NRS 097-1 Code of practice for the interconnection of embedded generation to electricity distribution networks Part 1: MV and HV (once published);
- NRS 097-2-1 Grid interconnection of embedded generation Part 2: Small scale embedded generation, Section 1: Utility interface.
- NRS 097-2 Grid interconnection of embedded generation Part 2: Small scale embedded generation, Sections 2 to 4 (once published);
- NRS 048 – Electricity supply – Quality of supply: Part 2: Voltage characteristics, compatibility levels, limits and assessment methods and Part 4: Application guidelines for utilities, Part 7, Application practices for end-customers (once published);
- SANS 10142-1 The wiring of premises;
- IEC 60364: Part 7 - Section 712: Solar photovoltaic (PV) power supply systems
- SANS 474/NRS 057 Code of practice for electricity metering;
- Compulsory Specifications Act (Act 5 of 2008) wrt SANS 60065/IEC 60065 Audio, video and similar electronic apparatus – Safety requirements and SANS 61558 – 1/IEC 61558 – 1: Safety of power transformers, power supplies, reactors and similar products Part 1: General requirements and tests, together with the appropriate Part(s) 2 of the SANS 61558/IEC 61558 series;
- Energy Networks Association (ENA) Engineering Recommendation (ER) G 83/1-1, ER G59/1 and Engineering Technical Report (ETR) 113
- Regulatory Requirements and Normative References in the Addo Elephant National Park Electricity Services application form for the connection of Embedded Generation (GEN/EMB)
- ENA ER G59/1 and ETR 113;
- Eskom DST 34-1765 Distribution standard for the interconnection of embedded generation;
- EG compatible with utility network fault levels;
- Declaration by ECSA registered professional engineer or professional engineering technologist that installation complies with all requirements;

- EG decommissioning confirmation is required once applicable;

All PV modules are to have the necessary EN IEC 61730 Class B rating/approval thereon and state the following information:

- Maximum series fuse per module protection rating;
- Rated open circuit voltage;
- Rated operating current;
- Rated short circuit current;
- Rated maximum power;
- Maximum permissible system voltage.

PV modules should be rated for wind loads up to 2400 Pa (short buildings - < 6m height) and 3600 Pa (tall buildings - > 6m height) to withstand design wind gusts.

PV modules with a minimum of a 25-year linear performance guarantee should be selected, with maximum performance degradation of 0.7% per annum.

PV modules should be supplied with positive power tolerances.

Module conductors are to be approved for use in a PV array system and of Ölflex XLR PV1 TÜV Type approved or equal and approved and all terminal conductors are to be rated for 90°C and rated for outdoor use.

Solar PV inverters must be included on the Addo Elephant National Park Electricity Directorate and Eskom's Approved PV Inverter list demonstrating conformance to NRS 097-2-1.

Inverters must also be equipped with the following capabilities:

- Maximum power point tracking (MPPT);
- Anti-islanding;
- RS485 or Ethernet connection for real time data transmission to BAS;
- IP rating sufficient for outdoor use;
- NRS 097 Central disconnect switch to disconnect input;
- To conform to IEC 6201; EN 50178 standards.

Tenderers are to treat the approved manufacturers/suppliers as "selected" manufacturers / suppliers, i.e. the non-performance of a particular manufacturer or sub-contractor will not exonerate a Contractor from his contractual obligations relating to the contract.

1.6.2 Tests and Acceptance

The *Contractor* conducts tests to evidence achievement of the completion milestones. The *Engineer* may, in terms of contract conduct his own tests and inspections, request additional tests of the *Contractor* or supervise tests conducted by the *Contractor*, without causing unnecessary delay and subject to due notice.

The *Contractor* shall compile checklists of their tests and inspections for the *Engineer*'s approval.

Mechanical Completion Test

The purpose of the Mechanical Completion Test (MCT) is to ensure that all parts of the Facility have been physically completed and installed correctly and according to the As-built documents.

The checks shall be compiled for each section of the Works as defined in the Works Definition focusing on physical installation, connection and compatibility and safety.

Grid Connection Test

The purpose of the Grid Completion Test (GCT) is to ensure safe energisation and synchronisation with the grid.

The *Contractor* shall be responsible for all pre-commissioning and commissioning tests. Unless otherwise stated prior to commencement of the tests, Addo Elephant National Park's SSEG and Eskom's Distribution Standard for Interconnection for Embedded Generation (DST 34-1765) shall be followed.

It shall be confirmed as a minimum that following are acceptable:

- Insulation resistance of all components
- String Voc, ISc, Vmpp and Impp are as expected
- String I-V curves are as expected
- Thermographic imaging detects no hot-spots on modules, combiner boxes and switchboards
- All inverters are functional and export power
- Power factor settings are correct
- Isolation switches are effective
- Protection devices are correctly calibrated, set and operating
- Communications are functional (internally and externally to Monitoring System) Alarms and signals are function correctly
- Meteorological station is functioning
- Monitoring system is functioning and remotely accessible
- Monitoring system UPS is functioning

Provisional Acceptance Test

The purpose of the Provisional Acceptance Test (PAT) is to confirm the correct functioning and operation of the PV Facility. These tests shall commence once Mechanical Completion has been achieved and the Grid Connection Tests are passed. The tests consist of:

- Performance Ratio (PR) Test of the entire Facility to confirm quality of design, construction and correct operation. The *Contractor* shall be required to guarantee a 3 (three) year average performance ratio (as entered in the Financial Model).
- Visual Inspection to confirm quality of materials and construction and confirm the plant is defect free for the purposes of commercial operation
- Functional Test to confirm correct operation not directly related to performance

PAT PR Test – Methodology

The PAT PR shall be calculated considering:

a) The PR shall be measured in accordance with IEC 61724 with the exception that Global Horizontal Irradiation shall serve as the reference as measured by the calibrated secondary-standard pyranometer and not Global Inclined Irradiation.
b) The Facility Meter shall be the reference point for electricity produced in kWh
c) Data shall be measured in 15 minute intervals
d) The Facility has demonstrated 5 consecutive days of operations
e) Only data deemed to be Admissible shall be used in the calculation
f) The PAT PR shall meet or exceed the 3 year average PR

Admissible data

Data is considered to be Admissible when:

a) The Facility is 100% available
b) The average Global Horizontal Irradiation during the 15 minute interval is greater than 400 W/m²
c) It is free of obvious error, irregularities or anomalies (at the *Engineer*'s discretion)

Extension of testing

a) There shall be at least 3 hours of Admissible data per day else that day is excluded entirely and PAT is extended by an additional day
b) If the minimum threshold of Admissible data cannot be achieved solely due to the average Global Horizontal Irradiation being less than 400W/m² then testing may be extended up to a maximum of 5 days. If the maximum extension is reached and the minimum threshold of Admissible Data has not been achieved then the *Engineer* may either:
    - Accept the PAT PR based on the lesser amount of Admissible Data or
    - Choose to reduce the average irradiation threshold to 300W/m² and calculate the PAT PR on the increased number of Admissible data
c) If the minimum threshold of Admissible data cannot be achieved due to Unavailability of the Facility, regardless of the irradiation, then PAT shall be extended indefinitely until 5 consecutive days of Admissible Data are achieved.

Stopping and Restarting of PAT

a) If, for any reasons beyond the *Contractor*'s control, the Facility or part thereof becomes unable to operate then the PAT shall be suspended until proper operation resumes and the *Contractor* may resume with the PAT until the required 5 consecutive days of operation have been achieved.
b) The *Contractor* shall notify the *Engineer* of any such suspensions and resumptions and maintain a log of the causes of such events.
c) If, after the occurrence of such a suspensive event, the *Contractor* can reasonably justify the likely occurrence of repeat events within the next 5 days, the *Contractor* may request permission from the *Engineer* to discontinue the PAT.
d) If the *Engineer* accepts the justification, he grants the *Contractor* permission to discontinue the PAT or else instructs the *Contractor* to continue.
e) If the PAT is discontinued, the *Engineer* and the *Contractor* shall agree on the Date to begin a new PAT.

Task Order Completion Certificate

At the completion of a successful PAT, the *Engineer* issues the *Contractor* with a Task Order Completion Certificate. This signifies the commencement of the defects and O&M period.

1.6.3 Operations and Maintenance after Task Completion

The *Contractor* shall develop an O&M plan to manage his obligations in delivery the guaranteed performance in the O&M Period. A preliminary plan is submitted with the Tender in the appropriate Schedule. The *Contractor*'s minimum Scope of Work shall include the following tasks bearing in mind the obligation to work cooperatively with WCG Staff in effecting the Training Plan.

Monitoring

a) The *Contractor* commits to remotely monitor the Facility for 7 days a week, 365 days a year within hours where Global Horizontal Irradiation exceeds 50 W/m².
b) The *Contractor* maintains a log of all anomalies, faults, failures, safety incidents, maintenance interventions and status of the spares list.
c) The goal of the monitoring is to remotely identify and troubleshoot faults, failures, incidents and anomalies and to coordinate the intervention with WCG Staff (once suitably trained) prior to launching a corrective maintenance intervention.
d) The *Contractor* compiles monthly, quarterly and annual performance reports indicating achieved vs expected and guaranteed performance and trends in performance.

Preventative Maintenance

The following is a minimum prescribed list of activities and frequencies. Should the equipment manufacture require an increased frequency of interventions then those shall supersede those proposed.

Component / Area	Type of activity	Description	Frequency
Site	Rodent control	Extermination of Rodents (as regarded necessary).	Quarterly or as required.
	Cleaning	Cleaning module of dust and debris.	Quarterly or as required.
Module	Visual	Damage to frame, hot spots, browning, delamination etc. back sheet undamaged, junction box damaged, Cables damaged, tightness of modules clamps and screws.	Bi-annually in year 1 thereafter annually.
	Visual	Signs of damage, exposure to sharp edges.	Annually.
Cables	Visual / non-intrusive cleaning	Display is functioning, vents are clean, no signs of damage, mounted firmly, noises, fans are working, excessive heat, cables are connected correctly.	Bi-annually in year 1 thereafter annually.
Inverters	Testing / intrusive cleaning	Thermographic imagery, earthing, check state of fuses, internal cleaning of vents and fans, clean PCBs and heat sinks Measure AC/DC conversion efficiency.	Annually.
	Visual / non-intrusive cleaning	Door seal condition, handle / lock operates correctly, safety signage, signs of overheating or sparks, condition of cables, connections.	Bi-annually.
Combiner boxes	Testing / intrusive cleaning	Thermographic imagery, insulation resistance, earthing, stat of fuses and SPDs, String IV testing, Voc, Isc, Vmpp Impp.	Annually.
	Visual / non-intrusive cleaning	Door seal condition, handle / lock operates, safety signage, signs of overheating or sparks, condition of cables, connections signs of moisture.	Bi-annually.
Switchboards	Testing / intrusive cleaning	State of circuit breakers, SPDS, insulation resistance, thermographic imagery.	Annually.
	Visual / non-intrusive cleaning	Cleaning of instruments, check instruments for damage.	Monthly.
Metrological station	Testing / intrusive cleaning	Recalibration of instruments / replacement with calibrated instruments.	Annually.
	Visual / non-intrusive cleaning	Inspect meter, inspect cables, antennae, clean housings.	Annually.
Monitoring system	Testing / intrusive cleaning	Test comms protocols, test UPS, remove on- site data for permanent backup.	Annually.

Corrective Maintenance

a) Any fault, failure, defect, anomaly or incident arising that cannot be resolved remotely by the *Contractor* shall require a corrective intervention;
b) In such events, the *Contractor* notifies the *Engineer* as soon as he becomes aware of such an issue;
c) The *Contractor* notifies *Engineer* within the current Business Day or at the beginning of the next Business Day if it is weekend or public holiday of:
   - The nature of the fault
   - The measures taken to correct or troubleshoot it remotely
   - The intended plan of action when on site
d) The *Contractor* shall then attempt to rectify the fault within 1 (one) Business Day;
e) If the *Contractor* is unable to remedy the fault within the allowed time, he shall notify the *Engineer* and submit a binding plan to correct the fault for the *Engineer*'s approval;
f) These events shall be considered as Facility Unavailability;
g) If the *Contractor* identifies, with reasonable evidence, that the fault was caused by the action of Others or Force Majeure then they shall be deemed to be excluded from Facility Unavailability;
h) h) If a fault is found to be a Defect claimable under a valid equipment warranty, the *Contractor* shall undertake the warranty claim proceedings on the *Client*'s behalf;
i) Following the resolution of fault or remedying of a defect, the *Contractor* shall compile a report detailing the nature of the problem, the actions taken to correct it, the likelihood of reoccurrence and recommendations on a strategy to prevent reoccurrence.

Reporting

The *Contractor* shall compile quarterly reports of preventative and corrective maintenance activities occurring in that period describing the activities conducted, faults / defects identified and remedied and actions taken to prevent further faults / defects. The time taken, costs incurred, and spares used shall be stated. The report shall describe scheduled maintenance visits to occur in the next period.

1.6.4 Performance Measurement during Operations and Maintenance period

The *Contractor*'s performance shall be measured on a monthly basis against the following criteria:

a) Visual inspection and random measurements on PV installation;
b) Actual measured output performance of the PV system;
c) Performance Ratio (PR): Anticipated vs. actual

Both performance evaluation criteria involve financial implications, meaning a performance measurement and compensation system will be implemented for the installed PV system. Thus, penalties will apply should the PV system not be operated and maintained properly. Visual inspections and measurements will be done on a three month or ad-hoc basis on all Solar PV installations.

Applicable Standards - The following standards shall apply:

- IEC 61724, Photovoltaic system performance monitoring - Guidelines for measurement, data exchange and analysis
- IEC 61683, Photovoltaic systems - Power conditioners - Procedure for measuring efficiency
- ISO 9845-1, Solar energy - Reference solar spectral irradiance at the ground at different receiving conditions, Part 1: Direct normal and hemispherical solar irradiance for air mass 1.5.
- ISO 9846, Solar energy - Calibration of a pyranometer using a pyrheliometer.
- ISO 9847, Solar energy - Calibration of field pyranometers by comparison to a reference pyranometer. / BS 7621:1993 Method for calibrating field pyranometers by comparison to a reference pyranometer
- ISO 9059, Solar energy - Calibration of field pyrheliometers by comparison to a reference pyrheliometer. / BS 7440:1991 method for calibrating field pyrheliometers by comparison to a reference pyrheliometer
- ISO 9060, Solar energy - Specification and classification of instruments for measuring hemispherical solar and direct solar radiation.
- ISO/TR 9901, Solar energy - Field pyranometers - Recommended practice for use.
- IEC 61725, Analytical expression for daily solar profiles

Special Testing of an Installation

The *Engineer* may at any time inspect any part of the entire installation. During Maintenance work, the *Engineer* shall at his discretion order special tests to be carried out on the Solar PV installation at intervals of not less than three months, to verify the satisfactory functional condition of the installation.

The *Engineer* reserves the right to select at random component equipment and trade practices to be tested by independent authorities for compliance with specifications as specified in this Contract document.

Performance-Based Payment

The *Engineer* will inspect each installation on a regular basis. The *Engineer* will use a score-card to measure the quality of preventative and corrective maintenance rendered by the *Contractor* during the preceding period, on all components that form part of the installation, in accordance with the maintenance specifications. The *Engineer* will record his inspection directly onto the score-card. The score-card shall serve to evaluate 10 (ten) performance indicators for each period in the manner set out below.

The *Contractor* shall always have the opportunity to score the maximum points, provided that his preventative and corrective maintenance work comply with the Specifications. The *Client* will therefore be protected against a reduced or unsatisfactory service level and may refuse payment or impose penalties on the basis of a point score below defined performance threshold.

Performance indicators

Performance indicators shall be selected to measure the *Contractor*'s service level of preventative and corrective maintenance.

The *Contractor* and the *Engineer* shall each have the opportunity to select five (5) performance indicators for each period, which shall focus on the measurement of maintenance quality against the relevant specifications for the ensuing period. All ten (10) performance indicators are known to both the *Engineer* and the *Contractor*.

The *Contractor* shall aim to perform satisfactorily on all ten performance indicators. All indicators shall be selected from the scope of his normal preventative and corrective maintenance work and shall be based on the maintenance control plan and operating and maintenance manuals. The work shall either be satisfactory, or unsatisfactory, and the *Contractor* shall score one (1) or zero (0) respectively per indicator. Performance indicators shall be used to focus on certain key aspects of the work and shall in no way limit the *Contractor*'s responsibility to do all the required work.

Satisfactory performance

The *Engineer* shall inspect the site on an arbitrary day to measure the quality of maintenance against the ten selected performance indicators. Should the *Contractor* score the maximum points (10) he shall receive his full maintenance payment for the installation. Should the quality of preventative maintenance, or components requiring persistent corrective maintenance be unsatisfactory according to the score-card, the *Contractor* may fail to achieve full payment due to a reduced service level. Each monthly payment for maintenance shall be subject to evaluation based on the score-card.

Measurement and Payment

The performance of the PV System shall be anticipated and consistent, given proper maintenance and swift repairs are in place. In order to promote transparency and accountability, a measuring and evaluating method will be implemented, measuring the performance and compensating the client for the underperformance of the system. The installed PV systems measured performance ratio against the guaranteed performance ratio will be evaluated on a monthly basis over the 36 months period.

Basis for calculation of the liquidated damages

The *Contractor* has to guarantee a certain PR over the O&M period. Periods of outage / low performance that are beyond the control of the *Contractor* are excluded from the PR calculation.

a) The PR is measured in accordance with IEC 61724 with the exception that Global Horizontal Irradiation (GHI) shall serve as the reference as measured by a calibrated secondary-standard pyranometer, and not Global Inclined Irradiation in module plane. The GHI as the reference is measured by the *Engineer* representing WCG.

The measured PR over period i is:

$$PR_{meas}^{i} = \frac{Y_f^i}{Y_r^i} \quad \text{……(1)}$$

where:

$$Y_f^i = \frac{E_{meas}^i}{P_{STC}} \quad \text{……(2)}$$

where:

Y_f is the specific yield or equivalent nameplate hours of the system measured in kWh/kWp in period i;
E is the energy output of the System measured in kWh AC in period i;
P_{STC} is System rated power measured as the total flash list power of all modules evaluated at standard test conditions (STC) being irradiation of 1 kW/m^2, cell temperature of 25°C, and air mass of 1.5 measured in kW_p.

And:

$$Y_r^i = \frac{H_m^i}{G_{STC}} \quad \text{……(3)}$$

where:

Y_r is the equivalent hours of STC experienced by the site in period i;
H_m is the total Global Horizontal Irradiation measured with a secondary standard pyranometer in kWh/m^2 in period i;
G_{STC} is the reference solar radiation at STC of 1 kW/m^2.

b) The Contractor guarantees the 3-year average performance ratio PRG,

c) If:

$$PR_{meas}^{i} < PR_G \quad \text{……(4)}$$

d) Then Liquidated Damages for low performance are paid by the Contractor to the Client as stated in the Financial Model.

The system's performance is expected to degrade initially within the first months of operation and therefore during the contracted O&M period. This means the *Contractor* has to factor that initial degradation into his guaranteed PR.

The *Contractor* furthermore has to factor in the O&M activities that will influence the performance, e.g. cleaning of the modules.

The *Contractor* decides on:

a) Quality of the design
b) Quality of components
c) Quality of the O&M (planned downtime, cleaning, reacting to unplanned downtime).

All three components will eventually lead to a PR over the contracted O&M period during which the *Contractor* is solely responsible for the performance of the plant. Only such periods of unplanned downtime that are beyond the control of the

Contractor are excluded from the PR calculation.

For every percentage point that the actual average performance ratio (PR) during the contracted O&M period is below the guaranteed PR as provided by the *Contractor* in his financial model, which forms part of his design, liquidated damages have to be paid by the *Contractor* to the client.

The liquidated damages are calculated as the present value of the projected amount of energy the client will lose over the lifetime of the PV asset due to the lower-than-expected performance, times a penalty factor. The entire electricity output of the plant excluding the down time outside the control of the *Contractor* where the PV system becomes unable to operate is used for performance ratio calculation. This should encourage the *Contractor* to conduct the O&M maintenance activities and optimize them such that the impact on performance is minimized.

Data submitted to the *Engineer* shall be free of obvious error, irregularities or anomalies, to the *Engineer*s' discretion. The captured data shall be presented to the *Engineer* on a monthly basis or as when requested. The *Engineer* shall evaluate the PV systems performance on a monthly basis, using the Performance Ratio method indicated above, and certify the amount payable due to the *Client*, if any.

Guaranteed Performance Ratio

The Contractor shall provide a Guaranteed Performance Ratio which shall be equal to or greater than 73.0%.

The proposed Guaranteed Performance Ratio will be used as the basis for assessing the PV Facility during the Provisional Acceptance Test prior to Completion and the Final Acceptance Test after the Defects Period with damages payable according to the losses incurred.

For every percentage point that the actual average performance ratio (PR) during the contracted O&M period is below the guaranteed PR as provided by the contractor in his Financial Model, which forms part of his design, liquidated damages must be paid by the contractor to the client. For the installed capacity of the Solar PV facility (kWp), the graph provided indicates the damages payable (excluding VAT) per month for every percentage, or part thereof, that the facility is underperforming, based on the performance ratio measuring method. The maximum damages payable for a certain month shall not exceed the potential avoided Energy and Demand Charges of the specific installation, taking the electricity rates applicable to the site into consideration.

In order to ensure the proper operation of the PV Facility, the Contractor shall provide equipment to continuously monitor and document the relevant conditions of the Plant at regular intervals by means of remote monitoring, data assessment and, if applicable, processing of malfunction messages.

Availability

The PV Facility (which includes the grid connection equipment) shall have a guaranteed availability of 98% (considering both planned and unplanned events). The Contractor shall make the necessary provision in order to achieve this availability, which will include but not be limited to:

- sufficient resilience and redundancy in the energy facility and grid connection design
- emergency preparedness plans
- sufficient spare parts
- sufficient operating /maintenance staff
- recommended preventative maintenance intervals and procedures

Plant Performance Monitoring

The performance of the PV Facility shall be measured through a Performance Ratio (PR). The PR shall be measured at the provisional acceptance test and final acceptance test of the plant. Both Confirmed Provisional and Confirmed Final Performance Ratios shall not be lower than the Guaranteed Performance Ratio Level provided as part of the design.

The Contractor shall install suitable instruments and make adequate arrangements to monitor the performance and ensure satisfactory compliance of the PV Facility. This shall include all suitable instruments, meters and data loggers etc. The Contractor shall provide a system for automatic monitoring of the plant's performance in accordance with the International Standard IEC 61724, Photovoltaic system performance monitoring - Guidelines for measurement, data exchange and analysis.

- Performance ratio measurements and monitoring for the purpose of meeting the contract requirements shall only be carried out using ISO 9060.
- The SCADA system provided with the installation shall be capable of calculating and storing information on performance ratio based on the pyranometers supplied data.

- The positioning and total number of temperature sensors used for performance ratio measurements and monitoring for the purpose of metering the contract requirements shall be agreed with The Employer's *Engineer* prior to construction. The reference design marks the location of the metering elements and should be used as a reference. A means of averaging the signals from the individual sensors shall be provided.

1.6.5 Training Program

The *Contractor* is required to develop and effect a training programme for WCG's Facilities Maintenance staff for the duration of the O&M Period. WCG's staff will assist with basic operations, maintenance and safety related tasks of the Facility.

The vision of the training is to allow WCG staff:

- to assist the *Contractor* in basic O&M activities and thereby reducing call-out time for minor interventions, fault-finding and troubleshooting;
- to demonstrate the Facility; and
- to operate the plant beyond the *Contractor*'s O&M period.

The Training Programme shall encompass, at least:

- The basic concepts and technology of Solar PV technology
- The purpose and functionality of the equipment installed in the Facility
- Safety procedures for working in and around the Facility
- The basic operating and control procedures of the Facility
- Basic fault-finding and troubleshooting
- Replacement of minor parts (e.g. fuses)
- How to monitor, interpret and report performance.

The knowledge transfer shall be through a phased approach beginning with the staff shadowing the *Contractor* during maintenance visits and eventually the *Contractor* supervising the staff while they conduct the inspections, tests and interventions. These phases shall be adopted on a quarterly basis with a review of the activities and key learnings arising in that quarter.

1.6.6 Certifying Task Completion.

Intermediate Acceptance

The purpose of intermediate acceptance (IAT) testing is to detect early poor performance and performance impacting defects during the defects period. The *Contractor* shall conduct the following at the end of the 1st and 2nd years of operations:

- Annual Performance Ratio (PR) Test as per the FAT methodology of the entire Facility to confirm long-term quality of design, construction and correct operation against guarantees.
- Visual Inspection to confirm wear and tear are within acceptable limits and not attributable to defects.
- Functional Test to confirm correct long-term operation not directly related to performance.

This shall be conducted simultaneously with the major annual O&M preventative maintenance activities to minimise impact on performance.

Final Acceptance Test

The purpose of the Final Acceptance Test (FAT) is to confirm that the Facility has functioned and operated consistently with expectations and guarantees during the Defects period. The tests will consist of the following to confirm the Facility is defect free:

- Performance Ratio (PR) Test of the entire Facility to confirm long-term quality of design, construction and correct operation against guarantees.
- Visual Inspection to confirm wear and tear are within acceptable limits and not attributable to defects.
- Functional Test to confirm correct long-term operation not directly related to performance.

FAT PR Test

The PR shall be measured in accordance with IEC 61724 with the exception that Global Horizontal Irradiation shall serve

as the reference as measured by the calibrated secondary-standard pyranometer and not Global Inclined Irradiation. The Facility Meter shall be the reference point for electricity produced in kWh.

The FAT PR shall be calculated considering:

a) 36 months of data measured at intervals of 15 minutes from the time of the Task Order Completion is achieved.
b) Periods of Facility unavailability shall be treated as periods of low performance in PR calculations.
c) Admissible data that is deemed to be free of obvious error, irregularities or anomalies.
d) Periods of unavailability related to grid instability or Force Majeure shall be excluded from PR calculations.
e) The FAT PR shall be compared to the 3-year average guaranteed PR.
f) Liquidated Damages for low performance are as stated in the Financial Model.

Certificate of Final Completion

At the completion of a successful FAT, the *Engineer* issues the *Contractor* with a Certificate of Final Completion. This signifies the end of the defects period.

1.6.7 Operational maintenance after Task Completion.

The *Contractor* shall provide O&M manuals (1-off hard copies + 1-off electronic) complete with commissioning results, test certification, component technical information and system/component warranties following successful completion of start-up and commissioning.

Provide Certificates of Compliance for each of the PV Systems and all associated electrical works as well as separate certificates for the modifications to each of the MDBs.

PART B: STANDARD SPECIFICATIONS

2. SPECIFICATIONS, STANDARDS AND WORKMANSHIP

The *service* is to be executed subject to these specifications, standards and workmanship requirements. Please note that compliance with all these specifications and standards, including requirements in terms of qualifications, accreditation (where applicable) and work experience of both the tendering entity and its key people will be material in the *Client's* risk assessment for awarding this contract.

Standard Specifications

Where reference is made to the standard specifications in this contract, it means the latest edition of the documents which apply to the specific discipline involved in the works, as referenced under any of the headings below. The standard specifications may, due to their generality and completeness, also cover items not applicable to this particular contract.

Project Specifications

Project specifications include amendments to the standard specifications as well as supplemental specifications applicable to work items not covered by the standard specifications. Project specifications, where applicable, may be found throughout the Works Information of this document, including works drawings. The bill of quantities may also contain references to standard specifications as well as project specifications, for clarification in terms of pricing for certain items, where applicable.

In the event of any discrepancy between the project specifications and a part of the standard specifications found in the Works Information of this document, the project specifications take precedence.

Accreditation, Qualifications and Work Experience

Minimum requirements for work experience, qualifications and accreditation (where applicable) as well as minimum personnel are as stated under the headings below. The tenderer must supply the relevant information in regard to accreditations, qualifications and work experience for both the enterprise and key people who will be working on this contract on the appropriate returnable schedule in the Works Information.

2.1 STANDARD SPECIFICATIONS

2.1.1 GENERAL

This part of the specifications gives the general requirements for electrical installation work related to the Solar PV installation. These requirements are based on the relevant quality specifications and are augmented by the specific requirements for this contract.

2.1.2 STANDARDS

It is a condition of this contract that the standard of workmanship and quality of materials shall comply with the relevant specifications and standards and will be subject to the approval of the *Engineer* and the party finally responsible for the operation and maintenance of the system. All correspondence in this regard shall however be directed to the *Engineer* and the final approval will only be granted by him.

2.1.3 LV PVCSWA INSULATED CABLES

2.1.3.1 General

This section covers the supply delivery and installation of 600/1000V PVCSWA cables for AC installations and 1500V solar cables for DC installations for use during this project.

All low voltage AC and DC cables shall be manufactured according to the specifications listed in the standardised specification.

The voltage gradient of the PVC dielectric shall be for 600/1 000 Volts for AC cables and up to 1500 Volts for DC cables unless otherwise stated.

DC cabling refers to those cables which provide the electrical connection between individual modules of a solar generation facility, the string combiner boxes and as well as from PV sub array and PV array combiner boxes to the inverters. Number of combiner boxes between string and connection to inverter shall be defined by the Contractor to achieve optimum output and allow suitable access for O&M purpose.

The solar cable shall adhere to the following standard specifications:

a) Single core,
b) Class 5 tinned stranded copper wires bunched together according to SANS 1411-1
c) Polyolefin insulated
d) Polyolefin sheathed for a low smoke zero halogen and flame-retardant composition.
e) Resistance to:
    (i) Ultraviolent radiation
    (ii) Ozone
    (iii) Chemicals
    (iv) Oil
    (v) Moisture
f) Maximum conductor temperature rated at 90ºC

Insulation and resistance measurements shall be carried out after every cable installation in order to locate any possible faults and records kept so that faults can be identified in future.

Cables shall be logged in a cable schedule according to module and string number for record keeping of the results of required cable tests for future fault finding.

All low voltage PVC insulated cables shall have stranded copper annealed conductors unless otherwise called for.

The following code shall be used for identifying cables:

2.1.3.2 Identification

Component	Code Letters
PVC di-electric	PVC
PVC sheath or extruded bedding	PVC
PVC tape bedding	PVCT
Steel wire armour	SWA
Earth continuity conductor in armour	ECC/SWA
Double wire armour	DWA
Concentric neutral or earth conductor	N, NE or ECC as relevant
PVC outer sheath	PVC
Where a supplementary earth core is included	G/Y

2.1.3.3 Joints and terminations of PVCSWA cables

The ends of these cables shall be made off in the conventional way with an earth bond between the armour, and the cores jointed through by means of crimping ferrules, colour to colour (no taping required).

Cable specific jointing kits shall be used and these shall consist of a celluloid jointing mould which shall be placed around the joint and the joint completed using resin to the joint manufacturer recommendations.

No joint will be permitted in any run of cable unless specifically specified or specifically approved by the *Engineer*.

Terminating PVC cable shall only be by means of glands and shrouds. Connecting of cable cores to bolted type terminals shall be affected by means of suitably sized lugs which shall either be sweated of crimped onto the relevant conductor ends.

No cable joints shall be permitted without approval from the *Engineer*.

2.1.3.4 Testing of cable terminations

The following tests are required:

a) Before terminations -

Prior to joining or termination the insulation and continuity tests by means of resistance shall be done:
- LV cable : 1 000V

b) After terminations –

The following tests shall be carried out on completed cable sections of laid and jointed cable.

The *Contractor* shall be responsible for all necessary test equipment and instruments and the necessary electricity supply to carry out the test.

c) PVC insulated cables –

A 2 000V Megger shall be used and the insulation between phases and phases to earth shall be measured.

d) Rejected cables –

If breakdown of any cable occurs during testing it shall be replaced and/or the cable end shall be re-done. This shall be to the *Contractor*'s account.

2.1.3.5 Handling

During loading and off-loading the cable drums must be handled carefully to avoid damage to the inner layers of the cable. Drums must not be dropped onto or off the delivery vehicle. If no winch, hoist or other mechanical means is available then drums must be gently rolled down suitable ramp or rails.

When rolling a drum of cable on the ground, it must always be rolled in the direction of the arrow stencilled by the manufacturer on the drum flange.

Periodic rotation of wooden drums is essential to avoid drum timbers from rotting through rising damp.
The above mentioned should be taken into account with the specifications from the manufacturer when handling cables during off-loading storage and installation.

Incorrect handling of drums could result in rejection of the cable by the *Engineer*, without additional time for the contract, or any other compensation being granted.

2.1.3.6 Installation of cables

2.1.3.6.1 Cables used for AC circuits

The following points must be adhered to for the correct installation of cables.

- Robust cable jacks with a spindle strong enough to carry the total load, shall be securely mounted and operated with the spindle level.
- The securing ropes must be cut so as to leave the inner end free to move, during unrolling operations.
- Correct wire mesh pulling stockings must be used for the drawing in of cables.
- The use of adequate, (approximately every 2 metres) well-oiled cable rollers, of the correct size or larger, shall be used.
- All pipe ducts must be cleared of all foreign matter before cables are pulled in.
- Adequate protection and attention at the entrance and exit to pipe ducts is essential.
- Maximum pulling forces specified by the manufacturers must not be exceeded.
- No cables must be laid when temperature is 10°C or lower unless the special conditions is required by the *Engineer*, have been fully met.

The following bending radii are the absolute minimum and under no circumstances must the radii be less than these dimensions for the size of cable specified.

- PVC insulated cable = 10 x D
- Paper insulated lead covered = 12 x D

- XLPE insulated cables = 15 x D
- Where D = overall sheath diameter

The Engineer reserves the right to reject any cables which have been twisted, kinked or damaged in other way, without additional time being granted for completion of the contract.

When laying the cable, a certain “snaking” must be permitted so that contraction during cold weather will not detrimentally affect joints, etc. Due allowance for this has been made in this specification.

2.1.3.6.2 Cables used for DC circuits

In conjunction with the guidelines given, the following shall be taken into account for DC cables:

Cables used for the interconnection of PV modules should be installed were possible to the mounting structure with durable fixings to provide protection against inclement weather, UV radiation and damage due to rodents and other animals.

The positive and negative DC cables shall be installed in separate cable trays to prevent electromagnetic coupling between two DC cables of opposing polarities. Where bundles of DC cables with positive and negative polarities run parallel in close proximity to each other a screening material should be installed between bundles to prevent electromagnetic coupling.

The area inside DC cable loops shall be kept as small as possible to reduce the induction of unwanted voltages and currents.

DC string, array and main cabling must be selected and installed in such a way to prevent the risk of leakage currents.

2.1.3.6.3 Measurement of cables

Quantities as shown on the Schedule of Quantities are approximate and the *Contractor* shall physically measure the route on site before ordering his cable.

All surplus cable at the end of the contract must be removed by the *Contractor* and the quantities for payment will be adjusted accordingly.

Cables shall be measured by the clerk of works by means of a measuring wheel once the trenches have been closed.

In addition to the cable lengths measured in the trenches and in cable trays, THE FOLLOWING SLACK WILL BE ALLOWED:

(i)	Slack in cable trays	+ 5%
(ii)	at 400V Distribution boards	+ 3m
(iii)	at 1 000V Distribution boards	+ 6m

2.1.3.6.4 Thermal resistivity

Cable current carrying capacity is affected by the thermal resistivity of the substances encountered.

The following table of values shall be used:

Thermal Res.	°Cm/W
• Waterlogged ground	0,50
• Concrete	0,90
• Gravel	1,00
• Sandy soil	1,20
• Clay	1,60
• Chalky soil	1,80

Impurities such as slag, ash and intense vegetation in the cable trench cause an increase of “g” and must be avoided, particularly close to the cable.

2.1.3.6.5 Positions of cables

Cables for the interconnection of solar modules shall be neatly installed along the mounting structure of the PV array

and fixed with UV resistant cable ties. String cables shall be installed in UV resistant trunking to a point where it enters the space.

If drilling or penetration of the surface is required, the entry point should be sealed to prevent water leaks and corrosion at the point of entry. String cables from the PV array should be installed in a cable tray inside the space up until the point where cables must be fixed against the walls for entry into the string boxes.

PVC cable conduit of appropriate size shall be used for the installation of cables against walls within buildings.

PVC bends shall be installed and fixed on the cable trays and string boxes for cables running into string boxes.

2.1.3.6.6 Testing on completion

Tests on completion shall be carried out on site in the presence of the *Engineer*, and the test results properly recorded and submitted.

On each completed section of laid and jointed cable, the insulated resistance shall be tested on approval, with an approved “Megger” type instrument of not less than 1 000 Volts for LV Low voltage.

All LV switchboards shall be “Megger” tested to approval after erection and installation on site, using the applicable test voltages.

2.1.3.6.7 Installed route plan and cable schedules

The *Contractor* is responsible to submit a final cable route plan (as installed) to the satisfaction of the *Engineer*. Due to allowance shall be made in the tender price for this work.

Failure to comply with this requirement will result in the delay of the issuing of the acceptance certificate. No completion certificate will be issued if these requirements are not met.

The following shall be indicated on this route plan in a satisfactory manner for all installed cables:

a) The route length for each cable as well as distances between joints.
b) Cable route with references to fixed points.
c) Cable joints with references to fixed points.
d) The cable drum number for each length.
e) Positions of cable route markers with reference to fixed points. The route markers shall be numbered and a separate drawing showing the face plates of all route markers (numbered), with North reference shall be submitted.

A site plan shall be provided to the *Contractor* for this work, who shall submit a transparent plastic film and three (3) paper prints of the route plan.

Cable schedules shall be submitted on A1 sized sheets containing information as required by the *Engineer*. All documentation and schedules to be provided in PDF format as well to the *Engineer*.

Any uncertainty in this respect shall be cleared before submission of the tender.

2.1.4 SOLAR PHOTOVOLTAIC MODULES

2.1.4.1 General

The *Contractor* is allowed to make use of the following photovoltaic module technologies:

- Monocrystalline silicon (pricing purposes only)
- Polycrystalline silicon (preferred)
- Thin film (pricing purposes only)

Crystalline silicon modules are required to be IEC 61215 certified, thin film modules are required to be IEC 61646 certified. Detailed specification sheets and certificates of compliance to these standards are to be provided. The *Contractor* may use locally assembled modules on condition that proof of these certifications specific to the local assembly facility can be provided.

In addition, the modules shall feature the following qualities:

- Normal Operating Cell Temperature (NOCT) is at maximum 46°C with a tolerance of ±2°C.
- The panel operating temperature range is to be at least -10 to 85°C.
- The temperature coefficients for power is to be at least -0.45%/°C (i.e. >= -0.45%/°C)
- All modules are required to have a positive output tolerance.
- Modules shall have anti-reflective coating.

PV modules shall comply with Standard Specifications as stipulated Standardised Specifications. Proof of PID resistance and PV + testing should be attached to the Technical Schedules.

Modules to be used should be reliable modules with a proven track record in performance, operation and reliability.

The *Contractor* shall ensure that PV modules are sourced from a Tier 1 manufacturer. Prove must be attached to the particular technical schedule.

The test results of the Photon International Laboratory for the specific PV Module offered must also be attached to this page.

2.1.4.2 Flash Tests

A comprehensive IV flash test report for each PV module procured shall be provided to the *Engineer* in Excel format prior to commencement of construction (this is not required for tender). The data must have the following information:

- Product name and number (external and internal)
- The test condition the measurement is carried out
- Serial number of the tested panel, including which panels are in which shipping containers and pallets
- Power at maximum power point (Pmpp)
- Voltage at MPP (Vmpp)
- Current at MPP (Impp)
- Fill factor
- Open circuit voltage (Voc)
- Short circuit current (Isc)
- Panel surface temperature (measured by temperature sensor, corrected and uncorrected if possible)

This information shall be provided by latest two (2) weeks prior to the arrival of PV modules on the Site.

2.1.4.3 Installation

The *Contractor* is responsible for the installation of modules according to the manufacturer's specifications. The PV module installation manual must be provided as part of the as-built documentation.

The manual shall contain all the necessary requirements and specifications for proper module installations such as (but not limited to):

- Types of mounting structures including physical requirements for securing mechanisms (screws, clamps, dimensions, tightening force, locations) and useful information such as recommended mounting types, recommended spacing to guarantee sufficient air circulation, restrictions to certain environments etc.
- Mechanical and electrical configuration guidelines (landscape, portrait, string and array sizing, grounding etc.).
- Earthing requirements.

2.1.4.4 Construction and Technical requirements

All modules supplied shall:

a) Be of the same type, model and from a single manufacturer.
b) Be chosen with the intention of maximizing the energy output per kW at low irradiation levels and temperature performance shall be considered in the selection.
c) Bear information on supplier, unique product reference number, CE type approval and main module parameters as stipulated.
d) Conform to either IEC 61215 Ed.2 for Crystalline cells or IEC 61646 for Thin-film cells as well as IEC 61730 for

both types.

e) Be able to withstand hail according to regulations for PV panels set out in IEC 61215
f) Have a positive initial power tolerance (i.e. +3%).
g) Be manufactured to ensure Anti-PID related degradation. Proof should be attached in the technical submission for acceptance.
h) Be fitted with an earth connection to be connected to the earthing system.
i) Be fitted with:
    (i) a box with a protection class of IP65, fitted with three bypass diodes,
    (ii) 1000mm solar cable leads rated at 1000Vdc for the interconnection of the PV modules,
    (iii) appropriate male and female connectors (MC4/ KSK4), for the interconnection of PV modules,
    (iv) a back cover made of composite material which is waterproof and dustproof,
    (v) a clear anodised aluminium frame with fixture facilities,
    (vi) an Earthing terminal for connection to earthing/ grounding systems and
    (vii) 4mm tempered glass according to EN12150 with high light transmission and low iron.

The Contractor shall:

a) Supply and install the PV Modules to achieve the specified levels of performance for the required design life of 25 years under the prevailing site environmental conditions according to the site conditions. PV Modules shall have minimum product warranties of 12 years and minimum linear power output warranties of 90% of the nameplate power after 10 years and 80% after 25 years.
b) Be responsible to decide the module arrangements to minimize the losses due to mismatching.
c) Where the manufacturer's module flasher data show an Impp deviation of more than 3%, PV modules shall be sorted into three groups to meet a set tolerance. Only modules from the same set shall be used in in the same string.
d) Ensure that PV modules conform to all relevant international standards with regards to design, testing and approvals.
e) Allow for, on a project-by-project basis and as required by the EIA and EMP, the use of anti-reflective coatings in order to mitigate against glint and glare of the protective cover of the solar cells.

The transportation, storage, handling and installation of the modules shall be in accordance with the specifications from the manufacturer, as to not to void the module manufacturer's warranty.

All modules must be constructed to withstand temporary mechanical forces due to inclement weather, hoisting or lifting during installation and vibrations caused by the structure it is installed on.

The module rated peak power shall be used to determine the peak power of the PV Plant. The peak power shall be the sum of the manufacturer's name plate data sheets for each individual module.

2.1.4.5 Guarantees and Warranties

Modules shall carry a defect warranty of at least 12 years and a linear 25-year performance guarantee of 80%.

The warranties offered by the module manufacturer shall be transferrable to the Client. Other terms and conditions for warranties transferability must be clearly defined.

The sales agreement with the module manufacturer shall clearly define the claiming procedure of defective modules, the required additional specific independent party involvement and any other conditions that might influence the honouring of the warranty and guarantee.

2.1.5 PV STRING BOXES

2.1.5.1 General

The PV string boxes used throughout this contract shall comply with the Standards listed in Standardised specifications, including standards applicable to required components to be fitted in the PV string boxes.

PV string boxes are used to combine a number of PV module arrays to achieve the specified output power requirements of the PV generator. PV modules can be combined to form a sub-string arrangement for sub-string boxes and string arrangements which are fed into inverters.

PV Modules are connected in series to obtain the required input voltage (V) for the DC side of the inverter. In order to obtain the required input current (A) the sub-strings (connected in series) are connected in parallel. The sub-strings are collected in the string box and are fed into the inverter. All PV modules shall be negatively grounded in the string/ sub string boxes.

A single line diagram of the electrical circuit of the PV generator must be attached on the inside of the string box.

2.1.5.2 String box components

Both sub-string and string boxes shall be fitted with:

a) Non-metallic cable glands for input and output cables. Required cable sizes shall be specified in the Project specifications,
b) DC fuse holders and fuses rated for each string/ sub-string input to SANS 60269-6,
c) DC on-load fused switch disconnector for each string/ sub-string input,
d) DC on-load fused switch disconnector for sub-string/ string outputs,
e) Surge protection devices according to SANS 61643-21,
f) DIN rails for the installation of fuse holders, on-load DC disconnectors for string inputs and outputs,
g) Terminals for:
    (i) Input string/ sub-string
    (ii) Output string/ sub-string
    (iii) Grounding / Earthing
    (iv) Two copper bus bars for the connection of positive and negative input strings/ sub-strings,
    (v) Earth bar for the connection of surge protection devices and earthing systems.

All components and surge and protection devices shall be rated at a 1000VDC. The calculated ampere ratings shall be specified in the Project Specifications. If an isolator is not provided on the output side of the string/sub-string box a separated DC on-load isolator should be provided next to the inverter. The on-load isolator should be easily accessible for switching during emergency situations.

2.1.5.3 String box construction

The enclosure of the string/ substring box shall have protection index of IP24 according to IEC 60529 as well as a class II degree of insulation against electrical shock according to IEC 61439-1. No metal cable entries shall be used.

Material used for construction shall be:

a) Self-extinguishing,
b) Flame retardant,
c) UV resistant according to IEC 61439-1,
d) Silicone and Halogen free,
e) Resistant to severe heat and dust.
f) Resistant to extreme cold and frosting.

String / sub-string boxes must be vermin-, dust- and waterproof. Installed components should easily be removable for maintenance and replacement of damaged parts. All metal parts shall consist of anti-corrosive materials.

Input and output cables shall be fastened onto the termination terminals according to the torques specified by the manufacturer.

The installation location must be easily accessible and offer a secure base for working on the device. String/ sub-string boxes shall be suitable for indoor and outdoor use, installed with the necessary warning signs and lockable with a pad lock for authorized personnel.

2.1.6 DC~AC POWER INVERTERS

2.1.6.1 General – Technical Requirements

The *Contractor* may make use of Central or String inverters.
The Inverters shall comply with safety requirements according to IEC 62109 and feature anti- islanding according to IEC 62116.

The selection of inverters shall be based on the PV installation design and functional requirements, including the integration requirements into the PV system and the compatibility to the selected PV modules for the installations.

The inverter supplier must approve the stringing chosen for the project. Inverters must be designed for PV application and include:

- A display showing the faults and the performances
- An advanced system to allow power control and efficiency (maximum efficiency) must be at least 97% (excluding transformer)
- Remote monitoring and control capabilities
- Isolation fault detection
- Anti-islanding
- Ability to start and stop function automatically
- Variable power factor setting
- The ratio of the input DC power to output AC power must be between 80% and 120% at STC
- The MPP voltages of the strings are to be verified to lie in the MPP voltage range of the inverter for temperatures between 0°C and 70°C. The maximum inverter input voltage is not to be exceeded at temperatures of -10°C.
- An IP protection class of at least IP54 is required for outdoor mounting and an IP grade of at least IP21 is required for indoor mounting of the inverters
- If inverters are installed outdoors, they must be protected from direct sunlight
- The inverter requires an external DC switch

In cases where applicable, there may special grounding requirements for inverters. These are stipulated by the PV module manufacturer. In such cases, it is the Contractor's responsibility to notify the Engineer and implement these requirements.

Inverters shall be string inverters and comply to NRS 097-2-1 as well as with Standard Specifications as stipulated in Part C3.1.2-Standardised Specifications.

All inverters shall be of the same manufacturer and type to ensure interconnectivity and ease of maintenance.
The Contractor shall provide inverter arrangement for the PV Plant that is selected to give overall optimal energy yield from the PV Plant over the life of the Project, taking into account the site conditions and the proposed module layouts, shading and orientations.

Datasheets and applicable drawings shall be submitted by the contractor to the Engineer prior to placing orders for purchase.

2.1.6.2 Technical specifications

Apart from the detailed technical specifications required in the technical schedules, inverters shall meet the following general requirements:

a) Inverters shall be equipped with communication capabilities as required by the Control and monitoring system (CMS); all inverters shall be able to be controlled / supervised by the same software or CMS system.
b) All inverters shall be rated up to and including 1000VDC and have an AC-side voltage of 400V.
c) Inverter specifications shall be selected with respect to the local climatic and environmental conditions. The inverters shall be suitable for installation and operation in conditions as required in Part-C4-Site Conditions.
d) Inverters to be used shall be reliable inverters with a proven track record in performance, operation and reliability.
e) Inverters have to comply with applicable norms and standards including but not limited to NRS-097-2-1:2010. All necessary data sheets and test certificates should be attached to the submission.
f) Inverters shall comply with South Africa Grid Code requirements for renewables.
g) Inverters shall have a protection class of IP65.
h) Inverters shall include grid monitoring and detect loss-of-mains from the Municipal/ Eskom grid to provide islanding protection.
i) Inverters shall have the following functions:
    (i) Over- and under voltages,
    (ii) Over- and under frequency,
    (iii) String failure detection,

(iv) Voltage vector shift and,
(v) Rate of change of frequency (ROCOF),
(vi) DC-side disconnection device and Class II Surge protection,
(vii) DC-side fuses for sting inputs according to project specifications
(viii) Earth fault monitoring,
(ix) DC reverse polarity protection,
(x) AC short-circuit protection and
(xi) Power factor regulation.

The protection relays used shall comply with the relevant sections of the international standard for protection relays IEC60255.

The quality of equipment supplied shall be generally controlled to meet the guidelines for engineering design included in the Standardised Specifications.

All transportation, storage, handling and installation of the inverters shall be in accordance with the specifications from the manufacturer, as to not to void the inverter manufacturer's warranty.

The *Contractor* will be required to confirm the inverter manufacturer's warranties for the given environment and installation type. The *Contractor* shall also mention if the inverter warranties can be extended.

2.1.6.3 Guarantees and Warranties

Inverters shall have a warranty of at least 10 years. The contract sales agreement with the inverter manufacturer shall clearly define the claiming procedure of defect inverters or parts. The required testing, independent verification requirements and any other conditions that might influence the honouring of the warranties.

Any extension and the full scope of that extension to the standard limited warranty that is included in the price should be indicated clearly.

Upon request by the *Engineer*, the *Contractor* must provide proof that the inverter manufacturers have sufficient financial backup that covers manufacturers in bankruptcy or insolvency procedures.

The conditions which void the warranties shall be clearly stated.

The warranties offered by the Inverter manufacturers shall be transferrable to the *Client*. Other terms and conditions for warranties transferability must be clearly defined.

2.1.7 PV MODULE MOUNTING STRUCTURE

2.1.7.1 General

A PV module mounting structure is generally a lightweight steel lattice structure used to install the PV modules and as a standalone structure on the natural ground level.

The structure should be capable of supporting the solar modules securely for the intended generation life of the installation. The installation shall comply with the standard specification as well as planning requirements in relation to maximum height.

The *Contractor* shall select an appropriate structure based upon investigations, structural analysis or soil density tests for mounting the modules on the ground.

The Contractor shall submit detailed designs with calculations to the *Engineer* for approval or amendments prior to purchasing of parts and installation.

2.1.7.2 Construction and technical specifications

The mounting system shall be designed and selected with specific attention to:

a) The selection of high-quality materials conforming with relevant SANS/ISO standards;
b) The stability of the mounting system over the required life of the project;

c) The need to decommission and remove the system at the end of the project life and reinstate the site according to the requirements under the planning approval;
d) Suitability of the design for the snow and wind loading regimes;
e) The response of the system to potential ground movement (land slip), wind vibrations and subsidence over long periods of time;
f) Avoidance of systems that have a tendency to work their way loose over time;
g) The corrosive impact of a combination of materials (e.g. unintended bimetallic corrosion).
h) Maintainability and overall system lifecycle cost;
i) Warranties offered on the materials and components provided;
j) The static design of the system and the bending and buckling characteristics of the material;
k) The thermal properties of the material and the impact of this on stresses within the structure;
l) All movements and dimensional changes that may occur due to thermal changes, deflections, settlement and creep;
m) Constructional inaccuracies of the supporting structure;
n) Accidental loads.
o) Adjustments by small increments in and out, up and down and side to side in the position of the supports to accommodate the full variations in the underlying construction;
p) Shimming required accommodating local variations in construction tolerances only;
q) The design of all fixings supporting and/or restraining the PV Modules.

The Contractor shall ensure that:

a) A single type of mounting system is provided for the PV modules;
b) The mounting system is compatible and intended for use with the proposed PV Modules proposed for the project and that it can support the weight of the PV Modules and transmit this weight safely back to the mounting structure without overloading or permanently displacing any of its components.
c) The mounting system does not represent a safety hazard in terms of exposed fasteners, sharp edges etc.
d) The mounting system is compatible with the site environmental conditions.

2.1.7.3 Corrosion

Environmental and site conditions must be considered in order to ensure corrosion resistance during the service delivery life of the installation.

Fixing parts; bolts, nuts, screws and brackets shall be of sufficient strength and anti-corrosive. Where bimetallic parts are used a separation barrier shall be installed to prevent bimetallic corrosion.

Cutting and/or drilling of PV modules, brackets, cables that might compromise the integrity of corrosion protection shall be avoided. If penetrations are compulsory the exposed or altered parts shall be treated with anti-corrosive substance to the satisfaction of the *Engineer*.

2.1.7.4 Mechanical considerations

Due to the nature and construction of the PV module installation the finished mounted modules are subjected to mechanical forces due to wind, snow and static loads. The mounting structure shall be designed to accommodate the abovementioned loads and movements due to fluctuation in temperatures during the generating life of the installation.

All brackets, anchors and supports shall be designed, fabricated and installed in full compliance with the requirements of the PV modules and mounting systems without distress to any component or assembly or panel joint integrity.

The general requirement for torquing of bolts shall be highlighted on the *Contractor*'s calculation, designs and drawings. Tightening torque values shall be clearly stated.

2.1.7.5 Types of mounting structures

For use of Aluminium: BS EN 1999: Design of aluminium structures shall be applied.
For use of Steel: BS EN 1993: Design of steel structures shall be applied.

The connections for the fixings onto the mounting structures shall be designed to the relevant codes and methods in

the SCI/ BCSA green books.

2.1.8 LOW VOLTAGE AC DISTRIBUTION BOARDS

2.1.8.1 Scope

This specification covers the minimum requirements for the manufacture, supply and delivery of low-voltage 3CR12 steel AC distribution boards (DB's), suitable for ground/ wall mounting and safe for use in areas accessible to the public.

The design of the DB shall comply with clause 5.1.1 of SANS 10142-1, which states that:

It shall not be possible to touch any live part within arm's reach with the standard finger test;

a) During normal operation, or
b) When a cover is removed, unless the cover is removed with the use of a tool or a key.

The DB shall be vermin proof, with a minimum IP rating of IP65, seam welded and with no sharp edges. The *Contractor* shall ensure all anti-corrosive measures are taken during manufacturing. All doors shall have a stainless-steel earth stud.

Trunking and cable trays used in the DB must be permanently secured using nuts and bolts.

A single line diagram of the electrical circuit of the PV generator must be attached on the inside of the string box for use during maintenance or outages.

2.1.8.2 System and environmental requirements

System parameters:

Secondary nominal voltage	400/230
Rupturing Capacity	6 kA
Rated Short Time Current (3 s)	10 kA
Frequency	50 Hz
Phases	3/1
Earthing	Neutral/earth

The kiosk shall be manufactured to be in use continuously under all weather and climatic conditions throughout the year, which conditions shall be as follows:

Atmospheric Temperature	-5°C minimum +45°C maximum
Altitude	100m minimum to 1 200m maximum
Lightning	Severe
Dust/sand	Severe
Average Power Factor	0,8
Maximum Humidity	95%

2.1.8.3 Cables

Provision shall be made for the connection of the cables and corresponding cable glands, with separate earth continuity conductors. Cable sizes shall be specified in the Project Specifications.

2.1.8.4 Switching compartment

The construction of the DB shall consist of an outside door with a transparent Perspex cover with cut outs exposing the toggle switches of the MCB's, the MCB locking brackets and other protection devices. All protection devices must be easily operated with the transparent cover installed. The transparent cover shall be fixed with removal bolts. Circuit descriptions and MCB designations should clearly be indicated with engraved plated fixed on the transparent cover.

The AC distribution box shall be sufficiently sized to house the required relays and circuit breakers for the Islanding protection.

2.1.8.5 DB construction

a) General:

(i) DB shall be manufactured from 1.6mm thick 3CR12.
(ii) The DB shall include a door for access to the circuit breaker compartment of the DB. The door's surround shall incorporate a splash proof channel.
(iii) A rain sill that protrudes past the door shall be installed above the door, to prevent rain falling on to the top surface of the door when it is closed. This sill shall be sturdy enough to be used as a handle to lift the DB.
(iv) The DB shall be constructed from pickled, passivated 3CR12.
(v) All cutting, forming, forging, machining, welding, fastening, annealing, stress relieving, post weld cleaning shall comply with the internal standards of the manufacturer of 3CR12 steel.
(vi) Adequate vermin proof ventilation holes shall be provided in the DB.
(vii) The circuit breakers must be installed vertically and be accessible from the front of the DB.

b) Door:

(i) The door shall be provided with a minimum of two non-ferrous handles of the wedge action type, capable of being padlocked in the fully closed position.
(ii) Two non-ferrous hinges shall be used and shall only be accessible from inside the DB. The door shall be hinged from the left-hand side.
(iii) The door shall be mounted flush with the front surface of the Distribution Box
(iv) The door shall be fitted with a night latch.
(v) The locking mechanism shall make use of the 3-point locking principle (B & N type 24132E). The rods used for the 3-point locking system shall be a minimum of 8 mm round bars. All the components of the locking mechanism shall be of pickled and passivated 3CR12 or stainless steel.
(vi) The door shall be braced using the remnants of the 2 mm 3CR12 sheet in order to improve its rigidity.
(vii) A sturdy door stay shall be provided on the front door to ensure that the door can be kept in a 90º open position. This door stay shall be manufactured from a non-ferrous metal.
(viii) The door stay must be of hook and eye type and not window stay type.
(ix) The hook must be made from a stainless-steel rod that has a minimum diameter of at least 6mm. The eye and/or additional steelwork welded to the AC Board to accommodate the door stay
(x) The door stay shall be constructed from 3mm 3CR12 Stainless steel.
(xi) The door stay must be robust to withstand wind pressure. The door shall be provided with gaskets of neoprene or approved material. Rubber or felt gaskets are not acceptable.

2.1.8.6 DB electrical equipment

a) New circuit breakers shall match existing brand installed at the facility.
b) The DB shall be supplied with bus bars for phases, earth and neutral with insulators fitted.
c) The phase and neutral busbars shall be constructed from 10mm thick copper to carry at least 200A and fastened by means of suitable insulators.
d) The neutral busbar shall be connected to earth busbar with a 70 mm^2 bridge piece. The neutral busbar shall be insulated from earth in the same manner as the phase bus bars.
e) The bus bars shall come fitted with a stainless-steel set screw, complete with 20 tinned steel washers, a stainless-steel spring washer and cadmium plated steel nut, in each pre-drilled hole.
f) From top to bottom, the phase order of the bus bars shall be red, yellow, blue and black.
g) All wiring connections shall be made by phase coloured PVC insulated copper conductors, lugged and connected to the correct bus bars. The ends of the conductors that are intended for connection to equipment and shall not be stripped and shall be protected with heat shrink end caps that can only be removed by cutting them off.

An on-load isolator rated at 420V should be installed next to the AC Distribution box to isolate the inverter with the DC side isolator for maintenance purposes. The on-load isolator should be locked during loss of mains for islanding protection.

2.1.8.7 Circuit breaker mounting

a) The DB shall be designed to house din rail-mounted circuit-breakers.
b) DIN-Rails shall be manufactured from stainless steel or aluminium.
c) The breaker compartment shall be lockable with a separate lock as to prevent unauthorized access to the breakers.

All MCB's in the DB shall be fitted with a lockable bracket. The bracket must be designed such that the MCB can only be locked in the off position. The bracket used in the outdoor board shall be made of 3CR12 stainless steel.

All MCCB's used in the AC Board must have a padlocking facility. The padlocking facility must be incorporated in the rotary handle of the MCCB's.

2.1.8.8 Samples

If requested to do so, a sample of each ACDB shall be provided for assessment purposes. The samples must please be collected after the tender has been awarded.

2.1.8.9 Marking and labelling

a) Notices shall be provided as required by the Occupational Health and Safety Act. All notices shall be secured to the DB using rivets.
b) The following information shall appear in legible and indelible marking as follows:

   The manufacturer's name or trademark;

   - A danger sign of minimum size 100 mm x 60 mm that forms an integral part of the housing and/or all doors. The sign shall be as specified in table1, WW7 of SANS 1186-1; and;
   - Appropriate SANS mark(s) of approved performance.

c) A label showing the name of the manufacturer, and the date of manufacture shall be placed on the inside of the ACDB door.
d) Each circuit breaker must have a removable blank trifoliate to be engraved with a circuit name/ number.
e) All electrical and control cables shall be labelled.

2.1.8.10 Drawings

The tenderer must submit for approval a complete drawing of every ACDB offered. Manufacturer's brochures shall be submitted.

2.1.8.11 Earthing and metal fixtures

All metal parts shall be connected individually and direct to the earth bar via a green 4mm² PVC copper conductors. All terminal rails should be fitted with an earthing terminal. All electrical components that have a provision for earth must be earthed. Looping of the earth wire between metal parts will not be acceptable.

All nuts, bolts and washers used for the construction of outdoor distribution board must be stainless steel. The 40x3mm copper earthing bar shall be connected to the copper pad with brass bolts, nuts and washers.

Each metal part shall have its own earth connected to the earth bar or earth stud. A 40 x 40 x 3mm copper pad shall be brazed to the outside of the box. All gland plates shall be earthed to the predrilled earthing bar by means of a braided tinned copper earthing strap with an effective copper cross-sectional area of 12 mm². The contact resistance between the main earth bar/stud and any earth stud located on doors, gland plates etc., must not exceed 0.1 ohms. All earth connections shall be as short as possible and shall not be coiled.

2.1.9 EARTHING SYSTEMS

2.1.9.1 Scope

This section covers the earthing of electrical installations and PV generators in buildings or other structures. The total earthing system of any electrical installation and PV generator shall be in complete accordance with SANS 10142, SANS 10200:1985 and SANS 10292:2001.

Supplementary earthing and bonding shall be provided throughout the facility with bonding of PV module mounting system, invertors, cable containment and wireways (and any other extraneous metalwork) , including bonds to the lightning protection air termination network at suitable intervals with the aim of achieving equipotential of the entire installation.

The *Contractor* shall install an earth mat-based earthing system for the PV Plant that eliminates the risk to personnel or animals of electric shock under normal operating condition as well as fault conditions. Furthermore, the earthing system shall ensure the functionality of electrical protection equipment during electrical faults.

2.1.9.2 General Requirements of an effective earth

An effective earth must prevent dangerous over voltages arising between metallic structures, frames, supports or enclosures of electrical equipment and the ground during fault conditions.

An effective earth must be able to permit fault currents of sufficient magnitude to flow so as to operate protective devices to isolate the fault before damage can occur.

The ohmic resistance of an effective earth must be low enough to ensure that the step potential on the ground in the vicinity of the earthing point is within safe limits under fault conditions i.e. a voltage gradient not exceeding 40 V/m for fault durations exceeding 1s.

2.1.10 METEOROLOGICAL STATION

2.1.10.1 Scope

The *Contractor* will procure and install suitable monitoring equipment as per the manufacturer's requirements.

The system shall feature meteorological equipment consisting of at least:

- 1x horizontal secondary-standard pyranometer
- 1x secondary-standard pyranometer in plane with the tracker
- Ambient temperature
- Module temperature
- Wind speed

The following are optional:

- Ambient pressure (optional)
- Relative Humidity (optional)

All instruments shall have valid calibration certificates and shall re-calibrated (or replaced with calibrated units every two years) for the duration of the O&M period.

2.1.11 MONITORING SYSTEM

2.1.11.1 Scope

The main standard applicable is the IEC 61724.

A logging tariff meter is to be installed at the delivery point compliant with SANS 474/NRS 057. The meter should be integrated into the monitoring system. The meter shall be able to share the meter readings with a *client* defined third party.

The monitoring system must be designed and implemented in such a way to have a lifetime of 25 years. The monitoring system is to continuously measure and record meteorological data, electrical parameters and status of the PV plant components. Updated conglomerated data is to be available online at least every 15 minutes. The norm specifies that the sampling frequency should be at least one minute for the parameters varying directly with the

sunlight and up to 10 minutes is allowed for the other parameters (e.g. temperature).

The monitoring system shall feature a UPS with 24-hour capacity to continue monitoring in times of grid outage.

The monitoring system shall have an online platform with different levels of access control.

The minimum data to be monitored are:

- DC current and voltage at the inverter input, per string
- Inverter behavior
- DC current and voltage input
- Output active and reactive power
- Phase voltage and current
- Grid frequency
- Grid status
- Energy output
- Alarms and faults
- Module temperature
- Ambient temperature
- Irradiation
- Tracker inclination
- Wind speed
- Energy output at the meter
- Status of the equipment (protection devices, inverters etc.)

2.1.12 SCADA SYSTEM FOR REMOTE MONITORING AND CONTROL OF SOLAR PV AND BESS INSTALLATION

2.1.12.1 Introduction

Purpose: This specification defines the technical requirements for a Supervisory Control and Data Acquisition (SCADA) system to remotely monitor, control, and optimize a solar photovoltaic (PV) power plant integrated with a Battery Energy Storage System (BESS).

Scope: The SCADA system shall encompass hardware, software, communication infrastructure, data acquisition, visualization, alarming, reporting, remote control capabilities, and cybersecurity features.

2.1.12.2 Objectives

- Real-time Monitoring: Provide continuous monitoring of all critical parameters of the PV and BESS systems, including power generation, voltage, current, temperature, and battery state of charge.
- Remote Control: Enable remote control of the PV and BESS systems, including power output adjustments, battery charging/discharging, and fault response.
- Data Logging and Analysis: Store historical data for performance analysis, troubleshooting, and regulatory compliance.
- Alarm Management: Generate alarms for abnormal operating conditions and enable automated responses to maintain system safety and reliability.
- Reporting: Generate customized reports for performance tracking, maintenance planning, and regulatory compliance.

2.1.12.3 System Architecture

Hardware Components -

- Central SCADA Server: High-performance server located at a secure control centre with redundant power supplies and hot-swappable components for reliability.

Minimum specifications:
- Dual Intel Xeon or equivalent processors
- 32GB RAM
- 1TB SSD RAID storage
- Multiple Ethernet and serial ports

- Remote Terminal Units (RTUs): Ruggedized RTUs for field data acquisition and control located at the PV plant and BESS sites.

  Minimum specifications:
  - Protection rating of at least IP66
  - Wide operating temperature range (-40°C to +70°C)
  - Support for cellular, Ethernet, and other relevant communication protocols

- Network Infrastructure: Secure communication infrastructure for remote connectivity.

  Options include:
  - Cellular networks (4G/5G) with VPN for secure data transmission
  - Satellite communication for areas with limited cellular coverage
  - Fiber optic or wireless Ethernet for local area network (LAN) connections

Software Components -

- SCADA Software:
  - Proven track record in renewable energy applications with remote monitoring and control capabilities
  - Support for real-time data acquisition, visualization, and analysis
  - Advanced alarming and event management with remote notification
  - Historical data archiving and trending accessible remotely
  - Comprehensive reporting capabilities with remote access
  - Integration with BESS control systems for remote optimization
  - Robust cybersecurity features (user authentication, access control, encryption)

- Operating System:
  - Windows Server or Linux-based OS with long-term support
  - Hardened for industrial environments and remote access

Communication Protocols -

- Modbus TCP/IP: Primary protocol for communication between SCADA server, RTUs, and field devices.
- IEC 61850: Support for IEC 61850 for interoperability with other substation automation systems (optional).
- DNP3: Optional support for DNP3 for communication with utility systems.
- Other: Compatibility with any proprietary protocols used by the PV and BESS equipment.

2.1.12.4 Remote Monitoring

PV Plant Data:

- Real-time acquisition of:
  - PV array power, voltage, and current
  - Inverter power, voltage, current, and status
  - Meteorological data (irradiance, temperature, wind speed)
  - Combiner box data (voltage, current)
  - String monitoring data (optional)

- Calculation of:
  - PV plant energy yield
  - Inverter efficiency
  - Performance ratio
  - Availability

BESS Data:

- Real-time acquisition of:
  - Battery state of charge (SOC)
  - Battery voltage, current, and temperature
  - Battery converter power, voltage, and current
  - BESS status and operating mode

- Calculation of:
  - BESS energy throughput
  - Roundtrip efficiency
  - Battery life estimation
  - Remaining useful life (RUL)

2.1.12.5 Remote Control and Optimization

PV Plant Control:

- Inverter start/stop
- Active power control (curtailment, ramp rate control)
- Reactive power control (power factor correction)
- Inverter control (MPPT, anti-islanding)

BESS Control:

- Charge/discharge control based on:
  - Time-of-use tariffs
  - Energy arbitrage
  - Frequency regulation
  - Voltage support

- Setpoint adjustments (e.g., SOC targets)
- Peak shaving
- Demand charge management

2.1.12.6 Alarming and Event Management

Alarm Prioritization:	Categorization of alarms based on severity.
Remote Alarm Notification:	Multiple notification channels (email, SMS, mobile app push notifications) to authorized personnel.
Event Logging:	Detailed logging of events with timestamps, accessible remotely.
Remote Troubleshooting:	Tools for analysing fault conditions and troubleshooting remotely.

2.1.12.7 Reporting

Standard Reports:

- Daily, weekly, monthly, and annual energy yield reports.
- Performance ratio and availability reports.
- BESS performance reports (energy throughput, efficiency, RUL).

Customizable Reports: Ability to create custom reports based on specific requirements, accessible remotely.

2.1.12.8 Cybersecurity

Secure Remote Access:	Strong authentication mechanisms (multi-factor authentication), encrypted communication channels, and role-based access control.
Intrusion Detection and Prevention:	Implementation of intrusion detection systems (IDS) and intrusion prevention systems (IPS) to monitor and protect against cyber threats.

Regular Security Updates:	Regular updates of SCADA software and firmware to address security vulnerabilities.

2.1.12.9 Additional Requirements

Data Backup and Recovery:	Regular automated backups of SCADA data to a secure offsite location with a robust disaster recovery plan.
Training and Support:	Comprehensive training for operators and maintenance personnel on SCADA system operation and maintenance, along with ongoing technical support.
Scalability:	The SCADA system should be scalable to accommodate future expansion of the PV plant and BESS.

2.1.12.10 Tender Requirements

Compliance:	The proposed SCADA system must comply with all relevant Addo Elephant National Park and local standards and regulations.
Documentation:	Detailed technical documentation, including system architecture diagrams, user manuals, and maintenance manuals, must be provided.
References:	Provide references of similar SCADA systems successfully implemented for remote monitoring and control of PV and BESS installations.
Warranty and Support:	Offer a comprehensive warranty and support package for the SCADA system.

2.1.13 SOLAR PV SUPPORT STRUCTURE

This specification outlines the design, materials, construction, and performance requirements for a Solar PV Support structure designed to provide shaded parking while generating electricity from sunlight.

2.1.13.1 General Requirements

- Design and Engineering:
  - Structural analysis and design to ensure safety and compliance with local building codes and standards.
  - Electrical system design for efficient PV module integration and power generation.
  - Site-specific layout optimization for maximum solar exposure and parking capacity.

- Materials:
  - High-quality structural steel for the Support frame (e.g., galvanized steel or aluminum).
  - Corrosion-resistant fasteners and hardware.
  - High-efficiency monocrystalline or polycrystalline PV modules from reputable manufacturers.
  - Wiring, conduits, and electrical components meeting safety standards.

- Configurations:
  - Single Mono (Inclination angle: 5 to 10 degrees):
    - 3 in portrait using 72 cells
    - 4 in portrait using 60 cells
    - 6 in landscape for either 60 or 72 cells
  - East West-Sawtooth:
    - 1 in portrait using 72 cells each direction east-west
    - 2 in landscape using 72 cells each direction east-west

- Spans distances (Depending on the system loading):
  - 5m (2 parking bays)
  - 7,5m spans (3 parking bays)

- Construction:

- Foundation design and installation (concrete footings or ground screws).
- Erection of the Support frame and structure.
- Installation of PV modules, wiring, and electrical equipment.
- Integration with existing electrical infrastructure or grid connection.

- Performance:
  - Specified minimum power output (kWp) based on site conditions and energy needs.
  - Expected annual energy production (kWh) based on solar irradiance data.
  - Monitoring system for tracking power generation and system performance.

2.1.13.2 Structural Requirements

- Load Capacity: Designed to withstand local wind loads and dead loads.
- Durability: Corrosion-resistant materials and coatings for a minimum 25-year service life.
- Maintenance: Easy access for cleaning and maintenance of PV modules.
- Safety: Compliance with electrical safety standards and grounding requirements.

- **Solar PV Support Material Specifications – Economic:** Single Mono, East West-Sawtooth:

The steel foundations of the structure are fixed into pre-drilled holes using concrete or connected to a base plate and chemically anchored to a concrete slab. All steel members are hot-dip galvanized to a thickness of 80-100µm. Aluminium purlins are used to ensure stiffer, yet lighter members. Only use S355 structural steel for the steel members.

Element	Section	Material	Tensile Strength	Finish / Corrosion Protection
Purlin	CE CAP2	6063 T6 Aluminium	200 MPa	Mill Finish
Girder	Cold Formed Lipped Channel	S355JR Structural Steel	350 MPa	100µm Hot-dip galvanised
Strut	Cold Formed Lipped Channel	S355JR Structural Steel	350 MPa	100µm Hot-dip galvanised
Module Clamps	50mm clamp	6063 T6 Aluminium	200 MPa	Mill Finish
Connections	M16, M10	Stainless Steel	8.8 specified	Stainless Steel

2.1.13.3 Electrical Requirements

- PV Modules:
  - Minimum efficiency rating (e.g., 18% or higher).
  - Warranty terms from the manufacturer.
  - Certifications (e.g., SANS, IEC, UL).

- Inverters:
  - Type (string inverters or central inverters).
  - Efficiency rating.
  - Maximum power point tracking (MPPT) capability.

- Electrical Balance of System (BOS):
  - Wiring, combiner boxes, disconnects, and protection devices.
  - Monitoring system with data logging and remote access capabilities.

2.1.13.4 Performance Requirements

- Power Output: Minimum kWp rating to meet energy goals.
- Energy Production: Estimated annual kWh production based on site assessment.
- Monitoring: System monitoring for performance analysis and fault detection.

2.1.13.5 Additional Features

- Lighting: Energy-efficient LED lighting for nighttime illumination.

2.1.13.6 Warranty and Maintenance

- Structural Warranty: Minimum warranty period for the Support structure (25 years for the structural steel installation).
- PV Module Warranty: Warranty terms from the module manufacturer (25 years for performance and 20 years for product).
- Inverter Warranty: Warranty terms from the inverter manufacturer (typically 15-20 years).
- Maintenance Plan: Outline of recommended maintenance procedures and schedule.

2.1.13.7 Acceptance Criteria

- Structural Inspection: Verification of structural integrity and load-bearing capacity.
- Electrical Testing: Verification of proper electrical connections and system performance.
- Performance Verification: Meeting the specified power output and energy production targets.

2.1.13.8 References and Standards

- Local building codes and standards:
  - SANS 10400 – National Building Regulations

- Structural codes and standards:
  - SANS 10160-1 – Basis of Structural Design
  - SANS 10160-2 – Self-weight and Imposed Loads
  - SANS 10162-1 – Structural Use of Steel
  - SANS 10100-0 – Structural Use of Concrete (for the foundations)
  - ISO 1461 - Hot dip galvanized coatings
  - Eurocode 9 – Design of aluminum structures

- Electrical & safety standards:
  - NRS-097
  - NRS048
  - SANS 10142-1
  - IEC 60364.

- PV module and inverter certifications.

PART C: PARTICULAR (PROJECT) SPECIFICATIONS

3. SPECIFICATIONS, STANDARDS AND WORKMANSHIP

The *service* is to be executed subject to these specifications, standards and workmanship requirements. Please note that compliance with all these specifications and standards, including requirements in terms of qualifications, accreditation (where applicable) and work experience of both the tendering entity and its key people will be material in the *Client's* risk assessment for awarding this contract.

Accreditation, Qualifications and Work Experience

Minimum requirements for work experience, qualifications and accreditation (where applicable) as well as minimum personnel are as stated under the headings below. The tenderer must supply the relevant information in regard to accreditations, qualifications and work experience for both the enterprise and key people who will be working on this contract on the appropriate returnable schedule in the Works Information.

3.1 STANDARD SPECIFICATIONS

Where reference is made to the standard specifications in this contract, it means the latest edition of the documents which apply to the specific discipline involved in the works, as referenced under any of the headings below. The standard specifications may, due to their generality and completeness, also cover items not applicable to this particular contract.

3.2 PARTICULAR (PROJECT) SPECIFICATIONS

Project specifications include amendments to the standard specifications as well as supplemental specifications applicable to work items not covered by the standard specifications. Project specifications, where applicable, may be found throughout the Works Information of this document, including works drawings. The bill of quantities may also contain references to standard specifications as well as project specifications, for clarification in terms of pricing for certain items, where applicable.

In the event of any discrepancy between the project specifications and a part of the standard specifications found in the Works Information of this document, the project specifications take precedence.

3.2.1 GENERAL

Information regarding the scope of the project, the site, alterations and additions to the General Specification and other aspects relevant to the construction are given below.

Tenderers must take due cognisance of these, and tender rates must make provision for any additional costs due to the factors mentioned.

Notwithstanding the information given, it remains the responsibility of the Tenderer to ascertain the actual conditions on site before submitting the cost for the Task Order.

Tenderers should notice that rates are requested for alternative items as well which might not necessarily be installed.

3.2.2 SUPPLY AUTHORITY

The electrical supply authority is Addo Elephant National Park (or specific municipality in which the project site is located) or Eskom.

3.2.3 OTHER CONTRACTORS

The successful tender shall be notified of future construction activity.

3.2.4 DESCRIPTION OF THE PROPOSED SPV GENERATOR

3.2.4.1 Power inverters and controllers

These shall be, inter alia, SMA / Goodwe / SolarEdge / Sungrow / Sunsynk, or equivalent accepted and approved. All power inverters shall be supplied according to the respective standardised specifications listed.

3.2.4.2 Inverter cabin

A rate is requested for an inverter cabin, if necessary, to be installed on the array field for the accommodation of the inverters, control equipment, inverter-type air conditioner, energy efficient interior lighting and electrical distribution to the main distribution board.
The option to install the inverters inside the building, if a saving can be realised, will also be considered once the tendered rates are available. This option will be further investigated in conjunction with the *Contractor*.

3.2.4.3 Solar Photovoltaic panels

The preferred PV panels will have anti potential-induced degradation properties.
All solar photovoltaic modules shall be constructed, supplied and delivered as mentioned in the Standardised Specifications and Technical Specifications.

Poly-crystalline type modules shall be used in this contract with a maximum power output of 545Wp and 570Wp. The solar module should facilitate corner drainage. Only Grade A / Tier 1 panels, the highest grade, will be considered.

3.2.4.4 Ground mounted structures for the PV array

The *Contractor* will be responsible for the submission of a suitable PV module mounting structure design and allowance shall be made for two different footing arrangements namely, drilled footings if the soil bearing pressure permits and concrete footings as an alternative.

The *Contractor* shall submit his design, with calculations, for the two types of footings to the *Engineer* for evaluation and approval prior to the purchase of materials. Only one type of footings will be utilised will be utilised based on the soil bearing pressure and the proposed footing arrangement submitted by the *Contractor*.

Detailed drawings shall also be submitted indicating earthing and bonding arrangement of the PV modules to the underground earthing system.

The design and calculations must correspond with the standard and technical specifications as stipulated in this tender document.

3.2.4.5 String and sub-string boxes

String boxes should correspond to the standardised and technical specifications as listed. Provision should be made for all positive and negative inputs and outputs.

The positive inputs shall be fitted with suitably rated fused isolators.

The outputs shall be fitted with a 2 pole DC isolator suitably rated and the output terminals shall be fitted with suitable surge protection devices connected to the earthing system.

3.2.5 LV CABLE RETICULATION

3.2.5.1 General

The LV cables are used for the cable interconnections in between solar modules, the connection of PV string boxes, supply cables for the DC input side and AC output side of the inverter. Only the AC cables, terminations and BCEC necessary are measured in the Schedule of Quantities and a rate, based on the total kWp installed, is requested for all DC cabling, surge protection, string boxes and ancillary equipment.

3.2.5.2 Cables and BCEC

All low voltage cables shall be SWA PVC Cu cables for the AC reticulation and single core DC cables without armouring as per SANS 1507-3. The required AC cable sizes will be as shown on the applicable drawing whilst the *Contractor* shall submit his DC cable design, with calculations, to the *Engineer* for evaluation and approval prior to the purchase of materials.

An annealed and stranded conductor of high conductivity Cu with cross diameter as indicated on the drawings shall be installed alongside the full route length of all AC LV cables and bonded to the PV array and steel structure.

The insulated earth conductor shall terminate onto the PV array mounting structure and earth studs by means of a suitably sized crimped lug and solidly bolted.

3.2.5.3 Terminations

Cables in DC installations shall be terminated by means of suitable PVC cable glands DC cables at string boxes and at inverters. Stainless steel cable glands complete with rubber seal are to be fitted where cables are terminated on an AC distribution board.

3.2.6 LOW VOLTAGE AC DISTRIBUTION BOARD

Allowance shall be made for the supply and installation of a new LV cable feeder between the load side of the change-over switch and distribution board in the building via the proposed inverter installation.

3.2.7 EARTHING

Earthing shall be done according to the General Technical Specifications.
An earth mat consisting of 10 mm^2 solid copper conductor is required on the platform on which the PV panels and mounting structures will be installed. All joints shall be done by means of a Cadweld® process.

The steel wire armouring of cables must be bonded to the earth bar at the AC distribution boards.

The solar photovoltaic generator (solar module array, mounting structure and inverters) shall be bonded to the underground earthing network by means of insulated earth conductor installed in galvanized water pipes, where applicable, on the positions as shown.

Copper rods 16mm^2 in diameter and 600mm in length shall be used in conjunction with the earth mat to obtain an earth resistance reading of less than 2 Ohm.

PV string boxes inverters and distribution boards should also be bonded to the same earthing network to ensure the safety of personnel and maintenance workers during fault conditions.

3.2.8 INSPECTIONS, TESTING, COMMISSIONING AND HANDING OVER

3.2.8.1 Physical inspection procedure

a) Once the *Contractor* has completed the installation, written notice shall be given to the *Client* in order that a mutually acceptable date can be arranged for a joint inspection.
b) During the course of the inspection, the *Engineer* will compile a list of items (if any) requiring further attention. A copy of this list will be provided to the *Contractor* who will have a period of 7 days in which to rectify the offending items of the installation.
c) The *Contractor* shall then provide written notice that he is ready for an inspection of the remedial work to the offending items.
d) This procedure will continue until the entire installation has been correctly completed to the satisfaction of the *Client*.

3.2.8.2 Testing and operational inspection procedure

a) In addition to the above the *Contractor* shall have the complete installation tested and approved by the *Engineer* where applicable.
b) Subsequent to the above testing and approval, the *Contractor* shall in the presence of the *Engineer* test all circuits relays and equipment for proper functioning and with respect to:
    (i) Phase balance.

(ii) Insulation level.
(iii) Polarity.

c) The *Engineer* has the right to call for, or to execute, any reasonable additional tests that may be necessary to render proof of the specification requirements having been met. The *Contractor* shall render all the necessary assistance to have such tests carried out without delay.
d) All tests shall be carried out in the presence of the *Engineer* and the costs shall be included in the unit prices for the installation thereof.

3.2.8.3 Commissioning and training of the *Client*'s personnel

On completion of the works the *Contractor* shall commission all the equipment installed to ensure proper and safe functioning. This commissioning will be done in the presence of the *Engineer* and the *Client*'s representatives in charge of the operation of this system. At least two representatives will be nominated for induction and operational training to be provided by the *Contractor* at no additional costs.

3.2.8.4 "As built" drawings and completion documentation

a) The *Contractor* shall provide the *Client* with as-built drawings showing all sizes and the exact location measured from fixed points of all electrical equipment, cable routes, supporting structures, updated site layout, cables, wiring diagrams, schematic diagrams, etc.
b) Three complete sets of the "As built" drawings and documentation shall be handed to the *client*.
c) The safety posters as required by the OHSA shall be permanently mounted inside substation buildings and on the outside of all housings of electrical equipment.
d) The Health and Safety file containing all documentation as required in the Construction Regulations promulgated under the OHSA. All commissioning testing information shall also be filed on this file.
e) In addition, a complete reticulation diagram showing all supply cables and switchboards shall be provided behind a plastic cover in the substation or adjacent to the Main Switchboard if not located in a substation as well as a schematic diagram of the main supply system.
f) Copies of all Certificates of Compliance of the completed projects shall be handed over to the *Client*.
g) Brochures of all equipment supplied must be provided for record purposes.

3.2.8.5 Clearing up and vacating of site

After completion of the Contract and after approval has been obtained from the *Engineer*, the *Contractor* shall remove everything he has brought to the site or has handled in the execution of the Contract and shall leave the site in a clean and neat condition to the satisfaction of the *Engineer*.

3.2.8.6 Operating & Maintenance

Preventative and corrective maintenance to be carried out by the *Contractor* over a period of 36 months after Task Order Completion.

3.2.8.7 Final handover of the project to the client

The installation shall be formally handed over to the *Client* on completion by means of a written hand over certificate.

The installation will not be regarded as complete and handed over to the *Client* until all the above requirements have been met.

SCHEDULE 1: Contract information required from *Contractor*

The *Client* requires the following information pertaining to the work for this contract to be furnished at the time of tender. The tenderer must provide ALL the information as stipulated in this schedule.

IMPORTANT – PLEASE NOTE: The information below is required for tender evaluation and adjudication purposes. Failure to provide ALL the information items below may lead to bid disqualification, if it renders the evaluation process ambiguous.

1.1 GUARANTEED DELIVERY TIMES

		Weeks
1.	Site Establishment	……
2.	Solar Photovoltaic panels	……
3.	DC~AC Power inverters	……
4.	Sub-string and string boxes	……
5.	Battery Energy Storage System (BESS)	……
6.	Electric Vehicle Charging Station	……
7.	Mounting Structure	……
8.	Solar PV Support structure	……
9.	DC cables	……
10.	AC cables	……
11.	Distribution Boards and protection equipment	……
12.	Other	……

1.2 POLYCRYSTALLINE SOLAR PHOTOVOLTAIC PANELS (only Grade A / Tier 1 will be accepted)

1. **PERFORMANCE UNDER STANDARD TEST CONDITIONS** (STC)

a) Maximum power : Pmax…… Wp

b) Open circuit voltage : Uoc……..… V

c) Maximum power point voltage : Umpp…….. V

d) Short circuit current : Isc…….. A

e) Maximum power point current : Impp……..…….. A

f) Warranty: 5 / 10 / 15 / 20 / 25 years : ……..

2. DIMENSIONS

a) Length : …… mm

b) Width : …… mm

c) Height : …… mm

d) Frame : …… material

e) Weight : ……kg

3. COMPONENTS MATERIALS

a) Cells per module : ……..

b) Cell type : ……..

c) Cell dimensions : ……..

d) Front : ……..

4. THERMAL CHARACTERISTICS

a) NOCT : ……˚C

b) TC Isc : …… %/K

c) TC Uoc : …… %/K

d) TC Pmpp : …… %/K

5. ADDITIONAL DATA

a) Power sorting : …….. Wp

b) Junction Box : ……

c) Connectors : ……

6. PARAMETERS FOR OPTIMAL SYSTEM INTEGRATION

a) Maximum system voltage SC II : …….. V

b) Maximum reverse current : …….. A

c) Load/dynamic load : ……..... kN/m²

d) Number of bypass diodes : ……

e) Operating range : ……..…… °C to ……..…. °C

1.3 SUB-STRINGS AND STRING BOXES

1. VOLTAGE SPECIFICATIONS

a) Maximum sting input voltage : …… VDC

b) Maximum input fuse voltage : …… VDC

c) Maximum output voltage : ……..... VDC

2. CURRENT SPECIFICATIONS

a) Maximum sting input current : ……..……ADC

b) Maximum input fuse current : ……ADC

c) Maximum continuous output current : ……..……...ADC

d) Short Circuit Current : ……....ADC

3. PROTECTION AND SURGE DEVICES

a) Surge arrestor Manufacturer & Class : ……..……

b) Overload protection : ……..

c) IP Rating : ……

d) Earth bar : ……..……..…… (L x mm²)

4. PHYSICAL PROPERTIES

a) Enclosure material : ……..……

b) Dimensions (W x H x D) : …… mm

c) Weight : ……..……..……...kg

d) String Inputs

i) Number of Inputs (Positive / Negative) : ……..…….

ii) Gland size : …… mm

iii) Cable size (Positive / Negative) : …… mm²

iv) Positive terminal Torque : …… N.m

v) Negative terminal Torque : ……N.m

e) String Outputs

i) Number of Outputs (Positive / Negative) : ……..

ii) Gland size : ……..…… mm

iii) Cable size (Positive / Negative) : …… mm²

iv) Positive terminal Torque : ……..……..…… N.m

v) Negative terminal Torque : ……N.m

f) Fixing/ Mounting Harness Material : ……..……..

1.4 SCADA SYSTEM FOR REMOTE MONITORING & CONTROL

1. SYSTEM ARCHITECTURE AND HARDWARE

a) Scalability : ……..……

b) Redundancy : ……..……

c) Compatibility : ……..……

d) Cybersecurity : ……..……

2. COMMUNICATION AND PROTOCOLS

a) Protocol Support : ……..……

b) Network Connectivity : ……..……

c) Remote Access : ……..……

d) Data Logging and Archiving : ……..……

3. DATA ACQUISITION AND MONITORING

a) Real-time Monitoring : ……..……

b) Alarms and Events : ……..……

c) Historical Trending : ……..……

d) Performance Reporting : ……..……

4. CONTROL AND OPTIMIZATION

a) Remote Control : ……..……

b) Setpoint Management : ……..……

c) Demand Response : ……..……

d) Predictive Analytics : ……..……

5. VISUALIZATION AND USER INTERFACE

a) Intuitive Interface : ……..……

b) Mobile Accessibility : ……..……

c) Multi-User Access : ……..……

6. WARRANTY AND SUPPORT

a) Warranty : ……..……

b) Maintenance : ……..……

c) Technical Support : ……..……

1.5 DC CABLES (for 630 kWp installation)

1. ELECTRICAL CHARACTERISTICS

a) Voltage:

i) Rated Voltage Rating : …… V

b) Current rating**:**

i) Installed in sleeves : …….. A

ii) Installed on cable tray : …….. A

c) 1s Short circuit rating : …… kA

d) 1Ø Voltage drop : ……... mV/A/m

2. PHYSICAL PROPERTIES

a) Conductor:

i) Material : ……

ii) Number of cores : ……

iii) Number of strands per core : ……

iv) Cross-Sectional Area : …… mm^2

v) Conductor diameter : …….. mm

vi) Resistance @ 20°C Maximum : …… Ω/km

b) Outer sheath:

i) Material used : ……

ii) Average thickness : ……

c) Inner Sheath Insulation

i) Material used : ……

ii) Average thickness : ……

d) Ultraviolet Protection

i) Technology implemented : ……

1.6 AC CABLES (for 630 kWp installation)

1. ELECTRICAL CHARACTERISTICS

a) Voltage:

i) Rated Voltage Rating : …… V

b) Current rating:

i) Installed in ground : …….. A

ii) Installed in ducts : …….. A

iii) Installed in air : …….. A

c) Current rating : …… kA/s

d) Voltage drop : …….. mV/A/m

2. PHYSICAL PROPERTIES

a) Conductor:

i) Material : ……

ii) Number of cores : ……

iii) Amount of strands per core : ……

iv) Cross-Sectional Area : …… mm²

v) Conductor diameter : …….. mm

vi) Impedance : ……..…… Ω/km

b) Outer sheath:

i) Material used : ……

ii) Average thickness : …… mm

c) Inner Sheath Insulation:

i) Material used : ……

ii) Average thickness : …… mm

d) Conductor insulation:

i) Material used : ……

ii) Average thickness : …… mm

1.7 DC-AC POWER INVERTERS (for 630 kWp installation)

1. INPUT (DC)

a) Max. DC power (@ cos ϕ = 1) : …….. W

b) Max. DC voltage : ……... V

c) MPP voltage range : ……... V

d) DC nominal voltage : ……... V

e) Min. DC voltage / start voltage : ……... V

f) Max. input current / per string : ……... A

g) Number of MPP trackers / strings per MPP tracker : …….

2. OUTPUT (AC)

a) AC nominal power (@ 400 V, 50 Hz) : …… W

b) Max. AC apparent power : …… W

c) Nominal AC voltage; range : …… V

d) AC grid frequency; range : …….. Hz

e) Rated power frequency/rated grid voltage : …… Hz ……. V

f) Max. output current : …… A

g) Power factor (cos ϕ) : ……

h) Phase conductors / connection phases : ……

3. EFFICIENCY

a) Max. Efficiency / Euro-eta : …… %

4. PROTECTION DEVICES

a) ESS switch-disconnector : ……...

b) Ground fault monitoring : ……...

c) Grid monitoring : ……...

d) DC reverse-polarity protection : ……...

e) Type II DC Surge arrestor integration : ……...

f) Reverse current protection : ……...

g) AC short circuit protection : ……...

h) Galvanically isolated : ……...

i) All-pole sensitive fault current monitoring unit : ……....

j) Protection class / overvoltage category : …… :……....

5. GENERAL DATA

a) Dimensions (W / H / D) in mm : …… mm

b) Weight : ……..… kg

c) Operating temperature range : …… °C …… °C

d) Noise emission (typical) : …… dB(A)

e) Internal consumption (night) : …… W

f) Topology : ……..

g) Cooling concept : ……..….

h) Degree of protection : ……..…

i) Degree of protection of connection area : ……..

j) Climatic category : ……

k) Max permissible value for relative humidity (Non-condensing) : ……..…… %

6. FEATURES

a) DC connection /AC connection : ……

b) Display : ……

c) Interfaces : ……

d) Warranty: 5 / 10 / 15 / 20 / 25 years : ……

Annexure A

Health and Safety Specifications for South African National Parks

South African NATIONAL PARKS

HEALTH & SAFETY SPECIFICATIONS

FOR

THE INSTALLATION OF A GRID-TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK

CONTRACT NO: CI-GK-0175

Date: March 2025

Contact person: Zama Mkhonza

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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 consider 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

Contractor | Witness for Contractor | Employer | Witness for Employer

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 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

Contractor	Witness for Contractor	Employer	Witness for Employer

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 2018 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 365 days and will involve more than 3600 person days or
- Tender value limit grade is 7, 8 or 9 of the Construction Industry Development Board (CIDB) grading.

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 contractor's 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 affected 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 sub-contractors;
- 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 consider 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 db; 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.

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 worker's 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 always approved PPE or clothing on site.

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

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

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.**
- **Annexure 1 of Electrical Installation Regulation Certificate of Compliance is required after all testing and commissioning and any other required certificates as per the project specification.**

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 Electrical Works 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 (where applicable):

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: Mr S Hlengwa	Tel: (012) 426 5392 Email: Simangaliso.hlengwa@sanparks.org
Client Agent	**Infrastructure & Special Projects,** Addo Elephant National Park Contact: Mr Altheo Botha	Tel: (042) 233 8669 / 082 579 7132 E-mail: altheo.botha@sanparks.org

PROJECT DETAILS:

Description of Works

The Installation of a Grid Tied PV Solar Plant for Addo Main Rest Camp, Addo Elephant National Park.

The following summarizes the works:

- Energy Generation: 630 kWp solar PV array, using high-efficiency monocrystalline PERC modules.
- Power Conversion and Management: 550-kW inverter system.
- Grid Interaction: The system will operate in grid-tied mode, allowing for seamless interaction with the local utility grid.
- Monitoring and Control: Comprehensive monitoring system to track the performance of the PV array, inverter, providing real-time data.
- Grid Compliance: The system is designed to comply with the South African grid code requirements.

Anticipated Construction Duration:
8 Months

Provisional Start Date:
September 2025

Completion Date:
April 2026

EXISTING ENVIRONMENT:

Hazards particular to this project by virtue of location:

Wild Animals:
The site is located within the Main Rest Camp of the Addo Elephant National Park. No wild animals will be encountered except for the occasional snake. A lookout for snakes is going to be required to protect the workers.

Members of public and children:
All necessary steps to be taken to protect the public from any dangers associated with the construction works being undertaken.

Public Roads:
The use of the roads network to be carefully planned to accommodate public, tenants and traffic.

Overhead, Above Ground and Underground Services crossing the site:

Overhead:	Applicable [should be removed by time of installation]
Underground:	Applicable
Ground Level:	Not Applicable
Services Drawings available:	Applicable / not fully updated

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):

Access to the site is from a busy road servicing the Workshops, Electrical Sub-station, and other Service Roads.

Existing ground conditions and ground survey report:

No geotechnical information regarding the ground conditions on the actual site are available. A related Geotechnical Report from Delta Geotech dated October 2020 is available (used for adjacent WWTW).

Please refer to the results of test pits TPE 1 to TPE 8 which was done on the Wastewater Treatment Plant Site which is situated next to the PV Solar Site.

- Ground is normal gravel with minor slopes to flat areas.
- Perched groundwater was intersected at the WWTW site at test pits TPE1 to TPE3 and TPE6.
- Groundwater occurs at depths of between 1.30m to 2.60m below ground level.
- Precautions to accommodate heaving soils are required.

Existing Traffic Systems:	
Conditions:	Gravel / Tar 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:

Working at Heights:
Not applicable.

Accommodation of Traffic (Management Plan):
The Principal Contractor must supply a Traffic Management Plan for the site within this identified scope, i.e. the Site Camp and Surrounds as well as the Work Area and Surrounds.
The Contractor must supply a method statement for traffic control at the section where excavation will take place along the access roads.

Members of the Public:
Some of the works is on the side of an access road to the WWTP and Workshops. The Contractor is responsible for the safety of the workers as well as the public. The Contractor will have to have sufficient warning & information signage on site to direct traffic flow pass the "barricaded works.

Wild animals:
There are probably baboons and 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:

- Cable installations
- Transformer & Ring Main Unit installation
- Excavations (structure foundations and cable trenches)
- Compacting and filling / Compactors Operations
- Hand Tools
- Fire
- Manual Handling of plant/material/equipment
- Members of public
- Noise and Dust
- Plant / Vehicle and Equipment Operations
- 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
• SANParks - Electrical shut down for connection, testing and change over. • Road Traffic Management (road crossing only) • 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 07:00 to 17:00	Saturday 07:00-13:00
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 consider adverse weather conditions on site activities and implement control measures to mitigate risk.	
Induction Training:	All workers to receive induction training prior to commencement on site. Special reference to SANParks Health and Safety Policy, Induction Awareness Training, SANParks EMPr and Code of Conduct.	

PROTECTION OF SITE AGAINST UNAUTHORISED 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) warning illuminates at night or when visibility is poor, or have other suitable precautionary measures if both 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. **General Fencing of Site:** Note that construction site must be **clearly demarcated** and have controlled access point. **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:	Yes, required
Hard Hats:	Yes, required
Safety Footwear:	Yes, required
Reflective Vests:	Yes, required
Specialist equipment:	As per job function
Goggles / Gloves / ear and respiratory protection	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

Contractor	Witness for Contractor	Employer	Witness for Employer

CONTRACT No: **CI-GK-0175**
PROJECT: **The Installation of a Grid Tied PV Solar Plant for Addo Main Rest Camp, Addo Elephant National Park**

Risk Rating is measured by determining the Likelihood(L) and Consequence (C) and using the Matrix to determine the Risk Rating (R).
Risk Ranking below 8 is deemed Tolerable, between 9 and 15 is deemed Medium Risk and above 20 is deemed High Risk

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
	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

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
			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
			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

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
	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
	A16	Fire prevention	Pollution of area	3	2	8	Construction Regulation 27(e)	Proper waste bins and waste removal
			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
	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

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
			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
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

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
	C3	Towing a Trailer	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
	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
	D4	Other electrical portable hand tools	Electrocution	3	5	22	Electrical Machinery Regulations 10(1)(a)(b)	Tool inspection register, site inspection and monitoring
			Exposure to noise	3	3	13	Noise Induced Hearing Loss Regulations(7)(1)(a)(b)(c)(d)	Training and PPE
			Vibration	2	2	5	Safe Operation Procedures (SOP) toolbox tool talks	Safe Operation procedure, Toolbox talks
			Accidental Injury	4	3	17	Safe Operation Procedures (SOP) toolbox tool talks	On site supervision
			Shaving flying into eyes	3	3	13	Safe Operation procedure	PPE, Supervision

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
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
	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 rubble/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/or unwanted cables / 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

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
			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
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,
	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

Steps in Operation	Ref No.	Hazard	Risk	P	F	S	Controls Measures	Action to Mitigate
			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
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		PPE, Competent person conduct work.
			Injury during assembly/dismantling	3	3	13	Construction Regulation 12(3)(a)	Induction Training, PPE, Supervision
Installation of Electrical Cables & Equipment	K1	Installation of electrical cable in trench	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,
			Dangerous / unsafe cable Joints	3	3	13	Electrical Installation Regulations (5)(1)(2)	Competent installer
	K2	Installation of electrical cables or tubbing	Cable handling / lifting resulting in injury	3	3	13	Electrical Installation Regulations (2)(1)	Induction training, PPE,
	K3	LV & MV reticulation	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) Electrical Installation Regulations 5 (3)(4)(5)	Competent person to do installation & inspection
			Dangerous / unsafe cable Joints	3	3	13	**Construction Regulation 24(d)(e) and Electrical Installation Regulations 5(3)(4)(5)**	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
	K4	Mini-Substation / RMU's / Transformer installations	Person encountering chemical agents	3	2	8	Safe Work Procedure Hazardous Biological Agents Regulation 10(1)(a)(b); 2(a)(b)(c)	PPE
			Explosion due to electrical connection to distributor or transformer supply.	3	2	8	Electrical Installation Regulations 5 (1-7)	PPE, Induction Training
			Connect cable for emergency purpose i.e., generator.	3	2	8		
			Electrocution	3	5	22	Construction Regulation 24(a)(b)(c) Electrical Installation Regulations 5 (3)(4)(5)	Competent person to do installation & inspection
Metalwork	M1	Welding and flame cutting	Unsafe flame cutting/ welding equipment	3	5	22	General Safety Regulations 9(1)(a)(b)(d)	Flame cutting equipment to be fitted with flashback arrestors, supervision
			Employees not competent to perform duty	3	3	13	General Safety Regulations 9(4)(a)(b)(i)(ii)	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

LIKELIHOOD RATING (L)		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 a year.
3	**Possible**	Might occur occasionally.	Event that may occur. Once in 3 years.
2	**Unlikely**	Could happen sometime.	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 (C)		ENVIRONMENTAL	SAFETY	HEALTH	FINANCIAL IMPACT
5	**Critical**	Permanent environmental damage to an extensive area.	Fatality. Permanent disabling injuries.	Life threatening or permanently disabling illness.	> R500,000
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.	Reversable injury or moderate irreversible impairment. Less than 10 days lost time.	Severe but reversible health effects. Results in lost time 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 – R999

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

Contractor | Witness for Contractor | Employer | Witness for Employer

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
A	Botha	**Regional:** Project Coordinator – I&SP	082 579 7132	**Yes**		
F	Marais	**Technician:** Technical Services - Parks	072 997 2624	**Yes**		
C	Jonker	**Senior Manager:** Technical Services	012 426 5303	**Yes**		
Z	Mkhonza	**COHS:** Coordinator Compliance	012 426 5199	**Yes**		

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 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 this documents, our safety documentation and health and safety legislation.

_____ _____

Signature of Contractor Date

Comments:

_____

_____

_____

_____

_____

_____

ANNEXURE B

Approved Environmental Management Programme

This project has an Environmental Impact Assessment component and the Department of Forestry, Fisheries and the Environment has issued an Environmental Authorisation (EA) for the CONSTRUCTION OF 10 NEW FAMILY CHALETS AND INFRASTRUCTURE AT LENDLOVU LODGE PHASE ONE IN ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE.

The Contractor must take note of the responsibilities for the implementation of the construction of the "INFRASTRUCTURE" portion of the EA.

Only reference to the Infrastructure (Solar PV Plant) is applicable for this tender.

LIST OF ACRONYMS AND ABBREVIATIONS

AENP	Addo Elephant National Park
BA	Basic Assessment
BAR	Basic Assessment Report
CBA	Critical Biodiversity Area
DFFE	Department of Forestry, Fisheries and Environment
DHS	Department of Human Settlement
DoA	Department of Agriculture
DEO	Designated Environmental Officer
DWS	Department of Water and Sanitation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EAP	Environmental Assessment Practitioner
EMF	Environmental Management Framework
EMPr	Environmental Management Program Report
ESA	Ecological Support Area
GN	Government Notice
IDP	Integrated Development Plan
I&APs	Interested and Affected Parties
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Protection Assessment
NNR	No Natural Area Remaining
NSBA	National Spatial Biodiversity Assessment
ONA	Other Natural Area
PPP	Public Participation Process
PSDF	Provincial Spatial Development Framework
SAHRA	South African Heritage Resources Agency
SANParks	South African National Parks
SAPS	South African Police Service
SDF	Spatial Development Framework
SIP	Strategic Integrated Projects

GLOSSARY OF TERMS

Alien species: A plant or animal species introduced from elsewhere: neither endemic nor indigenous.

Applicant: Any person who applies for an authorisation to undertake an activity or undertake an Environmental Process in terms of the Environmental Impact Assessment Regulations – National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as contemplated in the scheduled activities listed in Government Notice (GN) No R. 327, 325 and 324.

Biodiversity: The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.

Cumulative Impact: In relation to an activity, cumulative impact means the impact of an activity that in it- self may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Ecology: The study of the interrelationships between organisms and their environments.

Environment: All physical, chemical and biological factors and conditions that influence an object.

Environmental Impact Assessment: In relation to an application, to which Scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of the application.

Environmental Impact Report: In-depth assessment of impacts associated with a proposed development. This forms the second phase of an Environmental Impact Assessment and follows on from the Scoping Report.

Environmental Management Programme: A legally binding working document, which stipulates environmental and socio-economic mitigation measures that must be implemented by several responsible parties throughout the duration of the proposed project.

Heritage resources: This means any place or object of cultural and archaeological significance.

Precipitation: Any form of water, such as rain, snow, sleet, or hail that falls to the earth's surface.

Red Data species: All those species included in the categories of endangered, vulnerable or rare, as defined by the International Union for the Conservation of Nature and Natural Resources.

Riparian: The area of land adjacent to a stream or river that is influenced by stream induced or related processes.

Soil compaction: Soil becoming dense by blows, vehicle passage or other type of loading. Wet soils compact easier than moist or dry soils.

INTRODUCTION

This Environmental Management Programme (EMPr), amongst others, describes the mitigation measures and identifies the specific role players that will be responsible for implementation of the mitigation measures, in order to ensure that impacts on the environment are minimised during the construction, operational and decommissioning phases of the following development proposal in the Addo Elephant National Park, Eastern Cape Province:

- 20 x single tourist accommodation units (2 people per unit)
- Associated infrastructure, i.e. roads and bulk services (water, electricity and sewerage) as follows:
- 4m wide paved road, 1 450m long concrete block paved road with sunken kerbs
- 20 x concrete block paved driveway and parking areas adjacent to the unit (35m2 each)
- Central Boma with ablution facility
- Sewer pipeline of 1 400m gravity network to connect to the new wastewater treatment system
- Electrical and water reticulation to new units and connect to existing services

In addition to the above development, SANParks also propose the development of a Photo Voltaic Solar Supply system adjacent to the lodge. The details of the PV solar supply system are as follows (see illustrations of the three alternatives in Figure 2):

- General:
  - **Electrical Power required -**
    - 650 kW - 850 kW
  - **Area required to accommodate PV Solar Modules**
    - 11,287.5m²

This EMPr must form part of the contractual agreement between the relevant Contractor(s) and the Developer/Applicant.

NEMA Regulations Report Compliance

Appendix 4 of the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations, 2014 (as amended) provides the content requirements for Environmental Management Programmes. The table below lists the relevant requirements, indicates whether the relevant information is included in this report or not, and provides cross-references as to where the relevant information can be found in this report.

Table 1: Environmental Management Programme requirements as per Appendix 4 of the NEMA EIA Regulations, 2014 (as amended).

Reg.	EMPr Content	Included (Yes, No or N/A)	Report Section Reference
	A draft environmental management programme must comply with section 24N of the Act and include -		
(a)	details of: (i) the person who prepared the environmental management programme; and	Yes	Chapter 3
	(ii) the expertise of that person to prepare an environmental management programme;	Yes	Chapter 3
(b)	A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Yes	Chapter 4
(c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Yes	Chapter 2
(d)	A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including – i. planning and design; ii. pre-construction activities; iii. construction activities; iv. rehabilitation of the environment after construction and where applicable post closure; and, v. where relevant, operation activities;	Yes	Chapter 9
(f)	A description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to – i. avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; ii. comply with any prescribed environmental management standards or practices; iii. comply with any applicable provisions of the Act regarding closure, where applicable; and; iv. comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	Yes	Chapter 7 and 9
(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	YES	Chapter 9
(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	YES	Chapter 7
(i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	YES	Chapter 9
(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	-	-
(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	YES	Chapter 9

Reg.	EMPr Content	Included (Yes, No or N/A)	Report Section Reference
(l)	A program for reporting on compliance, taking into account the requirements as prescribed by Regulations;	YES	Chapter 7
(m)	An environmental awareness plan describing the manner in which – i. the applicant intends to inform his or her employees of any environmental risk which may result from their work; and, ii. risk must be dealt with in order to avoid pollution or the degradation of the environment; and,	YES	Chapter 8
(n)	Any specific information that may be required by the Competent Authority.	-	-

Report Layout
The table below summarises the content layout of this report.

Table 2: Summary of report content layout.

Chapter	Chapter Heading	Content Summary
1	Introduction	Provides a brief background to the proposed project and explains the compliance of this report with regards to Regulation 33 of the NEMA.
2	Map of the Proposed Activity	Provides a Sensitivity Map of the area surrounding the proposed project as well as a map showing the locality of the proposed project.
3	Environmental Assessment Practitioner	Provides details of the EAP who prepared this EMPr and provides information on the expertise of the EAP.
4	Project Description and Listed Activities Covered by this EMPr	Provides a brief project description and describes the relevant project phases and the NEMA Listed Activities triggered.
5	Existing Environmental and Impact Assessment Summary	Summarises the biophysical, social, economic and cultural aspects of the existing environment, and provides a summary of the impact assessment outcome.
6	Persons Responsible for Implementing this EMPr	Provides information on the persons who will be responsible for implementing this EMPr, and explains requirements with regards to on-site communication, site instruction entries, method statements, and record keeping.
7	Recommendations of the EAP	Provides recommendations of the EAP with regards to the Planning and Construction, Operation and Decommissioning phases.
8	Environmental Awareness Plan	Provides information on environmental awareness and risk training, and basic rules of conduct. Also provides an environmental risk plan.
9	Impacts and Mitigation Measures	Provides EMPrs for the relevant project phases.
10	Emergency Response Plan	Provides information on the emergency response plan.
11	Incident Register	Stipulates the content requirements for incident registers.
12	Rehabilitation Measures and Closure Plan	Provides rehabilitation measures and closure plan objectives.

MAP OF THE PROPOSED ACTIVITY

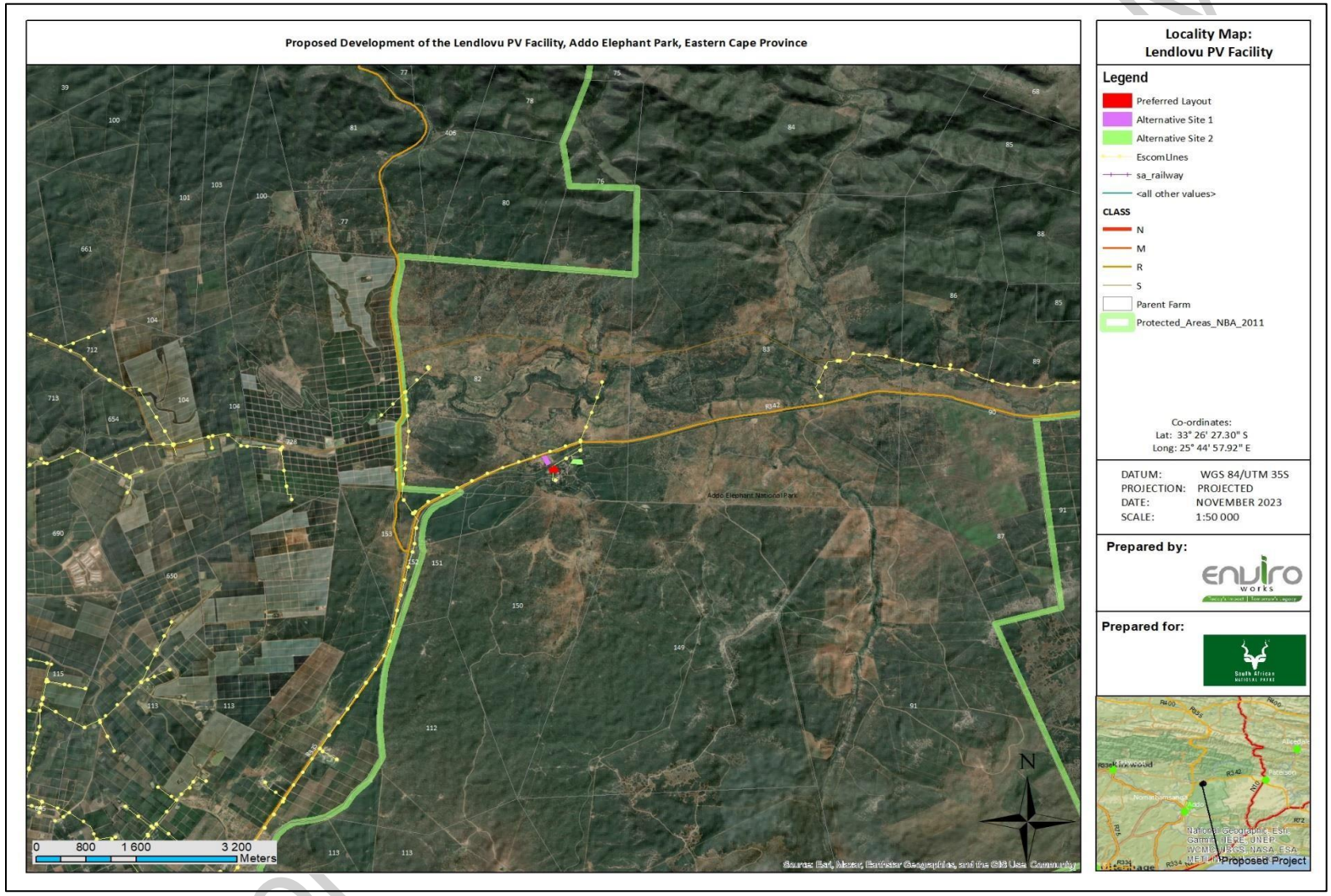


Figure 1: Locality Map of the Proposed Development

Contractor	Witness for Contractor	Employer	Witness for Employer

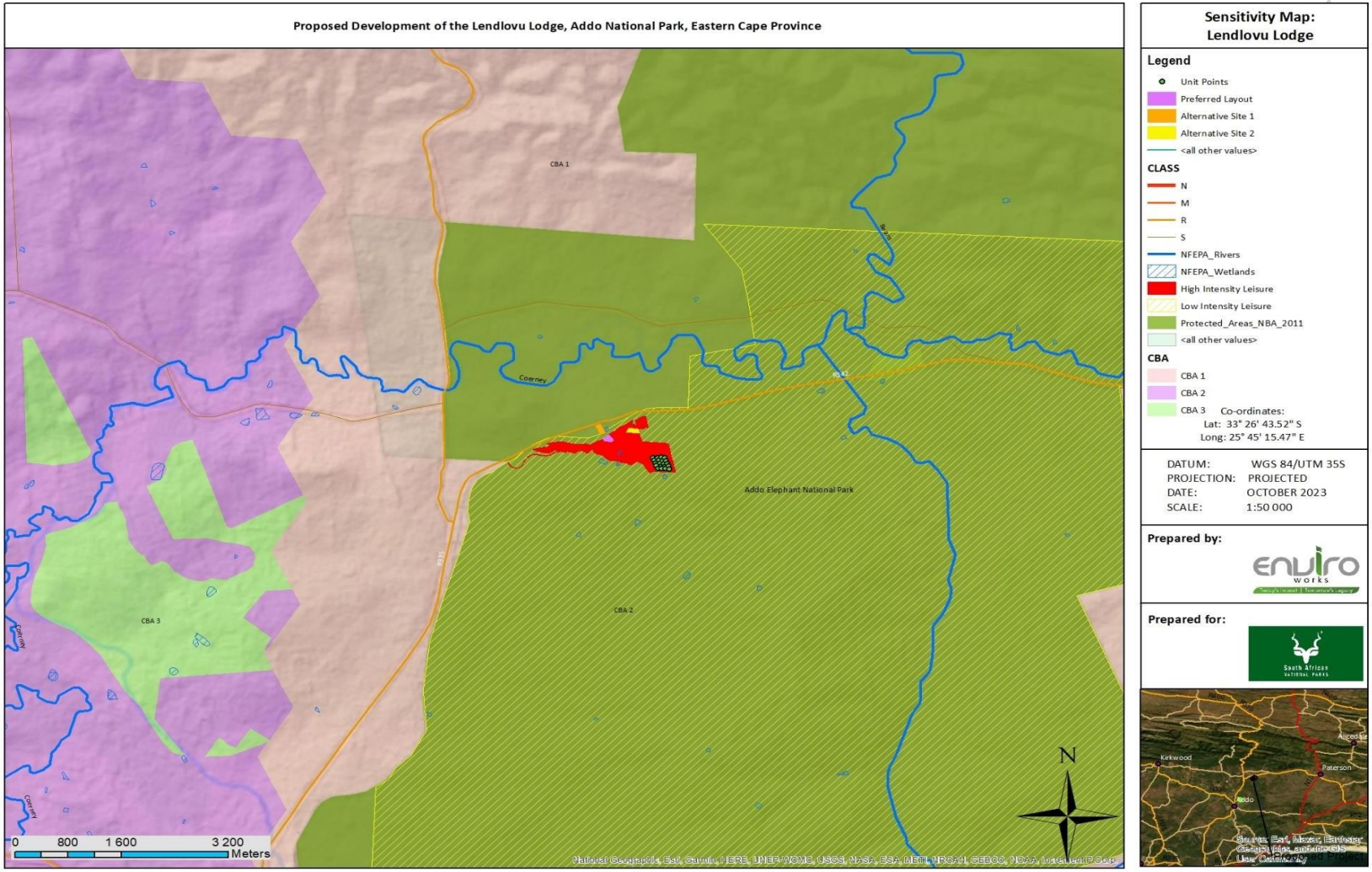


Figure 2:Sensitivity Map of the Proposed Area

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

ENVIRONMENTAL ASSESSMENT PRACTITIONER

This Environmental Management Programme Report was prepared by Michael Leach from Enviroworks, the Environmental Assessment Practitioner (EAP) who is undertaking this EIA process. The sections below provide the details of the EAP and explain the EAP's expertise to prepare this EMPr.

Details of the EAP

Business name of EAP:	Enviroworks
Physical address:	Unit 81, Millennium Business Park, 19 Edison Way, Century City, 7441
Postal address:	Suite 1064, Private Bag X2, Century City
Postal code:	7441
Telephone:	051 436 9675
E-mail:	michael@enviroworks.co.za
Fax:	086 601 7507

Expertise of the EAP

Name of EAP	Education qualifications	Professional affiliations	Experience at environmental assessments (yrs)
Michael Leach	BSc. Conservation Ecology (SU)	EAPASA: 2021/3872; IAIA 6051	5 years
Name of EAP (Reviewer)	Education qualifications	Professional affiliations	Experience at environmental assessments (yrs)
Elbi Bredenkamp	MSc. Botany (UFS)	EAPASA: 2019/2008	20 years

Curriculum Vitae of the EAP

Suite 1064, Private Bag X2, Century City, 7114
Unit 81, Millennium Business Park, 19 Edison Way, Century City
Cell 082 438 9744 I Fax 086 601 7507
michael@enviroworks.co.za I www.enviroworks.co.za

Michael Leach

RELEVANT QUALIFICATIONS

- Bachelor of Science in Conservation Ecology: University of Stellenbosch (2015)

Other Courses

- IAP2 Public Participation Training (31/10/2018)
- Snake Awareness: First Aid for Snakebite and Venomous Snake Handling (12/12/2020)

WORK EXPERIENCE – 4 Years

2016: Operations and maintenance (Cape Kaskar)
February 2017 – November 2017: Environmental Control Officer (Peninsula Permits)
June 2017 – August 2017: Field Assistant fynbos and Protea research (Post Graduate Students, SU)
November 2017 – February 2018: Field Assistant - Vegetation Mapping (Postdoctoral Student, SU)
May 2018 – Present: Environmental Consultant and Social Specialist (Enviroworks)

SOCIAL SPECIALIST EXPERIENCE

- Socio-Economic Impact Assessment as Part of The Application for The Amendment of The Existing Mine Right Held By Tja Naledi for The Mining of Sand, To Include Aggregate on Portion 4 of The Farm Woodlands 407, Ngwathe Local Municipality, Free State Province (Greenmined (Pty) Ltd) - 2019
- Social Impact Assessment for the Proposed Development of the Gromis-Nama-Aggeneis 400 Kv IPP Integration, Springbok, Northern Cape Province (Eskom Holdings SOC Ltd) - 2019/2020

BASIC ASSESSMENT EXPERIENCE

- Proposed Development of a Telecommunication Base Station and Associated Infrastructure on Portion 8 of The Farm Delta No. 1003, Groot Drakenstein, Western Cape Province (Coast to Coast) - 2018
- Proposed Development of New Sports Fields For Curro Holdings, on Portion 110 of The Farm Olifantsvlei No. 327, Johannesburg South, Gauteng Province (Curro Holdings) - 2018
- The Proposed Development of a Thirty Five Metre (35M) Telecommunication Base Station and Associated Infrastructure on Remaining Extent of Portion 13 of The Farm Van Aries Kraal No. 455, Grabouw, Western Cape Province (Coast to Coast) - 2019
- The Proposed Construction of a Curro School on Portion 54 of The Farm Blue Hills No. 397, Midrand, Gauteng Province (Curro Holdings) - 2019
- The Proposed Expansion of The Diesel Storage Capacity For Backup Power, on Erf 358, Midrand, Gauteng Province (Liquid Telecom (Pty) Ltd) - 2019
- The Proposed Development of a Backup Energy Centre Including Diesel Storage and Generators, on Erf 142504, Diep River, Cape Town, Western Cape Province (Liquid Telecom (Pty) Ltd) – 2020
- The Proposed Development of a Thirty Meter (30m) Telecommunication Base Station and Associated Infrastructure on Portion 87 of The Farm Langverwacht No. 241, Kuils River, Western Cape Province (Atlas Tower (Pty) Ltd) – 2020
- Proposed Upgrades to the Alpha 1 Recreational Lounge, Robben Island, Western Cape (Robben Island

Museum) – Current

- The Proposed Development of a Thirty Five Metre (35m) Telecommunication Base Station and Associated Infrastructure on Portion 42 of Farm 428, Plettenberg Bay, Western Cape Province (Atlas Tower (Pty) Ltd) – 2021
- The Proposed Development of a Twenty Five Metre (25m) Telecommunication Base Station and Associated Infrastructure on Lorraine Farm, The Remainder of Farm 790, Phillipi, Western Cape Province (Atlas Tower (Pty) Ltd) – 2021
- Rezoning and the Development of Fifteen (15) Resort Units on Portion 12 of the Farm Riet Valley No. 452, Gouritzmond, Western Cape Province (Hassequa Local Municipality) – Current

SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT EXPERIENCE

- Proposed Housing Development on the Farm Carolina No. 217, Great Kei Local Municipality, Eastern Cape Province (Department of Rural Development and Land Reform) – Current

ENVIRONMENTAL CONTROL OFFICER (ECO) EXPERIENCE

- Photographic and film shoots at various environmentally sensitive locations around Cape Town (Peninsula Permits) - 2017
- Periodic Maintenance of National Route 2 Section 4 between Swellendam and Riviersonderend, Western Cape Province (SANRAL) - 2018
- External Environmental Compliance Audit - The Periodic Maintenance of TR31 /1 (Km13.58-km45.02), TR 31/2 (Km2.16-Km 15.68) and MR0287 (Km 2.69-Km 14. 50) - Worcester to Robertson to Ashton (BVi Consulting Engineers) - 2019
- Development of an Electricity Switching Station on a Portion of Stellenbosch Farm St794/37, Somerset West (BVi Consulting Engineers) – 2020

ENVIRONMENTAL OFFICER EXPERIENCE

- Environmental Officer for Vestas Southern Africa (Pty) Ltd. - Oyster Bay Wind Farm - July 2020 – April 2021
- Environmental Officer for Vestas Southern Africa (Pty) Ltd. – Karusa Wind Farm and Soetwater Wind Farm – 2021

SCREENING ASSESSMENTS EXPERIENCE

- Screening for the Proposed Discarding of Milling Material at Three Stockpile Locations as Part of the Actophambili Road Works Along the R43 Between Worcester and Woseley, Western Cape. (Actophambili Roads) - 2019
- Improvement of the National Route R101 Section 08 From Bela Bela (0.0km) To Modimolle (26.8km), Limpopo Province (BVi Consulting Engineers Western Cape) - 2020
- The Improvement of National Road R516 Section 1 From R511 (Km 0.0) To Tooyspruit (Km 36.67), Limpopo Province (BVi Consulting Engineers Western Cape) - 2020
- The Improvement of National Road R516 Section 1 From Tooyspruit (Km 36.67) To Bela Bela (Km 83.8), Limpopo Province (BVi Consulting Engineers) – 2020

OTHER EXPERIENCE

- Youth Work – Teenage youth leader (Pinelands Baptist Church) - 2012 – 2020
- CDM Degassing Plant – Calibration and data capture (Promethium Carbon (Pty) Ltd) - 2018 – 2021
- Bird Monitor for the proposed Umsinde Emoyeni Wind Energy Facility, Murraysburg, Western Cape (Arcus Consulting) - April 2017

- Bird Monitor for the proposed Kap Vley Wind Energy Facility, Klienzee, Northern Cape (Arcus Consulting) - May 2017
- Field Assistant, Bat mast decommissioning, for the proposed Kap Vley Wind Energy Facility, Klienzee, Northern Cape (Arcus Consulting) - March 2018
- Residential Alien Invasive Species Report (Private) – 2019
- Plant Species Identification Report for The Widening of a the R60 Road Between Worcester and Ashton, Western Cape Province (BVi Consulting Engineers) - 2018

PROJECT DESCRIPTION AND LISTED ACTIVITIES COVERED BY THIS EMPr

Brief Project Description

The Addo Elephant National Park (AENP) is experiencing a growth in tourism demand due to its close proximity to the country's tourist hub of Port Elizabeth, allowing the development of unique and complementary visitor experiences and facilities.

Tourism programmes are aimed at the development, management, enhancement and provision of a range of sustainable tourism products to ensure a memorable experience for all park visitors. The high-level objective is to ensure that visitors have access to a range of unique and top-quality products and services that are competitively priced and in line with diverse and dynamic visitor needs.

South African National Parks (SANParks) wish to develop within the AENP to facilitate and accommodate the growth in tourism that is being experienced.

Moreover, this development is part of a community compensation project because the proposed development site has a land claim lodged by the local community. A portion of the profit generated from the operational activities of the proposed lodge will be used as a settlement for the land claim. This development forms part of SANParks' Land Claim Program and is therefore, directly aligned with their Socio-Economic goals.

Due to the aforementioned motivation for the proposed development, the following infrastructure will be developed (please see Figure 3):

- 20 x single tourist accommodation units (2 people per unit)
- Associated infrastructure, i.e. roads and bulk services (water, electricity and sewerage) as follows:

  - 4m wide paved road, 1 450m long concrete block paved road with sunken kerbs
  - 20 x concrete block paved driveway and parking areas adjacent to the unit (35m2 each)
  - Central Boma with ablution facility
    - Sewer pipeline of 1 400m gravity network to connect to the new wastewater treatment system
    - Electrical and water reticulation to new units and connect to existing services

In addition to the above development, SANParks also propose the development of a Photo Voltaic Solar Supply system adjacent to the lodge. The details of the PV solar supply system are as follows (see illustrations of the three alternatives in Figure 4):

General:

- **Electrical Power required -**
  - 650 kW - 850 kW
- **Area required to accommodate PV Solar Modules**
  - 11,287.5m²

Location Of PV Solar Plant

- **Preferred Option –**

- Location description:
- Located north of the Addo Reception between the existing Waste Water Treatment Plant, Technical Work Shops and Staff Village.
- **GPS Coordinate:** 33°26'32.12"S 25°44'43.86"E

- **Area required/available:**

- For PV Solar Plant: 11,500m² (1.15 Ha)
- Relocation of road: 1,100m² (0.11 Ha)
- Total area required: 13,700m² (1.37 Ha)

- **Note / Other:**

- The existing gravel access road which provide access to the existing Waste Water Treatment Plant would need to be relocated in order to provide free access to operate and service the plant.
- This position is ideal as it is close the point where it needs to feed into for distribution by the Rest Camp Electrical Network.

- **Alternative Option 1 –**
  - **Location description:**
    - Located north of the existing Main Rest Camp, between the R342 road
    - linking Addo Town with Paterson, and Transnet Rail Road.
    - **GPS Coordinate:** 33°26'26.97"S 25°44'39.03"E
  - **Area required/required:**
    - For PV Solar Plant: 11,500m² (1.15 Ha)
  - **Note / Other:**
    - The PV Solar Plant would be located next to a very huge Eskom Sub-Station or distribution network.
    - The PV Solar plant is further away than the preferred position and both the R342 and Transnet Rail Road would need to be crossed.
    - This position would also be outside the existing secured area.

- **Alternative Option 2 –**
  - **Location description:**
    - Located north east of the Staff Village and south of the “boma”.
    - GPS Coordinate: 33°26'27.21"S 25°44'57.85"E
  - **Area required/required:**
    - For PV Solar Plant: 11,500m² (1.15 Ha)

  - **Note / Other:**
    - The PV Solar Plant would be located next to the boma where animals are kept for either preparation for transport, nursing and medical treatment or general monitoring.
    - The PV Solar plant is further away than the preferred position and both.

Figure 3: Visual impression of the proposed Lendlovu Lodge and the accommodation units

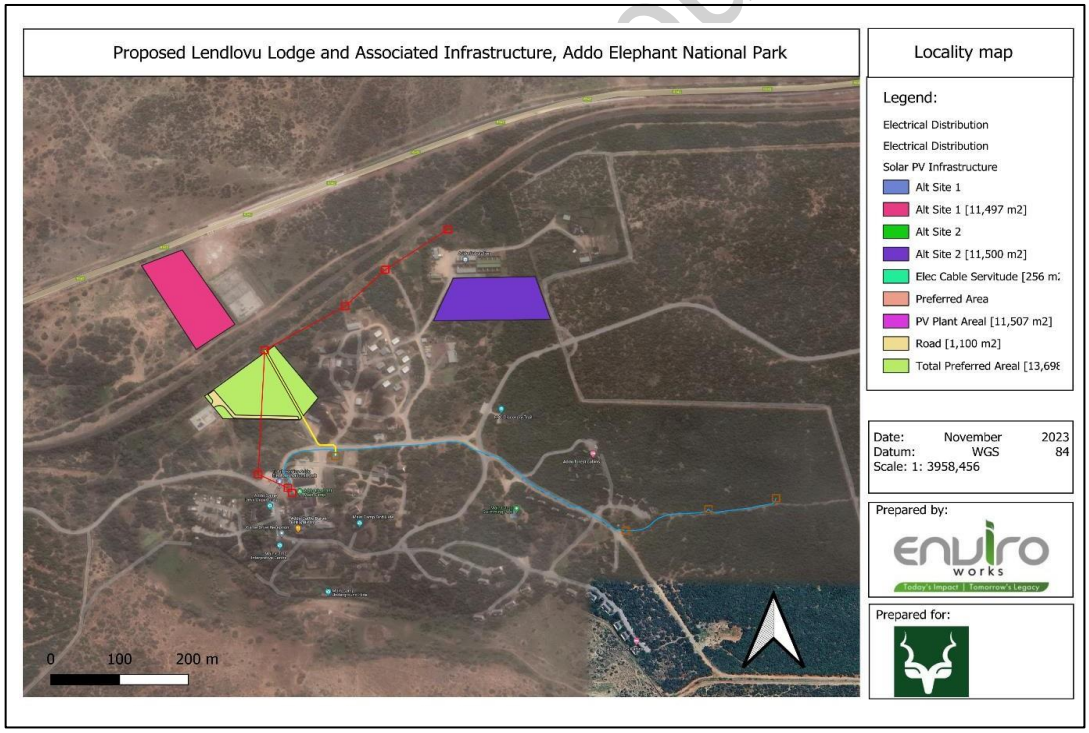


Figure 4 Visual impression of the proposed Lendlovu Lodge solar PV Plant

Project Phases

Three phases:

Contractor	Witness for Contractor	Employer	Witness for Employer

Construction Phase (includes planning, design, pre-construction and construction activities);
Decommissioning Phase.

NEMA Listed Activities Triggered

The NEMA EIA Listed Activities (as per the NEMA EIA Regulations Listing Notices 1, 2 and 3 of 2017, as amended) that will be triggered by the proposed project are listed in the table below.

Table 3: Listed Activities applicable to this application.

Listed Activity as described in GN R. 327 of 07 April 2017 (LN 1)	**Description of project activity**
Activity 1(ii): The development of facilities or infrastructure for the generation of electricity from a renewable resource where- (ii) the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare;	The proposed development will include the development of a solar photovoltaic plant (with a capacity of under 10MW) which will cover an area of more than 1 hectare.
Activity 27: The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation	The proposed development will include the development of a solar photovoltaic plant (with a capacity of under 10MW) and a resort lodge which result in the clearance of more than 1 hectare, but less than 20 hectares of indigenous vegetation
Listed Activity as described in GN R. 324 of 07 April 2017 (LN 3)	**Description of project activity**
Activity 12: The clearance of an area of 300 square meters or more of indigenous vegetation. a. Eastern Cape v. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.	The proposed development will have a combined footprint of approximately fourteen thousand square metres (140000 m2). In order to develop the new Lendlovu Lodge, more than three hundred square meters (300m2) of indigenous vegetation will be cleared.
Activity 6 The development of resorts, lodges, hotels, tourism or hospitality facilities that sleeps 15 people or more. Eastern Cape i. Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding conservancies	The proposed development includes the development of tourism hospitality facilities which will have a capacity to sleep approximately forty (40) people within a Protected Area.

EXISTING ENVIRONMENTAL AND IMPACT ASSESSMENT SUMMARY

The sections below summarise the existing environment, and the outcome of the impact assessment that was undertaken for the proposed project.

The Receiving Environment

The area falls within the Albany Thicket biome and the proposed development site is characterised by Sundays

Valley Thicket . The site falls within a Protected Area, namely the Addo Elephant National Park. The Sundays Valley Thicket vegetation consist of tall, dense thicket, with succulents, shrubs and trees widespread, with many spiny species. Spekboom (Portulacaria afra) is locally dominant. Sundays River Valley vegetation covers a large area, extending from the coast, just east of Gqeberha to Colchester up to Paterson and then west past Kirkwood, interspersed with patched of other vegetation types The Sundays Valley Thicket is classified as Least threatened as large areas are protected in the AENP and other reserves. Approximately 11.86% of the vegetation type has already been transformed through cultivation and urban development. The conservation target for the vegetation type is 19%.

The proposed site for the accommodation units and boma facility slopes from east to west. Vegetation on the site is dominated by dense thicket with little to no degradation interspersed with patches of bare soil. The area is bordered by a dirt road and game fence. The accommodation units will be spaced throughout the development site, and the vegetation in between them will be retained to screen the units. Each unit will have a size of approximately two hundred and thirty square metres (230 m²). The new boma facility will be located in the north-eastern corner of the development footprint and will cover an area of approximately two thousand square metres (2000 m2). The road network connecting the accommodation unit and boma will have an area of eight thousand square metres (8000 m2). In total, the Lendlovu Lodge development will have an area of approximately fourteen thousand square metres (14 000 m2).

Public Participation
To support public interest and inform the EIA process, a public consultation process proceeded throughout the lifetime of the assessment. A diverse mix of authorities, stakeholders and interested and affected parties were consulted during this time, representing the environment, social, economic and political realms of local and regional and national bodies.

Comments were responded to during various stages of the public participation process in the Basic Assessment Report and were addressed in project reports as relevant. It is considered that through public participation conducted by the EAP, parties had an adequate opportunity to partake in this process and all concerns were addressed to ensure that all parties are in agreement with the proposed development.
Specialist Investigations

Ecological Impact Assessment (de Kock, 2023)

The following recommendations are identified in the Ecological IA:

- All relevant permits must be obtained from the competent authorities to remove any protected plant and/or animal species.
- No construction activities will be allowed outside the demarcated footprint.
- All construction areas must be surveyed by a qualified botanist prior to commencement of vegetation removal.
- Vegetation Search and Rescue must be undertaken for construction areas.
- The construction footprint must be surveyed and demarcated prior to construction commencing.
- Permits must be obtained to remove all plant Species of Conservation Concern (SCC).
- A nursery will not be required. Relocated SCC can be replanted in areas with similar vegetation outside the construction site.
- No plant harvesting by construction staff will be allowed.
- Permits must be obtained to remove any animal SCC.
- Relocate as many SCC as possible, especially reptiles by a qualified Snake Handler in the case of

Reptiles.

- Relocated animals must be released in areas of similar habitats near the site of removal.
- A faunal specialist (or Park Ranger) must daily inspect the construction footprint during construction for faunal species stuck within the footprint.
- No poaching by construction staff will be allowed.
- Develop an Alien Vegetation Management Plan to mitigate the establishment and spread of undesirable alien plant species during construction.
- All visible alien plants must be removed prior to top and subsoil removal. Removal must occur through appropriate methods such as hand pulling, application of chemicals, cutting, etc. as in accordance with the NEMBA: Alien Invasive Species Regulations.

Heritage Screening Assessment (Kaplan, 2021 and 2023)

Given the anticipated low impact of the proposed Lendlovu Lodge and Solar Plant Development on archaeological resources, there are no objections to authorisation of the proposed project. It is therefore recommended that exemption from further specialist archaeological studies and mitigation be granted, with the following conditions.

1. If concentrations of archaeological resources (i. e. stone tools), unmarked human remains, or caches of ostrich eggshell water containers for example, are uncovered during vegetation clearing and construction, all work must immediately cease, and the finds reported to the South African Heritage Resources Agency (SAHRA) (021 642 4502), so that appropriate mitigation action may be undertaken. Burials must not be removed until inspected by a professional archaeologist.
2. The Environmental Control Officer (ECO) as well as the contractor must be informed prior to construction activities commencing, of the possible types of heritage sites and cultural material they may encounter and the procedures to follow when such sites are encountered.

Palaeontological Assessment Impact Assessment (Almond, 2021; Nel, 2023)
The following recommendations are put forth:

- Although no fossil material was identified within the site areas, it is possible that during excavation valuable fossil wood or dinosaurs could be unearthed.
- It is rather unlikely to uncovered a dinosaur fossil, however this is not excluded. Fossilised wood is abundant within the area.
- The fossilised wood slabs located at Point 22 (GPS coordinates: 33°26'26.99"S 25°44'52.77"E) should be protected and no construction should hinder the fossil until the appropriate mitigation (collection permit) has been granted.
- There are no objections on palaeontological heritage grounds to authorise the proposed development within the boundaries of the site areas.
- The ECO should be aware of any fossils (trace fossils, plants, bones etc.) that may be present, or any fossils that may be uncovered during excavation of the underlying strata.
- The construction managers should be aware of any fossils that may be present, and if any fossils are discovered during the construction phase the fossils should be safeguarded and a qualified palaeontologist should immediately be notified.
- The remains of trace fossils, plants, vertebrates are all of palaeontological interest and must be
- recorded and sampled by the palaeontologist at the developer's expense.

Visual Impact Assessment (du Plessis, 2021 and 2023)

The following recommendations are identified in the Visual IA:

Construction Phase:

- Access roads are to be kept clean;
- Site offices and structures should be limited to one location and carefully situated to reduce visual intrusions. Roofs should be grey and non-reflective;
- Construction camps as well as development areas should be screened with netting;
- Lights within the construction camp should face directly down;
- Vegetation clearance should be limited to the development footprint only;
- Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact;
- All areas disturbed by construction activities must be subject to landscaping and rehabilitation;
- All spoil and waste will be disposed to a registered waste site and certificates of disposal provided;
- The project must be timed so that rehabilitation can take place at the optimal time for vegetation establishment;
- Signage, if essential, should be discrete and confined to entrance gates. No corporate or advertising signage must be permitted.
- Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare; and,
- Mitigation of visual impacts associated with the construction phase would entail proper planning, management and rehabilitation of the construction site. Mitigation measures include the following:
- Reduce the time of construction through careful planning of logistics and ensure the productive implementation of resources;
- Limit disturbance of the environment to the development footprint; and,
- Limit construction activities to business hours (07:00 – 17:00).

Environmental Impact Ratings

PLANNING, DESIGN AND CONSTRUCTION PHASE

Planning, design and construction phase	**Preferred Site and Layout (Alternative 1)**		**Alternative Layout or Design (Alternative 2)**		**Alternative Layout or Design (Alternative 3)**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
	All visible alien plants must be removed prior to top-and subsoil removal. Removal must occur through appropriate methods such as hand pulling, application of chemicals, cutting, etc. as in accordance with the NEMBA: Alien Invasive Species Regulations.						
Nature of impact: Dust nuisance generated by the operation of machinery and vehicles.	**Activity:** The frequent upwelling of dust as consequence of the movement of vehicles and machinery on site may impact on worker health causing asthma and other respiratory conditions. Stockpiles are susceptible to the upwelling of fine particulate matter. Several ambient factors, the terrain characteristics, soil type and land use forms can attribute to the degree of loss and susceptibility of stockpiles towards the generation of dust. Regular watering of exposed surfaces may result in the reduction of wind-generated dust from stockpiles.						No impact will occur as the development activities will not take place. Vegetation and habitat features of the proposed development site will remain unaffected.

Significance rating:	M	L	M	L	M	L	-
Cumulative impact:	-	-	-	-	-	-	-
Proposed Mitigation:	• Implement dust suppression measures by watering areas to be cleared as well as already exposed surfaces with damaged soil particles, particularly during dry, windy periods; • Ensure all vehicles remain on designated roads and avoid the opening of detour or by- pass tracks; • Implement speed restrictions for vehicles on gravel roads; • Manage and maintain roadside vegetation to allow for absorption of runoff from road surfaces during and after rainy periods; and, • After construction, if access roads or portions thereof will not be of further use to SANParks, remove all foreign material and rip area to facilitate the establishment of vegetation, followed by a suitable revegetation program.						N/A
POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS:							
Nature of impact: The creation of job opportunities during the construction phase.	**Activity:** The construction period will create a few job opportunities for individuals residing in the area of the AENP						No construction phase impacts are associated with the no- go alternative thus no assessment has been undertaken.
Significance rating:	**L(+)**	**L(+)**	**L(+)**	**L(+)**	**L(+)**	**L(+)**	-
Cumulative impact:	-	-	-	-	-	-	-
Proposed Mitigation:	• Where reasonable and practical the contractors appointed by the Applicant must appoint local contractors and implement a “local first” policy, especially for semi and low-skilled job categories. However, due to the low skill levels in the area, the majority of skilled posts are likely to be filled by personnel from outside the area;						N/A

Planning, design and construction phase	Preferred Site and Layout (Alternative 1)		Alternative Layout or Design (Alternative 2)		Alternative Layout or Design (Alternative 3)		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	The recruitment selection process should seek to promote gender equality and the employment of women wherever possible, particularly for less labour-intensive work such as flag bearing and supervision; and, The ongoing presence of semi- and high-skilled personnel involved in the project construction phase will generate sustained clientele to a portion of the construction industry within the vicinity of the development.						
Nature of impact: Occupational Health and Safety.	**Activity:** During the construction phase, accidents, occupational diseases, ill health and damage to property can occur if pre-cautionary measures are not taken. Increased movement of vehicles may lead to accidents. As construction will take place in an area with wild animals, thus construction staff may be bitten or stung.						No construction phase impacts are associated with the no- go alternative thus no assessment has been undertaken.
Significance rating:	**M**	**L**	**M**	**L**	**M**	**L**	-
Cumulative impact:	-	-	-	-	-	-	-
Proposed Mitigation:	• Induction training should highlight the potentially dangerous conditions, including the possibility of encountering snakes; • Only suitably qualified/experienced personnel may remove faunal species from the construction site if required; • Caution must be exercised when lifting construction material off the ground which has stood for a while as snakes or other animals may have sought shelter beneath the material; • The Contractor shall comply with all standard and legally required health and safety regulations; • The Contractor shall provide a standard first aid kit at the site offices; • There must be a Safety Officer on site who has first aid training and knowledge of safety procedures; • The Contractor shall provide the appropriate Personal Protective Equipment for staff; and, • The Contractor must have insurance cover for the workmen.						N/A
POTENTIAL IMPACTS ON CULTURAL-HISTORICAL ASPECTS:							
Nature of impact: Damage and destruction of fossils during excavation activities.	**Activity:** Disturbance, damage or destruction of scientifically-valuable fossil heritage preserved at or beneath the ground surface within the development footprint during the construction phase due to surface clearance and excavations into bedrock.						No construction phase impacts are associated with the no- go alternative thus no assessment has been undertaken.

Significance rating:	L	L	L	L	L	L	-
Cumulative impact:	-	-	-	-	-	-	-

Planning, design and construction phase	**Preferred Site and Layout (Alternative 1)**		**Alternative Layout or Design (Alternative 2)**		**Alternative Layout or Design (Alternative 3)**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Proposed Mitigation:	• A representative sample of fossil wood blocks exposed at a surface within the project area should be collected in the pre-construction phase by a professional paleontologist for curation and display in the Addo Elephant National Park Interpretive Centre; • Any further substantial fossil remains (e.g. vertebrate bones, shells, fossil wood) encountered during excavation should be safeguarded in situ and reported to Eastern Cape Provincial Heritage Resource Authority for possible mitigation by a professional Paleontologist (Contact details: Mr Sello Mokhanya, 74 Alexander Road, King Williams Town 5600; Email: smokhanya@ecphra.org.za); • A Chance Fossil Finds Protocol to be appended to the Construction EMPr and implemented should any substantial fossil remains be uncovered; • Fossil material must be curated in an approved repository (e.g. National Park Interpretive Centre, museum / university collection) and all fieldwork and reports should meet the minimum standards for paleontological impact studies developed by SAHRA (2013); • No heritage structures may be marked or damaged; • Should any heritage resources (including but not limited to fossil bones, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and other built features, rock art and rock engravings) be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped. A trained Paleontologist or Heritage Specialist must be notified to assess the finds, and this must then be reported to the applicable Heritage Authority and the following details must be provided: o Date; o Position of the excavation (GPS) and depth; o A description of the nature of the find; o Digital images of the excavation showing vertical sections (sides) and the position of the find showing its depth/location in the excavation; o A reference scale must be included in the images (tape measure, ranging rod, or object of recorded dimensions); and, o Close-up, detailed images of the find (with the scale included); and, • All operators of excavation equipment must be made aware of the possibility of the occurrence of sub-surface heritage features. If any heritage artefacts are discovered the following procedures must be followed: o All construction in the immediate 50 m vicinity radius of the site must cease; o The Heritage Practitioner must be informed as soon as possible; o In the event of obvious human remains SAPS must be notified; o Mitigation measures (such as refilling, etc.) must not be attempted; o The area in a 50 m radius of the find must be cordoned off with hazard tape; and, Public access must be limited and the area must be placed under guard.						N/A

POTENTIAL VISUAL IMPACTS:							
Nature of impact: Impact on the sense of place for tourists.	**Activity:** The movement of construction vehicles, machinery and personnel on site shall result in a visual impact for tourists visiting the Addo Elephant National Park. Furthermore, the storage of construction materials shall result in disturbance and an unsightly character.						No construction phase impacts are associated with the no- go alternative thus no assessment has been undertaken.
Significance rating:	L	L	L	L	L	L	-
Cumulative impact:	-	-	-	-	-	-	-

Planning, design and construction phase	**Preferred Site and Layout (Alternative 1)**		**Alternative Layout or Design (Alternative 2)**		**Alternative Layout or Design (Alternative 3)**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Proposed Mitigation:	• Access roads are to be kept clean; • Site offices and structures should be limited to one location and carefully situated to reduce visual intrusions. Roofs should be grey and non-reflective; • Construction camps as well as development areas should be screened with netting; • Lights within the construction camp should face directly down; • Vegetation clearance should be limited to the development footprint only; • Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact; • All areas disturbed by construction activities must be subject to landscaping and rehabilitation; • All spoil and waste will be disposed to a registered waste site and certificates of disposal provided; • The project must be timed so that rehabilitation can take place at the optimal time for vegetation establishment; • Signage, if essential, should be discrete and confined to entrance gates. No corporate or advertising signage must be permitted. • Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare; and, • Mitigation of visual impacts associated with the construction phase would entail proper planning, management and rehabilitation of the construction site. Mitigation measures include the following: o Reduce the time of construction through careful planning of logistics and ensure the productive implementation of resources; o Limit disturbance of the environment to the development footprint; and, o Limit construction activities to business hours (07:00 – 17:00).						N/A

POTENTIAL IMPACTS ON NOISE ASPECTS:							
Nature of impact: Noise nuisance generated by construction works, vehicles and personnel.	**Activity:** The operating of vehicles and machinery on site results in the generation of noise disturbing tourists and animals in the surrounding area.						No construction phase impacts are associated with the no- go alternative thus no assessment has been undertaken.
Significance rating:	M	L	M	L	M	L	-
Cumulative impact:	M	L	M	L	M	L	-
Proposed Mitigation:	• As far as possible, the construction of the accommodation units and boma should be undertaken outside of the peak tourist seasons; • Limit working hours of noisy equipment to daylight hours; • All stationary noisy equipment such as compressors and pumps should be contained behind acoustic covers, screens or sheds where possible; • The regular inspection and maintenance of equipment must be undertaken to ensure that all components are functioning optimally; • Where recurrent use of machinery is frequent, machines should be shut down during intermediate periods; • No hooting; • Fit silencers to equipment;						N/A

Planning, design and construction phase	**Preferred Site and Layout (Alternative 1)**		**Alternative Layout or Design (Alternative 2)**		**Alternative Layout or Design (Alternative 3)**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
	• Unless otherwise specified by the ECO, normal work hours will apply (i.e. from 07:00 to 17:00, Mondays to Fridays and Saturdays 07:00 – 13:00); • Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours; • No loud music is permitted on site or in the Camp; • A Complaints Register must be maintained and the timing and nature of construction activities adjusted in response to potential complaints; and, • Guests must be made aware of the construction activities and the potential inconvenience.						

DECOMMISSIONING PHASE

Decommissioning phase	Preferred Site and Layout (Alternative 1)		Alternative Layout or Design (Alternative 2)		Alternative Layout or Design (Alternative3)		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
		POTENTIAL IMPACTS ON GEOGRAPHICAL AND PHYSICAL ASPECTS:					
Nature of impact: Negative impact of haphazard placement of infrastructure on the environment.	**Activity:** The establishment of a main site office and storage site during the decommission period will ensure that the poor placement of materials and infrastructure will be avoided. This could also result in the damage or pollution to surrounding areas caused by decommissioning activities.						No decommissioning phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	M	L	M	L	-
Cumulative impact:	-	-	-	-	-	-	-
Proposed Mitigation:	• Draw up and submit for approval to the Environmental Control Officer (ECO), a Site Layout Master Plan. This plan must show the final positions of laydown areas and the extent of all permanent and temporary site structures and infrastructure; • The planning for layout must be done in consultation on-site with the Environmental Control Officer (ECO) and Addo Elephant Park Management. The Site Layout Master Plan must be submitted to the ECO for approval at least seven days before the planned decommissioning commencement date; • The contractor may not deface, paint, damage or mark any natural features situated in or around the site for survey or other purposes; • The contractor must ensure that all construction personnel, labourers and equipment remain within the demarcated decommissioning site at all times; • Location of storage areas may not be situated in such a manner that they obstruct roads or pathways; • No infrastructure or equipment is to be placed on vegetated areas; • No vehicles to be parked on vegetated areas; • Location of storage areas must take into account prevailing winds, distance to water bodies and general on-site topography; • No servicing of vehicles or machinery may be permitted at the proposed decommissioning site. Any servicing of vehicles or machinery must take place in a designated area and on a sealed surface to prevent soil contamination; • Place infrastructure as far as possible on sites that have already been transformed; • Facilities may not be used as staff accommodation; • The Contractors camp layout must take into account availability of access for deliveries and services and any future works; • The Contractors camp must be of sufficient size to accommodate the needs of all sub-contractors that may work on the project; • The Contractor must identify, in their site plan, infrastructure within the proposed decommissioning, which must not be damaged. The Contractor's plan must include measures to address incidents should the infrastructure be damaged; and, • The Contractor must implement the following as required: o Suitable sanitation facilities, adequate for the number of staff on site (1 for every 15 personnel and 1 for each gender); and, o Facilities for solid waste collection.						N/A

Nature of impact: Topsoil Removal and Soil Erosion	**Activity:** The clearing of topsoil and excavation for the removal of building foundations may result in the destruction of fertile topsoil.						No decommissioning phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	**M**	**L**	**M**	**L**	**M**	**L**	-
Cumulative impact:	-	-	-	-	-	-	-
Proposed Mitigation:	• Remove topsoil approximately 300mm deep from establishment area and stockpile areas; • Topsoil stockpiles to be kept free from weeds; • Topsoil stockpiles to be placed on a levelled area and measures to be implemented to safeguard the piles from being washed away in the event of heavy rain/storm water; • Topsoil needs to be stored on designated areas only. This needs to be planned and indicated in the site-layout plan; • Ensure that topsoil is not mixed with subsoil and/or any other excavated material; • Provide containment and settlement facilities for effluents from concrete mixing and washing facilities; • Temporarily stored topsoil must be re-applied within 6 months, topsoil stored for longer needs to be managed according to a detailed Topsoil Management Plan;						N/A

Decommissioning phase	**Preferred Site and Layout (Alternative 1)**		**Alternative Layout or Design (Alternative 2)**		**Alternative Layout or Design (Alternative3)**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
	Provide spill containment facilities for hazardous materials like fuel and oil; and, Topsoil must be used in all rehabilitation activities and may not be compacted to ensure that its plant support capacity remains of high quality.						
Nature of impact: Surface and/or groundwater contamination due to decommissioning activities such as the use of hazardous materials on site e.g. cement, fuel and/or oil.	**Activity:** Spills could possibly occur on site and lead to the contamination of soil and, groundwater/surface water.						No decommissioning phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	M	L	M	L	-
Cumulative impact:	L	-	L	-	L	-	-

Contractor	Witness for Contractor	Employer	Witness for Employer

<table>
<tr><td>Proposed Mitigation:</td><td colspan="6">• Upon completion of decommissioning works all waste and rubble must be removed from site;
• Concrete must be mixed on mixing trays only and not on exposed soil. Concrete must only be mixed in areas which have been specially demarcated for this purpose (preferable where no natural vegetation occurs);
• Material Safety Data Sheets (MSDSs) must be available on site for all chemicals and hazardous substances to be used on-site, including information on their ecological impacts and how to minimise the impacts in case of leakage;
• All spillage must be cleaned up immediately after they have occurred;
• Spillage of concrete on any uncovered areas must immediately be scrapped up and appropriately disposed of;

• An event resulting in the spillage of a hydrocarbon and/or other hazardous substance, in terms of the Section 30 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) (as amended), must be reported to the Department of Forestry, Fisheries, Environmental (DFFE) Director General. All the necessary documentation must be completed and submitted to the authorities mentioned within the prescribed timeframes. This must include the reporting, containment and clean-up procedure;
• Vehicles and machinery must be maintained to avoid leakages;
• The discharge of any pollutants such as cement, concrete, lime, chemicals, etc. into the natural environment and the storm water system must strictly be prohibited;
• Fuel and chemical storage must be done within a designated area only, which is properly bund and able to contain 110% of the capacity of fuel or chemicals stored within;
• Construction vehicles must be inspected every morning before work commence to ensure that no leakages occur;
• All personnel must receive induction on how to report spillages, contain them and treat them accordingly;
• Spill kits must be available at each working station;
• Drip trays must be placed beneath all construction equipment that is stationary on site or within the site camp;
• Hazardous waste must be stored in bins with a lid in a demarcated waste area, and must be disposed of at a hazardous treatment facility with records on file;</td><td>N/A</td></tr>
<tr><td rowspan="2">Decommissioning phase</td><td colspan="2">Preferred Site and Layout (Alternative 1)</td><td colspan="2">Alternative Layout or Design (Alternative 2)</td><td colspan="2">Alternative Layout or Design (Alternative3)</td><td rowspan="2">No-Go Alternative</td></tr>
<tr><td>Before Mitigation</td><td>After Mitigation</td><td>Before Mitigation</td><td>After Mitigation</td><td>Before Mitigation</td><td>After Mitigation</td></tr>
<tr><td></td><td colspan="6">• General waste and hazardous waste must not be mixed and must be disposed of separately. If general waste is contaminated with hazardous waste all the waste must be treated as hazardous waste and disposed as such; and,

• A register must be kept of the quantities of waste disposed and proof of safe disposal (by the contractor), at an authorised waste disposal facility, must be retained by the Applicant and be available at the site office.</td><td></td></tr>
<tr><td>Nature of impact:
Handling of general waste materials on the decommissioning and threat to fauna.</td><td colspan="6">Activity:
The presence of personnel and decommissioning operations on site will increase the likelihood of littering and the dumping of solid waste.</td><td>No decommissioning phase impacts are associated with the no-go alternative thus no assessment has
been undertaken.</td></tr>
<tr><td>Significance rating:</td><td>M</td><td>L</td><td>M</td><td>L</td><td>M</td><td>L</td><td>-</td></tr>
</table>

Cumulative impact:	M	L	M	L	M	L	-
Proposed Mitigation	• The Contractor must submit a waste management plan; • An adequate number of scavenger proof litter bins are to be placed throughout the site. Two waste bins at least must be present, one (1) for hazardous waste and one (1) for non-hazardous waste at each working site. Dumping of waste on site is prohibited; • All bins must have a lid to prevent windblown litter; • General waste and hazardous waste must not be mixed and must be disposed of separately. If general waste is contaminated with hazardous waste all the waste must be treated as hazardous waste and disposed as such; • The importance of appropriately disposing waste must be highlighted in induction training for decommission personnel; • Waste sorting and separation must form part of the environmental induction and awareness programme, to encourage personnel to collect wastepaper, glass and metal waste separately; • Keep all work sites including storage areas, offices and workshops neat and tidy; • Dedicate a demarcated and signposted storage area on site for the collection of decommission waste; • All general and domestic waste is to be removed from site; • Care must be taken to ensure that no waste falls off disposal vehicles on-route to the drop-off area. If needed, a tarpaulin can be utilised; • The burning or burying of solid waste on site is prohibited. Do not burn PVC pipes or other plastic materials, as this is regarded as hazardous waste; • Littering by decommission workers shall not be permitted; • General refuse/rubbish shall be removed from site at least on a weekly basis; • Material removed from the decommissioning footprint must be appropriately disposed at an appropriately licensed waste disposal facility; • Portable ablution facilities must be utilised, and these must be serviced by a registered service provider, cleaned at least once a week, and safe disposal slips must be on file at the site office; • One (1) toilet must be provided for every fifteen (15) personnel and one (1) for every gender on site; • The DEO must inspect the decommissioning site and storage area at the end of each day for any litter. Litter should be cleaned up on a daily basis, even if litter is not from construction personnel; • The Contractor will be responsible for the removal of all waste from site;						N/A
Decommissioning phase	**Preferred Site and Layout (Alternative 1)**		**Alternative Layout or Design (Alternative 2)**		**Alternative Layout or Design (Alternative3)**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
	• Hazardous waste must be disposed of at a hazardous treatment facility, records and proof of safe disposal must be kept; and, • A register must be kept of the quantities of waste disposed and proof of safe disposal (by the contractor), at an authorised waste disposal facility, must be retained by the Applicant and be available at the site office.						

Nature of impact: Increased risk of veld fires.	**Activity:** Due to the presence of construction personnel in natural areas, fires can occur if not managed to the correct standard.						No decommissioning phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	M	L	M	L	-
Cumulative impact:	-	-	-	-	-	-	-
Proposed Mitigation:	• The Contractor shall take all reasonable and precautionary steps to ensure that fires are not started as a consequence of the activities on site; • Ensure the work site and the contractor's camp is equipped with adequate firefighting equipment. This includes at least rubber beaters when working in veld areas, and at least one fire extinguisher of the appropriate type irrespective of the site; • Workers must be adequately trained in the handling of firefighting equipment, and can include but not limited to: • Regular fire prevention talks and drills; and, • Posting of regular reminders to staff; • No open fires are permitted anywhere on site; • Do not store any fuel or chemicals under trees; • Do not store gas and liquid fuel in the same storage area (Hazardous substances to be stored in accordance with SANS); • Any fires that occur on site shall be reported to the ECO immediately and then to the relevant authorities; • In the event of a fire, the Contractor shall immediately employ such plant and personnel as is at his disposal and take all necessary action to prevent the spread of the fire and bring it under control; • Do not permit any smoking within 3m of any fuel or chemical storage area, or refuelling area. • A designated smoking area must be established on site and the disposal of cigarette butts in dedicated bins must be enforced; and, • All construction vehicles must be fitted with at least one fire extinguisher.						N/A
Nature of impact: Biological impacts associated with the movement of construction vehicles on site.	**Activity:** The movement of vehicles on site may result in the destruction of biodiversity and mortalities of fauna on site.						No decommissioning phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	M	L	M	L	-
Cumulative impact:	M	L	M	L	M	L	-

Decommissioning phase	Preferred Site and Layout (Alternative 1)		Alternative Layout or Design (Alternative 2)		Alternative Layout or Design (Alternative3)		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Proposed Mitigation:	• All construction vehicles to strictly remain on designated roads or within demarcated decommissioning areas; • During decommissioning create designated turning areas and strictly prohibit any off-road driving or parking of vehicles and machinery outside designated areas; • Construction personnel are to be informed during induction training of the need to be vigilant when driving, looking out for any fauna species, such as tortoises, that may be crossing roads; • A 30 km/h speed limit to be strictly enforced; • No night-time driving to be allowed; • All vehicles must be road-worthy, be maintained to prevent fuel or oil leaks and drivers are to be licensed appropriately for the driving of their assigned vehicle. Drivers responsible for the transportation of personnel must be specifically licensed to do so; • Signage is to be placed on vehicles at all times; and, • Vehicles and machinery utilised for decommissioning may not operate on site • without safety signage, car-top lights and reflective personnel gear.						N/A
Nature of impact: Traffic impacts associated with the movement of vehicles to and from site, such as increased congestion and potential for accidents.	**Activity:** The movement of vehicles in the vicinity of the decommissioning site may cause damage to road surfaces as well as increase in the traffic volume of the R335 and R342, within Addo and within Addo Elephant National Park.						No decommissioning phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	M	L	M	L	-
Cumulative impact:	-	-	-	-	-	-	-
Proposed Mitigation:	• Abnormal loads should be timed to avoid times of year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends and school holiday periods; • Vehicles used for transport of materials and sand must be fitted with tarpaulins to prevent the release of such material or items onto road surfaces; • Any damage to public roads is to be reported to the management authority and repaired to its original condition; • Transport of materials should be limited to the least amount of trips possible; and, • Abnormal loads should not be transported after dark.						N/A

Decommissioning phase	Preferred Site and Layout (Alternative 1)		Alternative Layout or Design (Alternative 2)		Alternative Layout or Design (Alternative3)		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL IMPACTS ON BIOLOGICAL ASPECTS:							
Nature of impact: Loss of Sundays River Valley Thicket during construction and loss of species.	**Activity:** The decommissioning of several permanent structures on site will result in the loss of Sundays Valley Thicket vegetation due to foundation excavation. Clearing of natural vegetation will result in a range of issues including increasing the risk of erosion, reducing sensitive vegetation types, reducing habitats for animals, and increasing the risk of alien vegetation spreading.						No decommissioning phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	M	L	M	L	M	L	
Cumulative impact:	-	-	-	-	-	-	
Proposed Mitigation:	• The decommissioning footprint must be surveyed and demarcated prior to decommission commencing; • No decommissioning activities will be allowed outside the demarcated footprint; • All areas must be surveyed by a qualified faunal specialist prior to commencement of vegetation clearing; and, Vegetation Search and Rescue must be undertaken for decommissioning areas.						N/A
Nature of impact: Loss of plant and animal Species of Conservation Concern.	**Activity:** Clearing may result in the loss of identified and non-identified plant SCC and animal SCC.						No impact will occur as the decommissioning activities will not take place. Vegetation and habitat features of the proposed decommissioning site will remain unaffected.
Significance rating:	M	L	M	L	M	L	-
Cumulative impact:	-	-	-	-	-	-	-

Proposed Mitigation:	• All decommissioning areas must be surveyed by a qualified botanist prior to commencement of vegetation removal; • Permits must be obtained to remove all plant SCC; • Relocate or replant as many SCC as possible to nearby areas with similar vegetation cover; • A nursery will not be required. Relocated SCC can be replanted in areas with similar vegetation outside the decommissioning site; • No plant harvesting by construction staff will be allowed; • Permits must be obtained to remove any animal SCC; • Relocate as many faunal SCC as possible, especially reptiles. In the case of reptiles, by a qualified snake handler; • Relocated animals must be released in areas of similar habitats near the site of removal; • No hunting, snaring, shooting, nest raiding or egg collection by the construction staff should be allowed; • Holes and trenches should not be left open for extended periods of time and should only be dug when needed. Trenches that may stand open for some days should have places where the loose material has been returned to the trench to form an escape ramp present at regular intervals to allow any fauna that fall in to escape; • Ensure that the decommissioning area is fenced off from adjacent areas which may harbour wild animals; • Do not store building materials and excess stockpiled soils within riparian zones or within areas where natural vegetation occur; • Should any fauna be discovered it should be relocated to an area outside the development footprint by a trained professional; and, • A faunal specialist (such as a SANParks ranger) must daily inspect the decommissioning footprint during decommissioning for faunal species stuck • with in the footprint.	N/A

Decommissioning phase	**Preferred Site and Layout (Alternative 1)**		**Alternative Layout or Design (Alternative 2)**		**Alternative Layout or Design (Alternative3)**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Nature of impact: Spread of alien and invasive plant species.	**Activity:** The loss of natural vegetation through vegetation clearing, and other decommissioning activities will increase the risk of alien plant species invasion.						No impact will occur as the decommissioning activities will not take place. Vegetation and habitat features of the proposed decommissioning site will remain unaffected.
Significance rating:	M	L	M	L	M	L	-
Cumulative impact:	-	-	-	-	-	-	-
Proposed Mitigation:	• Develop an Alien Vegetation Management Plan to mitigate the establishment and spread of undesirable alien plant species during decommissioning; and, • All visible alien plants must be removed prior to top-and subsoil removal. Removal must occur through appropriate methods such as hand pulling, application of chemicals, cutting, etc. as in accordance with the NEMBA: Alien Invasive Species Regulations.						N/A

Nature of impact: Dust nuisance generated by the operation of machinery and vehicles.	**Activity:** The frequent upwelling of dust as consequence of the movement of vehicles and machinery on site may impact on worker health causing asthma and other respiratory conditions. Stockpiles are susceptible to the upwelling of fine particulate matter. Several ambient factors, the terrain characteristics, soil type and land use forms can attribute to the degree of loss and susceptibility of stockpiles towards the generation of dust. Regular watering of exposed surfaces may result in the reduction of wind-generated dust from stockpiles.						No impact will occur as the decommissioning activities will not take place. Vegetation and habitat features of the proposed decommissioning site will remain unaffected.
Significance rating:	M	L	M	L	M	L	-
Cumulative impact:	-	-	-	-	-	-	-
Proposed Mitigation:	• Implement dust suppression measures by watering areas to be cleared as well as already exposed surfaces with damaged soil particles, particularly during dry, windy periods; • Ensure all vehicles remain on designated roads and avoid the opening of detour or by-pass tracks; • Implement speed restrictions for vehicles on gravel roads; • Manage and maintain roadside vegetation to allow for absorption of runoff from road surfaces during and after rainy periods; and, • After decommissioning, if access roads or portions thereof will not be of further use to SANParks, remove all foreign material and rip area to facilitate the • establishment of vegetation, followed by a suitable revegetation program.						N/A
POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS:							
Nature of impact: The creation of job opportunities during the decommissioning phase.	**Activity:** The decommissioning period will create a few job opportunities for individuals residing in the area of the AENP						No decommissioning phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	L(+)	L(+)	L(+)	L(+)	L(+)	L(+)	-
Cumulative impact:	-	-	-	-	-	-	-

Decommissioning phase	**Preferred Site and Layout (Alternative 1)**		**Alternative Layout or Design (Alternative 2)**		**Alternative Layout or Design (Alternative3)**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Proposed Mitigation:	• Where reasonable and practical the contractors appointed by the Applicant must appoint local contractors and implement a “local first” policy, especially for semi and low-skilled job categories. However, due to the low skill levels in the area, the majority of skilled posts are likely to be filled by personnel from outside the area; and, • The recruitment selection process should seek to promote gender equality and the employment of women wherever possible, particularly for less labour- • intensive work such as flag bearing and supervision.						N/A

POTENTIAL IMPACTS ON CULTURAL-HISTORICAL ASPECTS:							
Nature of mpact: Damage and destruction of fossils during excavation activities.	**Activity:** Disturbance, damage or destruction of scientifically valuable fossil heritage preserved at or beneath the ground surface within development footprint during the decommission phase due to surface clearance and excavations into bedrock.						No decommissioning phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	L	L	L	L	L	L	-
Cumulative impact:	-	-	-	-	-	-	-
Proposed Mitigation:	• Any substantial fossil remains (e.g. vertebrate bones, shells, fossil wood) encountered during excavation should be safeguarded in situ and reported to Eastern Cape Provincial Heritage Resource Authority for possible mitigation by a professional Palaeontologist (Contact details: Mr Sello Mokhanya, 74 Alexander Road, King Williams Town 5600; Email: smokhanya@ecphra.org.za). • A Chance Fossil Finds Protocol to be appended to the Decommissioning EMPr and implemented should any substantial fossil remains be uncovered; • Fossil material must be curated in an approved repository (e.g. National Park Interpretive Centre, museum / university collection) and all fieldwork and reports should meet the minimum standards for palaeontological impact studies developed by SAHRA (2013); • No heritage structures may be marked or damaged; • Should any heritage resources (including but not limited to fossil bones, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and other built features, rock art and rock engravings) be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped. A trained Palaeontologist or Heritage Specialist must be notified to assess the finds, and this must then be reported to the applicable Heritage Authority and the following details must be provided: o Date; o Position of the excavation (GPS) and depth; o A description of the nature of the find; o Digital images of the excavation showing vertical sections (sides) and the position of the find showing its depth/location in the excavation; o A reference scale must be included in the images (tape measure, ranging rod, or object of recorded dimensions); and, o Close-up, detailed images of the find (with the scale included); and,						N/A
	• All operators of excavation equipment must be made aware of the possibility of the occurrence of sub-surface heritage features. If any heritage artefacts are discovered the following procedures must be followed: o All decommissioning in the immediate 50 m vicinity radius of the site must cease; o The Heritage Practitioner must be informed as soon as possible; o In the event of obvious human remains SAPS must be notified; o Mitigation measures (such as refilling, etc.) must not be attempted; o The area in a 50 m radius of the find must be cordoned off with hazard tape; and, o Public access must be limited and the area must be placed under guard.						

POTENTIAL VISUAL IMPACTS:							
Nature of impact: Impact on the sense of place for tourists.	**Activity:** The movement of construction vehicles, machinery and personnel on site shall result in a visual impact for tourists visiting the Addo Elephant National Park. Furthermore, the storage of construction materials shall result in disturbance and an unsightly character.						No decommissioning phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance rating:	L	L	L	L	L	L	-
Cumulative impact:	-	-	-	-	-	-	-
Proposed Mitigation:	• Access roads are to be kept clean and dust suppression techniques should be implemented to minimise impacts of vehicle movement; • Site offices and structures should be limited to one location and carefully situated to reduce visual intrusions. Roofs should be grey and non-reflective; • Construction camps as well as development areas should be screened with netting; • Lights within the construction camp should face directly down (angle of 90˚); • Minimum vegetation should be removed to ensure the visual absorption capacity remain high; • Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact; • Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare; and, • Mitigation of visual impacts associated with the decommissioning phase would entail proper planning, management and rehabilitation of the decommissioning site. Mitigation measures include the following: • Reduce the time of decommission through careful planning of logistics and ensure the productive implementation of resources; • Limit disturbance of the environment to the development footprint; and, • Rehabilitate all disturbed areas immediately after decommissioning through cut and shape and possible revegetation should it be required.						N/A

POTENTIAL IMPACTS ON NOISE ASPECTS:							
Nature of impact: Noise nuisance generated by Decommissioning works, vehicles and personnel.	**Activity:** The operating of vehicles and machinery on site results in the generation of noise disturbing tourists and animals in the surrounding area.						No decommissioning phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Decommissioning phase	**Preferred Site and Layout (Alternative 1)**		**Alternative Layout or Design (Alternative 2)**		**Alternative Layout or Design (Alternative3)**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	M	L	M	L	M	L	-
Cumulative impact:	M	L	M	L	M	L	-

Contractor	Witness for Contractor	Employer	Witness for Employer

Proposed Mitigation:	• As far as possible, the decommissioning activities should be undertaken outside of the peak tourist seasons; • Limit working hours of noisy equipment to daylight hours; • All stationary noisy equipment such as compressors and pumps should be contained behind acoustic covers, screens or sheds where possible; • The regular inspection and maintenance of equipment must be undertaken to ensure that all components are functioning optimally; • Where recurrent use of machinery is frequent, machines should be shut down during intermediate periods; • No hooting; • Fit silencers to equipment; • Unless otherwise specified by the ECO, normal work hours will apply (i.e. from 07:00 to 17:00, Mondays to Fridays and Saturdays 07:00 – 13:00); • Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours; • No loud music is permitted on site or in the Camp; • A Complaints Register must be maintained and the timing and nature of decommissioning activities adjusted in response to potential complaints; and, • Guests must be made aware of the decommissioning activities and the potential inconvenience.	N/A

RECOMMENDATIONS OF THE EAP

Environmental Impact Statement

Summary of Negative Impacts

- Clearance of indigenous vegetation (Sundays River Thicket) and loss of habitat;
- Death of fauna;
- Increased potential of fires;
- Potential contamination of soil and water sources during construction;
- Increased noise and disturbance in the surrounding areas of the proposed lodge;
- Disturbance, damage or destruction of scientifically-valuable fossil heritage; and,
- Noise and visual nuisance.

Summary of Positive Impacts

- Increased funding for SANParks' to undertake maintenance and other conservation initiatives;
- Job creation during construction and operation;
- Reduced capacity load on the national electricity grid;
- Improved visitor experience for overnighting guests.

Cumulative Impacts

There is a future lodge development being considered adjacent to the area proposed for the chalets. Cumulative impacts considered in the assessment process included the cumulative clearance of vegetation and increased activity, due to more of tourists overnighting in the park, as a result of the proposed development and potential future development. The cumulative impacts of the proposed development were found to be of Medium and Low significance respectively for the proposed development. These impacts will be significant at a localised scale but given that they will take place within an area zoned for High Intensity Leisure the impact is deemed to be acceptable.

No-Go Areas

No specific No-Go Areas were identified within the proposed construction footprint. All vegetated areas outside of the designated construction footprint must be regarded as No-Go areas. No-Go Areas have not been illustrated, given the extent of vegetated areas within the proposed footprint and the fact that no specific areas were identified by specialists. Sensitive Areas and Buffer Areas have been identified and can be found in Appendix A. Buffer Areas indicate the surrounding areas are frequented by tourists. Buffer Areas are not regarded as No-Go Areas, but construction activities must be avoided in these areas as far as possible.

Impact Statement

Following a thorough investigation, the Environmental Assessment Practitioner found that from an environmental perspective the Preferred Alternative will have an acceptable impact with the implementation of mitigation measures, given that it will take place within an area zoned for such high-impact activities, and as such it is recommended that the Preferred Alternative be approved.

Validity Period of Environmental Authorisation

It is recommended that construction must commence within five (5) years of Environmental Authorisation being granted and the proposed development must be completed within ten (10) years from commencement.

PERSONS RESPONSIBLE FOR IMPLEMENTING THIS EMPR THE "RESPONSIBILITY" COLUMNS IN THE IMPACT AND MITIGATION TABLES PROVIDED BELOW INDICATE WHICH TEAM MEMBER(S) ARE RESPONSIBLE FOR IMPLEMENTATION OF THE IDENTIFIED MITIGATION MEASURES; THESE TEAM MEMBERS INCLUDE THE FOLLOWING:

- Construction contractor(s);
- Construction manager;
- Applicant / Developer; and the
- Designated Environmental Officer

The sections below list further supplementary measures, which must also be implemented by the relevant team members.

During the construction phase, the construction Contractor will:

- Be responsible to have the EMPr available on site at all times;
- Provide the applicant with a "Method Statement" which will indicate the procedures that will be
- applied in order to meet the requirements of any aspect of the EMPr; and
- Ensure that all problems identified during environmental inspections, are addressed and rectified as soon as reasonably possible.

During the construction phase, the Contract Project Managers will:

- Have the authority to stop work and issue fines;
- Receive reports from the ECO and report to the client;
- Enforce contractor obligations to the EMPr; and,
- Support the ECO in his/her roles and responsibilities.

During the construction phase, the <u>Environmental Control Officer</u> will:

- Meet with the contractor and project manager to hand over the site and go through the content of the EMPr, including the "do's and don'ts" of the project, to ensure that the parties understand their responsibilities to the EMPr;
- Be accountable for mMonitoring and auditing activities to ensure compliance with the EMPr and the Environmental Authorisation;
- Work correctively with other role-players, but not be influenced in opinion and must report to the applicant only;
- May, in the event of there being a serious threat to or impact on the environment, correspond with the contract project manager to stop work;
- Complete an ECO checklist after each site inspection and distribute this to the project team within 5 working days; and,
- Conduct a final environmental audit of the project on completion of construction and rehabilitation, for submission to the DFFE to review.

On-site Communication

The following sections describe the site communication measures that will need to be implemented.
Site Instruction Entries

The Site Instruction book must be used for the recording of general site instructions as they relate to the works on site. It must also be used for the issuing of stop work orders for the purposes of immediately halting any particular activities of the contractor in lieu of the environmental risk that they may pose.

Method Statements

Method statements from the Contractor will be required for specific sensitive actions on request by the authorities or the ECO.
A method statement forms the baseline information on which work in sensitive environments takes place and is a "live document" allowing for modifications to be negotiated between the Contractor and ECO / Engineer, as circumstances unfolds.
A method statement describes the scope of the intended work, step-by-step, in order for the ECO and Engineer to understand the Contractor's intentions. This will enable them to assist in devising any mitigation measures, which would minimise environmental impacts during these tasks. For each instance wherein it is requested that the Contractor submit a method statement to the satisfaction of the ECO, the format must clearly indicate the following:

What – a brief description of the work to be undertaken;
How – a detailed description of the process of work, methods and materials;

Where – a description/sketch map of the locality of work (if applicable); and

When – the sequencing of actions with due commencement dates and completion date estimates.

All method statements will form part of the EMPr documentation and are subject to all terms and conditions contained within the EMPr main document.

The Contractor must submit the method statement to the ECO before any particular construction activity is due to start. Work may not commence until the method statement has been approved by the ECO.

Record Keeping

All records related to the implementation of this EMPr (e.g. site instruction book, method statements) must be kept together in an office where they are safe and can be retrieved easily. These records must be kept for two years and must at any time be available for scrutiny by any relevant authorities.

Monitoring

Several monitoring actions are proposed which would be undertaken by various project role players. For detail on these actions, "Responsible Person/Party", and "Monitoring Frequency" associated with the identified mitigation measures, refers to the "Monitoring" column in the impact assessment below (Chapter 8).

Performance Assessment and Reporting on EMPr Compliance

A suitably qualified Environmental Control Officer (ECO) must be appointed by the Applicant/Developer to oversee the implementation of the construction phase mitigation measures described in this EMPr, as well as the conditions of authorisation as described in the Environmental Authorisation.

The ECO may not be someone appointed by the contractor, engineer or other party involved with this project, other than the Applicant / Developer.

The following applies, amongst others, to the ECO's role:

- The ECO must undertake monthly site visits during the construction phase;
- The ECO must report to the Applicant/Developer only;
- The ECO must present an environmental site induction/awareness training session to all personnel before work on site commences, as are also described below; and,
- After completion of the construction activities, an environmental audit must be undertaken by the ECO, before commencement of the operational ph**a**se, to determine compliance with the EMPr and the Environmental Authorisation. The audit report must be submitted to the Competent Authority.

The ECO can recommend the stopping of works if in his/her opinion there is a serious threat to, or impact on the environment, caused directly from the construction operations. This authority is to be limited to emergency situations where consultation with the Engineer or Applicant is not immediately available. In all such work stoppage situations the ECO is to inform the Engineer and Applicant of the reasons for the stoppage as soon as possible.

Upon failure by the Contractor or his employee(s) to show adequate consideration to the environmental aspects of this contract, the ECO may recommend to the Engineer to have the contractor's representative or any employee(s) removed from the site or work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the contractor.

ECO Site Inspection Reports

The ECO site inspection reports (also called "ECO checklists") will report on the compliance of the construction phase mitigation measures contained in the EMPr, as well as the conditions of approval described in the Environmental Authorisation. The report must be submitted to the Applicant, within five (5) working days of the

ECO site inspection and must be made available to the construction Contractor. Copies of the inspection reports must be kept on site.
The contractor's meeting minutes must reflect environmental queries, agreed actions and dates of eventual compliance. These minutes form part of the official environmental record.

Photographs

It is recommended that photographs are taken of the site prior to, during and immediately after construction as a visual reference. These photographs must be stored with other records related to this EMPr. If captured in digital format, hard copies, in colour, must be kept with all other records relevant to the implementation of this EMPr.

ENVIRONMENTAL AWARENESS PLAN

Environmental Awareness and Risk Training

All contractor team members involved in work on site are to be briefed on their obligations towards environmental controls and methodologies in terms of this EMPr, prior to work commencing. The briefing will usually take the form of an on-site talk and demonstration by the ECO. The education/awareness programme must be aimed at all levels of management within the contractor team. See "basic rules of conduct" below.

Basic Rules of Conduct

The following list represents the basic Do's and Don'ts towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid.

NOTE: ALL new site personnel must attend an environmental awareness/induction presentation. Please inform your foreman or manager if you have not attended such a presentation or contact the ECO.

DO:

- Clear your work areas of litter and building rubble at the end of each day – use the waste bins provided and prevent litter from being blown away by wind.
- Report all fuel or oil spills immediately and stop the spill from continuing.
- Dispose of cigarettes and matches carefully, so to prevent veld fires (arson and littering is an offence).
- Confine work and storage of equipment to within the immediate work area.
- Use all safety equipment and comply with all safety procedures.
- Ensure a working fire extinguisher is immediately at hand if any "HOT WORK" is undertaken e.g.
- welding, grinding, gas cutting etc.
- Prevent excessive dust and noise.

DO NOT:

- Damage any vegetation outside of the development footprint.
- Do not litter – report dirty or full facilities, i.e. full dustbins and dirty or blocked toilets.
- Do not make any fires.
- Do not enter any fenced off or demarcated areas.
- Do not allow waste, litter, oils or foreign materials into any storm water channels or drains or watercourses.
- Do not litter or leave food lying around.

IMPACTS AND MITIGATION MEASURES

A number of potential environmental impacts that may arise during the project have been identified. These are outlined in the following table below, and guidelines and mitigation measures are provided. The Contractor must familiarise himself with the requirements of the EMPr, keeping in mind that other site- specific requirements as outlined in the Environmental Authorisation must also be complied with.

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

Construction Phase Environmental Management Programme

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
1. ACTIVITY: PERMITS AND AUTHORISATIONS				
1.1	**Aspects: Legislative compliance.** **Impact: Non-compliance with South African environmental legislation.** **Objective: Ensure compliance with all triggered environmental legislation.** **Target: Commence site establishment with all permission and approvals received and on hand.**	Developer	Monitoring Action: Obtain copies of all permits; Record Keeping Responsible Person/Party The Applicant Monitoring Frequency: Once off	
	<u>Mitigation/Management Measures:</u> ➢ The Developer is to have the following permits on commencement: ➢ Environmental Authorisation; ➢ Environmental Management Programme; and, ➢ Building approval from the Municipality.			
2. ACTIVITY: SITE LAYOUT PLANNING				
2.1	Aspects: Site Layout Plan. Impact: Negative impact on the environment of unmanaged and unplanned placement of infrastructure. Objective: To ensure acceptable impact and management of environmental issues at the main site and storage site during construction by proper planning of layout of infrastructure placement. Target: All areas not demarcated for construction must remain vegetated and the impact must be minimised.		Monitoring Action: Records of the Site Layout must be present on site. Responsible Person/Party: Contract Project Manager / Engineer	

Mitigation/Management Measures: a. Draw up and submit for approval a Site Layout Master Plan. This plan must show the final positions and extent of all permanent and temporary site structures and infrastructure (inclusive of the distance from any sensitive environmental areas); b. The planning for layout must be done in consultation, on-site, with the Environmental Control Officer (ECO); c. The contractor may not deface, paint, damage or mark any natural features situated in or around the site for survey or other purposes; d. The contractor must ensure that all construction personnel, labourers and equipment remain within the demarcated construction sites at all times; e. No servicing of vehicles may be permitted on site, unless for emergency purposes; f. Stockpiles may not be situated in such a manner that they obstruct pathways; g. Location of storage area must take into account prevailing winds, distance to water bodies and general on-site topography; h. Place infrastructure as far as possible on sites that have already been transformed; i. Facilities may not be used as staff accommodation; j. The Contractors camp layout must take into account availability of access for deliveries and services and any future works; k. The Contractors camp must be of sufficient size to accommodate the needs of all sub-contractors that may work on the project; and, l. The Contractor must implement the following as required: ➢ Suitable sanitation facilities, adequate for the number of staff on site (1 for every 15 personnel and 1 for each gender); and, ➢ Facilities for solid waste collection.		Monitoring Frequency: Once off	

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

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
3. ACTIVITY: CONSTRUCTION PROGRAMME / SCHEDULE				
	Aspects: Project Management. Impact: Order and timing of construction activities and associated impacts. Objective: To Provide a clear indication of the order by which key construction activities will transpire. Target: Anticipate timing of impacts to coordinate the availability of any specialists and/or authorities who may be required to conduct site inspections.			
3.1	**Mitigation/Management Measures:** a. Draw up and sign off a project schedule with all contributing parties and service providers to commit to a timeline during which time construction milestones will be completed; b. Communicate any deviation from this schedule to all parties, so as to provide parties with sufficient opportunity for alternative arrangements to be made; c. Establish a risk register to identify and monitor potential factors which may result in setbacks/ delays on tasks within the project schedule; d. Hold management meetings with representatives of the project manager, contractor, engineer and other contributing parties to monitor and anticipate changes; and, e. Should circumstances/ incidents arise which may pose a risk to the project schedule, the construction contractor, and engineer and ECO are to keep records of this and the latter communicate this in the ECO Monthly Audit Checklist.	All Construction Parties	Monitoring Action: Meetings; Risk Register; ECO Audit Checklist; Photographs Responsible Person/Party: Contract Project Manager / Contractor / ECO Monitoring Frequency: Once off	

Contractor	Witness for Contractor	Employer	Witness for Employer

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
4. ACTIVITY: COMMUNICATION WITH LAND-OWNERS				
4.1	Aspects: Landowner Consent. Impact: Disturbance of existing land use. Objective: Maintain a conflict-free relationship with landowners/users. Target: No complaints received from landowners/users of affected property. **<u>Mitigation/Management Measures:</u>** a. Landowners are to be aware and in agreement of site access arrangements; b. Landowner has to provide consent to the site supervisor of the construction contractor prior to entering the construction footprint area for safety purposes; c. All property gates are to be kept closed when not in use (or kept in the open/closed state in which it was found); and, d. Any complaint or liaison with regard to environmental aspects, compensation or disorder to economic activities, must not be addressed by the contractor. A public complaint register must be kept on site and the contract project e. manager must inform the Developer and/or ECO to take further action.	Contract Project Manager / Contractor & Applicant	Monitoring Action: Meetings; Risk Register. Responsible Person/Party: Contract Project Manager / Contractor / ECO Monitoring Frequency: Monthly	

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
5. ACTIVITY: SITE ESTABLISHMENT				
5.1	Aspects: Demarcation of the site and vegetation removal. Impact: Direct impact on vegetation during construction and loss of species. Objective: Prevent unnecessary habitat destruction. Target: All areas not demarcated for construction must remain vegetated. **Mitigation/Management Measures:** a. No natural surfaces are to be marked other than using droppers, beacons or other artificial object; b. Ensure the upkeep of demarcation boundaries throughout the period of construction until rehabilitation has been completed; c. Keep areas affected to a minimum, strictly prohibit any disturbance outside the demarcated foundation footprint area; d. Clear as little indigenous vegetation as possible, aim to maintain vegetation where it will not interfere with the construction or operation of the development, rehabilitate an acceptable vegetation layer according to rehabilitation recommendations of the relevant EMPr, if possible; e. There must be a pre-construction environmental induction for all construction staff on site to ensure that basic environmental biodiversity principles are adhered to f. Where the ECO deems it necessary (e.g. sensitive, natural areas) an ecologist should be appointed and utilised; g. Restoration measures will be required to reinstate functionality in the disturbed soil and vegetation; h. Impacts to sensitive sites (drainage lines) must be avoided; i. No vegetation may be gathered for the purpose of creating fire; and, j. Areas to be cleared should be agreed and demarcated before the start of the clearing operations.	Construction contractor	Monitoring Action: ECO to take photographs of site before clearance; ECO Audit Checklist. Responsible Person/Party: ECO & DEO Monitoring Frequency: Monthly	

Contractor	Witness for Contractor	Employer	Witness for Employer

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
5.2	Aspects: Topsoil stripping and conservation. Impact: Destruction of topsoil. Objective: Conserve and protect topsoil from erosion and destruction. Target: Topsoil condition maintained. **Mitigation/Management Measures:** a. In the absence of a distinguishable topsoil layer, strip the uppermost 300 mm of soil; b. Restrict clearing areas for roads and foundation excavations to the smallest area possible; c. Remove topsoil approximately 300mm deep from establishment area and stockpile areas; d. Topsoil stockpiles to be kept free from weeds; e. Topsoil stockpiles to be placed on a levelled area and measures to be implemented to safeguard the piles from being washed away in the event of heavy rain/storm water; f. Topsoil needs to be stored on designated areas only. This needs to be planned and indicated in the site-layout plan; g. Ensure that topsoil is not mixed with subsoil and/or any other excavated material; h. Provide containment and settlement facilities for effluents from concrete mixing and washing facilities; i. Temporarily stored topsoil must be re-applied within 6 months, topsoil stored for longer needs to be managed according to a detailed topsoil management plan; j. Provide spill containment facilities for hazardous materials like fuel and oil; and, k. Topsoil must be used in all rehabilitation activities and may not be compacted to ensure that its plant support capacity remain of high quality.	Construction contractor	Monitoring Action: ECO Audit Checklist; Photographs; Responsible Person/Party: ECO & DEO Monitoring Frequency: Monthly	

Contractor	Witness for Contractor	Employer	Witness for Employer

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
6. ACTIVITY: SITE INFRASTRUCTURE PLACEMENT AND OPERATION				
	Aspects: Structures and lay-down areas. Impact: Deterioration of site features and surrounding areas. Objective: Prevent the deterioration of site features like soil, rainwater runoff and erosion. Target: The preservation of site conditions evident on establishment of structures and lay-down areas.			
6.1	**Mitigation/Management Measures:** a. Locate all structures and storage areas, including offices, workshops and stores in approved locations are per the Site Layout Plan; b. The camp with storage and laydown areas are to be kept secure and neat with access control measures adopted during construction; c. Clearly define which activities are to occur within which areas of the site by erecting signage; and, d. All hazardous substances, such as fuel, oil, diesel, paint, etc., must be stored in a secondary containment system (trays or bund) which is capable of storing at least 110% of the liquid capacity. If bund areas are used, it must be sealed to avoid seepages.	Construction contractor	Monitoring Action: Photographs; ECO Audit Checklist Responsible Person/Party: ECO Monitoring Frequency: Monthly	

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
7. ACTIVITY: CONSTRUCTION SITE OPERATIONS				
	Aspects: Security and fencing. Impact: Prevent danger of trespassing persons. Objective: Keep the site secure from trespassing or theft and keep animals out. Target: Site remains secure during construction with no incidences of trespassing, theft and injury or death to animals.	Construction contractor	Monitoring Action: Photographs; ECO Audit Checklist Responsible Person/Party: ECO & DEO Monitoring Frequency: Monthly	
7.1	**Mitigation/Management Measures:** a. Be responsive to open or closed status of gates; b. New or the upkeep of fences must be align to ensure safety of animals and maintain a reliable boundary area; c. Should construction activities require the removal of fences or gates to execute tasks, this must be replaced as soon as possible following completion and, d. In all cases, the landowners on whose property any use of fences or gates, must be consulted, to ensure that parties e. are informed of construction activity, schedules and vehicle movement.			

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	Aspects: Existing Services and Infrastructure. Impact: Damage to existing services and infrastructure. Objective: No damages to existing services and infrastructure. Target: No damages to existing services and infrastructure.	Construction contractor	Monitoring Action: Photographs; ECO Audit Checklist	
7.2	**Mitigation/Management Measures:** a. Take cognisance of the position of existing services and infrastructure (e.g. roads, pipelines, power lines and telephone services) that may get damaged due to construction activities; b. Ensure that existing services are not damaged or disrupted unless required by the contract and with the permission of the project manager; and c. In the event that infrastructure is damaged or services interrupted during construction, it will be done at the d. expense of the Contractor and shall receive top priority over all other activities.		Responsible Person/Party: Contractor & DEO Monitoring Frequency: Monthly	
7.3	Aspects: Traffic. Impact: Impact on traffic. Objective: Minimise the disruption of road users. Target: Minimal disruption of road users.	Construction Contractor	Monitoring Action: Incident Register; Photographs; ECO Audit Checklist Responsible Person/Party: Contractor & DEO Monitoring Frequency: Monthly	

	Mitigation/Management Measures: a. All vehicles must be road-worthy and drivers must be qualified, made aware of the potential road safety issues, and need for strict speed limits; b. Abnormal loads must be timed to avoid times of year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends and school holiday periods; c. Vehicles used for transport of materials and sand must be fitted with tarpaulins to prevent the release of such material or items onto road surfaces; d. Any damage to public roads is to be reported to the management authority and repaired to its original condition; e. Transport of materials should be limited to the least amount of trips possible; and,			
7.4	Aspects: Traffic. Impact: Traffic impacts associated with the movement of construction vehicles on site. Objective: To minimise the destruction of biodiversity, compaction of valuable topsoil and mortalities of fauna on site. Target: Minimal destruction of biodiversity, compaction of valuable topsoil and mortalities of fauna on site. **a. Mitigation/Management Measures:** b. All construction vehicles to strictly remain on designated roads or within demarcated construction areas; c. Avoid driving off road to minimise impact on vegetation and soil; d. During construction create designated turning areas and strictly prohibit any off-road driving or parking of vehicles and machinery outside designated areas; e. Abnormal loads and machinery should avoid movement over gravel roads during and immediately after rainfall events, so as to limit destruction of road surfaces and sedimentation of downhill rivers/streams; f. All vehicles must be road-worthy, be maintained to prevent fuel or oil leaks and drivers are to the licensed appropriately for the driving of their assigned vehicle. Drivers responsible for the transportation of personnel must be specifically licensed to do so; g. Signage is to be placed on vehicles at all times; and; h. After construction, if access roads or portions thereof will not be of further use to the landowner, remove all foreign material and rip area to facilitate the establishment of vegetation, followed by a suitable revegetation program; and, i. Construction-related vehicles and machinery may not operate on site without reflective safety signage, car-top lights and reflective personnel gear.	Construction Contractor	Monitoring Action: Incident Register; Photographs; ECO Audit Checklist Responsible Person/Party: Contractor, DEO & ECO Monitoring Frequency: Monthly	

Contractor	Witness for Contractor	Employer	Witness for Employer

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
7.5	Aspects: Erosion Control. Impact: Loss of topsoil, formation of bare soil and deterioration of habitat quality. Objective: Prevent soil erosion. Target: No signs of soil erosion are evident on site. **Mitigation/Management Measures:** a. Disturb as little ground area as possible, 62tabilize that area as quickly as possible, control drainage through the area, and trap sediment on site; b. Conserve topsoil with its leaf litter and organic matter, and re-apply this material to local disturbed areas to promote the growth of local native vegetation; c. Apply erosion control measures before the rainy season begins and after each season of construction, preferably immediately following construction; and, d. Maintain and reapply erosion control measures until vegetation is successfully established.	Construction contractor	Monitoring Action: Incident Register; Photographs; ECO Audit Checklist Responsible Person/Party: Contractor Monitoring Frequency: Monthly	

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
7.6	Aspects: Clearance of vegetation for roads and foundations. Impact: Loss of approximately two hectares of Sundays River Valley Thicket during construction, loss of species and spread of alien vegetation. Objective: Minimise loss indigenous vegetation and habitat. Target: No loss of sensitive and important plant species, no habitat loss beyond the development footprint and no spread of alien vegetation. **Mitigation/Management Measures:** a. The construction footprint must be surveyed and demarcated prior to construction commencing; b. As far as possible vegetation should be retained wherever possible such in between chalets; c. No construction activities will be allowed outside the demarcated footprint; d. All areas must be surveyed by a qualified faunal specialist prior to commencement of vegetation clearing; and, e. Vegetation Search and Rescue must be undertaken for construction areas.	Construction Contractor	Monitoring Action: ECO Audit Checklist; & Photographs Responsible Person/Party: ECO & DEO Monitoring Frequency: At commencement and thereafter Monthly	

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
7.7	Aspects: Construction activities such as clearance of natural vegetation, excavations and driving, and presence of construction personnel. Impact: Loss of plant and animal Species of Conservation Concern. Objective: Minimise the loss of plant and faunal Species of Conservation Concern. Target: No loss of plants and fauna Species of Conservation Concern. Plants and fauna Species of Conservation Concern occurring in the development footprint are successfully relocated. **Mitigation/Management Measures:** a. All construction areas must be surveyed by a qualified botanist or appropriately trained SANParks personnel prior to commencement of vegetation removal; b. Permits must be obtained to remove all plant SCC; c. Relocate or replant as many SCC as possible to nearby areas with similar vegetation cover; d. A nursery will not be required. Relocated SCC can be replanted in areas with similar vegetation outside the construction site; e. No plant harvesting by construction staff will be allowed; f. Permits must be obtained to remove any animal SCC; g. Relocate as many faunal SCC as possible, especially reptiles. In the case of reptiles, by a qualified Snake Handler; h. Relocated animals must be released in areas of similar habitats near the site of removal; i. No hunting, snaring, shooting, nest raiding or egg collection by the construction staff should be allowed; j. Holes and trenches should not be left open for extended periods of time and should only be dug when needed for immediate construction. Trenches that may stand open for some days should have places where the loose material has been returned to the trench to form an escape ramp present at regular intervals to allow any fauna that fall in to escape; k. Ensure that the construction area is fenced off from adjacent areas which may harbour wild animals;	Construction Contractor	Monitoring Action: ECO Audit Checklist; & Photographs Responsible Person/Party: ECO & DEO Monitoring Frequency: Monthly	

Contractor	Witness for Contractor	Employer	Witness for Employer

	l. Do not store building materials and excess stockpiled soils within riparian zones or within areas where natural vegetation occur; m. Should any fauna be discovered it should be relocated to an area outside the development footprint by a trained professional; and, n. A faunal specialist (such as a SANParks ranger) must daily inspect the construction footprint during construction for o. faunal species stuck with in the footprint.			
7.8	Aspects: Clearance of vegetation, excavations, movement of vehicles and presence of personnel. Impact: Spread of alien and invasive plant species. Objective: Minimise the establishment and spread of alien invasive plant species. Target: No establishment of new alien invasive plant species and no spreading of alien invasive plant species as a result of construction activities.	Construction Contractor	Monitoring Action: ECO Audit Checklist; & Photographs Responsible Person/Party: ECO & DEO Monitoring Frequency: Monthly	
	Mitigation/Management Measures: a. Develop an Alien Vegetation Management Plan to mitigate the establishment and spread of undesirable alien plant species during construction; and, b. All visible alien plants must be removed prior to top-and subsoil removal. Removal must occur through appropriate methods such as hand pulling, application of chemicals, cutting, etc. as in accordance with the NEMBA: Alien Invasive Species Regulations.			

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
7.9	Aspects: Handling of general – and hazardous waste materials on the construction site. Impact: The presence of personnel and construction operations will increase the likelihood of littering and dumping of solid waste. Objective: Management and disposal of general – and hazardous waste in an appropriate manner. Target: No record of pollution or site contamination by solid waste. **Mitigation/Management Measures:** a. The Contractor must submit a waste management plan; b. An adequate number of scavenger proof litter bins are to be placed throughout the site. Two waste bins at least must be present, one (1) for hazardous waste and one (1) for non-hazardous waste at each working site. Dumping of waste on site is prohibited; c. All bins must have a lid to prevent windblown litter; d. General waste and hazardous waste must not be mixed and must be disposed of separately. If general waste is contaminated with hazardous waste all the waste must be treated as hazardous waste and disposed as such; e. The importance of appropriately disposing waste must be highlighted in induction training for construction personnel; f. Waste sorting and separation must form part of the environmental induction and awareness programme, to encourage personnel to collect wastepaper, glass and metal waste separately; g. Dedicate a demarcated and signposted storage area on site for the collection of construction waste; h. All general and domestic waste is to be removed from site; i. Care must be taken to ensure that no waste falls off disposal vehicles on-route to the drop-off area. If needed, a tarpaulin can be utilised; j. The burning or burying of solid waste on site is prohibited. Do not burn PVC pipes or other plastic materials, as this is regarded as hazardous waste; k. Littering by construction workers shall not be permitted;	Construction Contractor	Monitoring Action: ECO Audit Checklist; Safe Disposal Documentation & Photographs Responsible Person/Party: ECO & DEO Monitoring Frequency: Monthly	

Contractor	Witness for Contractor	Employer	Witness for Employer

	l. General refuse/rubbish shall be removed from site at least on a weekly basis; m. Material removed from the development footprint must be appropriately disposed at an appropriately licensed waste disposal facility; n. Portable ablution facilities must be utilised, and these must be serviced by a registered service provider, cleaned at least once a week, and safe disposal slips must be on file at the site office; o. Keep all work sites including storage areas, offices and workshops neat and tidy. The DEO must inspect the development site and storage area at the end of each day for any litter. Litter should be cleaned up on a daily basis, even if litter is not from construction personnel; p. The Contractor will be responsible for the removal of all waste from site; q. Hazardous waste must be disposed of at a hazardous treatment facility, records and proof of safe disposal must be kept; and, r. A register must be kept of the quantities of waste disposed and proof of safe disposal (by the contractor), at an s. authorised waste disposal facility, must be retained by the Applicant and be available at the site office.			
7.10	Aspects: Sewage waste. Impact: Pollution and site contamination due to sewage. Objective: Provide facilities for appropriate collection and disposal of sewage. Target: No record of pollution or site contamination by sewage. **Mitigation/Management Measures:** a. Provide portable chemical ablution facilities, situated at convenient locations in proximity to work areas. This must be in relation to the quantity of users on site, with 1 ablution facility per 15 users and 1 for each gender; b. Locations for the placement of ablution facilities include the workshop and areas for resting and eating; c. Ablution facilities are to be maintained and cleaned regularly to ensure functionality and an adequate level of hygiene; d. Drinking water facilities, comprising of a water tank with a manual tap can be combined with hand washing facilities near site ablution; and, e. Only toilet paper is to be flushed down the chemical ablution facility. Personnel are to be informed on sanitary f. implementation as part of the environmental awareness.	Construction Contractor	Monitoring Action: ECO Audit Checklist; Safe Disposal Slips & Photographic Evidence Responsible Person/Party: ECO & DEO Monitoring Frequency: Monthly	

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
7.11	Aspects: Dust Generation. Impact: Dust nuisance from site operations on surrounding land owners. Objective: To avoid dust from excavated materials and construction activity caused by site operations. Target: Minimise the incidence of dust generation. a. Ensure all vehicles remain on designated roads and avoid the opening of detour or by-pass tracks; b. Implement speed restrictions for vehicles on gravel roads; c. Vehicles delivering or removing soil must be covered to reduce spills and windblown dust; d. Any complaints received by the Contractor regarding dust will be recorded and communicated to the ECO; e. Ensure all vehicles remain on designated roads and avoid the opening of detour or by-pass tracks; and, f. After construction, if access roads or portions thereof will not be of further use to SANParks, remove all foreign material and rip area to facilitate the establishment of vegetation, followed by a suitable revegetation program.	Construction Contractor	Monitoring Action: ECO to take photographs of the site and monitor dust levels on a daily basis; ECO Audit Checklist; Public Complaints Register Responsible Person/Party: ECO & DEO Monitoring Frequency: Monthly	

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
7.12	Aspects: Visual Impact. Impact: Visual impact of site operations on surrounding land owners. Objective: To avoid unnecessary visual impact caused by site operations. Target: Minimise the incidence of visual impact. a. Access roads are to be kept clean and dust suppression techniques should be implemented to minimise impacts of vehicle movement; b. Site offices and structures should be limited to one location and carefully situated to reduce visual intrusions. Roofs should be grey and non-reflective; c. Construction camps as well as development areas should be screened with netting; d. Lights within the construction camp should face directly down (angle of 90˚); e. Minimum vegetation should be removed to ensure the visual absorption capacity remain high; f. Infrastructure design need to be in line with the sense of place associated with the AENP; g. Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact; h. Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare; and, i. Mitigation of visual impacts associated with the construction phase would entail proper planning, management and rehabilitation of the construction site. Mitigation measures include the following: j. Reduce the time of construction through careful planning of logistics and ensure the productive implementation of resources; k. Limit disturbance of the environment to the development footprint; and, l. Rehabilitate all disturbed areas immediately after construction through cut and shape and possible revegetation should it be required.	Construction Contractor	Monitoring Action: ECO to take photographs of the site and monitor dust levels on a daily basis; ECO Audit Checklist; Public Complaints Register Responsible Person/Party: ECO & DEO Monitoring Frequency: Monthly	

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
7.13	Aspects: Noise Generation. Impact: Noise nuisance from site operations disturbing tourists and animals. Objective: To avoid excessive noise generation from site operations. Target: Minimise the incidence of noise generation. **Mitigation/Management Measures:** a. As far as possible, the construction of the chalets and associated infrastructure should be undertaken outside of the peak tourist seasons; b. Limit working hours of noisy equipment to daylight hours; c. All stationary noisy equipment such as compressors and pumps should be contained behind acoustic covers, screens or sheds where possible; d. The regular inspection and maintenance of equipment must be undertaken to ensure that all components are functioning optimally; e. Where recurrent use of machinery is frequent, machines should be shut down during intermediate periods; f. No hooting; g. Fit silencers to equipment; h. Unless otherwise specified by the ECO, normal work hours will apply (i.e. from 06:30 to 17:00, Mondays to Fridays); i. Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours; j. No loud music is permitted on site or in the Camp; k. A Complaints Register must be maintained and the timing and nature of construction activities adjusted in response to potential complaints; and, l. Guests must be made aware of the construction activities and the potential inconvenience.	Construction Contractor	daily basis; ECO Audit Checklist; Public Complaints Register Responsible Person/Party: ECO & DEO Monitoring Frequency: Monthly	

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
7.14	Aspects: Job creation and spending on local goods and services. Impact: Positive economic impacts for the local community. Objective: Maximise positive economic benefits associated with the proposed development. Target: The Local economy of Addo benefits from the proposed development. **Mitigation/Management Measures:** a. Where reasonable and practical the contractors appointed by the Applicant must appoint local contractors and implement a "local first" policy, especially for semi and low-skilled job categories. However, due to the low skill levels in the area, the majority of skilled posts are likely to be filled by personnel from outside the area; b. The recruitment selection process should seek to promote gender equality and the employment of women wherever possible, particularly for less labour-intensive work such as flag bearing and supervision; and, c. The ongoing presence of semi and high skilled personnel involved in the project construction phase will generate d. sustained clientele to a portion of the construction industry within the vicinity of the development.	Construction Contractor	Monitoring Action: ECO Audit Checklist. Responsible Person/Party: Contractor & DEO Monitoring Frequency: Monthly	

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
7.15	Aspects: Fire Prevention. Impact: Uncontrollable fire. Objective: Prevent the outbreak of fires emanating from construction activity. Target: No incidences of fires are recorded for the site. **Mitigation/Management Measures:** a. Assume acceptable precautions to guarantee that fires are not started as a result of works on site as specified below; b. The Contractor will be held responsible for any damage to structures or property on or neighbouring the Site as a result of any fire caused by personnel; c. The Contractor must ensure that construction related activities that pose a potential fire risk, such as welding etc., are properly managed and confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include clearing working areas and avoiding working in high wind conditions when the risk of fires is greater. In this regard special care must be taken during the high risk dry, windy summer months; d. The Contractor must provide fire-fighting training to selected construction staff and take cognisance of the Veld and Forest Fire Act, Act No. 101, 1998; e. Ensure the work site and the contractor's camp is equipped with adequate firefighting equipment. This includes at least rubber beaters when working in veld areas, and at least one fire extinguisher of the appropriate type irrespective of the site; f. Workers must be adequately trained in the handling of firefighting equipment, and can include but not limited to: g. Regular fire prevention talks and drills; and, h. Posting of regular reminders to staff; i. No open fires are permitted anywhere on site; j. Do not store any fuel or chemicals under trees; k. Do not store gas and liquid fuel in the same storage area (Hazardous substances to be stored in accordance with SANS); l. Cleared vegetation must be removed from site within seven (7) days of being cleared; m. Any fires that occur on site shall be reported to the ECO immediately and then to the relevant authorities; n. In the event of a fire, the Contractor shall immediately employ such plant and personnel as is at his disposal and take all necessary action to prevent the spread of the fire and bring it under control;	Construction Contractor	Monitoring Action: ECO to take photographs of site before clearance; ECO Audit Checklist. Responsible Person/Party: ECO Monitoring Frequency: Monthly	

Contractor	Witness for Contractor	Employer	Witness for Employer

	o. Do not permit any smoking within 3m of any fuel or chemical storage area, or refuelling area. A designated smoking area must be established on site; p. All construction vehicles must be fitted with at least one fire extinguisher; and, q. Emergency contact numbers including those of the surrounding farmers must be easily available on site.			
CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		**RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)**	**MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY**	**COMPLIANT? (for use by ECO)**
7.16	Aspects: Soil, surface water and groundwater contamination due to construction activities such as the use of hazardous materials on site e.g. fuel and oil. Impact: Pollution of soil and water contamination by hazardous waste. Objective: Provide facilities for appropriate collection and disposal of hazardous waste. Target: No record of pollution or site contamination by hazardous waste. **Mitigation/Management Measures:** a. Concrete must be mixed on mixing trays only and not on exposed soil. Concrete must only be mixed in areas which have been specially demarcated for this purpose (preferable where no natural vegetation occurs); b. Concrete mixing to be carried out away from sensitive areas; c. Material Safety Data Sheets (MSDSs) must be available on site for all chemicals and hazardous substances to be used on-site, including information on their ecological impacts and how to minimise the impacts in case of leakage; d. All spillage must be cleaned up immediately after they have occurred; e. Spillage of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bio-remediation or disposed of at a facility for the substance concerned. Disturbed land outside of the development footprint must be rehabilitated and seeded with vegetation seed naturally occurring on site; f. Vehicles and machinery must be regularly serviced to avoid leakages;	Construction Contractor	Monitoring Action: Incident Register; Photographs; ECO Audit Checklist Responsible Person/Party: DEO & ECO Monitoring Frequency: Monthly	

Contractor	Witness for Contractor	Employer	Witness for Employer

	g. At the work site the Contractor must maintain strict surveillance to ensure that no spills occur; h. The discharge of any pollutants such as cement, concrete, lime, chemicals, etc. into the natural environment must strictly be prohibited; i. Fuel and chemical storage must be done within a designated area only, which is properly bund and able to contain 110% of the capacity of fuel or chemicals stored within; j. Construction vehicles must be inspected every morning before work commence to ensure that no leakages do occur; k. All personnel must receive induction on how to report spillages, contain them and treat them accordingly; l. Spill kits must be available at each working station; m. Drip trays must be placed beneath all construction equipment that is stationary on site or within the site camp; and, n. Hazardous waste must be stored in bins with a lid in a demarcated waste area and must be disposed of at a hazardous treatment facility with records on file; o. General waste and hazardous waste must not be mixed and must be disposed of separately. p. If general waste is contaminated with hazardous waste all the waste must be treated as hazardous waste and disposed as such; and, q. A register must be kept of the quantities of waste disposed and proof of safe disposal (by the contractor), at an authorised waste disposal facility, must be retained by the Applicant and be available at the site office.			

Contractor	Witness for Contractor	Employer	Witness for Employer

CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
7.17	Aspects: Water Conservation. Impact: Wasting water as a result of negligence. Objective: Promote and implement water use efficiency mechanisms. Target: No Water Wastage. **Mitigation/Management Measures:** a. Re-use water were possible; b. Prevent leakages at taps and hoses by means of maintenance; c. Use buckets of water to clean tools instead of running water; d. Make sure that sediment, concrete, sand and rubbish does not end up going down stormwater drains. Cover or filter stormwater inlets and drains; and, e. Require workers to use a broom rather than a hose to clean paths and gutters. If water use is necessary, use high f. pressure hoses which are both water efficient and more effective cleaners.	Construction Contractor	Monitoring Action: Incident Register; Photographs; ECO Audit Checklist Responsible Person/Party: ECO & DEO Monitoring Frequency: Monthly	
7.18	Aspects: Health and Safety. Impact: Dangerous working conditions for workers. Objective: To prevent any casualties on site. Target: No Personnel casualties on site. **Mitigation/Management Measures:** a. The Contractor shall comply with all standard and legally required health and safety regulations; b. Induction training should highlight the potentially dangerous conditions, including the possibility of encountering snakes; c. Only correctly qualified/experienced personnel may remove faunal species from the construction site if required; d. Caution must be exercised when lifting construction material off the ground which has stood for a while as snakes or other animals may have sought shelter beneath the material; e. The Contractor shall provide a standard first aid kit at the site offices; f. There must be a Safety Officer on site who has first aid training and knowledge of safety procedures; g. The Contractor shall provide the appropriate Personal Protective Equipment (PPE) for staff; and,	Construction Contractor	Monitoring Action: Incident Register; Photographs; ECO Audit Checklist Responsible Person/Party: Contractor Health and Safety Representative Monitoring Frequency: Monthly	

	The Contractor must have insurance cover for the workmen.			
CONSTRUCTION PHASE: PROPOSED NEW LENDLOVU LODGE, ASSOICIATED INFRASTRUCTURE AND 650 KW - 850 KW SOLAR PV PLANT AT ADDO ELEPHANT NATIONAL PARK, EASTERN CAPE PROVINCE		**RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)**	**MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY**	**COMPLIANT? (for use by ECO)**
7.19	Aspects: Heritage Resources. Impact: Damage and destruction of fossils during excavation activities. Objective: To prevent any destruction of valuable artefacts. Target: No destruction of any fossils and artefacts. **a. <u>Mitigation/Management Measures:</u>** b. A representative sample of fossil wood blocks exposed at surface within the project area should be collected in the pre-construction phase by a professional palaeontologist for curation and display in the Addo Elephant National Park Interpretive Centre; c. Any further substantial fossil remains (e.g. vertebrate bones, shells, fossil wood) encountered during excavation should be safeguarded in situ and reported to Eastern Cape Provincial Heritage Resource Authority for possible mitigation by a professional Palaeontologist (Contact details: Mr Sello Mokhanya, 74 Alexander Road, King Williams Town 5600; Email: smokhanya@ecphra.org.za). d. A Chance Fossil Finds Protocol to be appended to the Construction EMPr and implemented should any substantial fossil remains be uncovered (Refer to Appendix 1); e. Fossil material must be curated in an approved repository (e.g. National Park Interpretive Centre, museum / university collection) and all fieldwork and reports should meet the minimum standards for palaeontological impact studies developed by SAHRA (2013); f. No heritage structures may be marked or damaged; g. Should any heritage resources (including but not limited to fossil bones, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and other built features, rock art and rock engravings) be exposed during excavation for the purpose of construction, construction in the vicinity of the	Construction Contractor	Monitoring Action: Incident Register; Photographs; ECO Audit Checklist Responsible Person/Party: DEO & ECO Monitoring Frequency: Monthly	

	finding must be stopped. A trained Palaeontologist or Heritage Specialist must be notified to assess the finds, and this must then be reported to the applicable Heritage Authority and the following details must be provided: h. Date; i. Position of the excavation (GPS) and depth; j. A description of the nature of the find; k. Digital images of the excavation showing vertical sections (sides) and the position of the find showing its depth/location in the excavation; l. A reference scale must be included in the images (tape measure, ranging rod, or object of recorded dimensions); and, m. Close-up, detailed images of the find (with the scale included); and, n. All operators of excavation equipment must be made aware of the possibility of the occurrence of sub-surface heritage features. If any heritage artefacts are discovered the following procedures must be followed: o. All construction in the immediate 50 m vicinity radius of the site must cease; p. The Heritage Practitioner must be informed as soon as possible; q. In the event of obvious human remains SAPS must be notified; r. Mitigation measures (such as refilling, etc.) must not be attempted; s. The area in a 50 m radius of the find must be cordoned off with hazard tape; and, t. Public access must be limited and the area must be placed under guard.			

EMERGENCY RESPONSE PLAN

The following table is provided to assist the ECO and construction Contractor with remedial work options and problem solving:

Observation or Event	Action by Inspector or Observer	Action by Construction Contractor
Spillage of diesel or hydrocarbons on soil	Report to construction Contractor and continue observations. Also check: ➢ That the source causing the spillage has ceased, and that the affected area is isolated to prevent spreading of the hazardous substance, where after it must be rehabilitated.	Action will be required as soon as possible (ASAP) by following the next steps: ➢ Dig down into the soil to see how far down the pollution penetrated, ➢ If less than 300mm penetrated: a. Turn the soil over to expose it to the air. b. Apply Mono Ammonium Phosphate (MAP) at a rate of 58gr/m² to the overturned soil. c. Water enough to keep the soil moist. ➢ If penetration is greater than 300mm: a. Remove the affected soil and spread in a layer not more than 300mm thick. b. Apply MAP at a rate of 50gr/m². c. Water enough to keep the soil moist. ➢ Repeat the above steps every 6 weeks or until the soil is clean.
Erosion	Report to construction contractor and continue observations. Also check: ➢ That all vehicular movement is restricted to existing access routes to prevent crisscrossing of tracks through undisturbed areas.	Action will be required ASAP: ➢ Implement erosion protection works at identified problem areas. ➢ Implement remedial works at affected areas in order to restore the area to its previous or better status.

Contractor	Witness for Contractor	Employer	Witness for Employer

INCIDENT REGISTER

INCIDENT REGISTER: PROPOSED NEW LENDLOVU LODGE, ASSOCIATED INFRASTRUCTURE AND SOLAR PV PLANT, ADDO ELEPHANT PARK, EASTERN CAPE PROVINCE					
NAME OF PERSON REPORTING THE INCIDENT	**INCIDENT**	**DATE OF INCIDENT IDENTIFIED**	**HOW WAS INCIDENT ADDRESSED?**	**DATE OF RECTIFICATION**	**SIGNATURE**

REHABILITATION MEASURES AND CLOSURE PLAN

The rehabilitation phase follows completion of construction works and entails site clean-up and site rehabilitation following the removal of the Contractor from site. The underlying aim of rehabilitation is the process of returning land within the site boundary to some degree of its former natural state.

Key aspects within this process include the:

- Removal of structures and infrastructure;
- Handling of inert waste and rubble;
- Handling of hazardous waste and pollution control;
- Final shaping of the terrain;
- Topsoil replacement and soil amelioration;
- Ripping and scarifying of surfaces;
- Planting of indigenous occurring vegetation (if deemed necessary); and
- Maintenance.

Rehabilitation Measures

Removal of structures and infrastructure

- On completion of a section of works, the area must be rehabilitated by suitable landscaping, levelling, topsoil dressing, land preparation, alien plant eradication and where ascribed for by the ECO, vegetation establishment;
- Clear and completely remove from site all construction structures and temporary infrastructure;
- All permanent infrastructure must be returned to a useable state.

Inert waste and rubble

- Remove all inert waste and rubble, such as excess rock, any structural foundations and remaining aggregates. Only once this material has been removed, the site shall be re-instated and rehabilitated;
- Domestic waste must be completely removed from the site and disposed of at a landfill site.

Topsoil replacement and soil amelioration

- The reinstatement of disturbed areas must follow immediately after the removal of structures and temporary infrastructure;
- Topsoil backfilling must be undertaken when the soil is dry, and not following any recent rainfall events;
- The replacement of topsoil must be sought in situ with construction where possible, or as soon as construction in an area has been completed;
- All stockpiled topsoil together with herbaceous vegetation must be replaced and redistributed over a disturbed area such as temporary access roads;
- Topsoil must be returned to the same site from where it was stripped;
- When insufficient topsoil remains, soil of a similar quality can be obtained from a nearby area within the construction area which was disturbed;
- Once topsoil has been returned to the ground, stripped vegetation must be randomly spread by hand over the area.

Maintenance

- All re-growth of invasive vegetative material will be monitored by the Developer for one year;
- All areas under rehabilitation are to be treated as no-go areas using danger tape and steel droppers/fencing and cornered off, to prevent vehicular, pedestrian and livestock access;
- Any re-vegetation must be done using plant species in occurrence on site;
- Control invasive plant species and weeds using approved methods of manual or chemical intervention;
- The re-establishment of vegetation must be allowed several rainy seasons, given the arid nature of the climate and region.

APPENDIX 1 – HERITAGE CHANCE FOSSIL FINDS PROTOCOL

APPENDIX 1: CHANCE FOSSIL FINDS PROCEDURE: Lendlovu Lodge project area, Addo Main Rest Camp, Addo Elephant National Park		
Province & region:	Eastern Cape, Sundays River Valley Municipality	
Responsible Heritage Resources Agency	ECPHRA (Contact details: Mr Sello Mokhanya, 74 Alexander Road, King Williams Town 5600; Email: smokhanya@ecphra.org.za).	
Rock unit(s)	Kirkwood Formation (Uitenhage Group) fluvial mudrocks and channel sandstones. Neogene calcretes, younger alluvium, soils, surface gravels.	
Potential fossils	Vertebrate bones and teeth (including dinosaurs), estuarine molluscs, fossil wood in Kirkwood "wood beds". Freshwater molluscs, calcretised trace fossils, possible bones and teeth of mammals, freshwater molluscs in Late Caenozoic alluvium.	
ECO protocol	1. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately (*N.B.* safety first!), safeguard site with security tape / fence / sand bags if necessary.	
	2. Record key data while fossil remains are still *in situ*: • Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo • Context – describe position of fossils within stratigraphy (rock layering), depth below surface • Photograph fossil(s) *in situ* with scale, from different angles, including images showing context (*e.g.* rock layering)	
	3. If feasible to leave fossils *in situ*: • Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation • Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Agency for work to resume	3. If *not* feasible to leave fossils *in situ* (emergency procedure only): • *Carefully* remove fossils, as far as possible still enclosed within the original sedimentary matrix (*e.g.* entire block of fossiliferous rock) • Photograph fossils against a plain, level background, with scale • Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags • Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist • Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation
	4. If required by Heritage Resources Agency, ensure that a suitably-qualified specialist palaeontologist is appointed as soon as possible by the developer.	
	5. Implement any further mitigation measures proposed by the palaeontologist and Heritage Resources Agency	
Specialist palaeontologist	Record, describe and judiciously sample fossil remains together with relevant contextual data (stratigraphy / sedimentology / taphonomy). Ensure that fossils are curated in an approved repository (e.g. museum / university / Council for Geoscience collection) together with full collection data. Submit Palaeontological Mitigation report to Heritage Resources Agency. Adhere to best international practice for palaeontological fieldwork and Heritage Resources Agency minimum standards.	

(Almond, 2021)

ANNEXURE C

Code of Conduct for Working in a National Park

South African NATIONAL PARKS

SOUTH AFRICAN NATIONAL PARKS

Project: THE INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK.

CODE OF CONDUCT FOR WORKING IN A NATIONAL PARK

AND

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 residing in 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;

2.1.3 Hunt or kill an animal, collect, damage or destroy a bird's nest or it's eggs;

2.1.4 Purposely or negligently cause a veld fire or damage any object of geological, archaeological, historical, ethnological or of any other scientific value to SANParks;

2.1.5 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;

2.1.6 Remove any animal (dead or alive) or parts thereof from the park (unless lawfully brought into the park);

2.1.7 Cut down trees or remove plants from a park or in any way damage any tree, plant or seeds;

2.1.8 Feed animals in national parks;

2.1.9 Drive a vehicle without a licence or allow a minor to drive a vehicle under his control;

2.1.10 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;

2.1.11 Enter a national park in an:

- Unlicensed (or unregistered) vehicles;
- Enter or use any closed road (no entry);

2.1.12 Vehicles may not be driven recklessly or negligently in a national park.

2.1.13 All drivers must consider other drivers and all animals.

2.1.14 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.

2.1.15 Without special permission, no person may organize or perform public entertainment or fund-raising campaigns.

2.1.16 Angling in rivers or dams is prohibited.

2.1.17 Angling, where permitted, is only allowed from sunrise to sunset.

2.1.18 Swimming is prohibited at designated angling areas.

2.1.19 No person may damage property or endanger property belonging to SANParks.

2.1.20 No person may use a radio or musical instruments in such a way as to cause a disturbance to others.

2.1.21 No person may dispose of any article or rubble other than in containers provided by SANParks.

2.1.22 No person may remove sand, stone or wood without the permission of SANParks.

2.1.23 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.

2.1.24 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.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 removed 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 authorised 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 authorised 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 organization'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 organizations with written consent working in a national park, may travel at a maximum speed of 65km/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 65km/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 anyone 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 unauthorised 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

THE INSTALLATION OF A GRID TIED PV SOLAR PLANT FOR ADDO MAIN REST CAMP, ADDO ELEPHANT NATIONAL PARK.

CONTRACT NO: CI-GK-0175

Part C4: Site Information

C4.1 LOCALITY

The project is located The Addo Elephant National Park (AENP) is situated in the Eastern Cape, with the Park's Main Rest Camp approximately 70 km northeast of Port Elizabeth.

The entrance to the Main Rest Camp is situated off the R342 road, linking Addo town in the south and Patterson in the north-east of the Addo Elephant National Park.

Site GPS Coordinate: S 33°26'32.33" E 25°44'43.11"

C4.2 NATURE OF GROUND, SUBSOIL AND GROUNDWATER CONDITIONS

A comprehensive geotechnical investigation was conducted in September 2020 to assess the ground conditions at the newly constructed wastewater treatment works (including the proposed pipeline routes and will be made available to the Contractor on request.

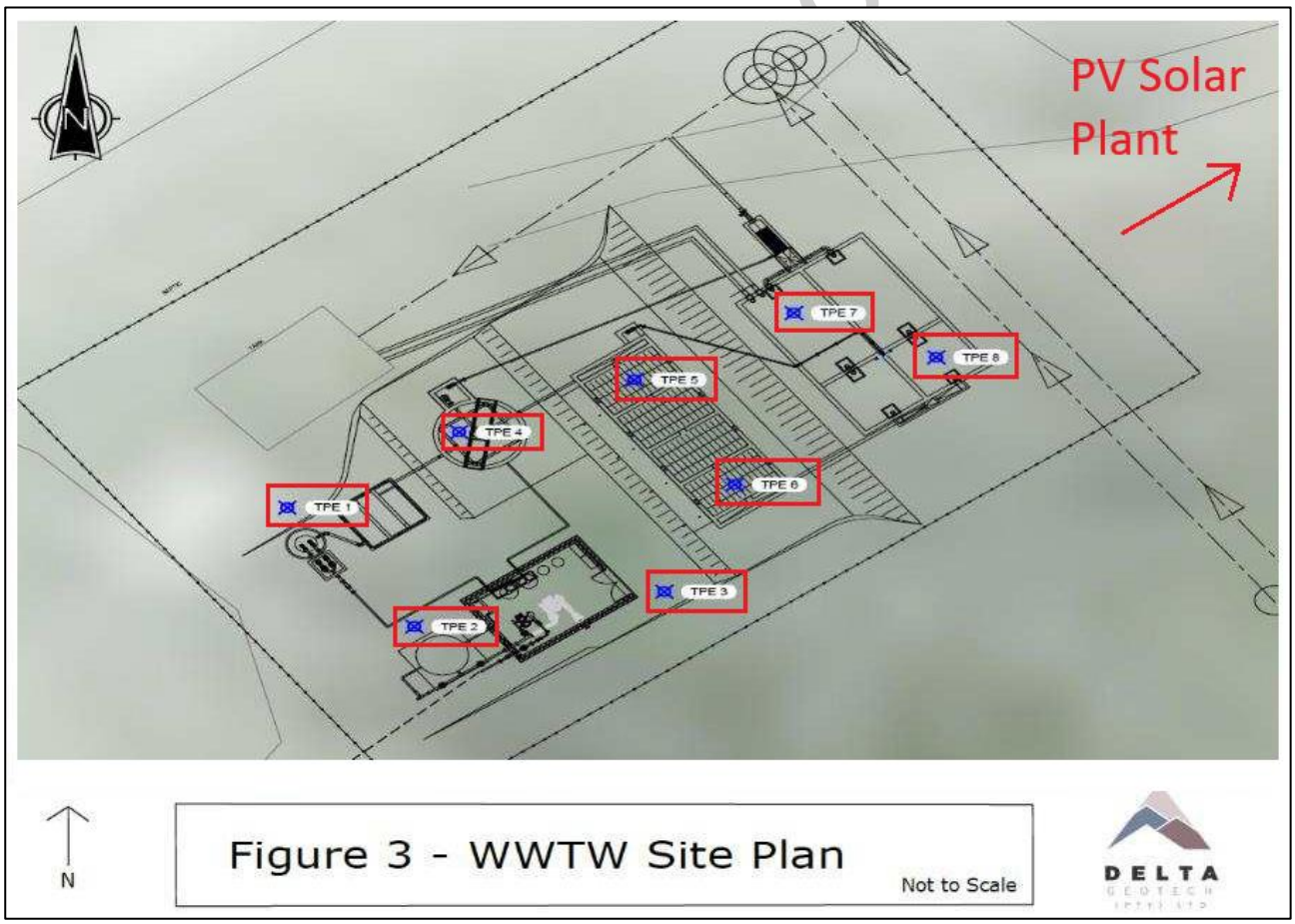
The investigation also assed the founding conditions at the wastewater treatment works site, the groundwater conditions and the suitability of the excavated materials to be used as selected fill and/or bedding and blanket material.

In general, excavated material will not be suitable for use as bedding for pipelines and material will have to be imported from commercial sources. Allowance will be made in the bill of quantities where bedding or fill material needs to be imported for construction purposes.

Contractors must satisfy themselves regarding the quality and type of material on site, since the Contractor is responsible for the supply of materials in compliance with the minimum requirements for the specific materials.

DELTA GEOTECH REPORT – Reference No. 20-721, dated October 2020 [The full report is available on request].

- *Please note that Test Pits TPE1 to TPE8 are applicable and can be used as an indication of possible ground conditions at the PV Solar Plant Site (TPE 9 to TPE13 on pipeline – not applicable).*



Contractor	Witness for Contractor	Employer	Witness for Employer

C4.2.1 ITEMS FROM THE EXECUTIVE SUMMARY FROM REPORT –

- The general geology of the area comprises Cretaceous aged units forming part of the Kirkwood Formation Uitenhage Group.
- The Kirkwood Formation comprises reddish and greenish mudstones and sandstones. Locally the site is overlain by fill, colluvial, residual soils and sedimentary rock.
- Perched groundwater was intersected at the proposed WWTW site at test pits TPE1 to TPE3 and TPE6.
- Groundwater occurs at depths of between 1.30m to 2.60m below ground level.
- Precautions to accommodate heaving soils are required.

C4.2.2 SITE GEOLOGY

C4.2.2.1 General Geology

The general geology of the area comprises Cretaceous aged units forming part of the Kirkwood Formation Uitenhage Group (Figure 2).

The Kirkwood Formation comprises reddish and greenish mudstones and sandstones.

C4.2.2.2 Site Geology

Locally the site is overlain by fill, colluvial, residual soils and sedimentary rock. These are further discussed in the sections below

- **Fill**
  Intersected in test pits TPE1 to TPE8 and TPE13, occurs from surface and extends to depths of between 0.20m to 1.00m begl. The soils generally comprise sand, silty sand, gravelly sand, clayey silty sand and gravelly silty sands with builders' rubble and refuse.

- **Colluvial**
  Intersected in test pits TPE7 and TPE9 to TPE13, occurs below fill or from surface and extends to depths of between 0.15m to 2.00m begl. The soils generally comprise silty sand, clayey silty sand and clayey sands.

- **Residual**
  Intersected in test pits TP1 to TP10 occurs below the fill and colluvium extending to depths of between 1.40 to 2.60m begl. The residual soils generally comprise clayey sand, sandy clay, clayey silt, sandy clayey silt or sandy clayey silt. The residual soils are a weathering product of the underlying rock.

- **Sedimentary Rock**
  Intersected in TPE5 and TPE7 to TPE11 at depths of between 0.15m to 2.60m begl. and extends to in excess of 0.90m to 3.00m begl.

  The rock is sandstone or mudstone and is completely, highly or moderately weathered soft, medium hard to hard rock.

- **Groundwater**
  Perched groundwater was intersected at the proposed WWTW site at test pits TPE1 to TPE3 and TPE6. Groundwater occurs at depths of between 1.30m to 2.60m begl.. The perched groundwater would be associated with the adjacent soakaway system and wetland area.

  The main water table is expected to occur at depth within the fractured rock aquifer.

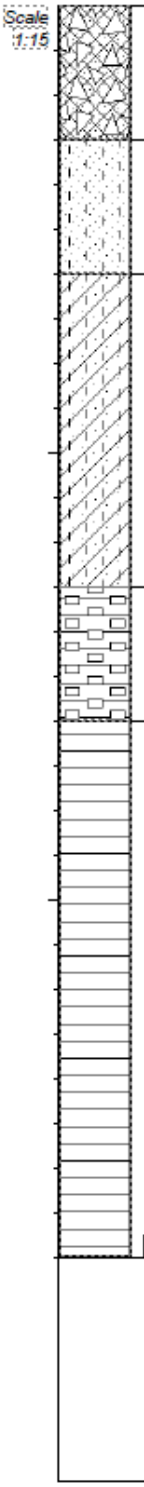
C4.2.3 GEOTECHNICAL EVALUATION [for wastewater treatment plant only]

LABORATORY AND FIELD RESULTS [DELTA GEOTECH REPORT – Reference No. 20-721]			
Material Type	**Classification Details**	**Laboratory Result Evaluation**	**Field Results Evaluation**
Fill	Sand, silty sand, gravelly sand, clayey silty sand and gravelly silty sands with builders' rubble and refuse.	None	Fill material has been deposited in an uncontrolled manner and has a variable composition with sporadic builder's rubble and refuse. It is potentially highly compressible and should not be considered as a founding horizon for the WWTW envisaged.
Residual	Silt & Clay = 48.4 to 52.2% Sand = 47.5 to 54.5% Gravel = 0.30 to 5.3% PI = 7 to 21 GM = 0.35 to 0.51 LS = 2.5 to 11.5 CBR = 1 @ 90% MDD CBR = 1 @ 93% MDD CBR = 2 @ 95% MDD CBR = 3 @ 98% MDD CBR = 4 @ 100% MDD CL and ML; A-4(2), A-6(5), A6(9); Low to medium heave potential. <G10	Residual soils contain almost equal proportions of fines and sand with a minor gravel component. PI as high as 21 is possible with an anticipated medium heave potential. Due to high to moderate fines content the residuum would have poor workability, this confirmed by low CBR strength, and maximum dry density. The residuum could be considered as a founding horizon where sufficiently firm in consistency but precautions to accommodate heave movement would be required. Heave movements of 8-10mm could be expected. It should not be considered for use as construction materials on site unless for landscaping.	DCP tests indicate residuum is generally soft at the contact between the overlying fill soils and becomes firm at depths of 1.00m to 1.50m begl. The residuum is therefore moderately to slightly compressible. If considered as a founding horizon bearing pressures would have to be adjusted according to in-situ consistency of the residuum.
Mudstone	Silt & Clay = 36.6% Sand = 25.8% Gravel = 37.6% PI = 17 GM = 1.27 LS = 9.00 CBR = 3 @ 90% MDD CBR = 4 @ 93% MDD CBR = 5 @ 95% MDD CBR = 6 @ 98% MDD CBR = 6 @ 100% MDD CL A-6-(5); Low heave potential; <G10	Predominantly granular material with up to 36% fines. Moderate PI and LS values indicate potential heave characteristics but due to a low weighted PI material has a low potential expansiveness. The presence of fines and possibly degree of weathering causing a weaker rock fabric may be responsible for low MDD and CBR strength of the mudstone. This material could possibly be suitable as a founding substrate but should not be considered for use during construction unless for landscaping.	The mudstone varies from completely to highly weathered very soft to medium hard rock and is generally, only slightly compressible. The mudstone could be considered as a competent founding horizon with minimal precautions required.

Element Consulting Engineers

HOLE No: TPE7
Sheet 1 of 1

JOB NUMBER: 000



NOTES

1) End of hole at 2.80m.
2) TLB refused @ 2.80m.
3) No water table.
4) No sample.

CONTRACTOR		INCLINATION	
MACHINE		DIAM	
DRILLED BY		DATE	
PROFILED BY	MJ	DATE	07-08-2020
TYPE SET BY	MJ	DATE	30/09/2020 10:43
SETUP FILE	STANDARD.SET	TEXT	..Pits\TestPitProfiles.doc

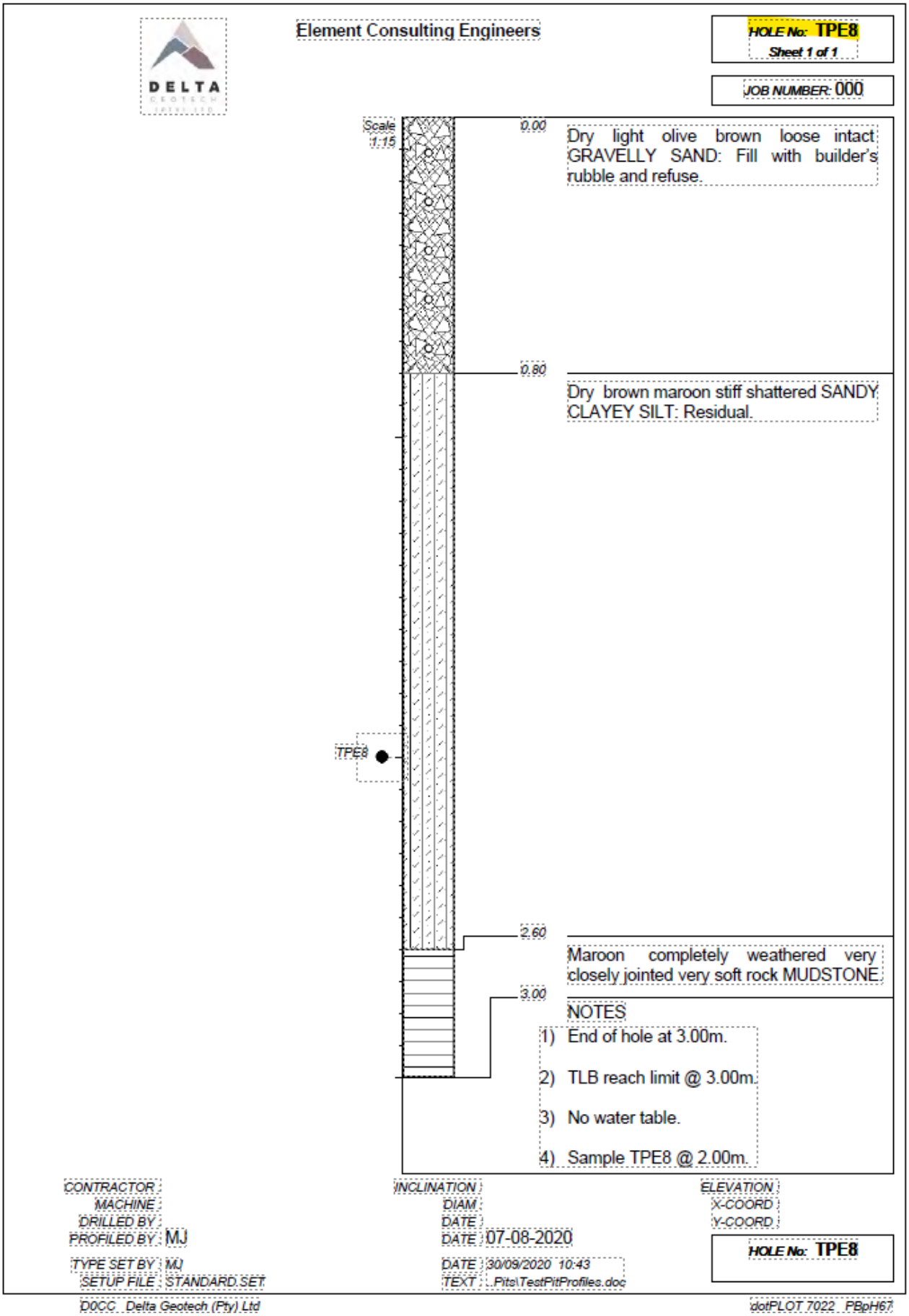
ELEVATION
X-COORD
Y-COORD

HOLE No: TPE7

D0CC Delta Geotech (Pty) Ltd

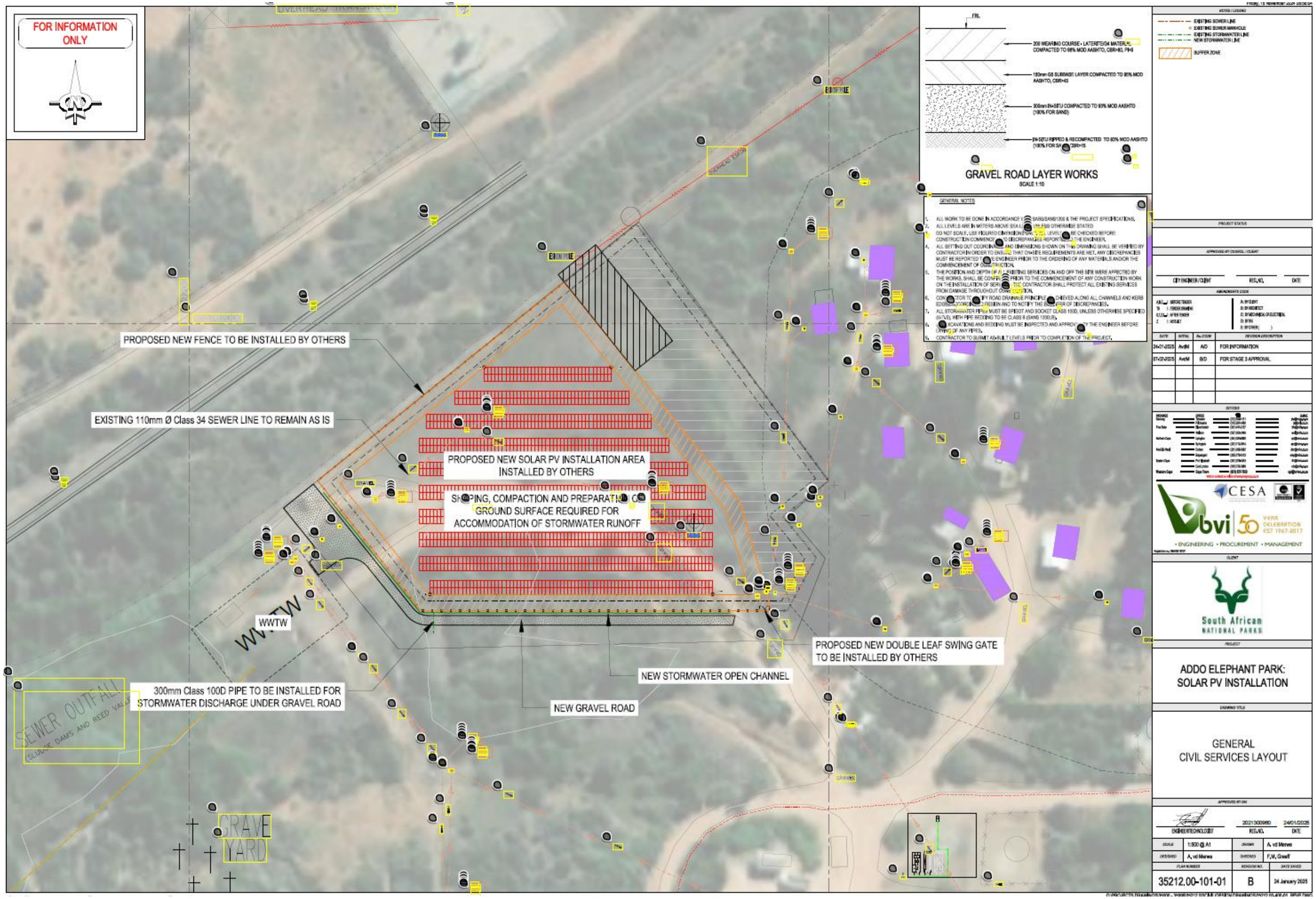
dotPLOT 7022 PBpH67

Contractor	Witness for Contractor	Employer	Witness for Employer


Element Consulting Engineers
HOLE No: TPE8
Sheet 1 of 1
JOB NUMBER: 000
Scale 1:15
0.00
Dry light olive brown loose intact GRAVELLY SAND: Fill with builder's rubble and refuse.
0.80
Dry brown maroon stiff shattered SANDY CLAYEY SILT: Residual.
TPE8
2.60
Maroon completely weathered very closely jointed very soft rock MUDSTONE.
3.00
NOTES
1) End of hole at 3.00m.
2) TLB reach limit @ 3.00m.
3) No water table.
4) Sample TPE8 @ 2.00m.
CONTRACTOR
MACHINE
DRILLED BY
PROFILED BY MJ
TYPE SET BY MJ
SETUP FILE STANDARD.SET
INCLINATION
DIAM
DATE
DATE 07-08-2020
DATE 30/09/2020 10:43
TEXT ..Pits\TestPitProfiles.doc
ELEVATION
X-COORD
Y-COORD
HOLE No: TPE8
D0CC Delta Geotech (Pty) Ltd
dotPLOT 7022 PBpH67

Part C5: Drawings

Drawing Description [print on A3 for tender]	**Drawing Number**
General Services Layout	35212.00-101-01_Rev.B
Bulk Supply Infrastructure: Single Line Diagram	35212.00-312-01_Rev.T0
Reticulation Layout (1)	35212.00-401-01_Rev.T0
Reticulation Layout (2)	35212.00-101-02_Rev.T0



Contractor | Witness for Contractor | Employer | Witness for Employer

FOR TENDER

BY BOSCH PROJECTS | BVi SCOPE OF WORKS

BVi SCOPE OF WORKS | BY BOSCH PROJECTS

GENERATOR

GENERATOR

4 POLE TRANSFER SWITCH ARRANGEMENT

LOCAL DB

MAIN CAMP DB
BY BOSCH PROJECTS

WORK LEGEND

1) ALL WORK TO BE CARRIED OUT STRICTLY IN ACCORDANCE WITH THE APPLICABLE SANS REGULATIONS AND LOCAL AND MUNICIPAL REGULATIONS AND BY-LAWS.

2) NO PART OF THIS DRAWING MAY BE SCALED.

3) ALL DIMENSIONS AND LEVELS GIVEN MUST BE CHECKED BEFORE COMMENCING ANY WORK. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER WITHOUT DELAY.

4) THIS DRAWING IS ONLY FOR THE ELECTRICAL INSTALLATION PURPOSES.

5) REFER TO THE LEGEND FOR DETAILS OF ELECTRICAL EQUIPMENT.

6) ALL ELECTRICAL INSTALLATIONS SHALL COMPLY TO THE LATEST SANS SPECIFICATIONS.

7) THE SITE ENGINEER MUST ENSURE THAT WORK IS DONE FROM THE LATEST REVISION OF DRAWINGS.

8) ALL HEIGHTS ARE GIVEN ABOVE FINAL FLOOR LEVEL.

9) AC MECHANICAL POINTS TO BE CONFIRMED BY THE MECHANICAL CONTRACTOR ON SITE.

10) THERE MUST BE A PHYSICAL BARRIER BETWEEN (NORMAL AND UPS) SECTIONS.

11) ALL DISTRIBUTION BOARDS TO HAVE 30% SPARE CAPACITY FOR FUTURE ADDITIONS.

PROJECT STATUS

APPROVED BY COUNCIL / CLIENT

CITY ENGINEER / CLIENT | REG. NO. | DATE

AMENDMENTS CODE

A: BEFORE TENDER
B: AFTER TENDER
C: AS BUILT

A: CIVIL
B: STRUCTURAL
C: MECHANICAL/ELECTRICAL
D: BVI
E: OTHER( )

DATE	INITIAL	Rev/ISSUE	REVISION DESCRIPTION
2025/02/26	G.H	TOD	FOR TENDER

OFFICES

CESA

bvi 50 YEAR CELEBRATION EST 1967-2017

• ENGINEERING • PROCUREMENT • MANAGEMENT

CLIENT

South African NATIONAL PARKS

PROJECT

ADDO ELEPHANT PARK:
SOLAR PV INSTALLATION

DRAWING TITLE

BULK SUPPLY INFRASTRUCTURE:
SINGLE LINE DIAGRAM

APPROVED BY BVI

G. HALBERSTADT
ENGINEERTECHNOLOGIST

20080282
REG NO.

26/02/2025
DATE

SCALE	NTS	DRAWN	W.R
DESIGNED	G.H	CHECKED	G.H

PLAN NUMBER	REVISION NO.	DATE SAVED
35212.00-312-01	TO	26/02/2025

D:\PROJECTS DRAWINGS\35000-35999\35212.00\ELECTRICAL\TENDER DRAWINGS\35212.00-312-01 REV TO.DWG

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

FOR TENDER

SOLAR PV SETTING OUT DATA

DESCRIPTION	X	Y
PV1	3192570.78CX	4962852.36
PV2	3192570.78CX	4963314.66
PV3	3192284.78CX	4963852.66
PV4	3192284.78CX	4963476.36

NOTE:
THIS DRAWING INCLUDES CO-ORDINATES THAT MAY BE SUBJECT TO INACCURACIES, IT IS ESSENTIAL THAT THESE CO-ORDINATES ARE CONFIRMED ON-SITE BY A SURVEYOR BEFORE PROCEEDING WITH ANY CONSTRUCTION OR PROJECT ACTIVITIES. PLEASE ENSURE ALL MEASUREMENTS AND POSITIONING ARE VERIFIED TO GUARANTEE THE PRECISION AND RELIABILITY OF THE INFORMATION PROVIDED.

OVERHEAD TRANSMISSION

EXISTING SUBSTATION

NEW UNDERGROUND 22000V CABLE

PROPOSED NEW MV SWITCHING POINT BY ESKOM (WILDCOAT)

PROPOSED NEW 22000/400V TRANSFORMER WITH EARTHING SYSTEM

EXISTING 22000V POLE MOUNTED TRANSFORMER, GROUND MOUNT WITH STEEL PLATE AND EARTHED WITH COPPER EARTH ROD

2x11000mm FLEXIBLE PVC HOSE

3D ILLUSTRATION

TYPICAL STRUCTURE DETAIL
SCALE 1:50

NOTES / LEGEND

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6) ALL ELECTRICAL INSTALLATIONS SHALL COMPLY TO THE LATEST SANS SPECIFICATIONS.

7) THE SITE ENGINEER MUST ENSURE THAT WORK IS DONE FROM THE LATEST REVISION OF DRAWINGS.

8) ALL HEIGHTS ARE GIVEN ABOVE FINAL FLOOR LEVEL.

9) AC MECHANICAL POINTS TO BE CONFIRMED BY THE MECHANICAL CONTRACTOR ON SITE.

10) THERE MUST BE A PHYSICAL BARRIER BETWEEN NORMAL AND UPS SECTION.

11) FACEPLATE OF NORMAL SECTION MUST BE WHITE AND THE FACEPLATE OF THE UPS SECTION MUST BE RED.

12) ALL DISTRIBUTION BOARDS TO HAVE 30% SPARE CAPACITY FOR FUTURE ADDITIONS.

PROJECT STATUS

13) THE DESIGN ON THE DRAWING IS COPYRIGHT PROTECTED AND REMAINS THE PROPERTY OF THE ENGINEER.

APPROVED BY COUNCIL / CLIENT

CITY ENGINEER / CLIENT | REG NO. | DATE

AMENDMENTS ISSUE

A/C / ISSUE TO/CO | A (P) SERV
TO / TENDER DRAWING | B (P) ARCHITECT
S.I.M. / AFTER TENDER | C (P) MECHANICAL/ELECTRICAL
I / AS BUILT | D (P) SM
E (P) STRUC

DATE	INITIAL	No./CODE	REVISION DESCRIPTION
28/02/2025	GJH	T0D	FOR TENDER

OFFICES

CESA

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• ENGINEERING • PROCUREMENT • MANAGEMENT

CLIENT

South African NATIONAL PARKS

PROJECT

ADDO ELEPHANT PARK:
SOLAR PV INSTALLATION

DRAWING TITLE

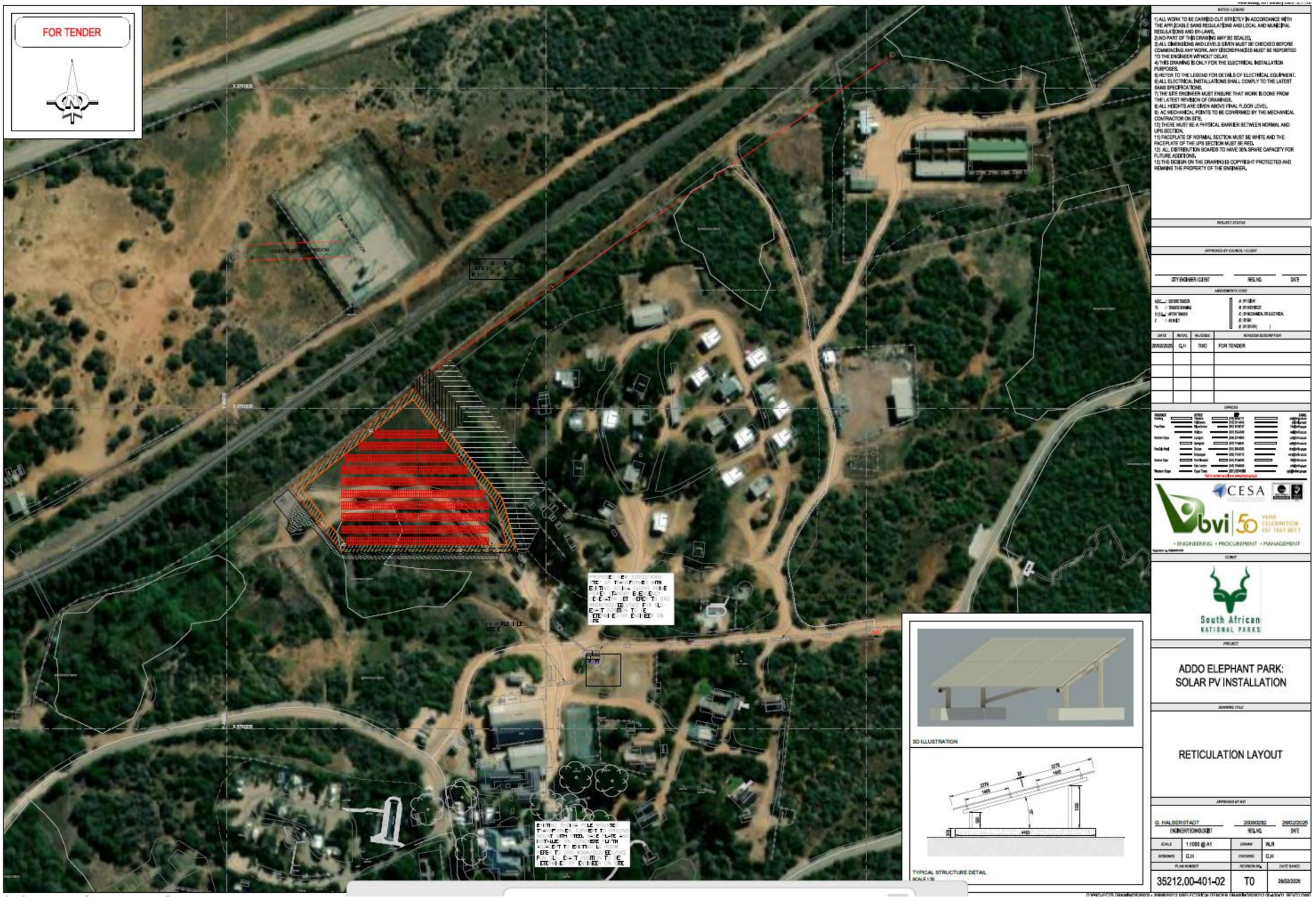
RETICULATION LAYOUT

APPROVED BY BVI

G. HALBERSTADT — ENGINEER/DRAUGHT | 2008/2002 REG NO. | 28/02/2025 DATE

SCALE	1:1000 @ A1	DRAWN	WLR
DESIGNED	GJH	CHECKED	GJH
PLAN NUMBER		REVISION NO.	DATE SAVED
35212,00-401-01		T0	28/02/2025

Contractor | Witness for Contractor | Employer | Witness for Employer



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