NEC3 Engineering & Construction Contract

Between **ESKOM HOLDINGS SOC Ltd**
(Reg No. 2002/015527/30)

and **[Insert at award stage]**
(Reg No. _____)

for **Design, supply, delivery, installation and commissioning of hybrid wind and solar PV microgrid research facility at Eskom Research, Testing and Development (RT&D)) in Rosherville**

Contents:		**No of pages**
Part C1	**Agreements & Contract Data**	**28**
Part C2	**Pricing Data**	**3**
Part C3	**Scope of Work**	**36**
Part C4	**Site Information**	**2**

CONTRACT No. **[Insert at award stage]**

C1.1 Form of Offer & Acceptance

- Offer

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

Design, supply, delivery, installation and commissioning of hybrid wind and solar PV microgrid research facility at Eskom Research, Testing and Development (RT&D) in Rosherville

The tenderer, identified in the Offer signature block, has examined the documents listed in the Tender Data and addenda thereto 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.

Options A	The offered total of the Prices exclusive of VAT is	**R [●]**
	Value Added Tax @ 15% is	**R [●]**
	The offered total of the amount due inclusive of VAT is[1]	**R [●]**
	(in words) **[●]**	

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document including the Schedule of Deviations (if any) to the tenderer before the end of the period of validity stated in the Tender Data, or other period as agreed, whereupon the tenderer becomes the party named as the *Contractor* in the *conditions of contract* identified in the Contract Data.

Signature(s) .....

Name(s) .....

Capacity .....

For the tenderer: .....

(Insert name and address of organisation)

Name & signature of witness ..... Date .....

Tenderer's CIDB registration number (if applicable) .....

[1] This total is required by the *Employer* for budgeting purposes only. Actual amounts due will be assessed in terms of the *conditions of contract*.

- Acceptance

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the tenderer's Offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the *conditions of contract* identified in the Contract Data. Acceptance of the tenderer's Offer shall form an agreement between the Employer and the tenderer upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract, are contained in:

Part C1	Agreements and Contract Data, (which includes this Form of Offer and Acceptance)
Part C2	Pricing Data
Part C3	Scope of Work: Works Information
Part C4	Site Information

and drawings and documents (or parts thereof), which may be incorporated by reference into the above listed Parts.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Returnable 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 Form of Offer and Acceptance. No amendments to or deviations from said documents are valid unless contained in this Schedule.

The tenderer shall within two weeks of 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 at, or just after, the date this agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one fully completed original copy signed between them of this document, including the Schedule of Deviations (if any).

Unless the tenderer (now *Contractor*) within five working days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the Parties.

Signature(s) .....

Name(s) .....

Capacity .....

for the Employer

.....
(Insert name and address of organisation)

Name & signature of witness .....

Date .....

Note: If a tenderer wishes to submit alternative tenders, use another copy of this Form of Offer and Acceptance.

- Schedule of Deviations to be completed by the *Employer* prior to contract award

Note:

1. This part of the Offer & Acceptance would not be required if the contract has been developed by negotiation between the Parties and is not the result of a process of competitive tendering.
2. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender.
3. A tenderer's covering letter must not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid be the subject of agreement reached during the process of Offer and Acceptance, the outcome of such agreement shall be recorded here and the final draft of the contract documents shall be revised to incorporate the effect of it.

No.	Subject	Details
1	**[●]**	**[●]**
2	**[●]**	**[●]**
3	**[●]**	**[●]**
4	**[●]**	**[●]**
5	**[●]**	**[●]**
6	**[●]**	**[●]**
7	**[●]**	**[●]**

By the duly authorised representatives signing this Schedule of Deviations below, the Employer and the tenderer agree to and accept this Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules, as well as any 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 Form shall have any meaning or effect in the contract between the parties arising from this Agreement.

	- **For the tenderer:**	- **For the Employer**
Signature	.....	.....
Name	.....	.....
Capacity	.....	.....
On behalf of	..... *(Insert name and address of organisation)*	..... *(Insert name and address of organisation)*
Name & signature of witness	.....	.....
Date	.....	.....

C1.2 ECC3 Contract Data

Part one - Data provided by the *Employer*

Clause	Statement	Data
1	**General**	
	The *conditions of contract* are the core clauses and the clauses for main Option	
		A: Priced contract with activity schedule
	dispute resolution Option	**W1: Dispute resolution procedure**
	and secondary Options	
		X1: Price adjustment for inflation
		X2 Changes in the law
		X3: Multiple currencies
		X5: Sectional Completion
		X7: Delay damages
		X13: Performance Bond
		X16: Retention
		X18: Limitation of liability
		Z: *Additional conditions of contract*
	of the NEC3 Engineering and Construction Contract, April 2013 (ECC3)	
10.1	The *Employer* is (Name):	**Eskom Holdings SOC Ltd (reg no: 2002/015527/30), a state owned company incorporated in terms of the company laws of the Republic of South Africa**
	Address	**Registered office at Megawatt Park, Maxwell Drive, Sandton, Johannesburg**
10.1	The *Project Manager* is: (Name)	**[●]**
	Address	**[●]**
	Tel	**[●]**
	Fax	**[●]**
	e-mail	**[●]**

10.1	The *Supervisor* is: (Name)	**[●]**
	Address	**[●]**
	Tel No.	**[●]**
	Fax No.	**[●]**
	e-mail	**[●]**
11.2(13)	The *works* are	**Design, supply, delivery, installation and commissioning of hybrid wind and solar PV microgrid research facility at Eskom Research, Testing and Development (RT&D)**
11.2(14)	The following matters will be included in the Risk Register	• **1. Interface with other contractors on site**
11.2(15)	The *boundaries of the site* are	**Part 4: Site Information**
11.2(16)	The Site Information is in	**Part 4: Site Information**
11.2(19)	The Works Information is in	**Part 3: Scope of Work and all documents and drawings to which it makes reference.**
12.2	The *law of the contract* is the law of	**the Republic of South Africa**
13.1	The *language of this contract* is	**English**
13.3	The *period for reply* is	**Two weeks**
2	**The *Contractor's* main responsibilities**	**Data required by this section of the core clauses is provided by the *Contractor* in Part 2 and terms in italics used in this section are identified elsewhere in this Contract Data.**
3	**Time**	
11.2(3)	The *completion date* for the whole of the *works* is Technical Support as and when required- Completion Date is:	**Fifteen (15) months duration from the contract starting date, Includes design and complete Construction, Commissioning and Handover.** **Twenty-one (21) months duration after Construction Completion Date**
30.1	The *access dates* are:	**Part of the Site** / **Date** **1** **Whole working Area** **20 April 2026**
31.1	The *Contractor* is to submit a first programme for acceptance within	**Within two weeks of contract start date the Contractor submitting a programme to Project manager for acceptance**
31.2	The *starting date* is	**20 May 2026**
32.2	The *Contractor* submits revised programmes at intervals no longer than	**One week.**

35.1	The *Employer* is not willing to take over the *works* before the Completion Date.	
4	**Testing and Defects**	
42.2	The *defects date* is	**52 weeks after Completion of the whole of the *works*.**
43.2	The *defect correction period* is	**One week**
	except that the *defect correction period* for	**Defect of such a nature that it cannot reasonably be repaired in 1 week, the *Contractor* promptly notifies the *Project Manager* and submits a plan for correcting the Defect.** **The *Contractor* and *Project Manager* agree on a time allowed for defect correction, in addition to the *defect correction period*** **If no agreement is reached in respect of further time allowed, the *defect correction period* remains 1week.**
5	**Payment**	
50.1	The *assessment interval* is	**between the 25th day of each successive month.**
51.1	The *currency of this contract* is the	**South African Rand.**
51.2	The period within which payments are made is	**Four weeks.**
51.4	The *interest rate* is	**the publicly quoted prime rate of interest (calculated on a 365 day year) charged from time to time by the Standard Bank of South Africa Limited (as certified, in the event of any dispute, by any manager of such bank, whose appointment it shall not be necessary to prove) for amounts due in Rands and** **(ii) the LIBOR rate applicable at the time for amounts due in other currencies. LIBOR is the 6 month London Interbank Offered Rate quoted under the caption "Money Rates" in The Wall Street Journal for the applicable currency or if no rate is quoted for the currency in question then the rate for United States Dollars, and if no such rate appears in The Wall Street Journal then the rate as quoted by the Reuters Monitor Money Rates Service (or such service as may replace the Reuters Monitor Money Rates Service) on the due date for the payment in question, adjusted *mutatis mutandis* every 6 months thereafter and as certified, in the event of any dispute, by any manager employed in the foreign exchange department of The Standard Bank of South Africa Limited, whose appointment it shall not be necessary to prove.**
6	**Compensation events**	

60.1(13)	The place where weather is to be recorded is:	**Germiston in Johannesburg**
	The *weather measurements* to be recorded for each calendar month are,	**the cumulative rainfall (mm)** **the number of days with rainfall more than 10 mm** **the number of days with minimum air temperature less than 0 degrees Celsius** **the number of days with snow lying at 09:00 hours South African Time** **and these measurements:**
	The *weather measurements* are supplied by	**the South African Weather Bureau**
	The *weather data* are the records of past *weather measurements* for each calendar month which were recorded at:	**The weather station closest to the Eskom ERIC Building supplied by the South African Weather Bureau**
	and which are available from:	**the South African Weather Bureau**
7	**Title**	**There is no reference to Contract Data in this section of the core clauses and terms in italics used in this section are identified elsewhere in this Contract Data.**
8	**Risks and insurance**	
80.1	These are additional *Employer*'s risks	**None**
9	**Termination**	**There is no reference to Contract Data in this section of the core clauses and terms in italics used in this section are identified elsewhere in this Contract Data.**
10	**Data for main Option clause**	
A	**Priced contract with activity schedule**	**There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.**
11	**Data for Option W1**	
W1.1	The *Adjudicator* is	**the person selected from the ICE-SA Division (or its successor body) of the South African Institution of Civil Engineering Panel of Adjudicators by the Party intending to refer a dispute to him. (see www.ice-sa.org.za). If the Parties do not agree on an Adjudicator the Adjudicator will be appointed by the Arbitration Foundation of Southern Africa (AFSA).**
	Address	**[●]**
	Tel No.	**[●]**

	Fax No.	**[●]**
	e-mail	**[●]**
W1.2(3)	The *Adjudicator nominating body* is:	**the Chairman of ICE-SA a joint Division of the South African Institution of Civil Engineering and the London Institution of Civil Engineers. (See www.ice-sa.org.za) or its successor body.**
W1.4(2)	The *tribunal* is:	**arbitration.**
W1.4(5)	The *arbitration procedure* is	**the latest edition of Rules for the Conduct of Arbitrations published by The Association of Arbitrators (Southern Africa) or its successor body.**
	The place where arbitration is to be held is	**Johannesburg**
	The person or organisation who will choose an arbitrator - if the Parties cannot agree a choice or - if the arbitration procedure does not state who selects an arbitrator, is	**the Chairman for the time being or his nominee of the Association of Arbitrators (Southern Africa) or its successor body.**

12 Data for secondary Option clauses

X1	**Price adjustment for inflation**			
X1.1(a)	The *base date* for indices is	**.A month prior to closing of the tender.**		
X1.1(c)	The proportions used to calculate the Price Adjustment Factor are:	**proportion**	**linked to index for**	**Index prepared by**
		0. 85	**adjustable**	**[●]**
		0.15	**non-adjustable**	
	Total	**1.00**		
X2	**Changes in the law**	**There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.**		
X3	**Multiple currencies**			
X3.1	The *Employer* will pay for these items or activities in the currencies stated	**Items & activities**	**Other currency**	**Maximum payment in other currency**
		[●]	**[●]**	**[●]**
		[●]	**[●]**	**[●]**
		[●]	**[●]**	**[●]**
		[●]	**[●]**	**[●]**
X3.1	The *exchange rates* are those published in	**[●] on [●] (date)**		
		The items & activities will be paid in the other		

		currency **- to a foreign Bank account nominated by the *Contractor*** **- to a valid SARB approved CFC account in South Africa** **- in accordance with an alternative payment method agreed with the *Employer* before the Contract Date.** **(select one of the three methods as agreed with successful tenderer and delete the others and this note)**		
X5	**Sectional Completion**			
X5.1	The *completion date* for each *section* of the *works* is:	***Section***	**Description**	***Completion date***
		1	**Completion of Detail Design Phase**	**22 July 2026**
		2	**Complete Procurement of all plant items**	**07 January 2027**
		3	**Complete Construction of the Plant**	**27 May 2027**
		4	**Complete Commissioning & Testing**	**24 June 2027**
X7.1 X5.1	Delay damages for late Completion of the *section*s of the *works* are:	***section***	**Description**	**Amount per day**
		1	**Delays in Completion designs**	**Not exceeding 10% of the total of the Prices for Construction at 0.03% per day**
		2	**Procurement of all plant items**	**Not exceeding 10% of the total of the Prices for Construction at 0.03% per day**
		3	**Delays in Completion of Construction**	**Not exceeding 10% of the total of the Prices for Construction at 0.03% per**

				day
		4	**Complete Commissioning & Testing**	**total of the Prices for Construction at 0.03% per day**
	The total delay damages payable by the *Contractor* does not exceed:	**10% of the contract price**		
X13	**Performance bond**			
X13.1	The amount of the performance bond is	**10% of the contract price**		
X15	**Limitation of the *Contractor*'s liability for his design to reasonable skill & care**	**There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.**		
X16	**Retention (not used with Option F)**			
X16.1	The *retention free amount* is	**Nil**		
	The *retention percentage* is	**10% of the contract price**		
X18	**Limitation of liability**			
X18.1	The *Contractor*'s liability to the *Employer* for indirect or consequential loss is limited to:	**R0.0 (zero Rand)**		
X18.2	For any one event, the *Contractor*'s liability to the *Employer* for loss of or damage to the *Employer*'s property is limited to:	**the amount of the deductibles relevant to the event**		
X18.3	The *Contractor*'s liability for Defects due to his design which are not listed on the Defects Certificate is limited to	**The greater of** • **the total of the Prices at the Contract Date and** • **the amounts excluded and unrecoverable from the *Employer*'s assets policy for correcting the Defect (other than the resulting physical damage which is not excluded) plus the applicable deductible as at contract date.**		
X18.4	The *Contractor*'s total liability to the *Employer* for all matters arising under or in connection with this contract, other than excluded matters, is limited to:	**the total of the Prices other than for the additional excluded matters.** **The *Contractor's* total liability for the additional excluded matters is not limited.** **The additional excluded matters are amounts for which the *Contractor* is liable under this contract for** • **Defects due to his design which arise before the Defects Certificate is issued,** • **Defects due to manufacture and fabrication outside the Site,**		

		• **loss of or damage to property (other than the *works*, Plant and Materials),**
		  • **death of or injury to a person and**
		  • **infringement of an intellectual property right.**

X18.5	The *end of liability date* is	**(i) Three (3) years after the *defects date* for latent Defects and** **(ii) the date on which the liability in question prescribes in accordance with the Prescription Act No. 68 of 1969 (as amended or in terms of any replacement legislation) for any other matter.** **A latent Defect is a Defect which would not have been discovered on reasonable inspection by the *Employer* or the *Supervisor* before the *defects date*, without requiring any inspection not ordinarily carried out by the *Employer* or the *Supervisor* during that period. If the *Employer* or the *Supervisor* do undertake any inspection over and above the reasonable inspection, this does not place a greater responsibility on the *Employer* or the *Supervisor* to have discovered the Defect.**
Z	**The *Additional conditions of contract* are**	**Z1 to Z15 always apply.**

Z1 Cession delegation and assignment

Z1.1 The *Contractor* does not cede, delegate or assign any of its rights or obligations to any person without the written consent of the *Employer.*

Z1.2 Notwithstanding the above, the *Employer* may on written notice to the *Contractor* cede and delegate its rights and obligations under this contract to any of its subsidiaries or any of its present divisions or operations which may be converted into separate legal entities as a result of the restructuring of the Electricity Supply Industry.

Z2 Joint ventures

Z2.1 If the *Contractor* constitutes a joint venture, consortium or other unincorporated grouping of two or more persons or organisations then these persons or organisations are deemed to be jointly and severally liable to the *Employer* for the performance of this contract.

Z2.2 Unless already notified to the *Employer*, the persons or organisations notify the *Project Manager* within two weeks of the Contract Date of the key person who has the authority to bind the *Contractor* on their behalf.

Z2.3 The *Contractor* does not alter the composition of the joint venture, consortium or other unincorporated grouping of two or more persons without the consent of the *Employer* having been given to the *Contractor* in writing.

Z3 Change of Broad Based Black Economic Empowerment (B-BBEE) status

Z3.1 Where a change in the *Contractor's* legal status, ownership or any other change to his business

composition or business dealings results in a change to the *Contractor*'s B-BBEE status, the *Contractor* notifies the *Employer* within seven days of the change.

Z3.2 The *Contractor* is required to submit an updated verification certificate and necessary supporting documentation confirming the change in his B-BBEE status to the *Project Manager* within thirty days of the notification or as otherwise instructed by the *Project Manager*.

Z3.3 Where, as a result, the *Contractor's* B-BBEE status has decreased since the Contract Date the *Employer* may either re-negotiate this contract or alternatively, terminate the *Contractor*'s obligation to Provide the Works.

Z3.4 Failure by the *Contractor* to notify the *Employer* of a change in its B-BBEE status may constitute a reason for termination. If the *Employer* terminates in terms of this clause, the procedures on termination are P1, P2 and P3 as stated in clause 92, and the amount due is A1 and A3 as stated in clause 93.

Z4 Confidentiality

Z4.1 The *Contractor* does not disclose or make any information arising from or in connection with this contract available to Others. This undertaking does not, however, apply to information which at the time of disclosure or thereafter, without default on the part of the *Contractor*, enters the public domain or to information which was already in the possession of the *Contractor* at the time of disclosure (evidenced by written records in existence at that time). Should the *Contractor* disclose information to Others in terms of clause 25.1, the *Contractor* ensures that the provisions of this clause are complied with by the recipient.

Z4.2 If the *Contractor* is uncertain about whether any such information is confidential, it is to be regarded as such until notified otherwise by the *Project Manager*.

Z4.3 In the event that the *Contractor* is, at any time, required by law to disclose any such information which is required to be kept confidential, the *Contractor*, to the extent permitted by law prior to disclosure, notifies the *Employer* so that an appropriate protection order and/or any other action can be taken if possible, prior to any disclosure. In the event that such protective order is not, or cannot, be obtained, then the *Contractor* may disclose that portion of the information which it is required to be disclosed by law and uses reasonable efforts to obtain assurances that confidential treatment will be afforded to the information so disclosed.

Z4.4 The taking of images (whether photographs, video footage or otherwise) of the *works* or any portion thereof, in the course of Providing the Works and after Completion, requires the prior written consent of the *Project Manager*. All rights in and to all such images vests exclusively in the *Employer*.

Z4.5 The *Contractor* ensures that all his subcontractors abide by the undertakings in this clause.

Z5 Waiver and estoppel: Add to core clause 12.3:

Z5.1 Any extension, concession, waiver or relaxation of any action stated in this contract by the Parties, the *Project Manager*, the *Supervisor*, or the *Adjudicator* does not constitute a waiver of rights, and does not give rise to an estoppel unless the Parties agree otherwise and confirm such agreement in writing.

Z6 Health, safety and the environment: Add to core clause 27.4

Z6.1 The *Contractor* undertakes to take all reasonable precautions to maintain the health and safety of persons in and about the execution of the *works*. Without limitation the *Contractor*:

- accepts that the *Employer* may appoint him as the "Principal Contractor" (as defined and provided for under the Construction Regulations 2014 (promulgated under the Occupational Health & Safety Act 85 of 1993) ("the Construction

Regulations") for the Site;

- warrants that the total of the Prices as at the Contract Date includes a sufficient amount for proper compliance with the Construction Regulations, all applicable health & safety laws and regulations and the health and safety rules, guidelines and procedures provided for in this contract and generally for the proper maintenance of health & safety in and about the execution of *works*; and
- undertakes, in and about the execution of the *works*, to comply with the Construction Regulations and with all applicable health & safety laws and regulations and rules, guidelines and procedures otherwise provided for under this contract and ensures that his Subcontractors, employees and others under the *Contractor's* direction and control, likewise observe and comply with the foregoing.

Z6.2 The *Contractor*, in and about the execution of the *works*, complies with all applicable environmental laws and regulations and rules, guidelines and procedures otherwise provided for under this contract and ensures that his Subcontractors, employees and others under the *Contractor's* direction and control, likewise observe and comply with the foregoing.

Z7 Provision of a Tax Invoice and interest. Add to core clause 51

Z7.1 Within one week of receiving a payment certificate from the *Project Manager* in terms of core clause 51.1, the *Contractor* provides the *Employer* with a tax invoice in accordance with the *Employer*'s procedures stated in the Works Information, showing the amount due for payment equal to that stated in the payment certificate.

Z7.2 If the *Contractor* does not provide a tax invoice in the form and by the time required by this contract, the time by when the *Employer* is to make a payment is extended by a period equal in time to the delayed submission of the correct tax invoice. Interest due by the *Employer* in terms of core clause 51.2 is then calculated from the delayed date by when payment is to be made.

Z7.3 The *Contractor* (if registered in South Africa in terms of the companies Act) is required to comply with the requirements of the Value Added Tax Act, no 89 of 1991 (as amended) and to include the *Employer*'s VAT number 4740101508 on each invoice he submits for payment.

Z8 Notifying compensation events

Z8.1 Delete from the last sentence in core clause 61.3, "unless the *Project Manager* should have notified the event to the *Contractor* but did not".

Z9 *Employer's* limitation of liability

Z9.1 The *Employer's* liability to the *Contractor* for the *Contractor's* indirect or consequential loss is limited to R0.00 (zero Rand)

Z9.2 The *Contractor*'s entitlement under the indemnity in 83.1 is provided for in 60.1(14) and the *Employer*'s liability under the indemnity is limited.

Z10 Termination: Add to core clause 91.1, at the second main bullet point, fourth sub-bullet point, after the words "against it":

Z10.1 or had a business rescue order granted against it.

Z11 Addition to secondary Option X7 Delay damages (if applicable in this contract)

Z11.1 If the amount due for the *Contractor*'s payment of delay damages reaches the limits stated in

this Contract Data for Option X7 or Options X5 and X7 used together, the *Employer* may terminate the *Contractor*'s obligation to Provide the Works using the same procedures and payment on termination as those applied for reasons R1 to R15 or R18 stated in the Termination Table.

Z12 Ethics

For the purposes of this Z-clause, the following definitions apply:

Affected Party means, as the context requires, any party, irrespective of whether it is the *Contractor* or a third party, such party's employees, agents, or Subcontractors or Subcontractor's employees, or any one or more of all of these parties' relatives or friends,

Coercive Action means to harm or threaten to harm, directly or indirectly, an Affected Party or the property of an Affected Party, or to otherwise influence or attempt to influence an Affected Party to act unlawfully or illegally,

Collusive Action means where two or more parties co-operate to achieve an unlawful or illegal purpose, including to influence an Affected Party to act unlawfully or illegally,

Committing Party means, as the context requires, the *Contractor*, or any member thereof in the case of a joint venture, or its employees, agents, or Subcontractor or the Subcontractor's employees,

Corrupt Action means the offering, giving, taking, or soliciting, directly or indirectly, of a good or service to unlawfully or illegally influence the actions of an Affected Party,

Fraudulent Action means any unlawfully or illegally intentional act or omission that misleads, or attempts to mislead, an Affected Party, in order to obtain a financial or other benefit or to avoid an obligation or incurring an obligation,

Obstructive Action means a Committing Party unlawfully or illegally destroying, falsifying, altering or concealing information or making false statements to materially impede an investigation into allegations of Prohibited Action, and

Prohibited Action means any one or more of a Coercive Action, Collusive Action Corrupt Action, Fraudulent Action or Obstructive Action.

Z12.1 A Committing Party may not take any Prohibited Action during the course of the procurement of this contract or in execution thereof.

Z12.2 The *Employer* may terminate the *Contractor*'s obligation to Provide the Services if a Committing Party has taken such Prohibited Action and the *Contractor* did not take timely and appropriate action to prevent or remedy the situation, without limiting any other rights or remedies the *Employer* has. It is not required that the Committing Party had to have been found guilty, in court or in any other similar process, of such Prohibited Action before the *Employer* can terminate the *Contractor*'s obligation to Provide the Services for this reason.

Z12.3 If the *Employer* terminates the *Contractor*'s obligation to Provide the Services for this reason, the amounts due on termination are those intended in core clauses 92.1 and 92.2.

Z12.4 A Committing Party co-operates fully with any investigation pursuant to alleged Prohibited Action. Where the *Employer* does not have a contractual bond with the Committing Party, the *Contractor* ensures that the Committing Party co-operates fully with an investigation.

Z13 Insurance

Z 13.1 Replace core clause 84 with the following:

Insurance cover **84**

84.1 When requested by a Party, the other Party provides certificates from his insurer or broker stating that the insurances required by this contract are in force.

84.2 The *Contractor* provides the insurances stated in the Insurance Table A.

84.3 The insurances provide cover for events which are at the *Contractor*'s risk from the *starting date* until the earlier of Completion and the date of the termination certificate.

INSURANCE TABLE A

Insurance against	Minimum amount of cover or minim limit of indemnity
Loss of or damage to the *works*, Plant and Materials	The replacement cost where not covered by the *Employer*'s insurance The *Employer*'s policy deductible, as Contract Date, where covered by the *Employer*'s insurance
Loss of or damage to Equipment	The replacement cost
Liability for loss of or damage to property (except the *works*, Plant and Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the *Contractor*) caused by activity in connection with this contract	Loss of or damage to property *Employer*'s property The replacement cost where not covered by the *Employer*'s insurance The *Employer*'s policy deductible, as Contract Date, where covered by the *Employer*'s insurance Other property The replacement cost Bodily injury to or death of a person The amount required by applicable l
Liability for death of or bodily injury to employees of the *Contractor* arising out of and in the course of their employment in connection with this contract	The amount required by the applicab law

Z 13.2 **Replace core clause 87 with the following:**
The *Employer* provides the insurances stated in the Insurance Table B.

INSURANCE TABLE B

Insurance against or name of policy	**Minimum amount of cover or minimum l of indemnity**
Assets All Risk	Per the insurance policy document

Contract Works insurance	Per the insurance policy document
Environmental Liability	Per the insurance policy document
General and Public Liability	Per the insurance policy document
Transportation (Marine)	Per the insurance policy document
Motor Fleet and Mobile Plant	Per the insurance policy document
Terrorism	Per the insurance policy document
Cyber Liability	Per the insurance policy document
Nuclear Material Damage and Business Interruption	Per the insurance policy document
Nuclear Material Damage Terrorism	Per the insurance policy document

Z14 Nuclear Liability

Z14.1 The *Employer* is the operator of the Koeberg Nuclear Power Station (KNPS), a nuclear installation, as designated by the National Nuclear Regulator of the Republic of South Africa, and is the holder of a nuclear licence in respect of the KNPS.

Z14.2 The *Employer* is solely responsible for and indemnifies the *Contractor* or any other person against any and all liabilities which the *Contractor* or any person may incur arising out of or resulting from nuclear damage, as defined in Act 47 of 1999, save to the extent that any liabilities are incurred due to the unlawful intent of the *Contractor* or any other person or the presence of the *Contractor* or that person or any property of the *Contractor* or such person at or in the KNPS or on the KNPS site, without the permission of the *Employer* or of a person acting on behalf of the *Employer*.

Z14.3 Subject to clause Z14.4 below, the *Employer* waives all rights of recourse, arising from the aforesaid, save to the extent that any claims arise or liability is incurred due or attributable to the unlawful intent of the *Contractor* or any other person, or the presence of the *Contractor* or that person or any property of the *Contractor* or such person at or in the KNPS or on the KNPS site, without the permission of the *Employer* or of a person acting on behalf of the *Employer*.

Z14.4 The *Employer* does not waive its rights provided for in section 30 (7) of Act 47 of 1999, or any replacement section dealing with the same subject matter.

Z14.5 The protection afforded by the provisions hereof shall be in effect until the KNPS is decommissioned.

Z15 Asbestos

For the purposes of this Z-clause, the following definitions apply:

AAIA means approved asbestos inspection authority.

ACM means asbestos containing materials.

AL means action level, i.e. a level of 50% of the OEL, i.e. 0.1 regulated asbestos fibres per ml of air measured over a 4 hour period. The value at which proactive actions is required in order to control asbestos exposure to prevent exceeding the OEL.

Ambient Air means breathable air in area of work with specific reference to breathing zone,

which is defined to be a virtual area within a radius of approximately 30cm from the nose inlet.

Compliance Monitoring means compliance sampling used to assess whether or not the personal exposure of workers to regulated asbestos fibres is in compliance with the Standard's requirements for safe processing, handling, storing, disposal and phase-out of asbestos and asbestos containing material, equipment and articles.

OEL means occupational exposure limit.

Parallel Measurements means measurements performed in parallel, yet separately, to existing measurements to verify validity of results.

Safe Levels means airborne asbestos exposure levels conforming to the Standard's requirements for safe processing, handling, storing, disposal and phase-out of asbestos and asbestos containing material, equipment and articles.

Standard means the *Employer*'s Asbestos Standard 32-303: Requirements for Safe Processing, Handling, Storing, Disposal and Phase-out of Asbestos and Asbestos Containing Material, Equipment and Articles.

SANAS means the South African National Accreditation System.

TWA means the average exposure, within a given workplace, to airborne asbestos fibres, normalised to the baseline of a 4 hour continuous period, also applicable to short term exposures, i.e. 10-minute TWA.

Z15.1 The *Employer* ensures that the Ambient Air in the area where the *Contractor* will Provide the Services conforms to the acceptable prescribed South African standard for asbestos, as per the regulations published in GNR 155 of 10 February 2002, under the Occupational Health and Safety Act, 1993 (Act 85 of 1993) ("Asbestos Regulations"). The OEL for asbestos is 0.2 regulated asbestos fibres per millilitre of air as a 4-hour TWA, averaged over any continuous period of four hours, and the short term exposure limit of 0.6 regulated asbestos fibres per millilitre of air as a 10-minute TWA, averaged over any 10 minutes, measured in accordance with HSG248 and monitored according to HSG173 and OESSM.

Z15.2 Upon written request by the *Contractor*, the *Employer* certifies that these conditions prevail. All measurements and reporting are effected by an independent, competent, and certified occupational hygiene inspection body, i.e. a SANAS accredited and Department of Employment and Labour approved AAIA. The *Contractor* may perform Parallel Measurements and related control measures at the *Contractor*'s expense. For the purposes of compliance the results generated from Parallel Measurements are evaluated only against South African statutory limits as detailed in clause Z15.1. Control measures conform to the requirements stipulated in the AAIA-approved asbestos work plan.

Z15.3 The *Employer* manages asbestos and ACM according to the Standard.

Z15.4 In the event that any asbestos is identified while Providing the Services, a risk assessment is conducted and if so required, with reference to possible exposure to an airborne concentration of above the AL for asbestos, immediate control measures are implemented and relevant air monitoring conducted in order to declare the area safe.

Z15.5 The *Contractor*'s personnel are entitled to stop working and leave the contaminated area forthwith until such time that the area of concern is declared safe by either Compliance Monitoring or an AAIA approved control measure intervention, for example, per the emergency asbestos work plan, if applicable.

Z15.6 The *Contractor* continues to Provide the Services, without additional control measures presented, on presentation of Safe Levels. The contractually agreed dates to Provide the Services, including the Completion Date, are adjusted accordingly. The contractually agreed dates are extended by the notification periods required by regulations 3 and 21 of the Asbestos Regulations, 2001.

Z15.7 Any removal and disposal of asbestos, asbestos containing materials and waste, is done by a registered asbestos contractor, instructed by the *Employer* at the *Employer*'s expense, and conducted in line with South African legislation.

C1.2 Contract Data

- Part two - Data provided by the *Contractor*

[Instructions to the contract compiler: (delete this notes before issue to tenderers with an enquiry) Whenever a cell is shaded in the left hand column it denotes this data is optional. If not required select and delete the whole row, otherwise insert the required Data.]

Notes to a tendering contractor:

1. Please read both the NEC3 Engineering and Construction Contract (April 2013) and the relevant parts of its Guidance Notes (ECC3-GN)[2] in order to understand the implications of this Data which the tenderer is required to complete. An example of the completed Data is provided on pages 156 to 158 of the ECC3 (April 2013) Guidance Notes.
2. The number of the clause which requires the data is shown in the left hand column for each statement however other clauses may also use the same data
3. Where a form field like this [ ] appears, data is required to be inserted relevant to the option selected. Click on the form field ***once*** and type in the data. Otherwise complete by hand and in ink.

Completion of the data in full, according to Options chosen, is essential to create a complete contract.

-	- **Statement**	- **Data**
10.1	The *Contractor* is (Name): Address Tel No. Fax No.	
11.2(8)	The *direct fee percentage* is The *subcontracted fee percentage* is	**%** **%**
11.2(18)	The *working areas* are the Site and	
24.1	The *Contractor's* key persons are: 1 Name: Job: Responsibilities: Qualifications: Experience:	

[2] Available from Engineering Contract Strategies Tel 011 803 3008, Fax 011 803 3009 or see www.ecs.co.za

	2 Name: Job Responsibilities: Qualifications: Experience:	**CV's (and further key persons data including CVs) are appended to Tender Schedule entitled .**		
11.2(3)	The *completion date* for the whole of the *works* is			
11.2(14)	The following matters will be included in the Risk Register			
11.2(19)	The Works Information for the *Contractor*'s design is in:			
31.1	The programme identified in the Contract Data is			
A	**Priced contract with activity schedule**			
11.2(20) 11.2(30)	The *activity schedule* is in The tendered total of the Prices is	**(in figures)** **(in words), excluding VAT**		
	- **Data for Schedules of Cost Components**	*Note "SCC" means Schedule of Cost Components starting on page 60, and "SSCC" means Shorter Schedule of Cost Components starting on page 63 of ECC3 (April 2013).*		
A	**Priced contract with activity schedule**	**Data for the Shorter Schedule of Cost Components**		
41 in SSCC	The percentage for people overheads is:	**%**		
21 in SSCC	The published list of Equipment is the last edition of the list published by The percentage for adjustment for Equipment in the published list is	**Minus %**		
22 in SSCC	The rates of other Equipment are:	**Equipment**	**Size or capacity**	**Rate**

61 in SSCC	The hourly rates for Defined Cost of design outside the Working Areas are **Note: Hourly rates are estimated 'cost to company of the employee' and not selling rates.** **Please insert another schedule if foreign resources may also be used**	**Category of employee**	**Hourly rate**
62 in SSCC	The percentage for design overheads is	**%**	
63 in SSCC	The categories of design employees whose travelling expenses to and from the Working Areas are included in Defined Cost are:		

C1.3 Forms of Securities

Pro formas for Bonds & Guarantees

For use with the NEC3 Engineering & Construction Contract

[Note to contract compiler:
Once it has been decided which securities are required for this contract delete from this file the ones not required, revise the notes below accordingly and delete this note.]

The *conditions of contract* stated in the Contract Data Part 1 include the following Secondary Options:

Option X4: Parent company guarantee
Option X13: Performance Bond
Option X14: Advanced payment to the *Contractor*

Each of these secondary Options requires a bond or guarantee "in the form set out in the Works Information". Pro forma documents for these bonds and guarantees are provided here for convenience but are to be treated as part of the Works Information.

Option X16: Retention (not used with Option F)

The *Contractor* may provide a Retention Money Guarantee in the form stated here. When the *Employer* receives and accepts a Retention Money Guarantee exactly in the form stated he will instruct the *Project Manager* not to assess any amount be retained in terms of secondary Option X16.

The *Contractor* shall guarantee his ASGI-SA Obligations by providing the *Employer* with an ASGI-SA Guarantee in the form provided here.

[Note to contract compiler: If there are no ASGI-SA Obligations in this contract, delete the above statement]

The organisation providing the bond / guarantee does so by copying the pro forma document onto his letterhead without any change to the text or format and completing the required details. The completed document is then given to the *Employer* within the time stated in the contract.

Pro forma Performance Bond – Demand Guarantee (for use with Option X13)

(to be reproduced exactly as shown below on the letterhead of the Contractor's Parent Company)

Eskom Holdings SOC Ltd
Megawatt Park
Maxwell Drive
Sandton
Johannesburg Date:

Dear Sirs

Reference No. **[●]** *[Drafting Note: Bank reference number to be inserted]*

Performance Bond – Demand Guarantee: *[Drafting Note: Name of Contractor to be inserted]*

Project [ ] Contract Reference: …… *[Drafting Note: Contractor contract reference number to be inserted]*

In this Guarantee the following words and expressions shall have the following meanings:-

"Bank" - means [●], [●] Branch, (Registration No. [●]); [Drafting Note: Name of Bank to be inserted]

"Bank's Address" - means [●]; [Drafting Note: Bank's physical address to be inserted]

"Contract" – means the written agreement relating to the Project, entered into between Eskom and the Contractor, on or about the [●] day of [●] 200[●] (Contract Reference No. [.]as amended, varied, restated, novated or substituted from time to time; [Drafting Note: Signature Date and Contract reference number to be inserted]

"Contractor" – means [●] a company registered in accordance with the laws of [●] under Registration Number [●]. [Drafting Note: Name and details of Contractor to be inserted]

"Eskom" - means Eskom Holdings SOC Ltd, a company registered in accordance with the laws of the Republic of South Africa under Registration Number 2002/015527/30].

"Expiry Date" - means the date on which the Defects Certificate is issued in terms of the Contract.

"Guaranteed Sum" - means the sum of R [●] ([●] Rand);

"Project" - means [insert if applicable.].

At the instance of the Contractor, we the undersigned _____ and _____, in our respective capacities as _____ and _____ of the Bank, and duly authorized thereto, confirm that we hold the Guaranteed Sum at the disposal of Eskom, as security for the proper performance by the Contractor of all of its obligations in terms of and arising from the Contract and hereby undertake to pay to Eskom, on written demand from Eskom received prior to the Expiry Date, any sum or sums not exceeding in total the Guaranteed Sum.

A demand for payment under this guarantee shall be made in writing at the Bank's address and shall:

be signed on behalf of Eskom by a Group Executive, Divisional Executive, Senior General Manager, General Manager or its delegate;

state the amount claimed ("the Demand Amount');

state that the Demand Amount is payable to Eskom in the circumstances contemplated in the Contract.

Notwithstanding the reference herein to the Contract the liability of the Bank in terms hereof is as principal and not as surety and the Bank's obligation/s to make payment:

is and shall be absolute provided demand is made in terms of this bond in all circumstances; and

is not, and shall not be construed to be, accessory or collateral on any basis whatsoever.

The Bank's obligations in terms of this Guarantee:

shall be restricted to the payment of money only and shall be limited to the maximum of the Guaranteed Sum; and

shall not be discharged and compliance with any demand for payment received by the Bank in terms hereof shall not be delayed, by the fact that a dispute may exist between Eskom and the Contractor.

Eskom shall be entitled to arrange its affairs with the Contractor in any manner which it sees fit, without advising us and without affecting our liability under this Guarantee. This includes, without limitation, any extensions, indulgences, release or compromise granted to the Contractor or any variation under or to the Contract.

Should Eskom cede its rights against the Contractor to a third party where such cession is permitted under the Contract, then Eskom shall be entitled to cede to such third party the rights of Eskom under this Guarantee on written notification to the Bank of such cession.

This Guarantee:

shall expire on the Expiry Date until which time it is irrevocable;

is, save as provided for in 0 above, personal to Eskom and is neither negotiable nor transferable;

shall be returned to the Bank upon the earlier of payment of the full Guaranteed Sum or expiry hereof;

shall be regarded as a liquid document for the purpose of obtaining a court order; and

shall be governed by and construed in accordance with the law of the Republic of South Africa and shall be subject to the jurisdiction of the Courts of the Republic of South Africa.

Any claim which arises or demand for payment received after expiry date will be invalid and unenforceable.

The Bank chooses domicilium citandi et executandi for all purposes in connection with this Guarantee at the Bank's Address.

Signed at _____ Date _____

For and behalf of the Bank

Bank Signatory: _____ Bank Signatory: _____

Witness: _____ Witness: _____
Bank's seal or stamp

Pro forma Retention Money Guarantee (may be used when Option X16 applies)

(to be reproduced exactly as shown below on the letterhead of the Bank providing the Guarantee)

Eskom Holdings SOC Limited
Megawatt Park
Maxwell Drive
Sandton
Johannesburg Date:

Dear Sirs

Reference No. **[●]** *[Drafting Note: Bank reference number to be inserted]*

Retention Money Guarantee: *[Drafting Note: Name of Contractor to be inserted]*

Project [ ] : Contract Reference: *[Drafting Note: Contractor contract reference number to be inserted]*

In this Guarantee the following words and expressions shall have the following meanings:-

"Bank" - means [●], [●] Branch, (Registration No. [●]); [Drafting Note: Name of Bank to be inserted]

"Bank's Address" - means [●]; [Drafting Note: Bank's physical address to be inserted]

"Contract" – means the written agreement relating to the Project, entered into between Eskom and the Contractor, on or about the [●] day of [●] 200[●] (Contract Reference No. ……. as amended, varied, restated, novated or substituted from time to time; [Drafting Note: Signature Date and Contract reference number to be inserted]

"Contractor" – means [●] a company registered in accordance with the laws of [●] under Registration Number [●]. [Drafting Note: Name and details of Contractor to be inserted]

"Eskom" - means Eskom Holdings SOC Limited, a company registered in accordance with the laws of the Republic of South Africa under Registration Number 2002/015527/30

"Expiry Date" - means the date on which the Defects Certificate is issued in terms of the Contract.

"Guaranteed Sum" - means the sum of R [●] ([●] Rand); [Drafting Note: Insert amount of Retention Money Guarantee.].

"Project" - means the……..

At the instance of the Contractor, we the undersigned _____ and _____, in our respective capacities as _____ and _____ of the Bank, and duly authorized thereto, confirm that we hold the Guaranteed Sum at the disposal of Eskom, as security for the proper performance by the Contractor of all of its obligations in terms of and arising from the Contract and hereby undertake to pay to Eskom, on written demand from Eskom received prior to the Expiry Date, any sum or sums not exceeding in total the Guaranteed Sum.

A demand for payment under this guarantee shall be made in writing at the Bank's address and shall:

be signed on behalf of Eskom by a director of Eskom or his authorised delegate.

state the amount claimed ("the Demand Amount');

state that the Contractor has failed to carry out his obligation(s) to rectify certain defect(s) for which he is responsible under the Contract (and the nature of such defect(s)) alternatively that the Demand

Amount is payable to Eskom in the circumstances contemplated in the Contract.

Notwithstanding the reference herein to the Contract the liability of the Bank in terms hereof is as principal and not as surety and the Bank's obligation/s to make payment:

is and shall be absolute provided demand is made in terms of this bond in all circumstances; and

is not, and shall not be construed to be, accessory or collateral on any basis whatsoever.

The Bank's obligations in terms of this Guarantee:

shall be restricted to the payment of money only and shall be limited to the maximum of the Guaranteed Sum; and

shall not be discharged and compliance with any demand for payment received by the Bank in terms hereof shall not be delayed by the fact that a dispute may exist between Eskom and the Contractor.

Eskom shall be entitled to arrange its affairs with the Contractor in any manner which it sees fit, without advising us and without affecting our liability under this Guarantee. This includes, without limitation, any extensions, indulgences, release or compromise granted to the Contractor or any variation under or to the Contract.

Should Eskom cede its rights against the Contractor to a third party where such cession is permitted under the Contract, then Eskom shall be entitled to cede to such third party the rights of Eskom under this Guarantee on written notification to the Bank of such cession.

This Guarantee:

shall expire on the Expiry Date until which time it is irrevocable;

is, save as provided for in **0** above, personal to Eskom and is neither negotiable nor transferable;

shall be returned to the Bank upon the earlier of payment of the full Guaranteed Sum or expiry hereof;

shall be regarded as a liquid document for the purpose of obtaining a court order; and

shall be governed by and construed in accordance with the law of the Republic of South Africa and shall be subject to the jurisdiction of the Courts of the Republic of South Africa.

Any claim which arises or demand for payment received after expiry date will be invalid and unenforceable.

The Bank chooses domicilium citandi et executandi for all purposes in connection with this Guarantee at the Bank's Address.

Signed at _____ Date _____ Bank's seal or stamp

For and behalf of the Bank

Bank Signatory: _____ Bank Signatory: _____

Witness: _____ Witness: _____

Pro forma ASGI-SA Guarantee

(to be reproduced exactly as shown below on the letterhead of the Bank providing the Guarantee)

Eskom Holdings Limited
Megawatt Park
Maxwell Drive
Sandton
Johannesburg Date:

Dear Sirs

Reference No. **[●]** *[Drafting Note: Bank reference number to be inserted]*

Pro-Forma ASGI-SA Guarantee: *[Drafting Note: Name of Contractor to be inserted]*

Project [ ] Contract Reference: **[●]** *[Drafting Note: Contractor contract reference number to be inserted]*

1. In this Guarantee the following words and expressions shall have the following meanings:-

1.1 "Bank" - means [●], [●] Branch, (Registration No. [●]); [Drafting Note: Name of Bank to be inserted]

1.2 "Bank's Address" - means [●]; [Drafting Note: Bank's physical address to be inserted]

1.3 "Contract" – means the written agreement relating to the Project, entered into between the *Employer* and the *Contractor*, on or about the [●] day of [●] 200[●] (Contract Reference No. **[●]** as amended, varied, restated, novated or substituted from time to time; [Drafting Note: Signature Date and Contract reference number to be inserted]

1.4 "*Contractor*" – means [●] a company registered in accordance with the laws of [●] under Registration Number [●]. [Drafting Note: Name and details of Contractor to be inserted]

1.5 "*Contractor's* ASGI-SA Obligations" – means the *Contractor's* ASGI-SA Obligations under and as defined in the Contract.

1.6 "*Employer*" - means Eskom Holdings Limited, a company registered in accordance with the laws of the Republic of South Africa under Registration Number 2002/015527/06.

1.7 "Expiry Date" - means the [●] day of [●] 200[●]; [Drafting Note: anticipated date of issue of ASGI-SA Performance Certificate to be inserted.]

1.8 "Guaranteed Sum" - means the sum of R [●] ([●] Rand);

1.9 "Project" – means the ……

2. At the instance of the *Contractor*, we the undersigned _____ and _____, in our respective capacities as _____ and _____ of the Bank, and duly authorized thereto, confirm that we hold the Guaranteed Sum at the disposal of the *Employer*, as security for the proper performance by the *Contractor* of the *Contractor's* ASGI-SA Obligations and hereby undertake to pay to the *Employer*, on written demand from the *Employer* received prior to the Expiry Date, any sum or sums not exceeding in total the Guaranteed Sum.

3. A demand for payment under this guarantee shall be made in writing at the Bank's address and shall:

3.1 state the amount claimed ("the Demand Amount');

3.2 state that the Demand Amount is payable to the *Employer* in the circumstances contemplated in

the Contract.

4. Notwithstanding the reference herein to the Contract the liability of the Bank in terms hereof is as principal and not as surety and the Bank's obligation/s to make payment:

4.1 is and shall be absolute provided demand is made in terms of this bond in all circumstances; and

4.2 is not, and shall not be construed to be, accessory or collateral on any basis whatsoever.

5. The Bank's obligations in terms of this Guarantee:

5.1 shall be restricted to the payment of money only and shall be limited to the maximum of the Guaranteed Sum; and

5.2 shall not be discharged and compliance with any demand for payment received by the Bank in terms hereof shall not be delayed, by the fact that a dispute may exist between the *Employer* and the *Contractor*.

6. The *Employer* shall be entitled to arrange its affairs with the *Contractor* in any manner which it sees fit, without advising us and without affecting our liability under this Guarantee. This includes, without limitation, any extensions, indulgences, release or compromise granted to the *Contractor* or any variation under or to the Contract.

7. Should the *Employer* cede its rights against the *Contractor* to a third party where such cession is permitted under the Contract, then the *Employer* shall be entitled to cede to such third party the rights of the *Employer* under this Guarantee on written notification to the Bank of such cession.

8. This Guarantee:

8.1 shall expire on the Expiry Date until which time it is irrevocable;

8.2 is, save as provided for in **0** above, personal to the *Employer* and is neither negotiable nor transferable;

8.3 shall be returned to the Bank upon the earlier of payment of the full Guaranteed Sum or expiry hereof;

8.4 shall be regarded as a liquid document for the purpose of obtaining a court order; and

8.5 shall be governed by and construed in accordance with the law of the Republic of South Africa and shall be subject to the jurisdiction of the courts of the Republic of South Africa.

8.6 Any claim which arises or demand for payment received after expiry date will be invalid and unenforceable.

9. The Bank chooses domicilium citandi et executandi for all purposes in connection with this Guarantee at the Bank's Address.

Signed at _____ Date _____

For and behalf of the Bank

Bank Signatory: _____ Bank Signatory: _____

Witness: _____ Witness: _____
Bank's seal or stamp

PART 2: PRICING DATA
ECC3 Option A

Document reference	Title	No of pages
C2.1	Pricing assumptions: Option A	
C2.2	The *activity schedule*	

C2.1 Pricing assumptions: Option A

How work is priced and assessed for payment

Clause 11 in NEC3 Engineering and Construction Contract, (ECC3) Option A states:

Identified and defined terms 11

11.2 (20) The Activity Schedule is the *activity schedule* unless later changed in accordance with this contract.

(27) The Price for Work Done to Date is the total of the Prices for

- each group of completed activities and
- each completed activity which is not in a group.

A completed activity is one which is without Defects which would either delay or be covered by immediately following work.

(30) The Prices are the lump sum prices for each of the activities on the Activity Schedule unless later changed in accordance with this contract.

This confirms that Option A is a lump sum form of contract where the work is broken down into activities, each of which is priced by the tendering contractor as a lump sum. Only completed activities are assessed for payment at each assessment date; no part payment is made if the activity is not completed by the assessment date.

Function of the Activity Schedule

Clause 54.1 in Option A states: “Information in the Activity Schedule is not Works Information or Site Information”. This confirms that specifications and descriptions of the work or any constraints on how it is to be done are not included in the Activity Schedule but in the Works Information. This is further confirmed by Clause 20.1 which states, “The *Contractor* Provides the Works in accordance with the Works Information”. Hence the *Contractor* does **not** Provide the Works in accordance with the Activity Schedule. The Activity Schedule is only a pricing document.

Link to the programme

Clause 31.4 states that “The *Contractor* provides information which shows how each activity on the Activity Schedule relates to the operations on each programme which he submits for acceptance”. Ideally the tendering contractor will develop a high level programme first then resource each activity and thus arrive at the lump sum price for that activity both of which can be entered into the *activity schedule*.

Preparing the *activity schedule*

Generally it is the tendering contractor who prepares the *activity schedule* by breaking down the work described within the Works Information into suitable activities which can be well defined, shown on a programme and priced as a lump sum.

The *Employer*, in his Instructions to Tenderers or in a Tender Schedule, may have listed some items that he requires the *Contractor* to include in his *activity schedule* and be priced accordingly.

It is assumed that in preparing his *activity schedule* the *Contractor:*

- Has taken account of the guidance given in the ECC3 Guidance Notes pages 19 and 20;
- Understands the function of the Activity Schedule and how work is priced and paid for;
- Is aware of the need to link the Activity Schedule to activities shown on his programme;
- Has listed and priced activities in the *activity schedule* which are inclusive of everything necessary and incidental to Providing the Works in accordance with the Works Information, as it was at the time of tender, as well as correct any Defects not caused by an *Employer's* risk;
- Has priced work he decides not to show as a separate activity within the Prices of other listed activities in order to fulfil the obligation to complete the *works* for the tendered total of the Prices.
- Understands there is no adjustment to the lump sum Activity Schedule price if the amount, or quantity, of work within that activity later turns out to be different to that which the *Contractor* estimated at time of tender. The only basis for a change to the Prices is as a result of a compensation event.

An activity schedule could have the following format:

Item No.	**Programme Reference**	**Activity description**	**Price**

A Microsoft spreadsheet is provided with the enquiry and the spreadsheet is encouraged to populate the summary. A printout of the spreadsheet can be added to this section.

C2.2 the *activity schedule*

Use this page as a cover page to the *Contractor*'s *activity schedule*.

PART 3: SCOPE OF WORK

Document reference	Title	No of pages
	This cover page	1
C3.1	*Employer*'s Works Information	
C3.2	*Contractor*'s Works Information	
	Total number of pages	

C3.1: EMPLOYER'S WORKS INFORMATION

Contents

1. Description of the works

1.1. Executive overview

A Microgrid is defined as a group of interconnected loads and distributed energy resources with defined electrical boundaries that acts as a single controllable entity and is able to operate in both grid-connected and island mode.

A project to establish a microgrid research facility is being developed as a source (supply and install) project. A microgrid plant that will be used for research purposes to advance and improve the existing offering on microgrids.

The Project is to be situated at Eskom Research and Innovation Centre (ERIC), Rosherville, Johannesburg.

The full scope is presented in Annexure A, **Hybrid Wind and Solar PV Microgrid Research Facility240-RT&D-785**.

1.2. Employer's objectives and purpose of the works

The scope of work includes the procurement of a complete hybrid wind and solar PV microgrid facility with all its components and the control room.

1.3. Interpretation and terminology

The following abbreviations are used in this Works Information and in **Hybrid Wind and Solar PV Microgrid Research Facility 240-RT&D-785**

Abbreviation	Meaning given to the abbreviation
AFC	Approved for Construction
OBL	Outside Battery Limits
BESS	Battery Energy Storage System
PV	Photovoltaic
PCS	Power Conversion System
SOC	State of Charge
AC	Alternating Current
DC	Direct Current
PCS	Power Conversion System

2. Management and start up

2.1. Management meetings

Regular meetings of a general nature may be convened and chaired by the *Project Manager* as follows:

Title and purpose	**Approximate time & interval**	**Location**	**Attendance by:**
Risk Reduction Meeting	As per NEC 3 procedure	**Site or where instructed by the *Project Manager***	*Employer.* ***Project Manager*** **(*Supervisor* &** **SHE officer) optional** *Contractor.* • **Project Director, Site Manager, Contract Manager, Site *Supervisor*/s, Scheduler and SHE Manager**
Progress meetings	Monthly or as instructed by the *Project Manager*	**Site or as instructed by the *Project Manager***	*Employer.* ***Project Manager*** **(*Supervisor* &** **SHE officer) optional** *Contractor.* • **Project Director, Site Manager, Contract Manager, Site *Supervisor*/s, Scheduler and SHE Manager**
Integration Meeting	Monthly or as instructed by the *Project Manager*	**Site or as instructed by the *Project Manager***	*Employer.* ***Project Manager Supervisor*** **SHE officer** *Contractor.* **Project Manager, Site Manager, Site *Supervisor*, Scheduler and SHE Manager**
Health, Safety and Environmental meetings	As stipulated in (SHE specification)	**Site or as instructed by the *Project Manager***	*Employer.* ***Project Manager Supervisor*** **SHE officer** *Contractor.* **Project Manager, Site Manager, Site *Supervisor*, Scheduler and SHE Manager**

Meetings of a specialist nature may be convened as specified elsewhere in this Works Information or if not so specified by persons and at times and locations to suit the Parties, the nature and the progress of the *works*. Records of these meetings shall be submitted to the *Project Manager* by the person convening the meeting within five days of the meeting.

All meetings shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the *conditions of contract* to carry out such actions or instructions.

The *Project Manager* prepares minutes of meetings for all meetings held between *Employer* and *Contractor*.

The minutes of a meeting contain all significant aspects of the meeting recorded together with any

actions placed and is presented to the *Contractor* for signature at the next project meeting. After the *Contractor* has signed the minutes of meeting, the minutes are to be officially published.

The *Contractor* shall attend regular site meetings with the *Project Manager* and *Supervisor* where the progress of construction will be reviewed. Such meetings shall be held monthly and may be attended by representatives of the *Employer*.

The *Contractor* shall also attend weekly meetings with the *Supervisor* and provide, prior to each meeting as required by the *Project Manager*, detailed programmes showing separately the various activities of the *Contractor* anticipated over the forthcoming two-week period as well as the progress achieved over the preceding week relative to the programme applicable to that period

2.2. Documentation control

2.2.1. Documents for providing the Works

The *Contractor* shall compose and submit all Documentation and Technical Information required throughout the project.

All documents supplied by the *Contractor* shall be subject to *Employer's* approval. The language of all documentation shall be in English. Metric/SI units shall be used throughout the *Contractors*' Documentation. The *Contractor* shall include the drawing number in the drawing title block. This requirement only applies to design drawings developed by the *Contractor* and his *Sub-contractors*.

In Providing the *Works*, all documentation and data prepared and submitted by the *Contractor* conforms with and adheres to the requirements of:

- On receipt of documentation from the Project Manager, the Contractor verifies receipt of all transmitted documentation, including document status/revision. The Contractor advises the Project Manager in writing of any discrepancies, omissions or poor quality in the documentation.
- The Contractor shall prepare and submit information to complete the Definition of the works and Services at Pre-Construction Stage, Pre-Commissioning stage, post Commissioning stage and Handover phase.
- Where entries are shown in both stages, First Stage information shall be regarded as provisional and shall be updated and finalized in the Last Stage. Where entries are not shown in both stages, information is required only at that stage and the information shall be regarded as finalized at the relevant stage.
- The Project Manager ensures that the document schedule is maintained and kept up to date for the duration of the contract.
- Prior to commencement of any Works, the Contractor confirms with the Project Manager that the Contractor is in receipt of and is working to the latest revision of all necessary documentation. All rectification undertaken by the Contractor resulting from a failure to do so will be to the Contractor's account.
- In cases where modifications or additions are required on Site, a Field Engineering Query will be submitted by the Contractor. The Project Manager will issue the required instruction and documentation. The Contractor will neatly mark up, on the latest edition and revision of such documentation as may be impacted, all field changes undertaken in the course of the construction and these mark-ups will be submitted as part of "As Built" documentation at the final hand over.
- Each supplier of documentation and data to the project is responsible for ensuring that all documentation and data submitted conforms to the Project Standards and data quality requirements in terms of numbering, uniqueness, quality, accuracy, format, completeness and currency of information. Data not meeting the Project Standards and data quality requirements will be cause for rejection and returned to the Contractor for corrective action and resubmission.
- Should any change be made to documentation or data, which has already been submitted to the Contractor, then new or revised documentation or data shall be issued by the Project Manager to replace the outdated information.
- All drawings must comply with the Employer's CAD Standard.

- The Contractor ensures that the Microsoft Office 2019, and Microsoft Project 2010 or earlier software and suitable 'IT' Infrastructure are in place to support the electronic transmission of documentation.
- Electronic files submitted to or from the Project Manager, Contractor, and Employer are free of any known viruses and extraneous "macros".

2.2.2. Transmittal

An incoming transmittal note accompanies all documentation submitted, by the *Contractor*. Upon receipt of the transmittal, the *Employer* signs to indicate acknowledgement of receipt and returns this to the *Contractor.* The *Contractor* ensures that the incoming transmittal contains the following minimum metadata:

- Transmittal title
- Transmittal number and revision
- Contract title
- Contract number
- Purpose
- Originator's/ Sender contact information
- Issue status
- Authorisation date
- Number of sets of attached documents

All Project documents (soft copies and hard copies) submitted, are listed on the transmittal with the following metadata fields:

- Title of the document
- Document Unique Identification number
- Revision number
- Name of Discipline
- Reason for issuing/submission
- Sender's detail
- Sent date
- Recipient's Details
- Date received
- Quantity of documentation referenced on the transmittal
- Number of copies
- Format/medium submitted
- Sender signature
- Recipient signature, once submitted, to acknowledge receipt

The *Contractor* compiles and submits all the documentation, for the various phases of the Project, in accordance with the agreed Programme. Documentation and drawings are programmed for delivery to meet the milestone dates and in accordance with the agreed MDL, that is to be developed by the *Contractor*.

The *Contractor* includes the *Employer's* drawing number in the drawing title block. This requirement only applies to design drawings developed by the *Contractor* and his Sub-*Contractor*s. It does not apply to drawings developed by manufacturers for equipment and material such as valves, instruments, etc. Drawing numbers will be assigned by the *Employer* as drawings are developed.

2.2.3. Email Subject

The email subject shall as a minimum, contain the following: **(Project Name_Discipline_Subject)**

Documentation is submitted to the *Project Manager*, as well as to the centralised and on-site Documentation Centres, by way of the following media:

- Electronic copies are submitted to both on site Documentation Centres, and to the Project Manager as well through generic email address (HYPERLINK "mailto:edrmsharedservices@eskom.co.za" edrmsharedservices@eskom.co.za).
- Electronic copies too large for email (above 6 Megabytes|), are delivered by large file transfer protocol.

- Hard copies are submitted to the Project Manager, accompanied by the Transmittal Note. These transmittals are also scanned and a copy sent to the project e-mail address as per the first bullet.

2.2.4. Identification of the Documentation

The document will have the following as a minimum attributes on the cover page:

- Title of the document
- Document Unique Identification number (Employer's number)
- Contractor Document number, if applicable
- Document status
- Revision number
- Document Type
- Document security level
- Document revision table/history
- Page number on the footer
- Document Author/Authoriser/
- Document Originator Contractor

The following additional attributes are important for technical documents: Package/System name, sub-system if applicable

- Contractor name
- Contractor number
- Plant Identification Codes

2.2.5. Format and Layout of Documents

For consistency, it is important that all documents used within a specific domain follow the same layout, style and formatting standard.

All Documents shall be equipped with an index where applicable. Such index shall be hyperlinked in electronic formats of the Documents. The *Contractor* shall submit the final Documentation in electronic format and on paper copies as shown in the table below.

ITEM	Paper Copies		Flash Disk
	Number	Size	Number
Documents	2	A4/A3	3
Reports, Calculations and Technical Documents	2	A4	3
Programmes and Work Plans	2	A3/A4	3
Method Statements	2	A4	3
Technical Data	2	A4	3
Drawings	2	A2/A3	3
Manufacturer's Information	2	A4	3
Controls & Wiring Diagrams	2	A3/A4	3
Scada Software	-	-	3
Antivirus Software	-	-	3
Test Certificates	2	A4	3
Commissioning Records	2	A4	3

O&M Manuals	2	A4	3
Guarantees & Warranties	2	A4	3
Reference Codes, Standards and Guides	2	-	3

The *Contractor* shall employ all appropriate project electronic document handling systems for the transmission of the Documentation. Any or all of the *Contractor's* Documents may be reviewed by the *Employer* to verify compliance with the Works Information Document and accordance with the Design Intent. All *Contractor's* Documents selected for review will be given a status mark as shown in the table below.

STATUS MARK	REVIEW COMMENT	MEANING
'A'	No comment	The *Contractor* may proceed.
'B'	Comments as noted	The *Contractor* may proceed at their own risk, incorporating the comments in a timely manner, and resubmit.
'C'	Re-submit before	The *Contractor* must resubmit before proceeding.

Any incomplete or substandard submissions will automatically be given 'C' status. The *Contractor* shall allow a period for the *Employer* to review and comment on the *Contractor's* submitted Documents, as shown in the table below.

TYPE OF SUBMISSION	WORKING DAYS	FROM
Contractors' Documents	5	Before date required by the Contractor
Draft O&M Manuals, draft record drawings and performance data	5	Before start of testing and commissioning
Commissioning & Testing Records	5	After tests
Input to the project Health & Safety File	5	Before construction commences
'A' Status O&M Manuals and Record Drawings	5	Before Practical Completion

Comments given by the *Employer* do not relieve the *Contractors* of their responsibilities and obligations regarding the execution of *the works* and compliance with the Contract Documentation and the Works Information Document. Comments given by the *Employer* do not constitute a Change under the Contract.

2.2.6. Drawings

The creation, issuing and control of all Engineering Drawings will be in accordance to the latest revision of the *Employer*'s standard: 240-86973501 (Engineering Drawing Standards – Common Requirements).

All *Contractor*s are required to submit electronic drawings in Micro Station (DGN) format, and scanned drawings in pdf format. No drawings in TIFF, AUTOCAD or any other electronic format will be accepted. Drawings issued to the *Employer* may not be "Right Protected" or encrypted.

2.2.7. Engineering Change Management

All Design change management shall be performed in accordance to the latest revision of the Eskom Project Engineering Change Management Procedure (240-53114026). and the *Employer* shall ensure that *Contractor* is provided with latest revisions of this procedure. Any uncertainty regarding this procedure should be clarified with the *Employer*. All design reviews will be conducted according to the Design Review Procedure (240-53113685).

2.2.8. Handover requirements

The *Contractor* is required to handover documentation in such a way that it is compatible with Eskom Quality systems.

2.3. Health and safety risk management

The *Contractor* shall comply with the: **Construction Work Contractor SHE Specification** requirements **240 RTD 790.**

2.4. Environmental constraints and management

The Contractor shall comply with the: **Environmental Management Plan (EMP) for RT&D Construction Work Requirements 240 RTD 791.**

2.5. Quality assurance requirements

The Contractor and all sub-Contractors shall comply with the requirements listed in the Employer's Quality requirement standard, 'Supplier Contract Quality Requirements Specification', document identifier **240-105658000** Supplier Quality Management Specification

2.6. Programming constraints

The programme is to be submitted for acceptance in accordance with Core Clause 31 in the Engineering and Construction Contract, in terms of which resources to complete each activity must be clearly identified. The *Contractor* will allow two weeks of the starting date for compiling a schedule to be reviewed by Eskom every two weeks to ensure accuracy. The *Contractor* will be expected to use the allowed time from start date to prepare a proper schedule by interfacing with all relevant stakeholders. It is suggested that Gantt or bar chart formats be used for project planning, while progress graphs/schedules be submitted at monthly project meetings to monitor progress.

The programme is to include all the requirements of clause 31.2 of the Engineering and Construction Contract.

Eskom will monitor the process of compiling a schedule of the contract on a weekly basis by means of a report from the *Contractor*. A weekly progress report is to be submitted to the *Project Manager*.

The *Contractor* monitors progress weekly in conjunction with the *Supervisor*. A weekly progress report is to be submitted to the *Project Manager*.

The *Contractor* submits his record of Work Done to Date (verified by the *Supervisor*) to the *Project Manager* on the 20th of each month. (The application is to have the same format as the relevant Activity Schedule, and show present, previous and total quantities to date).

2.7. Contractor's management, supervision and key people

The *Contractor* shall submit an organizational structure showing his human resources and their lines of authority/communication.

The *Contractor* shall ensure that they comply with the registration of identified personnel as per the requirements of the South African Council for the Project and Construction Management Professions (SACPCMP) as gazetted in Project and Construction Management Professions Act No. 48 of 2000, Section 18(1) (a) or (b) and (c).

The following are the categories that must be registered

- Construction Manager (CM), reference to Construction Regulation GNR. 84 of 7 February 2014 section 8(1), in terms of appointment and registration in terms section 18(1) (c) of the Act 48 of 2000.
- Construction Health and Safety Manager (CHSM), registration in terms section 18(1) (c) of the Act 48 of 2000.
- Construction Health and Safety Officer (CHSO), reference to Construction Regulations GNR.84 of 7 February 2014 section 8(6), and in terms section 18(1)(c) of the Act 48 of 2000

2.8. Invoicing and payment

Within one week of receiving a payment certificate from the *Project Manager* in terms of core clause 51.1, the *Contractor* provides the *Employer* with a tax invoice showing the amount due for payment equal to that stated in the *Project Manager's* payment certificate.

The *Contractor* shall address the tax invoice to Eskom Holdings SOC Ltd and include on each invoice the following information:

Name and address of the *Contractor* and the *Project Manager;*
The contract number and title;
Contractor's VAT registration number;
The *Employer*'s VAT registration number 4740101508;
Description of service provided for each item invoiced based on the Price List;
Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT;
(add other as required)

Add procedures for invoice submission and payment (e. g. electronic payment instructions)

2.9. Insurance provided by the *Employer*

Refer to clause 8 Contract Data (Part one – Data provided by the Employer).

For all Employer Insurance related queries, contact:

- Cluster Manager
- Eskom Insurance Management Services
- Eskom Holdings SOC Ltd
- Megawatt Park
- 011 800 2714

2.10. Contract change management

As per NEC

2.11. Provision of bonds and guarantees

The form in which a bond or guarantee required by the *conditions of contract* (if any) is to be provided by the *Contractor* is given in Part 1 Agreements and Contract Data, document C1.3, Sureties.

The *Employer* may withhold payment of amounts due to the *Contractor* until the bond or guarantee required in terms of this contract has been received and accepted by the person notified to the *Contractor* by the *Project Manager* to receive and accept such bond or guarantee. Such withholding of payment due to the *Contractor* does not affect the *Employer*'s right to termination stated in this contract.

2.12. Records of Defined Cost, payments & assessments of compensation events to be kept by the *Contractor*

A risk register is to be kept by the *Contractor* in which all events are recorded. Records of events that could give rise to Compensation Events are to be kept up to date for inspection by the *Supervisor* and/or *Project Manager* at all times and this is to be kept in a risk register. This is not for inspection purposes but for management as per core clause 16.

2.13. Training workshops and technology transfer

Refer to the Specification for Renewable Hybrid Wind and Solar PV plant Requirements 240-RT&D-785 for training related requirements.

3. Engineering and the Contractor's Design

The *Employer's* design requirements are provided in the Specification for Hybrid Wind and Solar PV Microgrid Research Facility 240-RT&D-785.

3.1. Parts of the *works* which the *Contractor* is to design

The *Contractor* is responsible for the design of the entire *Works*. Please refer to Specification for Hybrid Wind and Solar PV Microgrid Research Facility 240-RT&D-785.

3.2. Procedure for submission and acceptance of *Contractor*'s design

The *Contractor*'s design shall comply with all design requirements stated in Specification for Hybrid Wind and Solar PV Microgrid Research Facility 240-RT&D-785

A detailed design phase shall precede the construction phase of the Project during which the design drawings are submitted to the *Employer* for acceptance

3.3. Other requirements of the *Contractor*'s design

The Contractor is mandated in terms of Construction Regulations 2014: Duties of Designer, 6(1) g to fulfil the duties described therein. Any risk associated with the Contractor's design shall be highlighted to the Employer together with mitigation measures. These risks shall be included in the project risk register

3.4. Use of *Contractor*'s design

The Contractor to allow the Employer to use detailed designs, drawings and all relevant documents for operational, maintenance purposes and for future developments whenever required. Copy rights to remain with the Employer

3.5. Design of Equipment

3.6. As-built drawings, operating manuals and maintenance schedules

All As-built drawings, operational manuals and maintenance schedules shall be provided to the Employer in adherence with the applicable requirements stated in the relevant section of the Specification for Hybrid Wind and Solar PV Microgrid Research Facility 240-RT&D-785.

4. Procurement

4.1. General

4.1.1. Minimum requirements of people employed on the Site

People employed on site shall have all relevant documents as required by law for employment within the country, i.e. relevant work permits and Identifications.

4.1.2. BBBEE and preferencing scheme

The contractor will be required to maintain or improve the BBBEE level for the duration of the contract.

4.1.3. SUPPLIER DEVELOPMENT LOCALISATION AND INDUSTRIALISATION (SDL&I)

SDL&I mandate is to achieve maximum and sustainable local development impact through leveraging Eskom's procurement spend in a manner that allows flexibility within the business in order to accommodate government local development initiatives and policies.

As a State-Owned Enterprise, ESKOM supports Government's socio-economic development initiatives that it addresses through Supplier Development and Localisation objectives, which include enterprise development, transfer of skills, job creation, incubation, localisation of procurement initiatives and industrialisation.

For the purposes of tendering, the *tenderer* must demonstrate the manner in which the SD&L requirements will be met in due course in an implementation program. If the *tender* is awarded all SD&L undertakings (the *Contractor*'s SD&L Obligations) must be made by the *Contractor* at the time of contracting

4.1.3.1. SDL&I Undertaking

The SDL&I undertaking generally identifies the following areas for SDL&I evaluation. These are procurement from EMEs, QSEs, LMEs (Generic); local content of the tender as a whole; Job creation and Skills Development commitments of the tenderer.

Targets and weighting are set for each individual project.

Tenderers who complete and submit the undertaking as required, but who do not meet Eskom's targets, will not be disqualified. SDL&I undertakings do not form part of scoring but commitments will form part of contractual obligations.

Definitions and Interpretation

The definitions below shall be referred to in the interpretation of this document. The targets for EMEs, and QSEs are a percentage of the local content portion of the tender only.

4.1.3.2. Qualifying Small Enterprises (QSE)

The Codes define a QSE as any enterprise with annual total revenue of between R10 million and R50 million.

A QSE with at least 51% black ownership qualifies as a Level 2 contributor.

A QSE with 100% black ownership qualifies as a Level 1 Contributor.

A QSE that is regarded as a specialized enterprise with at least 75% black beneficiaries qualifies as a Level 1 contributor with B-BBEE level of 135% in terms of the Codes of Good Practice.

A QSE that is regarded as a specialized enterprise with at least 51% black beneficiaries qualifies as a Level 2 contributor with B-BBEE level of 125% in terms of the Codes of Good Practice.

A QSE is required to submit a sworn affidavit confirming their annual total revenue of between R10 million and R50 million and level of black ownership or a B-BBEE level verification certificate to claim points as prescribed by regulation 6 and 7 of the Preferential Procurement Regulations 2017.

4.1.4. Large Measured Entity (LME) /Generic

A generic Enterprise's B-BBEE compliance is measured using the Generic Scorecard. The Generic scorecard is based on five elements each of which has an assigned weighting which correlates with the importance of that specific element and a set target.

A generic Enterprise has a annual turnover that is more than R 50 million rands.

4.1.5. SDL&I Progress Report

Means the Contractor's SDL&I progress report

4.1.6. Local Content

- Goods made in South Africa (from local raw materials).
- Only good that are made within the borders of SA can be claimed to be local content.
- Local Content (is mainly based on local manufacturing, there must be value addition to the product.
- LC is measured on the product which must be manufactured in South Africa at a specified minimum threshold (LC).
- LC percentage is determined based on the availability of input materials.
- Assembly of products is considered to have some level of local content.
- Example where 100 local content is required, no imports are allowed all materials including the production process must be local.
- If local content is less than 100 imported raw materials can be used without any Exemption.
- Key to protect local industry against imports, build industrial capacity, create jobs and contribute to the economic growth in South Africa.

4.1.6.1. Local Procurement

Local Procurement Content" refers to value added in South Africa by South African resources. Where a single contract involves a combination of local and imported goods and/or services, Tenderer's response must be separated into its components as per the Price Schedule included with the tender documents. Local procurement content is total spending minus the imported component.
Tenderers are required to submit its proposals in the table below.

Local Procurement Content	Eskom target	Tenderer Proposal
	80%	

4.1.7. Tenderers procuring from entities with a minimum 51% black ownership

Subcontracting refers to activities which tenderers outsource to other enterprises in its supply chain during the execution of the contract scope of work.
The contractor can also achieve subcontracting requirements by claiming invoices paid to service providers of indirect expenses that it incurs in the operation of its business. Such expenses may include courier

services, training, transport costs, facility management, office /property rental, cleaning, gardening, ICT services.

Procurement from black Designated Group	Eskom Target	Tenderer Proposal
Black Owned	4%	
Black Women Owned	3%	
Black Youth Owned	2%	
Black Persons with Disability	1%	

4.1.8. Designated products:

The contractor indicate below Designated Components

Commodity	Components	Local Content Threshold
Furniture Products: Office Furniture	Melamine office desk with drawers	70%
	High back upholstered chair with arms on 5 star base	65%
	Side upholstered chair – sleigh base with arms	70 %
	Steel / Wood stationery cupboard or drawers filling cabinet	100%
Electrical and Telecom Cables	Power Cables: Low Voltage,	90 %
	Power Cables: Low cost reticulation	90 %
	Telecom Cables: Optic Fiber Cables	90 %
	Telecom Cables: Copper Telecom Cables	90 %
Valves products and actuators	Valves	70 %
	Manual or pneumatic actuator	70 %
Steel Products and Component	Fabricated Structural Steel	100 %
	Joining / Connecting Components	100 %
	Roof and Cladding	100 %
	Fasteners	100 %
	Wire Products	100 %
	Ducting and structural Pipework	100 %
	Gutters, downpipes and launders	100 %
	Primary sheet products	100 %
Plastic Pipes	Polyvinyl Chloride (PVC) pipe	100 %
	Hige Density Polyethylene (HDPE) pipe	100 %
	Polypropylene (PP) pipe	100 %
	Glass reinforced Plastic (GRP) pipe	100 %

Cement	Cement	100 %

4.1.9. Imported Goods and Services

Imported goods and services" means, but is not limited to: Goods and services directly imported into South Africa.

Goods which although stored in South Africa are produced and/or wholly manufactured outside the borders of South Africa and/or have a minimum of 50% (fifty percent) of production costs (including labour) incurred outside of South Africa and payable to foreign residents and/or foreign registered entities;

Goods that have been "substantially transformed" outside of South Africa. Substantially transformed refers to the irreversible incorporation of imported components in the goods, with the labour costs and profit content earned by foreign residents and/or foreign registered entities exceeding 50% (fifty percent) of the Contract Amount and/or the significant assembly and manufacture of the goods occurring outside of South Africa's borders; and/or

Services with at least 50% (fifty percent) of the labour cost incurred outside of South Africa's borders and/or with at least 50% (fifty percent) of the service fee payable to foreign residents and/or foreign registered entities, regardless of whether the service involves domestic capital goods or other domestic costs

4.1.9.1. Final Review

Final Review means the review (to be conducted at the completion date of the whole of works by the Project Manager) of the Contractor's performance in respect of the Contractor SDL&I Obligations

4.1.9.2. Skills Development

This is the requirement that tenderers commit to train certain individuals in specified trades.

The requirement is that the targeted numbers of individuals are trained and complete practical tasks to achieve the outcome of passing a trade test and qualifying as an artisan, or the equivalent for any other required skill.

As part of this contract, the contractor will be required to develop the skills:

Tenderers are required to submit proposals for the skills types / occupations and the number of candidates to be developed. The candidates shall be currently unemployed graduates from school, Universities and technical, vocational, education and training (TVET) campuses. The threshold will be as follows to ensure successful implementation of this initiative:

- ✓ Successful tenderer will be obligated to **skill one** candidate for every **R 5**
- ✓ **Million** received cumulatively ; The supplier will be required to implement this requirement a month after the threshold is reached.
- ✓ This obligation will be for the duration of the contract; however, the supplier needs to demonstrate positive progress on a monthly basis.

Type of skill / Occupations	Number of candidates

The process of developing these skills shall involve the participation by tenderers directly and through their supply network. In certain cases, the SETAs accredited training providers can be approached to participate in developing critical and scarce skills.

Skills development of candidates must represent the demographics of the country, South Africa.

Note: that these targets for skills development candidates categorically exclude Eskom employees and registered learners. The tenderers are required to take full responsibility for the total cost of developing the requisite skills, and Eskom shall not make any financial contribution towards the fulfilment of this obligation. Tenderers also are advised to approach their relevant SETAs to access grants, subsidies, and incentives as well as South African Revenue Services for tax rebates that are earmarked for skills development initiatives

4.1.10. Contractor's SDL&I Commitments

Means those commitments regarding local content, skills development, Job creation and procurement from EMEs and QSEs made by the Contractor in his tender submission and used by the Employer for the purposes of calculating the Contractor's SD&L score in the tender evaluation process

4.1.11. Contractor's SDL&I Obligations

Means those obligations of the Contractor regarding local content, skills development and procurement from QSEs and EMEs derived from Contractor's SDL&I Commitments and agreed between the Contractor and the Employer.

4.1.12. Certificate of Fulfilment

Means the certificate issued by the Employer after the Final Review as evidence of the Contractor's successful fulfilment of the Contractor SDL&I Obligations.

4.1.12.1. SDL&I Progress Reports

The Contractor shall submit monthly SDL&I progress reports to the Project Manager. SDL&I progress reports shall be submitted by the 7th (seventh) day of the month following the months to which the report relates. Each report shall include:

4.1.13. An executive summary

Charts and detailed descriptions of the progress in narrative format, including each stage of progress of the Contractor SDL&I Obligations, the meeting (or delay in the meeting) of anticipated dates and targets (as set out in the program) and any documents, statistics or other form of verification of the dates and targets to be provided in respect thereof.

Percentage progress and the actual or expected dates of commencement of any of the major stages making up the Contractor SDL&I Obligations.

Schedule of forecast and actual, together with a 3 (three) month look-ahead of major activities and events; Comparisons of actual and planned progress in terms of the Implementation Program.

4.1.14. Details of actual and planned resources

An Affidavit from the sub-Contractors stating the work that has been subcontracted to meet the Contractor's SDL&I obligations.

A schedule identifying all details of persons in the process of undergoing or who have successfully completed the Skills Transfer for the relevant period (including details of their personal information and certified copies of their test results and certificates received);

A risk register and assessment dealing with all areas of concern which may cause delays to the fulfilment of the SDL&I obligations and details of the corrective or other measures being adopted, or to be adopted to mitigate or overcome such delay; and such other matters and information (including schedules and charts) as the Project Manager may require to be included in the SDL&I progress report from time to time.

An electronic copy and two hard copies of each SDL&I progress report shall be submitted to the Project Manager.
Additional Reports

The Project Manager shall be entitled to request the Contractor to provide additional reports when in his opinion they are warranted to monitor the progress of the fulfilment of the Contractor SD&L obligations.

4.1.14.1. The Final Review

The parties' record that the purpose of the final review is for the Project Manager to determine whether the Contractor has fulfilled the Contractor's SDL&I obligations as at completion date.

The Contractor shall provide the Project Manager with the following documentation to be used by the Project Manager as a basis for the final review:

A consolidated SDL&I progress report recording all steps taken to meet the Contractor's SD&L obligations from the starting date to the completion date including all information and supporting documentation

All of the SDL&I progress reports provided by the Contractor during the course of the contract and any other additional report, documentation or information that the Project Manager deems to be reasonably relevant to the conduct of the final review (to be provided by the Contractor at least 21 (twenty-one) business days prior to the final review). The Project Manager shall notify the Contractor of such request by way of written notice at least 30 (thirty) business days prior to the final review.

The Employer shall, in its reasonable discretion, conduct the final review by comparing those Contractor's SDL&I obligations actually fulfilled by the Contractor as at the time of the final review against with the Contractor's SDL&I obligations as a whole.

The Project Manager shall notify the Contractor of its findings on the final review by way of written notice within 30 (thirty) business days of the final review. The notice shall contain the Project Manager's reasons for its findings.

Should the final review reveal that the Contractor has not fulfilled and/or complied with any of the Contractor's SD&L obligations as at the completion date:

The Contractor shall be in breach of a material obligation under the contract and the Employer shall be entitled to have immediate recourse to and make a claim against the whole of the retention as the penalty for the Contractor's breach of the Contractor SDL&I obligations.

Should the final review reveal that the Contractor has fulfilled and/or complied with all of the Contractor's SDL&I obligations as at the completion date, the Employer shall issue a certificate of fulfilment.

4.1.15. SDL&I Penalty and Performance Security

As security for the fulfilment of all SDL&I obligations, Eskom will apply a penalty of 1.5% of every invoice amount (excluding VAT) for failure to submit SDL&I performance reports every quarter; or failure to meet the SDL&I obligations in a contract.

4.2. Subcontracting

4.2.1. Preferred subcontractors

Mandatory subcontracting on contracts above R30 million is a condition for this contract.

If feasible to subcontract for a contract above R30 million, Eskom:
a) must apply subcontracting to previously designated groups.
b) must advertise the tender with a specific condition for contract award that the successful
c) tenderer must subcontract a minimum of 30% of the value of the contract to:
d) an EME or QSE.
e) an EME or QSE, which is at least 51% owned by black people.
f) an EME or QSE, which is at least 51% owned by black people who are youth.
g) an EME or QSE, which is at least 51% owned by black people who are women.
h) an EME or QSE, which is at least 51% owned by black people with disabilities.
i) an EME or QSE, which is 51% owned by black people living in rural or underdeveloped areas or townships.
j) a cooperative, which is at least 51% owned by black people.
k) an EME or QSE, which is at least 51% owned by black people who are military veterans.
l) more than one of the categories referred to in paragraphs (a) to (h).

Tender Returnable if the above element is a requirement.
- Proof of a sub-contract agreement/s must be submitted.
- CSD report of subcontractors
- Sub-contractor/s B-BBEE certificate / affidavit must be submitted.

Subcontracting, in this instance, will be treated as a condition for contract award. A supplier awarded a contract may not subcontract more than 25% of the value of the contract to any other entity that does not have an equal or higher B-BBEE status level of a contributor than the supplier concerned unless the contract is subcontracted to an EME that has the capability and ability to execute the subcontract.

4.2.2. Subcontract documentation, and assessment of subcontract tenders

The Contractor shall manage his sub-Contractors in the same way that the Employer manages the Contractor. Special attention must be given to the management of the sub-Contractors' SHEQ compliance.

The Contractor will be required to subcontract a minimum of 30% of the contract and the following designated groups will be targeted and this will be a condition of tender:
- an EME or QSE which is at least 51% owned by black people;
- an EME or QSE which is at least 51% owned by black people who are youth;
- an EME or QSE which is at least 51% owned by black people who are women.
- an EME or QSE which is at least 51% owned by black people with disabilities.
- an EME or QSE which is 51% owned by black people living in rural or underdeveloped areas or townships.
- a cooperative which is at least 51% owned by black people.
- an EME or QSE which is at least 51% owned by black people who are military veterans.
- an EME or QSE

4.2.3. Limitations on subcontracting

Proof of a sub-contract agreement will be required as proof of meeting the 30% minimum requirement

4.3. Plant and Materials

4.3.1. Quality

The Contractor shall comply with the 240-105658000 Supplier Quality Management Specification issued by the Employer

4.3.2. Plant & Materials provided "free issue" by the *Employer*

No Plant and material will be provided "free issue" to the Contractor for this Contract. All Plant and Material is to be provided by the Contractor

4.3.3. *Contractor*'s procurement of Plant and Materials

All transportation to site of plant and material required for this project will be by means of road transport. The Contractor must familiarise himself with the road conditions to site.

The Contractor must prepare a fenced off storage yard on or off-site for the off-loading and safekeeping of all plant and material delivered to site. Material must be off loaded and stored separately in areas allocated for this purpose. The Contractor must manage such storage areas as to ensure safety compliance as well as security of the plant and material.

The Contractor shall comply to document "240-105658000 Supplier Quality Management Specification in works information during fabrication, supply and delivery of foundation steelwork, reinforcing, earthing devices and all other foundation related material. All copper will be supplied by the Contractor

4.3.4. *Spares* and consumables

Refer to the Specification for Hybrid Wind and Solar PV Microgrid Research Facility 240-RT&D-785.

4.4. Tests and inspections before delivery

All the testing as required by the relevant specifications as indicated in the document shall be done by the *Contractor.*

4.5. Marking Plant and Materials outside the Working Areas

The *Contractor* shall mark all Equipment, Plant and Material which is outside of the working area destined for the works.

4.6. *Contractor's* Equipment (including temporary works).

The *Contractor* shall ensure the provision of suitable construction equipment for the construction of the works.

a) The Contractor provides all Equipment that is required to complete the works.
b) The Contractor shall ensure that all his construction labour and equipment remains within the fenced off allocated construction area.
c) The Contractor shall ensure that any staff, labour, or equipment moving outside his allocated construction site does not obstruct the normal operation of the ADF or the power station. Any additional access routes required must be coordinated with the Project Manager.
d) The Contractor must keep daily records of his equipment used on Site and the Working Areas (distinguishing between owned and hired Equipment) with access to such daily records available for inspection by the Project Manager at all reasonable times.
e) All Equipment used by the Contractor in providing the Works shall comply with the General Machinery Regulation 4 of the Occupational Health and Safety Act (Act 85 of 1993).

4.7. Cataloguing requirements by the *Contractor*

Not Applicable

5. Construction

5.1. Temporary works, Site services & construction constraints

5.1.1. *Employer*'s Site entry and security control, permits, and Site regulations

Access to the site is controlled and it is governed by the terms and conditions lay down by Eskom security officials. The proposed site will be shown to the Contractor during the site meeting or clarification meeting by the Employer.

The Contractor liaises with SHE Practitioner/Officers for Safety Induction prior work to commence. During Safety Induction, site access permits with a copy of the medical and a certified ID copy/passport (not older than three months) should be handed to the SHE Practitioner/Officer for approval.

The Contractor employees will take the signed site access documents to security reception official in order to finalize their site access. The Contractor ensures that all its employees carry their site access forms with them all the time. The Contractor is subjected to alcohol testing on a daily basis. The Contractor submits his application for vehicle permit to the Project Manager. The personnel and vehicles entering and leaving the site are subjected to routine searches.

The Contractor obtains a "Gate Removal Permit" from the Project Manager before materials and equipment can be removed from site. The "Gate Removal permit" gives itemised list of materials and equipment to be removed from site.

The Contractor ensures that a tool list is available on the day of arrival and that all tools are captured on the tool list. The tool list will be handed over to the Reception Security official that will stamp the tool list. The tool list will be kept safe and will be used when tools needs to be remove from site.

5.1.2. Restrictions to access on Site, roads, walkways and barricades

The Contractor complies with the Site Regulations as per Employer's Safety Health Specification 240 RTD 790.

Any subject within the authority of the Project Manager may be addressed by a Site Regulation.

Before work starts on Site, a kick-off meeting is held with the Contractor and the Project Manager, to explain in detail all requirements of the Site Regulations.

The Contractor is issued with a copy of the current Site Regulations at the project kick-off meeting.

5.1.3. People restrictions on Site; hours of work, conduct and records

The *Contractor* must clearly indicate its proposed working hours in the Tender and specifically in the programme provided with the Tender. After award the *Contractor* will adhere to these agreed working hours and keep detailed and accurate records of compliance herewith. The *Contractor* ensures that the *Supervisor* must sign these records daily and the *Project Manager* and *Supervisor* must have access to these records at any time.

The *Contractor* indicates any shift work or extended working hours required in order to meet with the required completion dates of the Package Order. The *Project Manager* and SHEQ manager's permission to work these hours are obtained prior to working such hours.

The *Contractor* keeps records of his people on Site, including those of his Sub-*Contractor*s which the *Project Manager* or *Supervisor* have access to at any time. These records will be needed when assessing compensation events.

5.1.4. Health and safety facilities on Site

Refer to the SHE specification, EMP, South African Government Guidelines and Directions on Management of COVID-19 and other epidemic outbreaks, World Health Organisation Guidelines, the latest Disaster Management Act and applicable government regulations. The Contractor shall appoint the security for the site camp and plant and material.

5.1.5. Environmental controls, fauna & flora, dealing with objects of historical interest

The environmental controls shall be complaint to the following:

- As per ESKOM RT&D Waste Management Procedure
- National Environmental Management Act (NEMA, Act No. 107 of 1998).
- National Environmental Management Waste Act (NEMWA, Act No. 59 of 2008

5.1.6. Title to materials from demolition and excavation

As per Clause 73.2 the *Contractor* has no title to materials from excavation and demolition

5.1.7. Cooperating with and obtaining acceptance of Others

Other Contractors are working in the same area as the work of this contract. In this regard, the Contractor co-ordinates his work with the Project Manager to maintain harmonious working conditions on Site.

During the progress of the works the Contractor provides access to Others who also execute work in the same area, on an as and when required basis.

The Contractor makes his own assessment of the problems and difficulties which may be encountered for providing access to and interfacing with Others (this includes access difficulties experienced during construction or commissioning phase.

5.1.8. Publicity and progress photographs

The taking of photographs at ERIC including the Project *works* is restricted and subject to the approval by the *Project Manager*.

For the purpose of the Progress Reporting Requirements, the *Project Manager* may prohibit the taking of such photographs and/or require that all such photographs be taken by an official *Employer* photographer. In the latter event, the *Contractor* is required to make arrangements directly with the photographer for the taking of the photographs required by the *Contractor* for the purpose of the Progress Reporting Requirements.

5.1.9. *Contractor*'s Equipment

The Contractor provides all Equipment that is required to complete the works.

a) The Contractor shall ensure that all his construction labour and equipment remains within the fenced off allocated construction area.
b) The Contractor shall ensure that any staff, labour, or equipment moving outside his allocated construction site does not obstruct the normal operation at ERIC. Any additional access routes required must be coordinated with the Project Manager.
c) The Contractor must keep daily records of his equipment used on Site and the Working Areas (distinguishing between owned and hired Equipment) with access to such daily records available for inspection by the Project Manager at all reasonable times.

d) All Equipment used by the Contractor in providing the Works shall comply with the General Machinery Regulation 4 of the Occupational Health and Safety Act (Act 85 of 1993).

5.1.10. *Equipment* provided by the *Employer*

No Equipment will be supplied by the Employer; however the Employer does reserve the right to negotiate with the Contractor that different equipment be used of another origin for whatever purpose that may become apparent at the time.

The Contractor supplies all equipment including cranes, scaffolding and other earthmoving equipment for the construction of the works.

5.1.11. *Site* services and facilities

5.1.11.1. Site Yard

Site Yard for the Contractor shall conform to the Employer's Safety Health and Environmental Specification 240 RTD 790-. It is required, for the proper co-ordination and execution of the works that the Contractor has an office on site for the duration of the Contract.

A site will be made available to the Contractor for his yard within ERIC security area. The proposed site will be shown to the Contractor during site meeting or clarification meeting. The yard is a raw site in size agreed upon by the Contractor and Project Manager and will be used by the Contractor for the establishment of his offices, workshop and stores.

The Contractor's yard is subject to periodic inspection by the Project Manager/delegated person.

The location of the nearest, power distribution point, storm water channel and road access point is indicated by the Employer. The Contractor is responsible for connection to the closest point of supply.

5.1.11.2. Supply of Electricity

Electricity will be made available for construction purposes from power points which will be indicated by the Project Manager. The Contractor is responsible for the provision of the reticulation system from the point of supply. Both 220 (AC) Volt and 380 (AC) Volt are available on request. All points of supply requested by the Contractor are provided in terms of quantity and location at the discretion of the Project Manager.

No guarantees of power supply quality are given and power supply breaks of some duration may occur without warning. Planned outages are also a possibility. The Contractor makes arrangements at his own expense to improve continuity and quality of power where necessary for any reason and no claim of any nature relating to power failures is considered.

No connection is made to the permanent installation at ERIC without the prior acceptance of the Project Manager.

The power supply is managed in accordance with the latest revision of the Eskom safety regulations i.e.:
a) 32-846, Operating Regulations for High-Voltage Systems.
b) COC for the site installation is required prior to power being switched on.

5.1.11.3. Lighting

The Contractor at his own expense provides temporary local lighting in accordance with the requirements of the OHS Act as amended. The Project Manager provides no local lighting. All construction lighting is the responsibility of the Contractor.

5.1.11.4. Water

The Contractor shall make provision for supplying both potable and construction water. The Contractor supplies at his own cost all the necessary connections, fittings, piping work, temporary plumbing and pumps necessary to supply to the various points where it is required. The Contractor is responsible for maintaining this equipment and for removing it at Completion of the whole of the works.

5.1.11.5. Roads

The Contractor provides temporary access points from the prescribed routes and roads to the points where the Contractor is required to perform work, having first obtained permission in writing from the Project Manager.

5.1.12. Facilities provided by the *Contractor*

It is required, for the proper co-ordination and execution of the works that the *Contractor* has an office on Site for the duration of the contract.

The Contractor includes in his establishment prices for all further treatment of the yard areas that he considers necessary for his entire operation throughout his period of occupation and under all weather conditions. The *Contractor* also includes for all security fencing, security and access arrangements. The yard will be kept clean and tidy at all times, this will include all workshops and storage areas under the control of the *Contractor*. Maintenance of the yard is the *Contractors* responsibility and is for the *Project Managers* acceptance.

Outfall drainage of all surface run-off drains is constructed by the *Contractor* to the acceptance of the *Project Manager* to minimise erosion and to effect control of contaminated water. The *Contractor's* plan for the layout of his yard area are accepted by the *Project Manager* prior to occupying the yard and the *Contractor* does not occupy any site area other than that allocated to him. The *Contractor's* plan states fully what measures are taken regarding removal and storage of topsoil, stabilisation of eroded areas and further loss of topsoil.

The *Contractor* complies with the environmental policy given in the Site Regulations. The *Contractor* provides, erects and maintains for his own use adequate size office accommodation and stores together with such drainage, lighting, heating, and hot and cold water services as may be required. Provision is also made for adequate parking and a turning area adjacent to all the aforesaid structures. The *Supervisor* prior to commencement of any work on Site accepts all designs and layouts for these provisions.

The *Contractor* dismantles and clears the yard of all such temporary structures and associated foundations and infrastructure at the direction of the *Supervisor* on Completion of the whole of the *works*. No such dismantling and clearance work is carried out without prior acceptance from the *Supervisor*.

The *Contractor* shall make provision for carrying out of all quality control testing required in terms of the works involved. This shall include, but is not limited to, the following:

- Soil grading analysis from 0.075 mm up to 100 mm as per TMH 1 A.
- Soil grading analysis from 0.002mm up to 0.075nn as per TMH 1A5.
- Soil testing for Atterberg limits as per TMH 1 A2-A4.
- Soil density testing (nuclear and sand replacement as per TMH 1 A10).
- Soil testing for moisture content.
- DCP testing.
- In situ permeability testing on all facilities.

The *Contractor* shall either provide a laboratory on site or may make use of approved external laboratories (SANAS accredited) and/or laboratories of other contractors on site subject to the approval of the *Supervisor*.

Results of permeability testing will only be accepted if carried out by an accredited laboratory

5.1.12.1. Employers Site Office

The Contractor shall provide and erect Site Offices for the Employer. The layout of the Employer's offices are to be approved by the Project Manager prior to erection.

5.1.12.2. Telecommunications

Neither a network point nor a telephone is available on site. Should the Contractor require one, he is to make his own arrangements with relevant authorities. Arrangements may also be made to use the telephones of the ERIC if they are available.

Should the Contractor wish to use radio communication equipment on site, he will make his own arrangements with the relevant authorities. In this case, he is requested to liaise with the head of security at the station to ensure that there is no interference with existing channels or equipment.

5.1.12.3. Sanitary Facilities and Refuse

The Contractor is to supply own sanitary facilities at his Contractor's yard. A refuge control system will be established by the Contractor. All waste and refuge will be collected and disposed of as directed by the Project Manager, at the Power Station refuse disposal site

5.1.12.4. Equipment/Appliances

Any electrical Equipment, or appliances, used by the Contractor conforms to the applicable OHS Act safety standards and is maintained in a safe and proper working condition. The Project Manager has the right to stop the Contractor's use of any electrical Equipment, or appliance, which, in the opinion of Project Manager, does not conform to the foregoing. Inspection of equipment/appliance will be done as required by OSH Act.

The Employer may assist the Contractor with the off-loading of equipment, plant and material but the responsibility for off-loading remains with the Contractor.

Any special tools and equipment to be used on site for the execution of the works is the responsibility of the Contractor.

5.1.13. Survey control and setting out of the *works*

The Project Manager designates the working area boundary limits and assigns for the Contractor's use access roads, parking areas, storage areas, existing facilities areas and construction areas. The Contractor does not trespass in or on areas not designated for his work.

The Contractor is responsible for keeping Contractor's personnel out of areas not designated for Contractor's use, except, in the case of isolated work located within such areas for which the Contractor is authorised to do so.

The control points will be established by the Contractor. Land surveys will be done by the Contractor before and after clear and grub, before and after topsoil strip and after final excavation before construction commences.

The Contractor will ensure that application for excavation permit is done well in advance before any excavation work can start in an area. The Employer will need the drawings of the work to be conducted in the area to show the Excavation authorised person of ERIC the drawings so that an excavation permit can be issued. A copy of the excavation permit with the drawings will be handed to the Employer for record keeping.

5.1.14. Underground services, other existing services, cable and pipe trenches and covers

USL V1 2024 Research Facility

5.1.15. Control of noise, dust, water and waste

The Contractor maintains a high standard of cleanliness during the conduct of his activities at ERIC. This includes areas allocated for storage of materials, site offices etc. to the satisfaction of the Project Manager. The Contractor keeps these areas clean and free from accumulation of waste materials and refuse regardless of the source.

The Contractor ensures during sweeping and dusting, that a minimum amount of dust is liberated into the atmosphere. Cleaning by vacuum cleaners is preferred and the use of compressed air for cleaning is prohibited.

The Contractor is responsible for the prompt removal of all waste to a designated disposal area. The disposal area will be on or in the vicinity of the Power Station and be indicated by the Project Manager.

For the purpose hereof, “waste” any matter, whether liquid or solid or any combination thereof, which is a by-product, emission, residue or remainder of any process or activity carried out in connection with the works and which is not reused on the Site in the in the ordinary course of carrying out the works within seven days of production.

The Contractor provides an adequate number of marked bins and containers at offices, in yards, at workshops and on the Site for the temporary storage of waste. These bins and containers are subject to approval by the Project Manager. The Contractor is required to segregate certain items of waste by type as designated by the Project Manager.

Bins and containers are emptied and waste removed to the designated area at least once a week. All the waste removed to the designated area at least once a week. All the temporary storage areas for bins and containers are kept tidy and must not constitute a nuisance to others. The Contractor takes all required steps to avoid spillage of waste alongside the bins and containers during removal and disposal thereof.

All waste that cannot be contained in either a bin or container is placed on a temporary waste site which the Project Manager identifies. The waste is removed as soon as possible but in any event at least once a week. No burning of waste is allowed at the Power Station.

Hazardous waste is dealt with in accordance with the safety, health and/or environmental requirements of the works and the Contractor is solely responsible for the proper disposal thereof. Hazardous waste will be disposed of at an authorised landfill site. Waste manifest will be kept for record keeping and hand over at the end of the Project.

Controlling water from excavations is done as required by the Environmental legislation and only after a method statement to this regard has been accepted by the Project Manager.

The Contractor must ensure that adequate pumping capacity is provided for the continual pumping of water from excavations. Water may be contaminated and should not be discharged into the environment unless tested.

5.1.16. Giving notice of work to be covered up

After construction the Contractor is to rehabilitate any damage caused to the environment to the satisfaction of the Supervisor. The remedial works are to be “signed-off” by both parties before acceptance. The contractor to take note of the QITP`s requirements relating to earthing, earth crimpets and clamps, which needs to be inspected prior to closing of trenches.

5.1.17. Hook ups to existing works

The Contractor complies with Eskom Life Saving Rules and will report any non-conformance

5.2. Completion, testing, commissioning and correction of Defects

5.2.1. Work to be done by the Completion Date

On or before the Completion Date the *Contractor* shall have done everything required to Provide the Works except for the work listed below which may be done after the Completion Date but in any case before the dates stated. The *Project Manager* cannot certify Completion until all the work except that listed below has been done and is also free of Defects which would have, in his opinion, prevented the *Employer* from using the *works* and Others from doing their work.

	Item of work	**To be completed by**
	As built drawings of whole of works	Within seven days after Completion
	Performance testing of the *works* in use as specified in the Works Information.	See performance testing requirements.

5.2.2. Use of the *works* before Completion has been certified

On or before the Completion Date the Contractor shall have done everything required to provide the Works. The Project Manager cannot certify Completion until all the work has been done and is also free of Defects

5.2.3. Materials facilities and samples for tests and inspections

The Contractor shall be responsible for the strength and quality of all materials used and workmanship employed. The Contractor shall be responsible for the stability of the permanent works and the temporary works. The fact that the Employer has not objected during the construction period to any materials and/or workmanship employed by the Contractor and even though such materials and/or workmanship has been inspected by the Supervisor shall not relieve the Contractor of such responsibility.

5.2.4. Commissioning

Commissioning is required before completion for all Mechanical, Control & Instrumentation and Electrical equipment/ installations work as specified within the scope of work and specification for the respective disciplines.

5.2.5. Start-up procedures required to put the *works* into operation

The Contractor gives the Project Manager written notice that the works are ready for energisation. Such notice will suit the requirements of the Employer.

No alterations or adjustments will be made to the works after functional checks are done without the Project Manager's written permission.

At this stage the following must have been achieved:

a) Installation and pre-commissioning completed.
b) Testing report and the associated certificates received.
c) Signed erection and safety clearance certificates.
d) Final Draft of the Technical, Operating, Maintenance manuals delivered.
e) All Quality Control Plan (QCP) documentation received.

5.2.6. Take over procedures

Take-over of The Works will be in accordance NEC procedures. The Contractor advises the Supervisor when the Works is available for final inspection

5.2.7. Access given by the *Employer* for correction of Defects

NEC Clause 43.4 requires that the *Project Manager* arranges for the *Employer* to allow the *Contractor* access to and use of a part of the *works* which has been taken over if needed to correct a Defect

5.2.8. Performance tests after Completion

The Contractor shall carry out necessary tests after completion to demonstrate that the performance of the Plant is in accordance with the Employer's Works Information requirements.

The Contractor will be required to provide a detailed method statement on how this verification will be achieved and any instrumentation/equipment required shall be part of the system provided by the Contractor.

5.2.9. Training and technology transfer

The *Contractor* provides training on the equipment and systems included as part of the *works* to the various categories of the *Employer's* technical staff (operators, maintenance and engineering personnel) for the duration of the *works*.

Training provided by the *Contractor* is directly applicable to the actual equipment supplied for the *works*. Generalised training based on similar equipment is not acceptable. The local facilities for training provided by the *Employer* is a suitably sized air-conditioned room, as well as trainee and trainer desks, an overhead projector and flipchart or white board. The number of personnel to be trained is as per the table below.

Table of Technical staff to be addressed in Training Proposal

Department	Number of Personnel
Operators	5
Maintenance	5
Engineering	10

The *Contractor* submits to the *Project Manager* for acceptance a detailed training programme as well as a prospectus for each course. Course material is provided for the number of trainees as per the table above.

The training schedule is incorporated in the Accepted Programme.

5.2.10. Operational maintenance after Completion

The contractor provides operational maintenance after completion of works.

6. Plant and Materials standards and workmanship

The *Contractor* shall ensure that all equipment, components materials services and workmanship are supplied designed, manufactured, installed and tested in accordance with the latest applicable IEC, SANS standards, International Codes, and Standards listed.

a) The Contractor shall ensure appropriate certification and independent testing has been carried out on any materials and products proposed.
b) The Contractor shall ensure materials and products used are suitable for the service conditions.
c)
d) The Contractor shall ensure that all Works, materials, parts, components etc. supplied shall be new.
e) The Contractor shall ensure materials and products delivered to site bear the manufacturer's name, brand name and any other data required to verify that their performance and specification complies with the requirements of this document and the Employer’s Project Specific Requirements.
f)
g) The Contractor shall follow manufacturers' instructions on the use of materials and products.
h)
i) The Contractor shall ensure the same manufacturer is used for materials or products of a similar type and that identical parts of similar products are interchangeable.
j) The Contractor shall ensure that materials and components are transported and stored in accordance with manufacturer’s guidelines.
k) The Contractor shall provide suitable packaging for the protection of all materials and equipment during delivery, storage, and where exposed to damage on site. The Contractor shall return re-usable packaging to the supplier. The Contractor shall take particular care to protect and maintain plant and equipment delivered early.
l) The Contractor shall examine materials and products supplied when delivered to site and immediately prior to installation. The Contractor shall replace any damaged or faulty materials or products.

7. List of drawings

7.1. Drawings issued by the *Employer*

This is the list of drawings issued by the *Employer* at or before the Contract Date and which apply to this contract.

Note: Some drawings may contain both Works Information and Site Information.

Drawing number	Revision	Title
USL V1 2024		Research Facility

7.2. Standards and Specifications

It is the *Contractor's* responsibility to ensure that they are in possession of the latest revision of these documents.

	Standards to comply with
	Solar Power Systems
	SANS 10142 or IEC 61215 – Wiring Code (electrical installations)
	SANS 1067 – Connection to the Grid (grid-tied systems)
	SANS 10142-1 or IEC 61730 – Low-Voltage Electrical Installations (requirements for safe connections)
	Battery Energy Storage Systems (BESS)
	SANS 10142 or IEC 61215 – Wiring Code (electrical installations)
	IEC 62619 – Safety requirements for lithium-ion batteries
	EN 62619:2017 Safety requirements for secondary lithium cells and batteries for use in industrial applications
	EN 62368-1:2014+A11:2017 Audio/video, information and communication technology equipment – Part 1: Safety requirements – Amendment 11: 2017
	EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
	Wind Energy Systems
	SANS 10142 or IEC 61400– Wiring Code (electrical installations)
	SANS 10142-1 & SANS 10142-2 or IEC 61400 – Installation Requirements for Wind Systems
	General Grid Compliance and Safety
	SANS 10142 – Safety and General Electrical Installation Standards
	Cabling and Wiring
	SANS 10142-1 or EN 50618 – Low-Voltage Electrical Installations: Requirements for wiring in solar, wind, and BESS systems
	SANS 1501-1 or IEC 60332-1-2 – Cables for Electrical Installations: Specifications for materials and installation of cables used in renewable energy systems
	SANS 10142-2 – Protection requirements for installations, ensuring safe disconnection and protection for renewable energy systems
	SANS 10142 or IEC 61000-6-5 – Standards for monitoring, control, and metering of electrical installations
	Power Conversion Unit
	EN 62109-1:2010 Safety of power converters for use in photovoltaic power systems – Part 1: General requirements
	EN 62109-2:2011 Safety of power converters for use in photovoltaic power systems – Part 2: Particular requirements for inverters
	EN IEC 62040-1:2019+A11:2021 Uninterruptible power systems (UPS) – Part 1: Safety requirements
	EN 62477-1:2012 Safety requirements for power electronic converter systems and equipment – Part 1: General
	EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
	Network Unit
	IEEE 1613 IEEE Standard Environmental and Testing Requirements for Communications Networking Devices in Electric Power Substations

	IEC 61850-3 Communication networks and systems for power utility automation – Part 3: General requirements for communication in electrical substations related to safety
	IEC 62368 or UL 60950-1 Audio/video, information and communication technology equipment – Part 1: Safety requirements
	IEC 61000-6-5 or IEC 61000-6-2 Electromagnetic compatibility (EMC) – Part 6-5: Generic standards – Immunity for equipment used in power stations and sub-stations
	IEC 62056-46 or IEC 61850-3 Electricity metering – Data exchange for meter reading, tariff and load control – Part 46: COSEM interface model for remote access.
	Electromagnetic Compatibility
	EN 55032:2015 Electromagnetic compatibility of multimedia equipment – Emission requirements
	EN 55032:2015/A11:2020 Electromagnetic compatibility of multimedia equipment – Emission requirements – Amendment 11: 2020
	EN 55024:2010 or EN 55024:2010+A1:2015 Information technology equipment – Immunity characteristics – Limits and methods of measurement
	EN 55035:2017 Electromagnetic compatibility of multimedia equipment – Immunity requirements – Part 1: Equipment
	EN 55035:2017/A11:2020 Electromagnetic compatibility of multimedia equipment – Immunity requirements – Part 1: Equipment – Amendment 11: 2020
	EN 61000-3-11:2000 or IEC 61000-3-11:2000 Electromagnetic compatibility (EMC) – Part 3-11: Limits – Limitation of voltage changes, voltage fluctuations, and flicker in public low-voltage supply systems, for equipment with rated current >16 A and ≤ 75 A per phase
	EN 61000-3-11:2019 or IEC 61000-3-11:2017 Electromagnetic compatibility (EMC) – Part 3-11: Limits – Limitation of voltage changes, voltage fluctuations, and flicker in public low-voltage supply systems, for equipment with rated current >16 A and ≤ 75 A per phase – Amendment 1: 2019
	EN 61000-3-12:2011 Electromagnetic compatibility (EMC) – Part 3-12: Limits – Limitation of voltage changes, voltage fluctuations, and flicker in public low-voltage supply systems, for equipment with rated current >75 A and ≤ 600 A per phase
	EN 61000-6-2:2005 Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
	EN 61000-6-4:2007+A1:2011 Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments – Amendment 1

PART 4: SITE INFORMATION

Document reference	Title	No of pages
	This cover page	1
C4	Site Information	
	Total number of pages	

PART 4: SITE INFORMATION

General description

For the general description of the Project and the required Site Information please refer to Section 3.1 of the Specification for Hybrid Wind and Solar PV Microgrid Research Facility 240-RT&D-785.

Eskom Research and Innovation Centre (ERIC) at Rosherville illustrating the RHF location.

Existing buildings, structures, and plant & machinery on the Site

The hybrid wind and solar plant must integrate with existing infrastructure (water, electricity, etc) and other research plants including the Hybrid Wind and Solar PV plant plant at ERIC.

The following drawing provides further information on the existing infrastructure.
Electrical Integration:

- 228-EE-2024-01: Single Line Diagram: MV Reticulation Schematic
- 228-EE-2024-04: North West Sub – Equipment Layout
- 228-EE-2024-08: Single Line Diagram: North West Sub LV-DB

Subsoil information

For geotechnical information relating to the project area, please refer to Solar PV Facilities, Geotechnical Investigation Report, by Worley Parsons Resources & Energy completed in 2013

Hidden services

For the location of hidden services please refer to the drawing: Research Facility USL V1 2024

Other reports and publicly available information

None

ANNEXURE A

Title: **Hybrid Wind and Solar PV Microgrid Research Facility**

Unique Identifier:	**240-RTD-785**
Alternative Reference Number:	**N/A**
Area of Applicability:	**RT&D-TS&RM**
Documentation Type:	**Report**
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Next Review Date:	**N/A**
Disclosure Classification:	**Controlled Disclosure**

- TABLE OF CONTENTS

1 Description of the Works

1.1 Executive Overview

A Microgrid is defined as a group of interconnected loads and distributed energy resources with defined electrical boundaries that acts as a single controllable entity and is able to operate in both grid-connected and island mode.

Microgrids are predominantly applied in areas where grid connectivity solutions to energy access are a challenge or feasibility is not cost justifiable. To still provide access to electrical power, alternative access solutions such as decentralized power is one option to consider.

To select areas suitable for microgrids solution, the following criteria is applied:

- Far from the existing conventional networks
- Farm-dweller houses where farming business operations do not favour overhead lines in the farm.
- Access challenges such as lack of bridges and roads
- Situated on valleys or mountain tops making it difficult to reach using conventional networks and pose maintenance and operating challenges post construction.
- Requiring costly infrastructure to be connected such as substations and long line upgrades.
- Constrained networks – grid-tied solution
- Projects with higher cost per connection
- Areas that are environmentally sensitive and which may influence wildlife, protect plants, or have a visual impact.
- Areas prone to site and servitude acquisition challenges for big infrastructure
- Lower and manageable risk of vandalism
- Must be the least life cycle cost solution when compared to a conventional solution.

Concept – the existing Eskom Microgrid currently being deployed is the basis of the concept for the envisaged research facility.

A project to establish a microgrid research facility is being developed as a source (supply and install) project. A microgrid plant that will be used for research purposes to advance and improve the existing offering on microgrids. The facility will be situated at Eskom's RT&D Rosherville facility.

The **Microgrid Research Facility** will have the following major components that are integrated to operate as a unit:

- Solar PV panels
- Wind Turbine Generators (WTG)
- Batteries
- Power conversion system (PCS)
- Programmable load
- Control room
- Monitoring and Control system

- All auxiliaries

1.2 Site and Physical Orientation

The facility being procured will be situated at Eskom RT&D at the following physical address:
Lower Germiston Rd,
Rosherville,
Johannesburg, 2095
GPS coordinates: 28° 6'47.69"E 26°13'58.08"S

The aerial map below is accompanied by the .kmz files that can be viewed in Google Earth Pro for a more refined locational information.

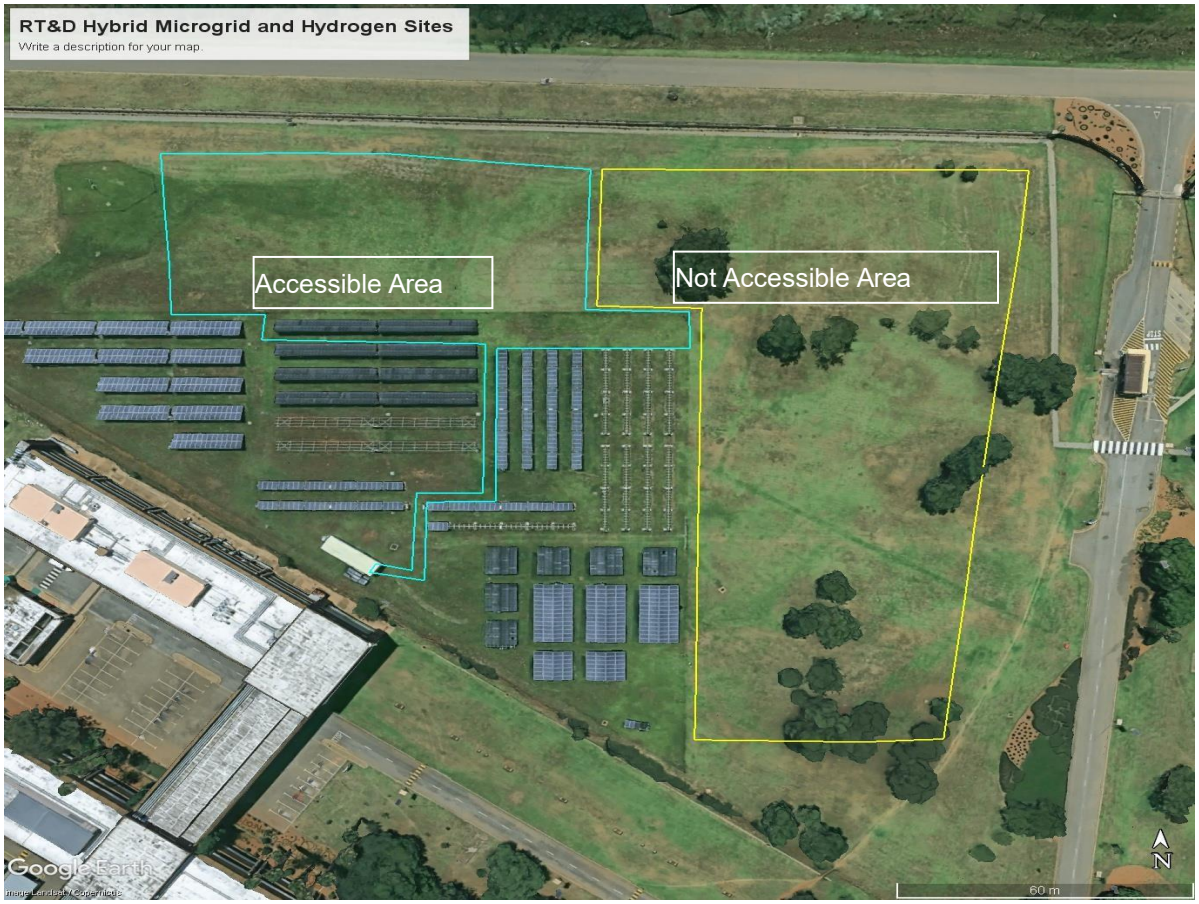

Figure 1: Planned Microgrid Facility Layout at Eskom RT&D, Rosherville

1.3 Employer's Requirements

The scope of work shall include the procurement of a complete hybrid wind and solar PV microgrid facility with all its components and the control room as shown in the below schematic. The following main components and parameters are required:

- 30kWac solar PV with single axis tracking
- 60kWh BESS
- 30kW wind energy turbine (can be 2x15kW turbines)
- 30kW Power conversion system with voltage and frequency control capabilities
- 30kW Programable load with power factor range 0.8 lead/lag
- Network communication unit
- ADMS capability
- Circuit breakers for protection and isolation
- Site office and control room

- Detailed design of the microgrid facility in line with the required connection topology
- Commissioning of microgrid facility to Eskom Research and Innovation Centre,
- Project management service, and
- Training of Eskom staff to operate the microgrid facility.

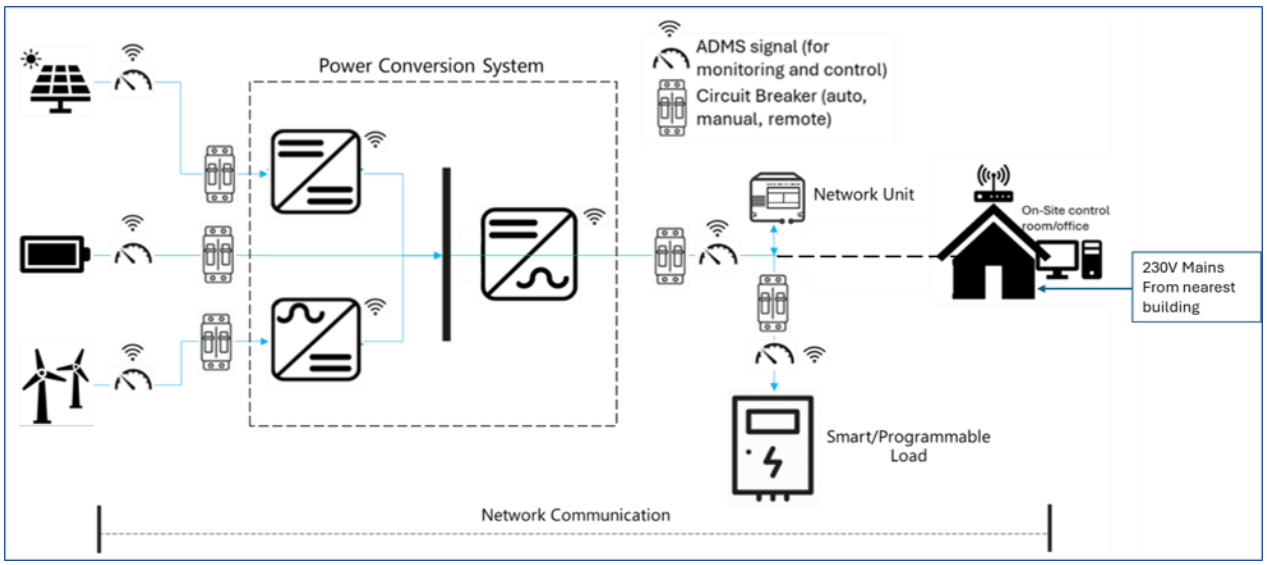

Figure 1: Microgrid architecture diagram

1.4 The *Employer* has the following specific requirements for the hybrid wind and solar PV microgrid research facility, which the Contractor shall adhere to:

1.4.1 This will inform the *Contractor* of the site-specific requirements for the design of the Hybrid Wind and Solar PV Microgrid Research Facility.

1.4.2 Determine the appropriate location at the selected sites for the installation of the Hybrid Wind and Solar PV Microgrid Research Facility to ensure effective measuring and monitoring.

1.5 Design the Hybrid Wind and Solar PV Microgrid Research Facility with the following range of functionalities to ensure comprehensive control, efficient operation, and robust performance:

- Manual Control: The microgrid system must provide the capability for manual control, allowing the operator to intervene directly when necessary. This is essential for testing different scenarios and making real-time adjustments to the system's operation.
- Voltage Control (Volt-var Control): The system must be equipped with voltage control capabilities to maintain stable voltage levels across the microgrid. This involves adjusting reactive power to manage voltage variations, ensuring that all connected loads receive power within the specified voltage range.
- Frequency Control: Maintaining the frequency of the AC supply within acceptable limits is critical for the stability and reliability of the microgrid. The system shall include frequency control mechanisms to adjust the power output and balance generation with consumption, preventing frequency deviations.
- P-Control (Curtailment): The microgrid must manage and curtail power output to match demand and prevent overloading. This functionality is essential for maintaining system stability, especially during periods of high demand or limited generation capacity.
- Load Management: Effective management of load demand is a key functionality of the microgrid. The system must dynamically adjust load consumption based on real-time data read from the load metres, ensuring optimal performance and preventing using the batteries beyond optimum limits. This helps in maintaining a stable and reliable power supply to all connected loads.
- Switching: The microgrid includes advanced switching capabilities to seamlessly transition between different power sources. This ensures a continuous and reliable supply of electricity, even when switching from one generation source to another.

- Metering and Revenue Collection: The system shall feature advanced metering solutions to accurately measure energy consumption at various points within the microgrid. This data can be used for revenue collection and billing purposes, as well as for detailed analysis of energy usage patterns. Accurate metering is essential for managing costs and optimizing system performance.

- Short-Term Forecasting: It shall be equipped with short term forecasting capability and use the resource forecast to optimise its dispatch strategy between the available energy resources in the facility.

- Programmable Load: The microgrid shall include a programmable load feature that can emulate different load classes and profiles. This allows for comprehensive testing of the system's response to various load conditions, including different power factors and demand patterns. The programmable load can simulate maximum demand and 24-hour profiles, providing valuable data for optimizing the microgrid's performance.

- Economic Dispatch: the system must be equipped with capability that will make it possible to programme it to do economic dispatch. Such capability shall make choosing between the solar, wind and batteries possible based on the programme

1.5.1 Solar PV Requirement:

The solar PV panels will be installed on a ground-mounted support structure, providing a stable and accessible platform for the array. To maximize energy capture, the PV system will include single axis tracking capability, allowing the panels to follow the sun's movement throughout the day. This feature significantly enhances the efficiency and output of the solar PV system, making it a valuable component of the microgrid. The required PV power output for this facility is 30kWac.

1.6 Battery Energy Storage Requirements:

Batteries are required to charge from the PV and from the wind turbines' generation outputs. The usable BESS capacity required for this microgrid is 60kWh. Thus, the successful respondent must design the capacity (constructed) such that the usable output is 60kWh. The design must account for manufacturer's suggested DoD.

1.7 Wind Turbine Generator Requirements:

The turbines are required to provide power generation during the night-time and when the solar resource is scarce. The output of the turbines shall be 30kWac. The functionality to control power output/curtailment in line with the load demand shall be made available. The following scope of work must be carried out:

- Geotechnical Study
- Foundation Type Based on Soil Conditions
- Wind Resource Assessment
- Wind Direction & Turbulence
- Turbine Sizing & Capacity Matching
- Environmental Impact Assessment
- Structural Analysis of Turbine Components
- Permitting & Legal Compliance
- Noise Assessment

1.8 Power Conversion System (PCS) Requirements:

The power conversion system shall convert the combine output of the PV and BESS from DC to AC (230V, 50Hz). In addition, the power conversion system must allow the BESS to charge from the WTG.

The power conversion system is expected to play a vital role of providing the AC output in line with the standards discussed in sections below. It must provide volt-var support and frequency control support. It shall be able to take set-points and provide outputs as per the set-points that will be provided by the measurement and control unit of the microgrid.

The power conversion system shall have a capacity of 30kW.

For the cases where the PCS capacity is greater or equal to 100kW and grid-tied, a grid forming capability will be required to provide grid support.

1.9 Programmable Load Requirements:

The programmable load will complete the microgrid by representing the customers. It shall be equipped with capability to take the following load profiles:

- 24-hour profile
- 8760-hour profile
- Generalised seasonal profiles (typical summer, winter day, etc)

- Typical week and weekend day profile
- Data resolution: 15 minutes data
- Profile length: 8760 hours (1 year)
- Input data: apparent power (kVA); real power (kW); reactive power (kvar); power factor

The input data will be provided in MS Excel spreadsheets.

This load must be capable of maximum demand of 30kW at 0.8 power factor (lead/lag)

1.10 Network Unit Requirements:

The network will carry sensors, and smart meter services.

10.1.1. Network Switch :

- Fan-free and dual-power supply redundancy design.
- Supports PoE++.
- Supports at least 8 x 10/100/1000Base-T Ethernet ports, 4 x 10GE SFP+ ports.
- long-term operating at -40°C to 65°C.
- Fault-free operation under strong magnetic interference, meeting the requirements of IEEE1613.
- Complies with the requirements of the strict environmental standard IEC61850-3 for substations.

10.1.2. Network Router:

- Industry-grade and high-performance edge computing
- Fan-free and dual-power supply redundancy design
- Supports at least 2 x RS485/RS232, 3 x GE electrical ports, 2 x GE SFP ports
- long-term operating at -40°C to 65°C
- 5G, LTE TDD, LTE FDD, WCDMA
- Fault-free operation under strong magnetic interference, meeting the requirements of IEEE1613
- Complies with the requirements of the strict environmental standard IEC61850-3 for substations.
- Fault-free operation under strong magnetic

10.1.3. AC collection unit:

- Supports the IEC62056-46 protocol.

- Supports analogue quantity acquisition functions such as voltage and current, and can measure voltage, current, power, power factor, etc.
- Accuracy: 0.2S active power level, 2 reactive power level.

10.1.4. HPLC/G3PLC communication unit:

- Supports the IEC62056-46 protocol.
- A maximum of 2000 STAs and 15-level trunks are supported.

10.1.5. Protection Requirements:

Key components of the facility shall be equipped with circuit breakers that can be controlled locally and remotely. The role of such breakers is to provide overcurrent fault protection during fault condition, detection and isolation of faulty sections of the facility and auto-reclosing after the fault was cleared. The state of these breakers (on/off) must be viewable from the office and the system must allow manual changes to switch state. The fault current rating of the protection breaker shall be calculated as part of the design by the successful bidder.

10.1.6. Monitoring and Control Functionality Requirements:

The monitoring and control functionality will show the physical working status of each entity. It will provide all the information about the facility and will be displayed in the dashboard format in the Office Room. The following minimum functionalities are applicable:

- Configuration of devices in the field.
- Activation and deactivation of devices.
- Replacement of faulty devices and keeping a record and history of replaced devices.
- Configuration of thresholds on devices.
- Device data collection & processing.
- Two-way communication capability (Remote connect\disconnect)).
- On demand request and response capabilities.
- Device lifecycle management.
- Demand response management.
- Management of smart grid data and non-consumer devices.
- Managing of device events (tampers, outages) and alarms)).
- Reporting and Analytics.
- Outage and Power Quality analysis.
- Remote firmware upgrade of field devices.

- Remote disconnection/ reconnection of energy supply.
- Ability to Maintain system time synchronization across all devices to ensure accuracy of data.
- Ability to provide Output of Generation.
- Measurement of load customer.
- Ability to Collect and analyse the power consumption data of end user/load for the purposes of power consumption monitoring, load management, and line loss analysis.
- Real time monitoring.

10.1.7. Office Room Signals:

The control room is to be equipped to monitor and report a wide range of signals, ensuring comprehensive oversight and management of the microgrid. It must be equipped with the following

- Viewing screen (>80cm): all-in-one interactive smart whiteboard for training (interactive touch panel; video conferencing; built-in speaker; built-in microphone; built-in camera),
- Screen to support voice tracking and auto framing function,
- Compatible with Microsoft Teams, zoom and other meeting software, wireless projection with/without Wi-Fi network.
- Manual input controls for the facility (for switching, setpoints, etc)
- Data storage and cloud upload capability

- **The control room will be hosted in the container which needs to meet the specification as follows:**

Container specifications	20ft
Inner dimensions of the container (mm)	6058*3100*3100
Air conditioning type	Integrated fluorine pump air conditioner + dual system backup
Fire extinguishing method	Heptafluoropropane automatic fire extinguishing system
Trigger fire extinguishing	Smoke sensor and temperature sensor (standard configuration), fire alarm system, emergency manual button triggering, and fresh air and smoke exhaust system after a disaster
Monitors	Supports local and remote web page access and provides the alarm function.

These signals will be provided by the Monitoring and Control system discussed in 5.8 above, the key signals include:

- Frequency: Monitoring the frequency of the AC supply to ensure stability.
- Voltage Regulation: Ensuring that voltage levels remain within specified limits.
- Reactive Power Flows: Tracking the flow of reactive power to manage power quality.
- Active Power: Monitoring the active power generated and consumed.
- Quality of Supply: Assessing the quality of the electrical supply, including voltage dips and harmonics.
- BESS State of Charge (SOC): Tracking the SOC of the BESS to manage energy storage.
- BESS Cell Health: Monitoring the health of individual BESS cells to ensure longevity and reliability.
- BESS Charging and Discharging Power: Tracking the power levels during charging and discharging cycles.
- System topology/
- Data collected from these signals will be archived in the cloud, providing a valuable resource for future analysis and applications.
- Low power factor detection
- Unbalance phases monitoring and detection.
- System tampering and unauthorised access.

Remote access: It shall be possible to remotely access the monitoring and control system remotely via a secured network. In addition, the same dashboard displayed in the Office Room shall be accessible remotely.

- **The control room shall include the following furniture's:**

1. **Operator(s) Workstation**
   - 4 x Ergonomic Office Chairs – Adjustable height, cushioned seats, armrest with wheels for easy movement.
   - Under-Desk Pedestal Drawers – Small, lockable storage for personal and work-related items.
   - Wall-Mounted Shelves – For storing manuals, small tools, and frequently used documents.
   - Wi-Fi access point – For internet connectivity.
   - 7 x Ethernet cables and sockets – For internet connectivity.

- 6 x Standard Size: 32'' to 43" monitors – For expanded display.
- 3 x Telephones – For calls.
- Notice Board 244cm(L) x 5cm(W) x 125cm(H) – for notices.
- Whiteboard with Marker Tray – Task planning, updates and brainstorming.
- Personal Storage Lockers – Small, lockable units for staff belongings.
- Integrated Power Outlets - Desks with built-in power supply and charging ports for convenience.

2. Conference & Meeting Area (Boardroom)

- Rectangular Conference Table – For meetings and discussions to accommodate 10 people.
- 10 x Ergonomic Office Chairs – Adjustable height, cushioned seats, with wheels for easy movement.
- Multifunctional Whiteboard/Blackboard – For writing notes or drawing system flow diagrams.
- Power Outlets at the Conference Table – Built-in outlets and for charging devices or connecting laptops.
- Projection Screen and Projector – A retractable screen for presentations, integrated with the conference table or ceiling.
- Speakers – For sound during meetings.

3. Staff Break Area

- Compact Kitchenette with Cabinets – Small kitchen area with a counter, sink, and cupboards for storing snacks and drinks.
- Round or Square Dining Table – A simple table with 4-6 chairs for quick meals or breaks.
- Compact Refrigerator – A small, budget-friendly fridge for storing food and beverages.
- Microwave & Coffee Station – Basic microwave and coffee maker for quick heating and beverage preparation.
- Water Cooler – Freestanding water cooler.

4. Other Items

- Trash Bins.
- Wall Clocks & Digital Timers.
- First Aid Kit.
- Fire extinguisher.

10.1.8. Housing enclosure for batteries, power conversion and other sensitive electronics:

Batteries shall be stacked and/or housed in a suitable enclosure that makes it easy to transport.

The contractor shall provide a separate enclosure to house batteries, power conversion system and other sensitive electronic and electrical equipment. This is to protect sensitive equipment from weather elements. It shall have effective fire detection and protection, and effective cooling mechanism. The enclosure must not exceed the dimensions (mm) (BxWxH): 1000x1000x2000. To prove ease of transportability, the enclosure must demonstrate the possibility of being transported in components than as a single unit. As such, it must be possible to transport the enclosure by means of labour personnel.

10.1.9. Overall Generating Capacity:

The generation capacity of the facility is to be designed to meet various research and operational needs.:

- AC voltage must be 230V, 50Hz in the facility,
- The PV system will have an output of 30 kWac,
- BESS to be rated at 60 kWhac, providing ample storage for energy management,
- Power conversion system, with a capacity of 30 kW, will convert DC power from the PV panels and BESS to AC power for distribution,
- The wind turbine generator will also contribute a total of 30 kWac to the system,
- The programmable load to have a maximum of 30 kWac at 0.8 power factor, ensuring that the microgrid can simulate different load scenarios effectively.
-

10.1.7.1 The expected life span of the hybrid wind and solar PV microgrid research facility shall be at least 15 years.

10.1.7.2 All components and accessories required for the successful operation of work under the scope of this project, either specified in detail or not, shall be supplied, installed and commissioned by the *Contractor* as necessary.

10.1.7.3 The hybrid wind and solar PV microgrid research facility shall be complete with all the equipment and material necessary for the safe, reliable operation, maintenance and support post installation of the hybrid microgrid system.

10.1.7.4 Any equipment and or function of the hybrid wind and solar PV microgrid research facility not specified herein shall be designed and supplied as required by the overall design of the hybrid microgrid system.

10.1.7.5 The *Employer* and *Contractor* shall agree on the site prioritisation in terms of the execution of the design, installation and commissioning of the hybrid wind and solar PV microgrid research facility accordingly.

10.1.10. Interpretation and Terminology

Microgrid: is a group of interconnected loads and distributed energy resources with defined electrical boundaries that acts as a single controllable entity and is able to operate in both grid-connected and island mode.

The following abbreviations are used in this Scope Document:

Abbreviation	Meaning given to the abbreviation
AFC	Approved for Construction
OBL	Outside Battery Limits
BESS	Battery Energy Storage System
PV	Photovoltaic
PCS	Power Conversion System
SOC	State of Charge
AC	Alternating Current
DC	Direct Current
PCS	Power Conversion System

11 Management Strategy and Start Up

11.1 The Contractor's Plan

The *Contractor* shall provide, the scope execution plan which complies to the requirements of this scope.

The *Contractor's* plan takes into consideration the employer's requirements as stated in section 1.2 above and below information:

11.1.1 Submit installation, commissioning, operating and maintenance manuals and procedure for the Hybrid Wind and Solar PV Microgrid Research Facility.

11.1.2 Facilitate acceptance testing of the at the *Contractor's* premises.

11.1.3 Submit a training proposal for the practical training which will be approved by the Employer. As a minimum, the training proposal shall address the following requirements:

- Number of Participants: 10
- Requirements: This should be carried out as part of the installation and commissioning of the Hybrid Wind and Solar PV Microgrid Research Facility,and shall be based on the training proposal submitted by the contractor.
- Training Location: at a selected Eskom site.
- Training Duration: Should be based on installation and commissioning duration.
- Training Modules: Should include but not be limited to the following aspects: Installation, commissioning, operation, maintenance, software operation and troubleshooting, web-based application operation and troubleshooting, download and analysis of results, safety aspects.
- Program per training intervention: Proposal to be submitted by the contractor.
- Certification: Issuing certificates of attendance to all participants.

11.1.3.1 Supply a Hybrid Wind and Solar PV Microgrid Research Facility complete with all accessories and material required, as per the approved design.

11.1.3.2 The Contractor provides the quality control plan and inspection test plan for all activities of this scope.

11.1.3.3 Install and commission the Hybrid Wind and Solar PV Microgrid Research Facility at the *Employer*'s selected site.

11.1.3.4 Provide practical training to the *Employer*, as part of the installation and commissioning works.

11.1.3.5 Submit a training proposal for the theoretical training which will be approved by the Employer. As a minimum, the training proposal shall address the following requirements:

- Number of Participants: 20
- Requirements: Classroom training. Complete training manuals to be provided covering all training modules to be presented.
- Training Duration: Suppliers to declare duration of training based on contractor's training proposal.
- Training Modules: Should include but not be limited to the following aspects of the Hybrid Wind and Solar PV Microgrid Research Facility: Installation, commissioning, operation, maintenance, software operation and troubleshooting, web-based application operation and troubleshooting, download and analysis of results, safety aspects. The training content of the training modules shall be approved by the Employer.
- Program: Based on contractor's training proposal.
- Certification: Issue certificates of attendance to all participants.

11.1.3.6 Provide theoretical training to the *Employer* once commissioning is completed.
11.1.3.7 Provide technical support to the *Employer* on an as-and-when required basis.
11.1.3.8 The *Contractor* may be required to participate in knowledge transfer workshops on request from the *Employer*, on an as-and-when required basis.

11.1.4 The following general requirements shall apply:

- All components and accessories required for the completion and successful operation of the Work covered under the scope of this project, either specified in detail or not, shall be supplied by the *Contractor* as necessary.
- The Hybrid Wind and Solar PV Microgrid Research Facility shall be complete with all the equipment and material necessary for the safe, reliable operation and maintenance of the Hybrid Wind and Solar PV Microgrid Research Facility.
- Any equipment and/or function of the Hybrid Wind and Solar PV Microgrid Research Facility not specified herein shall be designed and supplied as required by the overall design of the Hybrid Wind and Solar PV Microgrid Research Facility.
- The Contractor shall provide transportation of all equipment and accessories required as part of the work to the relevant sites.
- The Contractor shall provide suitable storage of all equipment during installation and commissioning activities.
- Provide all the required documentation pertaining to the Hybrid Wind and Solar PV Microgrid Research Facility.

11.2 Management Meetings

Meetings will be held between the Employer, the Contractor and any other co-opted members. The Contractor will be represented at each meeting by appropriate members of its staff. All meetings will be chaired by the Project Manager.

The venue for these meetings will be as determined by the Project Manager. The Project Manager will prepare and issue the minutes of these meetings.

All meetings shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the *conditions of contract* to carry out such actions or instructions.

A summary of the planned meetings is provided in Table 1

11.2.1 Kick Off Meeting

Kick-off meeting will be held within 1 week after the award of the contract. This meeting will cover Project implementation, the Scope of work, and Schedule. This will give the *Contractor* an opportunity to discuss all matters related to carrying out their responsibilities.

11.2.2 Progress Meetings

Weekly progress meetings will be held covering progress to date on the execution of the scope of works, and all associated risks, risk impact and risk mitigation.

11.2.3 Design Review Meetings

The *Contractor* shall present the Design to the *Employer* for technical review along with all relevant drawings.

A design review in a planned exercise is envisaged to ensure that there is a common understanding of the applicable standards and specification requirements, and to provide an opportunity to scrutinize the design to ensure the requirements meet the *Employer*'s requirements.

During this meeting, the comments of the *Employer* on the design will be reviewed and discussed in detail to finalize the design for the Hybrid Wind and Solar PV Microgrid Research Facility system. The *Contractor's* installation and commissioning methodology will reviewed as part of the design review.

The design shall be accepted by the Project Manager for approval.

Table 1: Project Deliverables

No.	Milestones	Completion Date
1	Completion of Detail Design Phase	22 July 2026
2	Complete Procurement of all plant items	07 January 2027
3	Complete Construction of the Plant	27 May 2027
4	Complete Commissioning & Testing	24 June 2027