NEC3 Engineering & Construction Contract

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

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

for **Refurbishment and Upgrade of Electrical Systems at Megawatt Park**

Contents:		**No of pages**
Part C1	**Agreements & Contract Data**	**[•]**
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CONTRACT No. **[Insert at award stage]**

Part C1: Agreements & Contract Data

Contents:

		No of pages
C1.1	**Form of Offer and Acceptance**	**[●]**
	[to be inserted from Returnable Documents at award stage]	
C1.2a	**Contract Data provided by the *Employer***	**[●]**
C1.2b	**Contract Data provided by the *Contractor***	**[●]**
	[to be inserted from Returnable Documents at award stage]	
C1.3	**Proforma Guarantees**	**[●]**

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:

Refurbishment and Upgrade of Electrical Systems at Megawatt Park

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 B, C or D	The offered total of the Prices exclusive of VAT is	**R [●]**
	Sub total	**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*

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

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
		X5: Sectional Completion
		X7: Delay damages
		X12: Partnering
		X13: Performance Bond
		X16: Retention
		X17: Low performance damages
		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)	**To be advised at contract award stage**
	Address	**Eskom Megawatt Park,Sandton**
	Tel	**[●]**
	Fax	**[●]**
	e-mail	**[●]**

10.1	The *Supervisor* is: (Name)	**[●]**
	Address	**[●]**
	Tel No.	**[●]**
	Fax No.	**[●]**
	e-mail	**[●]**
11.2(13)	The *works* are	**Design, installation, commissioning, refurbishment and upgrade of the electrical system at Megawatt Park**
11.2(14)	The following matters will be included in the Risk Register	**1. Adverse weather conditions, such as heavy rainfall, snowfall, and strong winds, necessitate the contractor to exercise caution when organizing the schedule and resources for the project.** **2. Any harm to existing equipment and foundations is the responsibility of the Contractor to replace or reconstruct. All delays in construction and procurement of such equipment will be borne by the Contractor and will not be charged back to Eskom.** **3. Theft. The site and working areas are to be guarded to ensure that no theft can take place that will affect construction.** **4. Material suppliers. Suppliers to meet all Eskom requirements. The Employer will not handle any disputes between the Suppliers and the Contract.** **5. Time. This contract has to be completed within the contract period. The Employer shall not be liable for any delays caused by the Contractor.** **6. The contractor will need to be aware that the site will be operational during construction and should provide the necessary security measures to ensure that security is not compromised.** **7. Reputable OEM used with accredited installers, where required.** **8. Limited as-built, operation and maintenance information.** **9. The contractor will need to be aware of the Eskom security requirements and standard that must be adhered to and comply with.** **10. Additional risks will be identified during the initial project meeting and continuously assessed throughout the project duration.**
11.2(15)	The *boundaries of the site* are	**Megawatt Park**
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	**Five (5) working days**
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	**[●].**

11.2(9) The *key date*s and the *condition*s to be met are:

	***Condition* to be met**	***key date***
1	**Project Schedule**	**2 weeks After Contractor appointment**
2	**Notice of construction be given to Department of Labour**	**Before Execution of works.**
3	**Security clearance of personnel and induction**	**Before Execution of Works**
4	**Safety File Submission and induction**	**Before Execution of works.**
5	**Design Approval**	**After Contractor appointment**
6	**Construction Phase**	**As per approved schedule**
7	**Commissioning and training**	**As per approved schedule**
8	**Handover**	**As per approved schedule**

30.1	The *access dates* are:	**Part of the Site**		**Date**
		1	**Megawatt Park Blocks A,B and C**	**After the SHE evaluations have been passed by the Contractor.**
31.1	The *Contractor* is to submit a first programme for acceptance within	**Two (2) weeks of the Contract Date**		
31.2	The *starting date* is	**The date for the site handover will be provided after the contract has been awarded and the SHE audit has been done and passed by the Contractor.**		
32.2	The *Contractor* submits revised programmes at intervals no longer than	**Every Two (2) weeks**		
35.1	The *Employer* is not willing to take over the *works* before the Completion Date.	**All works shall be completed before the *Employer* can take over the *works***		
4	**Testing and Defects**			
42.2	The *defects date* is	**weeks after Completion of the whole of the *works*.**		
43.2	The *defect correction period* is	**52 weeks after Completion of the whole of the works.**		
5	**Payment**			
50.1	The *assessment interval* is	**between the [●] 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	**25th of every month.**		
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:	**Megawatt Park, Sunninghill**
	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 at the nearest station next to the site.**
	The *weather data* are the records of past *weather measurements* for each calendar month which were recorded at:	**[●]**
	and which are available from:	**the South African Weather Bureau and included in Annexure A to this Contract Data provided by the *Employer***
60.1(13)	Assumed values for the ten year return *weather data* for each *weather measurement* for each calendar month are:	**As stated in Annexure A to this Contract Data provided by the *Employer*.** **Note: If this arrangement is used, delete the rows above for 60.1(13) and delete this note.**
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**	**1. Health & Safety** **2. Structural/Site** **3. Legal/Regulatory** **4. Commercial** **5. Environmental** **6. Security** **7. Coordination**

84.1	**The Employer provides these additional insurances**	**as stated for "Format A" available on http://www.eskom.co.za/Tenders/InsurancePolicies Procedures/Pages/EIMS_Policies_From_1_April_2014_To_31_March_2015.aspx (See Annexure B for basic guidance)**
84.2	The insurance against loss of or damage to the *works*, Plant and Materials is to include cover for Plant and Materials provided by the *Employer* for an amount of	
84.3	The minimum limit of indemnity for insurance in respect of loss of or damage to property (except the works, Plant, 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 for any one event is	**As prescribed by the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 and the Contractor's common law liability for people falling outside the scope of the Act with a limit of Indemnity of not less than R500 000 (Five hundred thousand Rands).**
84.4	**The minimum limit of indemnity for insurance in respect of 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 for any one event is**	**As prescribed by the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 and the Contractor's common law liability for people falling outside the scope of the Act with a limit of Indemnity of not less than R500 000 (Five hundred thousand Rands).**
9	**Termination**	**Refer to the NEC clauses regarding termination**
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.**
A	**Priced contract with activity schedule**	
60.6	The *method of measurement* is	**[●] published by [●] and amended as stated in Part C2.1, Pricing Assumptions.**
20.4	The *Contractor* prepares forecasts of Defined Cost for the *works* at intervals no longer than	**[●]weeks.**
50.6	The *exchange rates* are those published in	**[●] on [●] (date).**
53.1	The *Contractor's share percentages* and the *share ranges* are	***share range*** / ***Contractor's share percentage***
		less than [●] % / **[●]%**
		from [●]% to [●]% / **[●]%**
		from [●] to [●]% / **[●]%**

		greater than [●]%	**[●]%**

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	**[●] South Africa**
	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	**[●].**		
X1.1(c)	The proportions used to calculate the Price Adjustment Factor are:	**proportion**	**linked to index for**	**Index prepared by**
		Fixed 15%		
		Electrical equipment and Materials 40%	**(Table O-2)**	**Seifsa**
			(Table G-2(A)	**Seifsa**

		Electrical installation works 10%	**(Table G-2(A)**	**Seifsa**
		Material – Paint 3%	**(Table M-6)**	**Seifsa**
		Labour - 15%	**(Table C3 AHPE)**	**Seifsa**
		Overheads -4%	**(Table D-2)**	**Seifsa**
		Transport - 3%	**(Table L2-A)**	**Seifsa**
		Total 1:00	**non-adjustable**	

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.**		
X5	**Sectional Completion**			
X5.1	The *completion date* for each *section* of the *works* is:	***Section***	**Description**	***Completion date***
		1	**MWP Block A**	**TBC**
		2	**MWP Block B**	**TBC**
		3	**MWP Block C**	**TBC**
X5 & X7	**Sectional Completion and delay damages used together**			
X7.1 X5.1	Delay damages for late Completion of the *section*s of the *works* are:	***section***	**Description**	**Amount per day**
		1	**MWP Block A**	**R 30 000.00**
		2	**MWP Block B**	**R 30 000.00**
		3	**MWP Block C**	**R 30 000.00**
	Remainder of the *works*			
	The total delay damages payable by the *Contractor* does not exceed:	**R 30 000.00 per day up to a limit of 20% of the contract value.**		
X7	**Delay damages (but not if Option X5 is also used)**			

X7.1	Delay damages for Completion of the whole of the *works* are	**R[●] per day up to a limit of R[●]**	
X12	**Partnering**		
X12.1(1)	The *Client* is (Name)	**[●]**	
	Address	**[●]**	
	Tel	**[●]**	
	Fax	**[●]**	
X12.2(1)	The *Client's* objective is.	**[●]**	
X12.1(4)	The Partnering Information is in	**[●]**	
X13	**Performance bond**		
X13.1	The amount of the performance bond is	**10% of the contract value excluding VAT**	
X16	**Retention (not used with Option F)**		
X16.1	The *retention free amount* is	**10 % for each payment certificate**	
	The *retention percentage* is	**50% to be paid immediately on completion and 50% balance to be paid after 52 weeks after the works have been completed.**	
X17	**Low-performance damages**		
X17.1	The amounts for low-performance damages are:	**Amount**	**Performance level**
		R30,000.00 per day up to a limit of 20% of the Contract Value.	**Failure of the refurbished electrical system, including MV switchgear, transformers, LV switchgear, protection systems, battery tripping units and diesel generators, to achieve the performance, reliability, operational and acceptance test requirements specified in the Scope of Work and Technical Specifications.**
		R30,000.00 per day up to a limit of 20% of the Contract Value.	**Failure to successfully complete commissioning, functional testing, protection testing, synchronization testing (where applicable), load testing, integration with the Building Management System, and achievement of all Take Over criteria required for the electrical systems at Megawatt Park.**

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) [●] 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.
X20	**Key Performance Indicators (not used when Option X12 applies)**	
X20.1	The *incentive schedule* for Key Performance Indicators is in	**Annexure [●] to this Contract Data**
X20.2	A report of performance against each Key Performance Indicator is provided at intervals of	**[●] months**
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 *work*s, Plant and Materials	The replacement cost where not covered by the *Employer*'s insuranc 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 *work*s, 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 insuranc 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 applicat 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.

Annexure A: One-in-ten-year-return *weather data* obtained from SA Weather Bureau for [weather station]

If any one of these *weather measurements* recorded within a calendar month, before the Completion Date for the whole of the *works* and at the place stated in this Contract Data is shown to be more adverse than the amount stated below then the *Contractor* may notify a compensation event.

	Weather measurement				
Month	Cumulative rainfall (mm)	Number of days with rain more than 10mm	Number of days with min air temp < 0 deg.C	Number of days with snow lying at 08:00 CAT	[Other measurements if applicable]
January	**[●]**	**[●]**	**[●]**	**[●]**	
February	**[●]**	**[●]**	**[●]**	**[●]**	
March	**[●]**	**[●]**	**[●]**	**[●]**	
April	**[●]**	**[●]**	**[●]**	**[●]**	
May	**[●]**	**[●]**	**[●]**	**[●]**	
June	**[●]**	**[●]**	**[●]**	**[●]**	
July	**[●]**	**[●]**	**[●]**	**[●]**	
August	**[●]**	**[●]**	**[●]**	**[●]**	
September	**[●]**	**[●]**	**[●]**	**[●]**	
October	**[●]**	**[●]**	**[●]**	**[●]**	
November	**[●]**	**[●]**	**[●]**	**[●]**	
December	**[●]**	**[●]**	**[●]**	**[●]**	

Only the difference between the more adverse recorded weather and the equivalent measurement given above is taken into account in assessing a compensation event.

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.

Clause	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 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

		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]*

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 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]

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 "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].

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

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

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

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 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.

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

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

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

3.3 state that the Demand Amount is payable to Eskom 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 Eskom and the Contractor.

6. 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.

7. 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.

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 7 above, personal to Eskom 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

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 **7** 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 **7** 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**

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

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C3.1: EMPLOYER'S WORKS INFORMATION

1 Description of the *works*

1.1 Executive overview

The Mega Watt Park Electrical Systems Refurbishment Project is intended to renew and modernise critical electrical infrastructure serving the Mega Watt Park campus. The project responds to the age, condition and obsolescence of the existing medium-voltage switchgear, transformers, main low-voltage switchgear and standby diesel generator systems. The existing 11 kV switchgear has exceeded its stated 30-year lifespan, is not internally arc compliant and contains obsolete end-of-life components. The existing oil-filled transformers have exceeded their economical design life, with visible oil leakage reported in certain plant areas, while the main low-voltage switchgear has exceeded its stated 20-year lifespan and includes obsolete switching components. Certain standby diesel generators are also beyond their stated design life and are non-functional.

The Works comprise the phased design, refurbishment, replacement and integration of the affected electrical systems. The principal interventions include the replacement of two medium-voltage incomer cables, existing medium-voltage switchgear and associated battery tripping units, oil-filled transformers with dry-type transformers, affected main low-voltage switchboards and distribution boards, and the diesel generators serving Blocks A and B. Existing outgoing low-voltage cables and selected medium-voltage cables are to be tested and condition-assessed, with replacement or repair undertaken where required.

The appointed Contractor will assume responsibility for validating the Employer's preliminary designs and power-system studies and for completing the detailed multidisciplinary design. The Contractor's responsibilities extend through procurement, manufacturing, factory acceptance testing, delivery, off-loading, decommissioning, installation, site testing, commissioning, plant optimisation and final handover. The Contractor must also update applicable drawings and schedules, design the protection and control systems, provide compliant earthing and lightning protection, and submit the necessary technical and compliance documentation.

The refurbishment is to be implemented in a manner that maintains the integrity and availability of electrical supply to the Mega Watt Park campus. The specification proposes a controlled replacement sequence, beginning with the main low-voltage boards, followed by transformers, medium-voltage boards and, lastly, diesel generators. A mobile substation may be used to support the progressive transfer of supplies while existing medium-voltage boards are replaced.

The completed installation is required to provide a safe, reliable, maintainable and fully functional electrical system that is integrated with the existing site infrastructure. New devices are to be communication-enabled for connection to the Building Management System, and all new equipment is to be tested, commissioned, labelled, documented and handed over with the required as-built drawings, operating manuals and maintenance information.

1.2 *Employer*'s objectives and purpose of the *works*

The objective of the Mega Watt Park Electrical Systems Refurbishment Project is to improve the safety, reliability, maintainability and operational performance of the campus electrical infrastructure by replacing ageing, obsolete and non-compliant equipment with modern, standards-

compliant electrical systems. The project will refurbish and upgrade the medium-voltage switchgear, battery tripping units, transformers, low-voltage switchgear, selected power cables and standby diesel generator systems while ensuring minimal disruption to the existing electrical supply.

The purpose of the Works is to provide a complete engineering, procurement, construction, testing and commissioning solution for the replacement and integration of these critical electrical assets. The Contractor will be responsible for validating the Employer's preliminary designs, undertaking detailed multidisciplinary design, procuring and installing new equipment, implementing associated protection, control, earthing and communication systems, and delivering a fully functional, safe and reliable electrical network integrated with existing Mega Watt Park infrastructure.
Upon completion, the refurbished installation will support improved operational resilience, reduced maintenance risk, enhanced personnel safety and long-term sustainability of the facility's electrical supply and backup power systems.

1.3 Interpretation and terminology

The following abbreviations are used in this Works Information:

Abbreviation	Description
AHU	Air Handling Unit
ASHRAE	American Society of Heating Refrigeration Air Conditioning Engineers
BMS	Building Management System
CIBSE	Chartered Institution of Building Services Engineers
C&I	Control and Instrumentation
DGN	MicroStation CAD drawing, vector format
DWG	AutoCAD drawing, vector format
ERE	Eskom Real Estate
HVAC	Heating Ventilation and Air Conditioning
LPS	Low Pressure Services
MCC	Motor Control Centres
O&M	Operating and Maintenance
OEM	Original Equipment Manufacture
QCP	Quality Control Procedure
SANS	South African National Standards

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 register	Weekly	Microsoft teams/Megawatt Park	*Employer*, *Contractor*
Weekly progress report, reporting on actual work completed.	Every Friday of the week, reporting on the previous week's progress		
Compensation events	When required	Megawatt Park	*Employer, Contractor*
Project Progress meetings	Weekly	Megawatt Park	*Employer*, *Contractor*
Overall contract progress	Weekly	Megawatt Park	*Employer*, *Contractor*
Look ahead schedule	Bi - Weekly	Megawatt Park	*Employer*, *Contractor*

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.

2.2 Documentation control

- The Contractor submits all documentation to the Project Manager and the Project Manager to the Contractor's Project/Contract Manager.
- Electronic contract communication is restricted to electronic mail only.
- All communications are filed and kept on Site. These communication documents are to adhere to the ECC 3 communication requirements.
- For contractual issues, standard NEC templates and forms are used by both parties or if unavailable, the Employer's templates and forms are used e.g. Non Conformance Reports, Pre-commissioning checks or Assessment Certificates. Alternatively, the Contractor prepares appropriate documentation to meet the Employer's requirements.
- The Contractor submits all commercial documentation as specified in the Invitation to Tender document, as well as all documentation as specified by the SHEQ requirements.
- The Contractor submits a project specific site team organogram indicating all its employees that will form part of the site team relevant to the project. The numbers, designations and names of all employees must be clearly indicated. Names are not required for positions, which will be filled as part of local hire and subcontracting. This will be the Contractor's Permanent Core Team. All additional recruits, which are not part of the Contractor's Permanent Core Team, will be recruited as per the process set out in 4.1.2.1, Recruitment of General, Semi-Skilled, and Skilled Labour.

- The Contractor submits a preliminary detailed project programme, in Microsoft Projects format that indicates all activities and milestones for the project.

2.3 Health and safety risk management

The *Contractor* shall comply with the health and safety requirements contained in Annexure _____ to this Works Information.

The supplier/contractor/tenderer is expected to comply to the following documents when working at/rendering a service to Eskom but not limited to the following:

- Occupational Health and Safety Act 85 of 1993 and its Regulations (OHS Act)
- Disaster Management Act, no 57 of 2002.
- Safety, Health and Environmental requirements contained in the SHE Specification for Contractors.
- Eskom SHEQ Policy, Standards, Procedures, Guidelines, Specifications and Regulations as listed below:
- Eskom Safety, Health, Environmental and Quality Policy: 32-727
- Eskom Lifesaving Rules, Directive: 32-421
- Eskom Procedure on Smoking: 32-36
- Eskom Incident Management Procedure 32-95 (latest revision)
- Implementation of Occupational Hygiene management programme, Standard 240-42262670
- Eskom Life Saving Rules, Directive: 240- 62196227
- Eskom vehicle and driver safety management 32-93
- Eskom vehicle specification 32-345
- Eskom Contractor Health and Safety requirements standards 32-136
- Employees' right of refusal to work in an unsafe situation 240-43848327
- Eskom Waste Management Standard 32-245
- Annexure B: Acknowledgement Form for Eskom SHE Rules and other Requirements

Appendix A, The Contractor requests all applicable Eskom procedures & requirements. The Contractor ensures safety awareness at all times through continuous training. The Contractor, at all times is responsible for the supervision of his employees, agents, Subcontractors and takes full responsibility and accountability for ensuring they are competent, compliant and aware of the legal requirements and other requirements and execute the works accordingly.
The Contractor ensures that all statutory appointments and appointments required by any Eskom Regulations are made in writing and that all appointees fully understand their responsibilities and are trained and competent to execute their duties.
The Divisional/Regional Safety Risk Manager or his representative having jurisdiction over the works must provide the relevant safety, health and environmental (SHE) criteria for incorporation into this Works Information. The SHE specification / scope must be signed off by the Divisional/Regional Safety Risk Manager or his representative confirming that the applicable safety criteria have been taken into account.
The Commodity Manager / Buyer must refer the tender to the Divisional/Regional Safety Risk Manager or his representative in order to evaluate against enquiry-specific safety criteria.
The Divisional Safety Risk Managers who will be responsible for the allocation of resources to assist P&SCM with the above processes are as follows:

- Generation: Roley McIntyre
- Transmission: Tony Patterson
- Distribution: Alex Stramrood
- Enterprises: Jace Naidoo
- Corporate: Kerseri Pather

The Contractor shall comply with the health and safety requirements contained in Annexure _____ to this Works Information.

2.4 Environmental constraints and management

All waste introduced and/or produced on the Employer's premises by the Contractor for this contract is handled in accordance with the minimum requirements for the Handling and Disposal of Hazardous Waste in terms of Government Legislation as proclaimed by the Department of Water Affairs and Forestry and Employer's environmental requirements.
All environmental incidents are reported to the Employer within 24 hours of such occurrence. All environmental incidents occurring on the Project Site (or on any other places, if any, as may be specified under the Contract as forming part of the Site) are recorded, detailing how each incident was dealt with in an Environmental Incident register.
The Contractor shall construct and/or implement all the necessary environmental protection measures in each area before any production work will be allowed to proceed. The Employer may suspend the Works at any time in terms the Conditions of Contract should the Contractor, in the Employer's opinion, fail to implement, operate or maintain any of the environmental protection measures adequately.
The Contractor ensures that all goods, services or works supplied in terms of the Contract comply with all applicable environmental legislations (National Environmental Management Act, 1998 [Act No 107 of 1998]). The Contractor is responsible for keeping the work area clean of any environmental waste.
The Contractor shall comply with all relevant applicable laws, environmental legislation and regulations, conditions of environmental approvals, environmental management plans, and Employers Policies and Procedures. The Contractor must submit an Environmental Policy demonstrating commitment to protection of the environment. The Environmental Policy shall form part of the SHE file submission. Upon the Employer's approval, the Contractor shall immediately implement the policy and any amendments and keep it in operation for the full duration of the Contract. The policy shall be communicated to all personnel and copies of the policy shall be prominently displayed at all places of work.
The Contractor shall determine and develop the aspects and impacts register related to the scope of work. All aspects of the planning, manufacturing, pre-construction, construction and operational phases shall be considered. During the designing activity, the Contractor must always take into account the product's life cycle perspective in mind.
The Contractor shall comply with the environmental criteria and constraints.

The Contractor shall comply with the environmental criteria and constraints stated in Annexure _____

2.5 Quality assurance requirements

The Contractor complies to the following documents when working at/rendering a service to Eskom but not limited to the following:

- 240-12248652 - List of Tender Returnable/Quality Requirement Document

- 240-68099512 - FORM A: Tender & Contract Quality Requirements for QM 58 and Quality Requirements for ISO 9001 Standard.
- 240-105658000 (QM 58)- Supplier Quality Management: Specification
- 240-109253698- Contract Quality Plan (CQP) 240-109253302- Quality Control Plan (QCP)/ Inspection and Test Plan (ITP)

After the acceptance of the construction drawings the contractor submits the associated construction Method Statements and relevant QCP/ITP for acceptance and determination of intervention points prior to construction.
Failure to comply with an accepted Method Statement/QCP or ITP may result the issuing of a NCR, rejection of the works as well as the withholding of payment until the appropriate remedial actions have occurred.

- The Contractor demonstrates, provide, and maintains a Quality Management System that is ISO 9001:2008 certified or compliant thereto. Compliance with the provisions of this clause in no way relieves the Contractor of the final responsibility to furnish an acceptable product and/or services.
- The Contractor agrees to control and professionally preserve and store appropriate documents, records, and recordings for a period of at least 3 years after termination of the agreement to guarantee the traceability of the services rendered and inspection thereof.
- The Contractor agrees to regularly update and implement all the latest technology available as well as the necessary improvements for the installation, production and organisation deemed necessary to meet the requirements of the agreement and in order to enhance all system capabilities and effectiveness to deliver high quality, cost-effective services.
- The delivered product and / or services shall be uniform in Quality and condition, sound and free from defects or external copyright or intellectual property rights, consistent with good industry practices and adhere to requested Eskom requirements, without deviation.
- Eskom shall have the right to conduct surveys and perform surveillance of the Contractor’s and/or Sub-Contractor facilities to evaluate their capability to comply with the requirements necessary to conform to contractual requirements.
- Eskom reserves the right to inspect, at reasonable times, any or all of the work included in the Works Information at the Contractor’s or Sub-Contractor’s premises or elsewhere. Verification by Eskom shall not absolve the Contractor of the responsibility to provide acceptable product and / or services, nor shall it preclude subsequent rejection by Eskom.
- The services must comply with the agreed specifications and the applicable directives and technical standards set out in the contract and annexures. Defects notified by Eskom shall be remedied by the Contractor upon demand by Eskom without undue delay and at no extra cost. The Contractor shall continuously monitor and identify non-conformances, both internal and external, as signals of opportunities for improvement making process and other relevant changes to prevent recurrence.
- The Contractor shall further identify potential problems before they occur by identifying deviations in patterns or trends in product, service or process performance.
- Nothing contained in the contract and/or scope of work and /or Works information shall relieve in any way the Contractor from the obligation of quality control thereof.
- The Contractor guarantees that the quantity, quality and outward appearance of the delivered Product / services comply with the requirements of the contract and/or relevant specifications.
- The Contractor shall, on request, prove its ability to relate to the proposed scope of work which establishes the manner in which the Contractor intends to perform the Contract.
- The Contractor shall, on request, prove its organisational, logistics and support resources to ensure the requirements of the contract can and will be achieved.
- Eskom reserves the right to assess and measure, during the existence of the agreement, the qualifications, capability and competence of the key staff (assigned personnel) in relation to the scope of work and to interview any / all Contractors to confirm the Quality evaluation.
- The professional personnel who will be conducting the service will be available on a continuous basis until the conclusion of the project.
- The Contractor shall demonstrate experience in comparable projects or specific aspects of the project and / or performance in similar projects, on request.

- The Quality of the service / product and the contents thereof will always be in accordance with professional standards.
- For the duration of the Contract, the professional staff rendering the service / product, must be and remain a member of his/her Professional Society (where available/applicable)
- The Contractor must, at all relevant times, scrutinise and be aware of Eskom's requirements with specific focus on, inter alia, its philosophy, principles, strategies, practises, mission, vision, models, policies and practises.
- It is the Contractor's obligation to ensure that their operations and the products and services it provides to Eskom comply with any applicable statutes and or regulations. Any non-compliance by the Contractor and the resultant corrective actions shall be the responsibility of the Contractor.
- The Contractor shall ensure that he complies with the Works Information and that appropriate quality requirements (as in the main contract) are included in subcontracts placed by Contractors to ensure subcontractor's compliance with the Works Information.
- The Contractor shall execute the Works in accordance with Eskom's Quality requirements set out in QM 58 document: Supplier Contract Quality Requirements Specification.

2.6 Programming constraints

- A programme showing the key activities is to be submitted with the tender documents and once appointed within two weeks. The Contractor submits a single integrated programme that incorporates all the work to be performed including that of his Subcontractors.
    - The Employer requires the works completed by the completion date specified.
    - The Contractor provides an initial programme with the tender submission. The Programme is aligned to section C2.2 - The Activity Schedule.
- The Contractor provides a detailed, integrated programme to the Project Manager that incorporates all the work to be performed including that of his Subcontractor/s within two weeks of the starting date.
- The programme is submitted electronically in MS Project format (2010 version or any other version which allows compatibility for viewing and editing) and provides all activities with expected durations, resource allocations and start and completion dates.
- If the programme is suitable and agreed between the parties, the Project Manager accepts the programme otherwise he/she requests changes to be made before re-submission. The first Accepted Programme becomes the baseline programme and subsequent changes are labelled as revisions in numerical order.
- Thereafter, the Contractor updates the programme on a weekly basis, including updating the actual dates and durations, while optimising remaining activities to ensure that the original planned completion date is met. The programme updates are submitted each Monday morning latest by 12:00.
- Non-submission of the initial programme results in a twenty-five percent (25%) deduction from the first assessment amount due. This amount is only paid in the next assessment, dependent upon submission and acceptance of the programme.
- Non-compliance to the completion date on the programme results in claims for delay damages by the Employer.
- Completion of any activity on the programme is achieved only upon sign-off of the relevant hold/witness/surveillance point by the Project Manager.
- The interfaces between Subcontractors as well as the interfaces between Subcontractors and the Contractor are clearly identified.
- Project key dates are incorporated into the programme.
- All critical path items are indicated and outlined on the programme.

- The order and timing of operations which the Contractor plans in order to provide the Works. Strict adherence to the programme will be monitored and updated on fortnightly basis to achieve the completion dates and submitted to Eskom Project Co-ordinator. Non-conformance to the stated programme will be liable for delay damages. Any deviations on time and cost are subject to Eskom approval.
- The Contractor provides the Project Programme in Microsoft Projects Format to the level 3 detail. The programme is to be updated weekly and submitted to the Service Manager for review.

2.7 *Contractor*'s management, supervision and key people

Contractors Management shall be available for all meetings related to this contract whenever a need arises and they shall be available to their employees.

- Safety Officer - National Diploma with 3 years' experience in Environmental Health, OR Safety Management and SAMTRAC.
- Quality Controller - National Diploma (Technical) plus 3 years plant experience.
- Project Manager - SACPCMP registration 3 - 5 years' experience

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*

The Contractor familiarises themselves with the Eskom Insurance Format A as provided in the Contract Data and make provision for all items that they are liable for.
As stated for "Format A" available on
http://www.eskom.co.za/Tenders/InsurancePoliciesProcedures/Pages/EIMS_Policies_From_1_April_2014_To_31_March_2015.asp

2.10 Contract change management

- Any item that affects the prices or has the potential to do so, is immediately communicated to the Project Manager via an early warning and/or followed by a quotation and will be categorised as compensation event.
- After consideration, approval may be given by the Project Manager and the Contractor may implement the compensation event accordingly. All claims will not necessarily be approved as a compensation event nor do quotes have to be accepted unchanged since the Project Manager performs an evaluation and approves justifiable costs only.
- All invoices or documentary proof, calculations, invoices etc. are submitted to the Project Manager for assessment purposes.

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*

The Contractor shall keep full and accurate records relating to all compensation events and any Defined Cost assessments required under the contract.

The records shall include, but not be limited to:

- labour timesheets and attendance registers
- payroll records supporting labour rates used in quotations
- quotations, purchase orders, invoices and delivery notes for Plant and Materials
- subcontract agreements, quotations, invoices and payment records
- records of Contractor's Equipment utilised
- calculations and assumptions used in the preparation of compensation event quotations
- copies of notifications, instructions and accepted quotations relating to compensation events
- payment certificates issued by the Project Manager
- tax invoices submitted by the Contractor
- proof of payments received from the Employer; and
- any other records reasonably required by the Project Manager to assess compensation events.

2.13 Training workshops and technology transfer

After Completion of the contract, the Contractor is required to provide training and transfer system knowledge to the building owner/manager by submitting documented Design Intent, As-built drawings, Operational and Maintenance Manual, Commissioning Records, Commissioning Report and by providing training on all the systems to the building management staff to ensure that they have all the information and understanding needed to operate and maintain the features and systems in the building.

The Contractor is to provide on-site training and training material to the Engineers, Operators and Maintenance personnel prior to taking-over of the Works. The training will preferable be offered during the commissioning and testing. The Contractor will, prior to handing over of the Works, satisfy the Employer or authorized representative that maintenance and operational personnel are competent and adequately trained to maintain and operate the Plant and Materials supplied.

The training is to cover the following, however not limited to:

- Information provided in the design intent report (including energy/environmental features)
- Review of controls set up, programming, alarms and troubleshooting
- Review of O&M manuals
- Building operation (start up, normal operation, unoccupied operation, seasonal changeover, shutdown)
- Measures that can be taken to optimise energy efficiency

- Occupational health and safety (OH&S) issues
- Maintenance requirements and sourcing replacements
- Obtaining and addressing occupant satisfaction feedback
- Steps for Conducting On site Training are to include, but not limited to:
- Preparation
- Introduction
- Explanation
- Demonstration
- Practice Under Supervision
  Conclusion
- The operating and maintenance manual must be available during the training of site staff. Site staff must also be made familiar with the contents of that manual.

3 Engineering and the *Contractor*'s design

3.1 *Employer*'s design

The scope of works for this package includes the engineering design, procurement and construction work as indicated in this document for Heating Ventilation and Air Conditioning (HVAC) system. Although this package scope covers the entire MWP facility, the areas and buildings covered by the refurbishment project only includes the refurbishment of blocks A, B, and C.

The Employer will provide the following documentation/drawings for information sharing and for review by the Contractor:

- Appendix A1.1: Existing MWP MV Reticulation Single Line Drawing
- Appendix A1.2: Proposed MV Reticulation for block A and block B _ Excluding Block C – E
- Appendix A2: Proposed sizing for MV Switchgear (List of MV Boards)
- Appendix A3. MV Switchgear Schedules
- Appendix A4: Existing and Proposed Substation Layouts (Main MV Substation Room)
- Appendix A5: Transformer Technical Schedule AB
- Appendix A6.1: Proposed sizing for LV Switchgear (List of LV Boards)
- Appendix A7: LV Cables Technical Schedule AB including power cables testing guideline for Eskom Real Estate.
- Appendix A8.1: Diesel Generators preliminary sizing schedule AB
- Appendix A8.2: Diesel Generators Technical Schedule AB
- Appendix A9: MV and LV provincial cable schedules

- Appendix A10: List of Electrical Design Drawings for Block A – Block D
- Appendix A11: Typical Electrical Vendor Documents Submittal Schedule (VDSS)
- Appendix A12: Relevant Eskom Standards
- Appendix A13: Compliance Schedule for all systems or deviations if any
- Appendix B: Preliminary Load Flow Study results
- Appendix C: Preliminary Short Circuit Study results

All Employer information and property made available to the Contractor, including the work done by the Contractor for the Employer, is confidential and may not be disclosed to anyone unless authorised by the Project Manager.

3.2 Main electrical system description

3.2.1 MV Switchgear

The existing Medium Voltage switchgear (11kV) at MWP is of metal enclosed assembly, for indoor use. It makes use of vacuum and withdrawable circuit breakers. Refer to drawing number 0.50/2001 (Megawatt Park Phase 1 & 2, 11kV Network) for illustration of MV reticulation at Megawatt Park).
The MV switchgear is used throughout MWP to supply, transformer feeder circuits and board-to-board feeder circuits forming part of the 11kV ring. Existing MV switchgear is not Internal Arc Compliant and has surpassed its lifespan of 30 years. The primary deficiency pertains to the switchgear components which have reached their end-of-life expectancy and obsolete.

3.2.2 Transformers

The transformers are fed from the Medium Voltage switchgear via power cables. The voltage from the 11kV board is step down to 400V via Oil Filled Transformers and thus supply any loads vial the main Low Voltage Boards or Distribution Boards. The connection from the low voltage site of the transformer to the Low Voltage Board is by means of busbars. Refer to drawing number 0.50/2001 (Megawatt Park Phase 1 & 2, 11kV Network) for illustration of existing transformer ratings at Megawatt Park).
The existing transformers at MWP are Oil Filled transformers and have surpassed their economical design life. In certain plant areas the transformers are showing visible oil leakages.

3.2.3 Main Low Voltage Switchgear

The existing main LV switchgear at MWP is of Metal Enclosed assembly, for indoor use, rated 400V. The main LV boards are fed directly from the step-down transformers via busbars. The main LV Boards are located on the basement at MWP which supplies the 400V Distribution Boards located on various levels at MWP. The 400V Distribution Boards provides small power and lighting requirements for each section at MWP. The existing LV switchgear has surpassed their lifespan of 20 years and mainly consist of obsolete F/E isolator switches instead of the modern rotary isolator switches.

3.2.4 Diesel Generators

Diesel generators are mainly used to supply backup power for all the essential loads when normal supply is lost. There are two (2) existing old diesel generators located at the basement of block A and block B, rated 440kVA (Detroit) and 800kVA (Deutz) which are both not functional respectively. The two (2) existing diesel generators have surpassed their lifespan of 30 years. Block C and D also contain two (2) existing diesel generator (one functional and the other is not functional). On Block C and D, loads which were feeding from the nonfunctional diesel generator have been transferred to the functional diesel generator. Block E (conference area including club house building/gym area do not have diesel generators). Two (2) new diesel generators for Data

Centre (2 x 2000kVA) have been recently installed and commissioned to replace the existing two (2) x containerised 1250kVA Diesel Generator sets. The two (2) containerised diesel generators (1250kVA) are still in a good condition.

3.2.5 Power cables and cable racks

The installed power cables at MWP, for MV applications are XLPE throughout and PVC for low voltage cables. The MV cables sizes were standardised when they were installed. The standardised sizes for existing MV cables are:

- 120mm2 (4C x 120mm2 cable (11kV Ring Main, with 70mm earth cable))
- 95mm2 (MV Panel to Transformers) and 70mm2 (earth cable size), 21 meters.
- For provisional MV and LV cable schedules and estimated cable lengths, refer to Appendix A9.

3.3 Parts of the *works* which the *Contractor* is to design

The Contractor is responsible for the design, submit detailed design report, procurement and manufacturing, factory acceptance testing, transportation and delivery to Site, off-loading, decommissioning of existing equipment, installation, perform site acceptance testing, commissioning and plant optimisation of the following as a minimum:

- Review and validate the preliminary Power System studies (load flow and faut level studies).
- MV Switchgear panels in accordance with:
    - SANS / IEC 62271 for Air Insulated Switchgear (AIS)
    - Battery Tripping Units in accordance with (240-53114248) or any SANS related standard
    - Complete MV Boards Technical Parameters (Appendix 2)
    - Complete Switchgear Schedules (Appendix A3).
- Transformers design in accordance with SANS60076-11 and complete Appendix A5
- Main LV Switchgear or Distributions Boards in accordance with SANS 61439, SANS 60947, SANS 61641 and SANS 1973, and complete Appendix A6.
- Diesel Generators in accordance with 240-62772909 (Stationery Diesel Generators) and SANS SANS 8528 (Reciprocating internal combustion engine driven alternating current generating sets _ all parts) and complete Appendix A8.
- Layout of the switchboards and panels,
- Protection and control schemes in accordance with 240-56227589 (List of Approved Electronic Devices to be used on Eskom Power Stations Standard)
- Power cables (MV cables and LV cables) in accordance with 240-56030635 or SANS 1339 (XLPE cables) and 240-56227443 / SANS 1507, SANS 1574 and complete Appendix A7.
- Review, validate and update of Employer's preliminary design drawings as depicted in Appendix A10.
- Earthing and lightning in accordance with 240-56356396.
- Provision of all Technical Documents for handover in accordance with Appendix A11.
- Complete Appendix A13: Full Compliance to Employer's requirements for all affected electrical systems and submit deviation for review by Employer during tendering stage.

Battery Limits

The battery limit is from the medium voltage switchgear and associated battery tripping units in various MV switchgear rooms, including all step-down transformers, all main low voltage boards or Distribution Boards which are directly fed from step-down transformers, diesel generators for block A and block B, including testing and replacement if deemed necessary all outgoing low voltage cables from the main low voltage boards.

Project's battery limit is as depicted below:

- Replacement of two (2) medium voltage incomer cables with 2 X 300mm2 , AI 3C XLPE, insulated PVC bedded, steel wire armoured, PVC Sheathed, 6.25/11kV cables. For detailed scope of work, refer to report number 363-ERE-CEEC-D00035-29.

- Replacement of existing is medium voltage switchgear and associated battery tripping units as depicted in Appendix A2 and A3.
- Replacement of oil filled transformers with dry type transformers as depicted in Appendix A5.
- Replacement of main low voltage board or Distribution Board as depicted in Appendix A6.
- Replacement of diesel generators for block A and block B as depicted in Appendix A8.
- Testing and replacement of all outgoing low voltage cables from the main low voltage board, if deemed necessary.

Assumptions

Electrical designs assumptions are as follows:

- Any process plant upgrade shall not exceed the maximum capacity of existing transformers which provide bulk power supply for main low voltage boards

3.3.1 MV Boards general requirements

Replacement of Medium voltage switchgear shall be in accordance with IEC 62271 all parts.
All MV switchgear shall be designed for a nominal voltage according to SANS 1019 and SANS 62271, to be internal arc certified IAC AFRL according to SANS 62271-200 and to withstand a short-circuit current of minimum 10% higher than required by calculations for a duration of three (3) seconds. A type test certificate compliant with SANS shall be supplied for the unit(s) offered.
The room layout drawings are provided by the Contractor*,* and the *Contractor* ensures that the new switchgear fit into the allocated space.
General requirements for MV boards include but not limited to the following:

- The Contractor designs medium voltage switchgear that comply with 62271 all parts.
- The Contractor confirm Compliance for MV Switchgear replacement in accordance with SANS 62271 and provides reasons for any deviations.
- The MV Switchgear must be of a type tested design as per IEC 62271-200 as a minimum.
- The Contractor designs associated protection schemes for MV boards and submit for review and acceptance by Employer during detail design stage.
- The Contractors specifies the floor smoothness required by switchgear panels to ensure that their integrity is not compromised for the duration of its design life. The Contractor assesses in the substations and provides switchgear unit-struts and solution required for ensuring that the floor level is even and within the required tolerances.

3.3.1.1 Ratings and operating conditions

- Preliminary panel ratings are in Switchgear Schedules in Appendix 3 and preliminary Technical Parameters in Appendix 2.
- Ratings for switching devices are in accordance with SANS 62271.
- The system characteristics and operating conditions are stipulated in SANS 62271.
- Switchgear operating and service conditions are also stipulated in SANS 62271.

3.3.1.2 Panel designs and construction

- Panel design and construction of the switchgear shall be as per SANS 62271. The switchgear is for indoor use, air and gas insulated, metal-enclosed and internal arc classified in accordance with IEC 62271-200.
- IP rating shall be IP42 and colour coding for 11kV Switchgear shall be G29 (light grey) for standardisation with the new MV switchgear recently installed at MWP Data Centre.

3.3.1.3 Special consideration for internal arc proof design

The Contractor complies with the internal arc requirements according to SANS 62271. The following special requirements are considered:
a) If required, the Contractor determines the requirements for the openings on the substation walls for venting ducts.
b) These openings are adequate for the effective release of the gases and vapour from the substation when internal arcing occurs.
c) The Contractor illustrates that the design of the venting systems caters for the effective release of pressurised gases during arcing conditions. Results from theoretical calculations and/or simulations done in this regard are provided to the Employer for acceptance.

Pressure relief flaps in a power compartment are designed such that the gasses are not directed to any other compartment during an internal arc fault. Each functional unit contains the arc without spreading it to any other functional unit. Due to the internal arc classification and for maintenance purposes, no VT or earthing device is installed within the pressure relief area on top of any functional unit.
All Switchboards with fault rating of 31.5kA and above are equipped with exhausting ducts to channel the hot gasses generated by internal arc fault to the outside of the substation. The design of switchboard with fault rating below 31.5kA allows for venting to the inside of the substation subject to Eskom's acceptance. In such a case, proof that it is safe to do so is provided.
For substations with soft ceilings and/or windows, venting is directed to the outside of the substation via the exhausting duct. Personnel require free access to the low voltage compartment and the IAC requirements are upheld.

3.3.1.4 Circuit Breakers

Existing circuit breakers ratings are provided as per Switchgear Schedules in Appendix 3 and new breakers shall comply with SANS 62271.

3.3.1.5 Earthing devices

The switchgear design includes busbar and cable earthing devices as an integral part of the associated functional unit. The earthing devices shall be design as per SANS 62271.

3.3.1.6 Accessories

Each functional unit is equipped with accessories to meet the design requirements, and the accessories shall comply with SANS 62271.

3.3.1.7 Main MV Substation Room Layout

Refer to Appendix A4 for the proposed equipment layout inside the main MV Substation room based on the selected technology by the Employer. The *Contractor* shall create the equipment room layout for MV Substations and further verify the *Employer's* proposed layout and updated the room layout based on the final designs by the Contractor. Contractor shall create equipment layouts for all the MV boards forming part of the replacement scope.

3.3.1.8 Self-Contained Battery and Chargers Units (SCBC Units) BTUs

Each MV substation contain Self-Contained Battery and Charger Units (SCBC units) or Battery Tripping Units which shall be replaced as part of the MV switchgear. Existing rating for BTU installed inside the Southwest MV Substation, on block C and D are as follows:

- AC input: 230V AC, 19A,

- DC Output: 110V DC, 25A,
- No of cells: 86 Cells

The Contractor shall be responsible for sizing all Self-Contained Battery and Charger Units for each substation and ensures that the battery chargers comply with the battery charger requirements as stipulated in SANS 1652 as well as associated battery bank standard (SANS 1632-3 (Vented Type Nickel Cadmium cells)) or any other SANS related standards.
Colour coding for BTU shall be G29 (light grey) for standardisation with the new Battery Tripping Unit recently installed at MWP Data Centre.

3.3.1.9 MV breakers controls

Existing MV breakers on the MV Boards are manually operated which impose a safety risk for operators. The new operating philosophy requires all the breakers to be manually operated and further have option for remote operation.

3.3.1.9.1 Remote Hand-Held Control Units

Only three (3) hand-held remote-control unit for switching all circuit breakers and earth switches are proposed to be submitted as part of the works. The minimum length of the lead cable shall be 30 meters, ending in a male connector, suitable to connect to the female receptacle mounted in the front LV compartment door.
The hand-held unit shall be fitted with:

- Green push button with the "I” symbol, for closing of circuit breakers and earth switches.
- Red push button with the "O” symbol, for tripping/opening of circuit breakers and earth switches.

3.3.2 Transformers

Design and manufacturing of new dry type transformers shall be in accordance with the requirements of SANS 60076-11.
Contractor shall complete and submit Technical Schedule AB (Appendix A5) for each rating of dry type transformer.

3.3.3 Main LV Boards

Replacement of main Low voltage switchgear or Distribution boards shall be in accordance with SANS 61439, SANS 60947, SANS 61641 and SANS 1973.

Contractor shall complete and submit Technical Schedule AB (Appendix A6) for the main LV boards.

The Contractor shall provide the equipment layout drawings for all low voltage boards forming part of the replacement scope and ensures that the new switchgear or distribution boards fit into the allocated space.

The *Contractor* shall further provide the following as a minimum:

- Detail schematics using the typical schematics as baseline
- Technical Schedule B (completed as per requirements of schedule A)
- Switchgear Schedules
- Maintenance and Operating Manuals
- General Layout drawing of the switchgears and panels

- Protection and control schemes in accordance with the protection functional and interface block diagrams.

Form of separation shall be in accordance with SANS 61439-2, for different sections and sub-section. Form of separations shall be as follows:

- Incoming functional unit (incomer and bus-section panels) shall have a Form 4b.
- Outgoing functional units shall have a minimum of Form 3b.
- MCB groups shall have a minimum of Form 2b.
- For control panels with fault rating below 10kA, form of separation shall have a minimum of Form 1 or as agreed with the user.

The finished external colour of the AC Distribution Board shall be Light Orange, except for mounting plates and other supporting structures, which can be galvanised or alloy cold zinc steel. The base-frame shall be painted black.

The finished external colour of the DC Switchgear shall be A11: Signal Red to SANS 1091

3.3.3.1 Incomer protection and feeder protection for ACB's

The incomers must have an electronic protection relay. Incomer protection scheme has the following functions: Three phase definite time under voltage, definite time overcurrent, IDMT overcurrent and definite time and IDMT earth fault. The IDMT overcurrent and earth fault is set as main protection for the arc detection interlock and back-up protection for downstream circuits.
The measuring elements are adjustable to operate in the voltage ranges as specified on the standards and have drop-off/pick-up ratios greater than 95%. Setting adjustment is preferably continuously variable, but if adjusted in steps, these do not exceed 10%. In addition, the IED's have binary input facilities for external trip and close signals.

3.3.3.2 Chop-over circuits (if applicable)

The chop-over between the diesel generator and the normal 400V supply, and vice versa, must be accomplished within the shortest time possible to avoid unavailability.
Before components like a chop-over system can be installed it must be of a proven design. Proof must be provided that a component was installed at another power station of similar size and type for at least a year without any deficiencies or failures.

3.3.3.3 Harmonics

The harmonic distortion of the supply voltage under normal operation shall be as stipulated on the LV Switchgear standard.

3.3.3.4 Stabilized power supplies

Sizing of the stabilising power supply shall be done by the Contractor. The sizing must be sufficient to ensure that no functional unit will change status from closed to open due to a voltage drop (to 0 V) of the supply for 5 seconds. The voltage must be maintained at 230 V plus minus 5% during the 5 seconds.
Control circuits are in general of a standard type. For each circuit the specific standard drawing relating to a particular circuit is mentioned in the Switchgear schedule, and it will correspond to one of the Standard Schematic Diagrams.
The control voltage is normally fed from a DPI or UPS. For the control voltage, the Contractor must supply as a main offer: a 230V AC Dip Proof Inverter and Line Filter per switchgear. The Contractor must also supply as an alternative a redundant 230V AC double conversion on-line Uninterruptible Power Supply (UPS) as per SANS 62040.

Where DC control voltages are specified, the control equipment must be rated for continuous operation and comply with the DC voltage variations.

3.3.3.5 Special requirements

- The Contractor must ensure that all equipment supplied will grade in terms of 240-56227426. This includes grading with upstream and downstream equipment not affected by this contract.
- The switchgear is of the PTTA free standing, front-operated, and rear-access cabling type. Power cables for both DC and AC are bottom entry. Control cables are either top or bottom entry.
- The transformer incomer switches are withdrawable air-break circuit breakers (ACB), with external protection relays, as specified in the Switchgear schedules and in the standard schematics.
- Interlocking must be as per relevant SANS standards. There must be mechanical interlocking between busbar earth switch and all incomers or bus-sections on the switchgear.
- All MCB's must have bolt-on covers, i.e. it must require a tool to open the compartment. All MCB's must have individual lockout facility in the off position only.
- Busbar earth switches complete with necessary interlocking are required for each switchgear. The earth switches must be fully type-tested at rated fault level and time specified for the switchgear.
- Indication and monitoring:
    - Incomers must have no voltage and current indication.
    - Cable live indicators are required on switchgear-to-switchgear feeders.
    - Busbar voltage indication on transformer incomers is required as indicated in the schedule.
    - Ammeter indication is required on all motor starters.
    - MCB monitoring is required.
- The IP rating shall be specified in accordance with relevant SANS standards. The switchgear will interface with any remote system via hard wiring. Recommended IP rating is IP42.
- Local / manual and remote electrical control is required on both the incomer and the bus-section. Remote operation shall be as defined in section 2.4.1.9.1
- All MCB, fuse curves, CFS curves and protection relays curves must be provided by the
- Contractor. These curves must be given to the Employer in a hard copy format (as part of the technical manual). Equations must be provided by the Contractor to reconstruct these curves in Excel. The equations must start from the lowest possible current of operation up to the designed fault level of the switchgear.
- The Contractor must provide a test bench for withdrawable circuits. This bench will be used to test the withdrawable functional circuits.

3.3.3.6 Design Acceptance

The Employer reviews and accepts the following set of drawings, per switchgear, before any manufacturing can take place:

- schematic/key cabling diagrams for each circuit; this must include all the wire numbers, termination numbers, termination strip numbers, fuse sizes and spare contacts;
- switchgear schedule for each switchgear with reference to component schedule.
- component schedule for each circuit;
- General Arrangement drawings of cable terminations.

3.3.3.7 Hold Points

- After manufacturing the Prototype Switchgear and prior to the installation of any equipment or wiring

- After all the wiring have been installed in the Prototype Switchgear. (Prototype Switchgear ready for testing, prior to dispatch to testing authority)
- Witnessing of the Prototype Switchgear testing by the Employer
- After manufacturing of the 380V Switchgear and installation of equipment and wiring. Functional testing of all circuits and trays
- Inspection prior to delivery of any Switchgear to site
- After each 380V Switchgear has been installed

3.3.4 Diesel Generators

Replacement of existing Diesel Generator shall be done in accordance with the Specification for Stationery Diesel Generator Systems (240- 62772907) or any relevant SANS Standards. The Contractor shall be responsible to verify and validate the preliminary generator system designs as depicted in drawing number 230311–E–E–200-E, sheet 1 of 10, drawing number 230311-E-E-4B1-R, drawing number 230311-E-E-4P1-E and proposed single line drawing of diesel generators for block A and B as depicted in figure 1 below and provide resizing if deemed necessary. Contract completes and submits Technical Schedule AB (Appendix A8) for each diesel generator forming part of replacement. Recommended starting system for each diesel generator is battery starting system and the Contractor shall be responsible to provide sizing for the batteries and battery type. The Contractor shall provide the overall single line drawing for electrical system which indicate the point of connection for each diesel generator.

The following Employer's requirements shall be taken into consideration when sizing the diesel generators:

- New diesel generators design for Block A and Block B are expected to supply all the loads for the Blocks except for chiller and boiler plant.

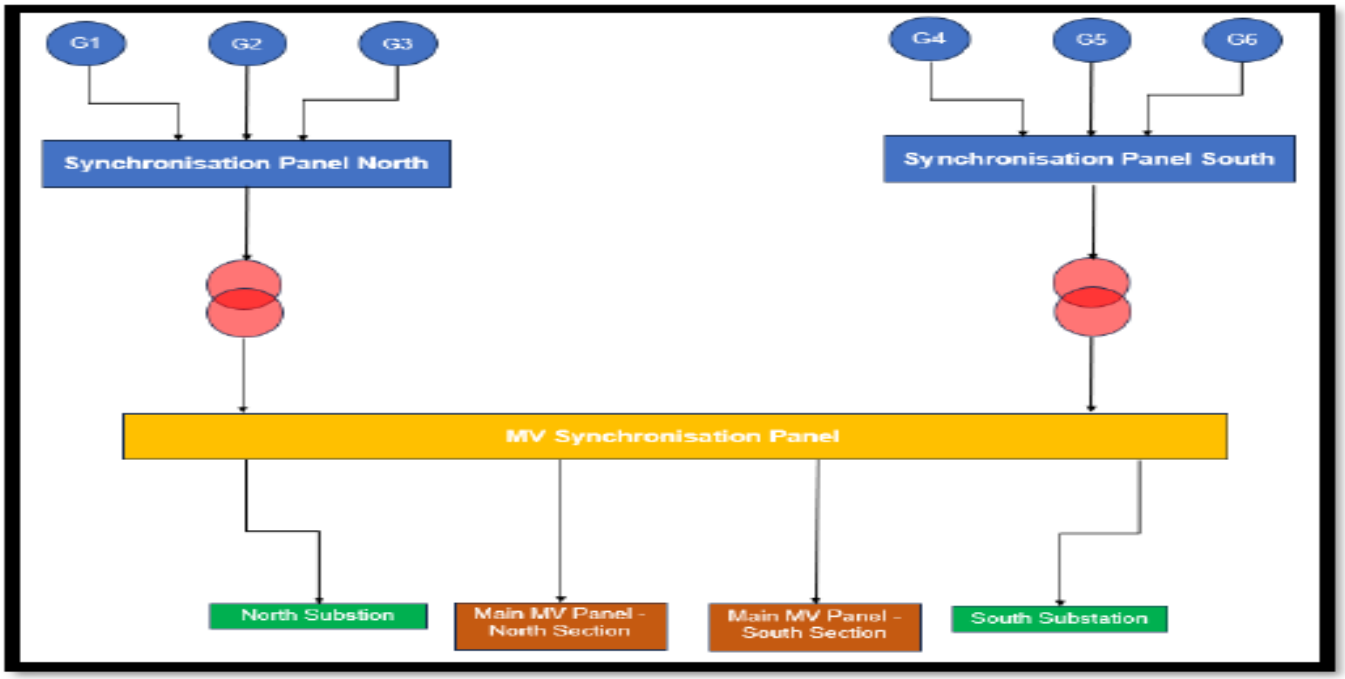


Figure 1: Preliminary design reticulation for block A and block B diesel generators

Preliminary *Employer's* designs for diesel generator backup for block A and block require 6 x 800kVA diesel generator sets to cater the total diversified load of 3673kVA, to ensure each diesel generator is not loaded at more than 80% capacity. The total running capacity for all diesel generators shall be 3840kVA.
The generators are proposed to be installed on the southern side of block B due to space constrains with the MWP campus. To avoid the high costs of low voltage distribution, 2 x 2500kVA step up transformers be installed to transform the voltage from 400V to 11kV as depicted figure 1 above.
Each generator shall be equipped with 1000 litre base mounted tank, which will provide a runtime of between 6 to 8 hours of backup power. A receiving bulk fuel tank with a capacity of 9000 litres is recommended to be installed centrally, from which the day tanks will be filled automatically, and this will provide a total estimated runtime of 80% load of +/- 13 hours. The bulk tank is limited to 9000litres due to existing site fuel storage capacity of 69 000 litres and in accordance with SANS 10131, a maximum of 85 000litres can be stored above ground without the need for Environmental Impact Assessment (EIA).
Contractor shall be responsible for decommissioning and preservation of existing diesel generators in block A and block B.
Diesel generators synchronisation panels, as depicted in figure 1 are proposed to be located inside existing rooms as indicated on drawing number 230311-E-E-4B1-R area 2. The existing room is recommended to be partitioned for separating the synchronisation panels for medium voltage and low voltage. Contractor shall further evaluate the option of installing the synchronisation panels within suitable containers that contains sufficient cooling system and lighting. The option of utilizing containers for housing the synchronisation panels shall be submitted as an alternative option for review and acceptance by the Employer.

3.3.4.1 Technical deliverables during the bidding phase

The following 2 option shall form for part of technical deliverables during the bidding stage for evaluation:

- Option 1: Contractor to review and validate the following proposed design for Installation of 6 x Diesel Generators to back the entire Block A and Block B:
    - Drawing number 230311–E–E–200-E, sheet 1 of 10, (Diesel Generator System Design _ SLD)
    - Drawing number 230311-E-E-4P1-E (Proposed positions for Diesel Generators _ Block A and B backup)
- Option 2: Contractor to submit propose designs for Diesel Generator Backup for entire MWP Buildings (Block A to Block E) for review and acceptance by Employer
- Employer shall review the submitted options and advice the project manager on the recommended option for implementation.

3.3.5 Earthing and lightning designs

The Contractor shall verify the existing earthing integrity for all equipment forming part of replacement and restore to acceptable condition, in accordance with 240-56356396 (Earthing and Lightning Protection Standard) or any other SANS related standards. All new electrical equipment shall be bonded to existing earth mat and earth continuity test conducted for assurance. Test results shall be submitted to the Employer for review and validation.

Due to high rate of copper theft at various sites, alternative materials such as aluminium can be considered for replacement of stolen copper. Refer to section 3.2.5, table 3 of 240-56356396 (Earthing and Lightning Standard) for equivalent cross sectional area of copper versus aluminium conductors.

3.3.6 Protection requirements

The Contractor to design the protection for the scope of this project such that it complies with the requirements of the MV and LV protection philosophy.

Protection relays shall comply with “List of Approved Electronic Devices to be used on Eskom Power Stations Standard (240-56227589)”. The protection relays must be on the Employer’s approved protection relay list which is contained in the standard “List of Approved Electronic Devices to be used on Eskom Power Stations Standard (240-56227589)”.

3.3.7 Power Cables and cable racks

Scope of work on power and control cables is as follows:

- MV Incomer cables:
    - Replacement of two (2) medium voltage incomer cables with 2 X 300mm2, Al 3C XLPE, insulated PVC bedded, steel wire armoured, PVC Sheathed, 6.25/11kV cables. For detailed scope of work, refer to report number 363-ERE-CEEC-D00035-29.
- Power cables and control cables within MWP Campus:
    - The power cables will be reused as far as possible
    - MV and LV power cables will be cut back, joined and terminated on the new MV and LV Switchgear were deemed necessary.
    - All MV and LV power cables will access the new MV switchboards via existing cable tunnels or core drilling via the bottom of the substation.
    - All control and protection cables will be replaced with new cables and these cables will be bottom or top entry, depending on the strategy of execution.
    - The existing servitudes will be reused as far as possible, for power, control and communication cables.
- Refer to Appendix 9 for existing provisional MV and LV cable sizes, Appendix A3 (existing MV cable sizes) and Appendix A6.2 (existing LV cable sizes)

Existing MV cables between MV Switchgear and Transformers as well as between the two (2) MV Boards (board to board feeder) will be tested and condition assessed and report sent to the Employer for decision making if the cables must be retained or replaced. All outgoing Low Voltage power cable from the main Low Voltage Board will be tested and condition assessed and report sent to the Employer for decision make if the cables must be replaced or not. Damaged power cables will be joined where required and the control cables will be replaced. Joining of control cables is not allowed.
All Power, Protection, Control and DC cables will be routed in separated cable racks or trays and will be correctly supported to prevent stress on the conductors and insulation material. Provision for new racks will be made where required. The existing cable route will be utilised, and new route will be determined where required.
Testing of existing power cables shall be done as per the reference Employer cable testing guideline (363-ERE_DDDD-D00185-8). All cabling scope will be in accordance with SANS 1339 (MV cables _ XLPE) and SANS 1507 including SANS 1574 for LV cables, PVC.

3.3.8 Power System Study

Preliminary power system studies (Appendix B _ Load Flow study, Appendix C _ Short Circuit study) were conducted by consultants. The outcome of the study indicates that there is still spare capacity on the main MV Boards to supply the new blocks (Block F and G). Due to the plans to construct new blocks at MWP, the Contractor is required to validate the existing power system studies and amend where necessary. The outcome of the study (fault levels) shall be used to validate the kA ratings of the MV and LV Boards. Power system study report shall be shared with the Employer for review and validation prior the manufacturing stage of electrical equipment.

3.3.9 Constructability analysis

The Contractor shall submit detail method statement for replacement of MV boards.

The proposed sequence for replacement of electrical equipment is as follows:

- Replace mail low voltage boards first,
- Secondly, replace transformers
- Thirdly, replacement of medium voltage boards
- Lastly, replacement of diesel generators.

3.3.9.1 Mobile Substation

Safety measures shall be taken into consideration for gradually swinging the supplies from the existing MV boards (11kV) in case the replacement on the boards are not completed within the specific period required to return electrical supply. Due to space constrain on the existing switchgear rooms, the option of purchasing or renting a mobile substation is recommended to gradually swing over the supplies from the old switchgears to the temporary mobile substation. The rating of the MV board to be mounted on the mobile substation shall be based on existing boards with maximum busbar rating as well as the switchgear with the most number of panels (South or North main MV Board).

3.3.9.2 MV boards replacement strategy

The MV boards will be replaced per sections, starting with downstream MV boards (boards with 4 panels), followed by MV boards feeding from the 11kV ring (11kV South board, 11kV North board and 11kV HV Board II), and lastly replacement of the main MV boards (11kV main North Board and 11kV main South Board). During the swing over of cables from the main MV boards to the mobile substation, there will be a downtime of approximately not more than 8 hours, and these activities are recommended to be done over the weekends. High level replacement strategy for main MV Boards (South main MV Board and North main MV Board) are as indicated in the following table:

PANEL NUMBER	PURPOSE	CURRENT STATUS	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	STAGE 6	STAGE 7
0	Eskom Incomer No. 3	On	Off	Replace	T&C	On	On	On	On
1	Ring 3 - Phase 2 NM Substation	On	Off	Replace	T&C	On	On	On	On
2	Ring 2 - Main DB Kitchen Substation	On	Off	Replace	T&C	On	On	On	On
3	Main DB-NE Section 1 (Transformer 1)	On	Off	Replace	T&C	On	On	On	On
4	Airconditioning DB - Section 1 - Transformer 2	On	Off	Replace	T&C	On	On	On	On
5	Boiler 1 - Transformer 3	On	Off	Replace	T&C	On	On	On	On
6	Ring 1 - Supply to North Substation	On	Off	Replace	T&C	On	On	On	On
7	Eskom Incomer No. 1	On	Off	Replace	T&C	On	On	On	On
8	Bus Section	Off	Off	Off	Off	Off	Replace	T&C	Off
9	Eskom Incomer No. 4	Off	Off	Off	Off	Off	Replace	T&C	Off
10	Ring 1 - Supply to South Substation	On	On	On	On	On	Replace	T&C	On
11	Boiler 2 - Transformer 4	On	On	On	On	On	Replace	T&C	On
12	Airconditioning DB - Section 2 - Transformer 5	On	On	On	On	On	Replace	T&C	On
13	Main DB-NE Section 2 (Transformer 6)	On	On	On	On	On	Replace	T&C	On
14	Ring 2 - Hort. Substation East	On	On	On	On	On	Replace	T&C	On
15	Ring 3 - Phase 2 NW Substation	On	On	On	On	On	Replace	T&C	On
16	Eskom Incomer No. 2	On	On	On	On	On	Replace	T&C	On

3.3.10 Building Management System

All new devices installed must be BMS communication enabled via Modbus TCP/IP (Ethernet) and/or BACnet/IP (Ethernet) protocols. The Contractor's scope includes the supply, installation, configuration, points list/register map, mapping, commissioning and any proprietary tool needed to setup the module. In special cases, with approval, Modbus RTU (RS-485) or BACnet MS/TP (RS-485) could be acceptable. The interface from the communication module to the Building Management System (BMS) will be done by others.

3.3.11 Electrical Method Statement

The *Contractor* shall provide detailed method statements on how he intends to carry out the works; this shall apply for all the electrical systems and any part of the works as provided in the conditions of contract. Method Statements shall be provided for:

- All activities associated with the decommissioning of existing electrical systems.
- All activities associated with the installation and commissioning of electrical systems

3.3.12 Mechanical Requirements

Mechanical requirements to support the replacement of electrical systems (MV and LV switchgear, transformers and diesel generators) is as depicted in the following sub sections:

3.3.12.1 Substation rooms cooling system

The main electrical systems forming part of replacement (MV boards, main LV boards and transformers) are installed in separate rooms which share the common cooling system (extraction fan) via common duct, as typically indicated on drawing number 0.50/12242 rev 3Z (AC and Vent Services Lower Ground Floor _ Phase II).

Mechanical Contractor scope of work includes but not limited to the following:

- Verify retaining or upgrading of existing extraction fans after consideration of heat loads generated for new electrical equipment.
- Based on the assessment above, the Contractor shall decommission existing extraction fans, design, manufacture, install and commission new extraction fans if deemed necessary.
- Ducting: Assess condition of existing ducts, supply and install new ducts if deemed necessary.

3.3.12.2 Diesel generator system requirements

With reference to the Employer preliminary designs for diesel generator system, as depicted on drawing number 230311- E- E- 200-E Generator Plant – Fuel, the Contractor scope of wok includes but not limited to the following:

- Sizing, design, supply, installation and commissioning of the pumps, non-return valves, pressure relief valves for the fuel system.
- Sizing, supply, installation and commissioning of all associated components and steel piping for the diesel generator system.

3.3.12.3 Fire Protection requirements

3.3.12.3.1 Switchgear replacement background

Existing MV switchgear installed at MWP are air insulated switchgear and each MV boards and LV boards are installed in separate rooms as depicted on drawing number 0.50/12242. With reference to section 5.2.4 of 240-54937450 (Fire Protection Standard), in general switchgear rooms does not require fixed fire protection based on the risk and critically of the plant and only gas suppression systems are required. The existing switchgear rooms contain fire extinguishers which are mounted on the wall. There is no evidence that the existing switchgear rooms were constructed with walls, doors and floors which has a minimum of 2-hour fire resistance.
Furthermore, there is existing fire detection system for both MV and LV rooms which is functional. The system provides early warning of possible fire.

3.3.12.3.2 Contractor scope of work

There is no anticipated scope of work for Contractor within the switchgear rooms related to fire protection system.
Replacement of existing fire extinguishers shall be the responsibility of Employer.
Since these are existing buildings, replacement of doors and coating of walls and floors for compliance with a minimum of 2-hour fire resistance are recommended to be done as part of a separate project.

3.3.13 Transformer replacement requirement

Similarly, oil filed existing transformers are installed in separate rooms as depicted on drawing number 0.50/12242. Existing oil filled transformers shall be replaced with dry type transformers to minimise the fire risk as stipulated in section 5.7.1 of 240-54937450 (Fire Protection Standard).
Like switchgear rooms, transformer rooms also contain a fire detection system which provides early warning of possible fire.

3.3.13.1.1 Contractor scope of work

With reference to table 2, section 5.7.1 of 240-54937450 (Fire Protection Standard), only passive fire protection and manual fire protection is required for indoor installation of dry type transformers.

- Furthermore, replacement of existing fire extinguishers shall be the responsibility of Employer.
- Contractor shall be responsible for decommissioning and preservation of existing fixed fire protection system within the transformer rooms.

Since these are existing buildings, replacement of doors and coating of walls and floors for compliance with a minimum of 2-hour fire resistance are recommended to be done as part of a separate project.

3.3.14 Diesel generator system background

Diesel is classified as a CLASS II combustible liquid which has a higher flash point and therefore poses less of an explosion risk. Preliminary designs for diesel generator systems were conducted as depicted on drawing number 230311- E- E- 200-E Generator Plant – Fuel.
As per the preliminary designs, each generator (6x) shall be equipped with 1000 litre base mounted tank, with a receiving bulk fuel tank with a capacity of 9000 litres to be installed centrally, from which the day tanks will be filled automatically. The bulk tank is limited to 9000 litres due to existing site fuel storage capacity of 69 000 litres and in accordance with SANS 10131, a maximum of 85 000litres can be stored above ground without the need for Environmental Impact Assessment (EIA).
A deluge/foam fire protection system is not mandated for a single 10000 litre above-ground diesel storage tank provided it is properly installed to code with appropriate separation distances and secondary containment.

3.3.14.1.1 Contractor scope of work

The Contractor shall review and validate the designs before implementation.
During the review, validation, designs, manufacturing, installation and commissioning process, the Contractor shall ensure the diesel storage tank bunding, corrosion protection and separation distances are compliant with SANS 10089 Parts 1 to 3, specifically on the following:

- SANS 10089-1: Storage of diesel tanks above-ground
- SANS 10400 Part T: General requirements for safety distances, fire resistance and structural elements for diesel storage locations.

Contractor to consider segregating the diesel generators from each other by space / 2 hr rated fire walls. The Contractor shall review and validate the proposal is to install as a minimum FIRE WALLS to be placed on 3x sides of each of the generators (minimum 1 m higher that the generator).
Contractor to conduct a risk assessment to determine if the proposed location for fuel tank is located close to critical infrastructure or other flammable materials and provide guidance for review and acceptance by the Employer.
The Contractor shall confirm the configuration for tank construction (e.g. double skinned, construction material), and paint specification prior manufacturing for review and acceptance by the Employer.

Contractor shall be responsible for decommissioning and preservation of existing diesel generators for block A to block B as stipulated in section 1.4 above. The Contractor shall also be responsible to decommission and remove the exiting fixed fire protection located in the existing diesel generator rooms.

3.3.15 Cabling requirements

3.3.15.1 Cable requirements background

As stipulated in electrical section 2.4.7 existing power cables will be tested and replaced if deemed necessary and new power cables installed where applicable.

3.3.15.2 Contractor scope of work

Contractor shall manufacture, supply and install 2 hour rated fire barriers where power cables penetrate through the walls and floors.
Installation of 2 hour rated fire barriers on cable tunnels between adjacent rooms to be considered later once all the refurbishment projects for MWP are completed. Installation of the barrier now will hinder other projects as there are several cables expected to utilize the existing cable tunnels.
Contractor shall seal and apply a fireproof coating of approximately 1 meter on all existing and new power cables (1m from the penetration area) forming part of the scope of work which penetrate through the walls and floors.

3.3.16 Civil and structural requirements

The Civil Contractor scope or works contain but not limited to the following:

- Core drill any walls or concrete slaps where new MV and LV power cables may be required to be routed from the boards to the field equipment where existing cable trenches and cable racks may not be used.
- Cable trenches requirement (if applicable):
    - Laying of underground cables in trenches shall be done in compliance with SANS 10198-8 (Cable Laying and Installation).
    - Cables laid at the bottom of the trench will lay on a 150mm sand layer. Contractor shall only be allowed to reduce the 150mm sand layer requirement under prior approval from the Employer and under proper technical justification based on the Thermal Resistivity (TR) of the backfill material.
    - MV cables (if applicable) will lay at the bottom of the trench, at a minimum depth of 1000mm.
    - LV (DC and AC) cables to be a minimum of 300mm above the MV cable layer and laid at a minimum depth of 600mm.
    - The depth of signal tape must be at least 200mm above cables and 300 mm below the surface to warn contractors of the presence of cables. Trenches greater than 1 m wide should have two or more equally spaced warning tapes above the cables.
    - If applicable, distance between DC and AC cables will be a minimum of 200mm (from nearest duct or cable edge).
    - Fibre optic cables must be separated 125 mm from low voltage cables and medium voltage cables if applicable.
    - Where power cables had to cross the roads, cables shall be laid in cased ducts concreted along their entire length. The depth from the top of the protection tube to the surface shall be not less than 0.80m.
    - If applicable, conductive (copper) signal cables will lie at least 200mm apart from LV cables.

  - Minimum separation from the cables (LV or MV) to the excavation walls, shall be not less than 50 mm.
  - If applicable, the contractor shall displace cables horizontally through the different layers (MV cables should be accessible for repair without causing damage to the cables above).
  - All cables to be surrounded by soft sand backfill (a fine-fill material to be used for MV and LV cables). The thickness of the sand backfill above the cables shall align with the requirements of the trench design study and the TR of the sand backfill shall be as per the requirements of the trench design study. Under no circumstances will river-sand or any soil with unsuitable TR shall be allowed.
  - Earthing, where applicable, will be laid at the lowest layer of the trenches.
  - Trenches shall be backfilled with clean fill material free from aggregate, debris, organic material, and stones. Trenches shall be backfilled in layers of no more than 150 mm each and mechanically compacted to 93% of maximum density at optimum moisture content, to avoid cavities that may cause collapse of trench top due to settling of the soil.
- The weights for new equipment (MV and LV switchgear) are currently unknown. The calculated weight for existing MV boards (Incomer and Feeder panels are 1700kg (each) i.e 1000mm (length) x 1540mm (width). The Contractor shall validate once the new weights are obtained for new equipment that the civil infrastructure is not compromised by the proposed equipment. With the new technology, the anticipation is to obtain new equipment (1300kg i.e 800mm (length) x 1540mm (width) that weighs less than existing equipment.
- The Contractor shall ensure in all the substation where new MV and LV boards are installed; the floor is smooth enough to ensure that the equipment integrity is not compromised for the duration of its design life
- Excavate, design and construct a concrete foundation where required for all new equipment. The minimum strength of concrete shall be 35 MPa.
- Construct a bund wall for main fuel diesel tank.

Civil and structural designs shall be done in accordance with the following standards:

- SANS 10160-1: 2001 (Basis of structural design and actions for buildings and industrial structure, Part 1: Basis of structural designs)
- SANS 10160-2: 2001 (Basis of structural design and actions for buildings and industrial structure, Part 2: Self weight imposed)
- SANS 10400: The application of National Building Regulation
- SANS 10198-8: Cable Laying and Installation
- 240-106365693 Standard for the External Corrosion Protection of Plant, Equipment and Associated Piping with Coatings
- SANS 10111 Engineering drawing principles
- SANS 684 Structural steel paint
- SANS 1200 (series) Standardised specification for civil engineering construction
- SANS 10109-1 Concrete floors Part 1: Bases to concrete floors

Experience and competency

The Contractor submits the following:

- Submits a Curriculum Vitae (CV) with a minimum of five (5) years relevant experience for Civil Engineer/Technologist. The Civil Engineer/Technologist to be professionally registered with the Engineering Council of South Africa (ECSA). Copy of valid ECSA registration certificate to be submitted.
- List of verifiable project references (minimum of x3 projects) demonstrating experience and competency in similar projects)

3.3.17 Plant labelling and coding

Plant labelling including KKS coding for all new equipment shall be done in accordance with the Plant labelling standard (240-71432150).

3.4 Procedure for submission and acceptance of *Contractor*'s design

3.4.1 Technical Schedules A and B

Technical Schedules A&B are compulsory tender returnable, whereby schedule A is the particulars of the Employer's requirements and schedule B is the guarantees and technical particulars of equipment offered by the Contractor.

- Where there is insufficient space provided in Schedule B, particulars must be furnished on a separate sheet clearly marked with the number of schedules A item they refer to.
- Schedule B for all Technical Schedules must be completed in full by the Contractor.
- If the Contractor does not fully comply with Employer's requirements, those deviations must be clearly stated in the deviation schedule. Where the Contractor proposal is essentially equivalent to the requirements of the Employer, such deviations must be shown as clarifications
- If a blank space is left in Schedule B next to Employer's requirements listed in Schedule A it is assumed that the Contractor does comply with this requirement.

NOTE! As per the technical schedules A and B, the information is to be provided by the Contractor. All information is required to be provided with the proposal. Any information not final should be marked "preliminary/not final".

3.4.2 Vendor Document Submittal Schedule (VDSS)

The Employer shall submit the Vendor Document Submission Schedule (VDSS), Appendix A11 to the Contractor as part of tender indicating the minimum documents to be exchanged between the Employer and Contractor. The Contractor shall submit the updated Vendor Document Submission Schedule (VDSS) to the Employer for review and acceptance with additional documentation recommended by the Contractor.
The submission date for the updated VDSS by the Contractor to the Employer shall be agreed between the Contractor and the Project Manager. The Employer will pre-allocate document numbers on the VDSS and send back to the Contractor through the delegated Employer's Representative. The VDSS is revisable, and changes must be discussed and agreed upon by all parties. Changes in the VDSS can be additional documentation to be submitted, changes in submission dates or corrections in documentation descriptions, document numbers, etc. The Contractor's VDSS shall indicate the format of documents to be submitted.

3.4.3 Tests

The Contractor shall arrange and conduct the Factory Acceptance Tests (FATs) for all electrical systems and invite the Employer to witness certain activities. The Contractor installs systems and equipment on at the factory, in accordance with Employer's master programme to which the Contractor align his own program and schedule.
The Contractor performs Site Integration Test.
The Contractor completes hand over certification with the Employer.
The Contractor is required to include all technical information in all relevant design handover packs. In addition, the Contractor is to include all construction and erection documents of all relevant design handover packs.
The Contractor shall complete Quality Control Plans (QCPs) and Inspections and Test Plans (ITPs) (at a check sheet level) before contract award. These shall be reviewed, and Employer comments addressed (by the Contractor) and signed off by the Employer within 30 days after contract award.

3.4.4 Commissioning

The Contractor shall be responsible for hot and cold commissioning of all electrical equipment and thus ensure a fully functional system that is integrated to existing site systems.

3.4.5 List of long lead Items

- Medium Voltage Switchgear: 24 months
- Transformers: 5 – 6 months

- Main Low Voltage Switchgear, Protection system (IEDs), Self-Contained Battery and Charger Units: 18 months
- Diesel Generators: 3 – 4 months
- Power cables: 1 - 2 months

3.5 Other requirements of the *Contractor*'s design

All the design solutions are developed by the relevant Professional Engineers or Professional Engineering Technologist at all design stages; the associated Professional Engineer / Professional Technologist will form part of the Contractor's supervision team and inspect and sign off the various quality documents.

3.6 Use of *Contractor*'s design

The *Contractor* grants to the *Employer*, with effect from the starting date, an irrevocable royalty-free non-exclusive licence to use all of the documents provided to provide the Works (including, but not limited to calculations, drawings, manuals, models and other documents of a technical nature), for any purpose whatsoever, including for the purpose of operating, repairing, maintaining, dismantling, re-assembling and making adjustments to all parts of the Works.

3.7 Design of Equipment

The components are to be designed to facilitate efficient manufacture, inspection, transportation, installation, maintenance, cleaning and repairs.

- The components are to be designed to ensure safe and satisfactory operation for a life expectancy of at least 15 years under the conditions prevailing at Eskom Megawatt Park.
- The components are to be designed to prevent undue stresses being produced by expansion and contraction due to temperature change and other local natural and manmade conditions.
- The components are to be designed to keep maintenance costs to a minimum.
- The components are to be designed to comply with all the legal requirements in respect of safety and the prevention of environmental pollution.
- The components are to be designed to satisfy any specific requirements contained in the relevant statutory codes and standards.
- The components are to be designed for operation of 365 day per annum, 24hrs per day.
- The components are to be designed such that all material from which the components are manufactured from is compatible with the intended duty and service conditions. All components are suitable treated and protected from corrosion.

3.8 Equipment required to be included in the *works*

As per the *Contractor's* approved design to satisfy the requirements stated in this document

3.9 As-built drawings, operating manuals and maintenance schedules

Proposed maintenance schedules and activities to complete during maintenance activities.

- At Take-over, the Contractor provides two full sets of as-built documentation as hard copies and electronic PDF and native CAD formats (DGN or .DWG which must be compatible with Bentley MicroStation) to the Employer.
- The Operating and Maintenance Manual must describe how the plant is to be operated and by whom, as well as the desired level of training and orientation required for the building occupants. The operation and maintenance manuals are to consist of the following as a minimum:
    - List of Contents (Index)
    - Introduction
    - General description of the functions of each of the systems including detailed description of each element of each system, how it functions, how it operates and how to maintain it and what attic stock or tools to carry.
    - Full as-built drawings and detailed drawings, brochures and catalogues for each system and each element of each system.

- The format of the O & M documentations is to be A4 and be a specially bound document with hard cover and with metal ring binding. (All drawings and details are to be reduced to A3 format and folded into A4 format.)
- The names, addresses and telephone/fax numbers/email addresses of all responsible persons and manufacturers/suppliers are to be listed in the O&M manual.
- A full list with reference numbers is to be included to enable the O&M staff to order materials and spares.
- Colour diagrams are be provided to illustrate the operation and function of each system with reference to the relevant as-built drawings or brochures of Plant and Materials. These diagrammatic drawings must also indicate the locations of valves with their numbers.
- outlines all the required maintenance activities for the complete works as well as the frequency of such activities and by whom.

3.10 Equipment required to be included in the *works*

As per the *Contractor's* approved design to satisfy the requirements stated in this document

3.11 As-built drawings, operating manuals and maintenance schedules

Proposed maintenance schedules and activities to complete during maintenance activities.

- At Take-over, the Contractor provides two full sets of as-built documentation as hard copies and electronic PDF and native CAD formats (DGN or .DWG which must be compatible with Bentley MicroStation) to the Employer.
- The Operating and Maintenance Manual must describe how the plant is to be operated and by whom, as well as the desired level of training and orientation required for the building occupants. The operation and maintenance manuals are to consist of the following as a minimum:
  - List of Contents (Index)
  - Introduction
  - General description of the functions of each of the systems including detailed description of each element of each system, how it functions, how it operates and how to maintain it and what attic stock or tools to carry.
  - Full as-built drawings and detailed drawings, brochures and catalogues for each system and each element of each system.
  - The format of the O & M documentations is to be A4 and be a specially bound document with hard cover and with metal ring binding. (All drawings and details are to be reduced to A3 format and folded into A4 format.)
  - The names, addresses and telephone/fax numbers/email addresses of all responsible persons and manufacturers/suppliers are to be listed in the O&M manual.
  - A full list with reference numbers is to be included to enable the O&M staff to order materials and spares.
  - Colour diagrams are be provided to illustrate the operation and function of each system with reference to the relevant as-built drawings or brochures of Plant and Materials. These diagrammatic drawings must also indicate the locations of valves with their numbers.
  - outlines all the required maintenance activities for the complete works as well as the frequency of such activities and by whom.

3.12 List of Drawings

3.12.1 Documentation issued by the Employer

Refer to Appendix A10 for List of applicable electrical drawings to be issued by the Employer on request. This is the list of documents issued by the *Employer* at or before the Contract Date and which apply to this contract.

Document number	Revision	Title
0.50/45006 Sheet 1	0	Megawatt Park Site Plan Layout Drawing
0.50/2001	0	Megawatt Part Phase 1 & 2, 11kV Network

3.13 Applicable National and Eskom Standards

The Contractor is required to adhere to the latest editions of standards as referenced in this section. within, the following SANS standards, codes of practice, regulations & standards:
Where there is contradiction between the Employer's standards, SANS standards and this report, this report shall take precedence, followed by Eskom standard and lastly the SANS or IEC standards. The contractor shall ensure that they are acquainted with the contents of such documents.

Eskom Standard	
Number	**Tittle**
240-53114248	Valve Regulated Lead Acid Batteries
240- 62772907	Stationery Diesel Generators
240-56227589	List of Approved Electronic Devics
240-56030635	MV Power Cables
240-56227443	LV Power Cables
240-56356396	Earthing and Lightning Protection
240-56227426	Management of Power Station MV and LV Protection and Settings
240-54937450	Fire Protection Standard
240-106365693	Standard for the External Corrosion Protection of Plant, Equipment and Associated Piping with Coatings
240-71432150	Plant Labelling and Coding Standard
363-ERE_DDDD-D00185-8	Power Cables (MV and LV) Testing Guideline
GGR 0992	Plant Safety Regulations
D-DT-085	MV and LV Power Cables Trenches Details

International and National Standards	
Number	**Tittle**
IEC 60071	Insulation Co-ordination
IEC 60060-1	High voltage test techniques Part 1: General definitions and test requirements
IEC 60269	Low-voltage fuses
IEC 60529	Degrees of protection provided by enclosures (IP code)
IEC 60898	Electrical accessories – Circuit-breakers for overcurrent protection for household and similar installations
IEC 60947	Low voltage switchgear and control gear-Part 2 (circuit-breakers)
NRS002	Graphic symbols for electrical diagrams
SANS 152	Low-voltage air-break switches, air-break disconnectors, air-break switch disconnectors and fuse-combination units
SANS 156	Moulded case circuit breakers.
SANS 1091	National colour standards for paint
SANS 1507	Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1900/3300 V)
SANS 1574	Electric flexible cables
SANS 10108	The classification of hazardous locations and the selection of electrical apparatus for use in such locations
SANS 10142-1	Wiring of premises Part 1: Low-voltage installation
SANS 10198	Part 13 - The selection handling and selection of electric power cables of rating not exceeding 33 kV
SANS 60439	Low-voltage switchgear and control gear assemblies
SANS 10142-2	The wiring of premises Part 2: MV installation above 1kV ac not exceed 22kV ac and upto and including 3MVA installed capacity
SANS 62271 -1	High Voltage Switchgear and Control gear – Part 1: Common Standards
SANS 62271 - 100	High Voltage Switchgear and Control gear – Part 100: High Voltage Alternating Current Circuit Breakers
SANS 62271 - 102	High Voltage Switchgear and Control gear – Part 102: Alternating Current Disconnectors and Earthing Switches
SANS 1652	Battery Charger
SANS 62040	Uninterruptible Power Supplies
SANS 1632-3	Vented Type Nickel Cadmium cells
SANS 61869-1	Instrument Transformers Part 1: General Requirements
SANS 61869-2	Instrument Transformers Part 2: Additional requirements for current transformers
SANS 61869-3	Instrument Transformers Part 3: Additional requirements for inductive voltage transformers
SANS 1019	Standard Voltages, Currents and Insulation Levels for Electricity Supply
SANS 1195	Busbars
IEC 60038	Standard Voltages
SANS 60269	Low Voltage Fuses
SANS 61439-1	Low Voltage Switchgear and Control gear assemblies – Part1: General Rules
SANS 1339	Electric cables: Cross linked polyethylene (XLPE) insulated cables for voltages from 3.8/6.6kV to 19/33kV MV.
SANS 60076-11.	Power Transformers Part 11: Dry type transformers
SANS 1973-1	Low Voltage Switchgear and control assemblies, with rated short time withstand current exceeding 10kA
SANS 61641	Guide for testing LV Switchgear under conditions of arcing due to internal fault.
SANS 1507	Electric cables with extruded solid dielectric insulation for fixed installation (300/500V to 1900/3300)

4 Procurement

The *Contractor* provides the following procurement services in performing the Works:

- Preparation of Employer approved supplier and Sub-Contractor's lists for equipment and contracts to be submitted to the Employer for review and approval.
- Follows the most cost and time saving procurement strategies.
- Contract management services for the selection, appointment, and management of Sub-Contractors, where required to execute the scope.
- Obtains delivery dates from Sub-Contractors and suppliers in order to realize the Completion Date;
- Receiving of invoices, verification thereof in terms of purchase orders and contract provisions, certification of invoices as being correct and payable and supply of correct invoices to the Employer
- Management of and negotiating of all suppliers and Sub-Contractors compensation events and recommendations to the Employer as to the validity, amount and payment of such events.
- Determination of penalties payable by suppliers and Sub-Contractors and recommendation to the Employer as to the enforcement of such penalties prior to any communication to suppliers and Contractors.
- Ensuring that all suppliers and Sub-Contractors, from whom the Contractor procures equipment and materials do not retain, encumber or reserve title to such items.

4.1 People

4.1.1 Minimum requirements of people employed on the Site

All the *Contractors* personnel are subjected to access control conditions as per Eskom requirements.

- All workers employed on site comply with Eskom's health and safety standards. Workers are not allowed to be transported on the back of vans or bakkies.
- Workers are restricted to the area of activity in close proximity to the construction.
- The Contractor recruits within the immediate District Municipality for general labour/ skills to execute the project.

4.1.2 BBBEE and preferencing scheme

The Contractor is required to achieve or maintain BBBEE Level 4 rating in accordance with SD&L requirements.

4.1.3 Accelerated Shared Growth Initiative – South Africa (ASGI-SA)

Not applicable for the contract.

4.2 Subcontracting

4.2.1 Preferred subcontractors

The Contractor notifies the Project Manager in the event of using any Sub-contractor and provides the Project Manager with a list of all sub-contractors on the project. Subcontractors cannot subcontract work to another subcontractor. The choice of the proposed sub-contractor is subject to the Project Manager's approval before using the services of such subcontractor. The Subcontractor must be familiar with the required work and should submit CV's of past experience and have the necessary statutory accreditations.

The Contractor provides the Project Manager with the Health and Safety plans of all the sub-contractors on the project, before commencing the project.

4.2.2 Subcontract documentation, and assessment of subcontract tenders

The Contractor uses the NEC subcontractor agreements. All subcontractor quotations for which provisional sums or budgets have been allowed, is first approved by the Employer or his representative with documentary proof. This is done well in advance of the planned scheduling of the work.

4.2.3 Limitations on subcontracting

As per Eskom requirements, subcontracting will be limited to 30% as far as possible. The Employer is notified where subcontracting exceeds the 30% threshold prior to commencement of the specific subcontracting works.

4.2.4 Attendance on subcontractors

The *contractor* attends to the activities of all subcontractors including direct subcontractor.

4.3 Plant and Materials

4.3.1 Quality

The *Contractor* will not use Plant or Materials which are generally recognised as being unsuitable or otherwise to be avoided for the purpose for which they are intended.
Only components of high reliability will be utilised, with a proven operating history, to enable the Plant to achieve required reliability and availability. Plant and Material design, engineering and manufacture will accord with the best modern practice applicable to high-grade products of the type to be furnished, so as to ensure the efficiency and reliability of the Works and the strength and suitability of the various parts for the Works.
Plant and Materials withstands ambient conditions and the variations of temperature arising under working conditions without distortion, deterioration or undue strains in any part.
All parts are made accurately, and where practicable, to standard gauges so as to facilitate replacement and repairs. Like parts are interchangeable.
No repair of defective Plant and/or Materials will be permitted without the Project Manager's Acceptance and any such repair, if accepted, will be carried out to the satisfaction of the *Employer*.
The Project Manager is free to specify hold and witness points during the installation and on-site testing stages of the project. The *Contractor* issues preliminary notification of such hold and witness points by fifteen working days advance notice to the Project Manager and confirms such hold and witness points at least seven working days prior to the activity.

Typical hold points are listed below:

i. Design Review
ii. Factory Acceptance Test
iii. Delivery to Site
iv. Erection and configuration
v. Site Acceptance Test
vi. All manuals and drawings (in the specified format)
vii. Commissioning

In addition to maintaining appropriate inspection and test records to substantiate conformance to requirements, the following records are safely stored for a minimum period of seven years following the final Completion of the Works:

i. Construction, layout and component Acceptances
ii. Type and routine test certificates
iii. Construction drawings and Acceptances

After this period, the *Contractor* offers these records to the *Employer* (in writing) and obtains a disposal instruction.
Documentation regarding quality procedures is submitted within thirty days of Contract Award. The *Employer* will review and comment on the acceptability of these documents in a time frame as per the requirements of the contract for contractual correspondence. If controlled copies of these documents have been submitted to the *Employer*, then the controlled copy numbers may be quoted in the submission.

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

None, all Plant and Materials are to be provided by the Contractor.

4.3.3 *Contractor*'s procurement of Plant and Materials

The Contractor is responsible for ensuring that all products are preserved in their appropriate manner as described in their specifications or in Eskom preservation, shipping and transportation procedures as applicable. The Contractor shall submit the preservation, shipping and transportation procedures to the Employer for review and acceptance. The Employer may choose to witness the packaging, loading and offloading of the products depending on their criticality, this will be indicated in the intervention points on the QCP / ITP document. The Contractor shall ensure that all storage requirements for products are properly implemented to preserve the products against adverse conditions, deterioration, damages, etc. Storage and preservation procedures for the different products must be submitted to the Employer for review and acceptance. The Employer may request to inspect the stored products at any given point during the storage period of the product. Requirements for preservation, shipping and transportation are addressed in 240-105658000

4.3.4 Spares and consumables

The *Contractor* provides as part of the tender proposal, a recommended parts list as well as a proposal for the execution there of:

i. The *Employer* is responsible for purchasing of recommended spares.
ii. The *Contractor* is responsible for ensuring that consignment spares are available in time of need.

Each recommended spare part is to be uniquely identified with a part number, which can be cross referenced to a part list and associated drawing. The *Employer* prefers that support from the OEM is available locally in South Africa.

4.4 Tests and inspections before delivery

The Employer carries out quality inspections at his own discretion. The Employer will inspect and approve stages of manufacture of all Plant and Materials necessary to ensure the correct quality of Plant and Materials as prescribed in the accepted project quality plan.
All inspections and testing are to be performed in accordance with the Quality Control Procedure (QCP) developed by the Contractor after Acceptance by the Employer.

The Contractor must provide facilities for inspection of all items of Plant and Materials at the place of the manufacture and this requirement must extend to all sub-contractors and suppliers if applicable. All material labour or assistance, tools, gauges, articles or apparatus that the Employer may require for the purpose of testing, gauging and inspection, must be provided by the Contractor. The Contractor must provide all such facilities for testing and the contract price must include for this.

The Employer reserves the right to reject items that do not conform to the Employer's requirements. When the plant has passed the prerequisite tests, the Employer will furnish to the Contractor a certificate or endorse the Contractor's test certificate to that effect. Examination by the Employer does not relieve the Contractor from the responsibility of carrying out all tests which may be necessary to ensure the required standard of manufacture or from any obligations in terms of the contract.
The achievement of adequate standards during the tests at the place of manufacture, if performed, is only the first requirement. The final criterion will be performance onsite, and any of the requirement which proves defective due to bad workmanship or material must be replaced forthwith by the Contractor at his own cost on the instruction of the Employer.

The following tests are conducted by the Contractor and are to be witnessed by the Employer at the manufacturer's works or Contractor's premises as a minimum requirement:

i. Visual inspection of the Plant and Materials

ii. Review of the certification requirements
iii. Inspection of paint work and corrosion protection.
iv. Verification that all components are delivered to the Contractor's premises.
v. Verification that all power plugs is correct.
vi. Verification that components installed is correct.
vii. Verification that all labels are correct.

4.5 Marking Plant and Materials outside the Working Areas

All Material paid for by the Employer is clearly labelled as being the Employer's property.

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

The Contractor provides the following to complete the Works:
i. All scaffolding required
ii. Any Equipment necessary to complete the Works
iii. Lifting facilities

The Contractor supplies, installs, maintains and removes all temporary construction facilities and utilities necessary to Provide the Works.

4.7 Cataloguing requirements by the *Contractor*

4.8 Unique Identifier 240-1289988974 to be provided on request

5 Construction

The *Contractor* is required to:

- Submit a comprehensive method statement of the entire Works to the Project Manager for acceptance prior to the start of the Works
- Submit a project specific safety file to the Employer for comments / acceptance.
- Prepare earthworks for craneage access and working rigging areas if required.
- Manage his activities on site to ensure that no interference takes place between his work and that of others.
- Complete "Contract Activities Daily Reports".
- Liaise with the Project Manager regarding utilities and telephone facilities required for his Site establishment.
- Liaise with the Project Manager regarding the location of waste disposal sites and rubbish dumps,
- Maintain and promotes labour harmony on the Site and in the working environment.
- Immediately report any potential labour disharmony to the Project Manager.
- Not recruit or employ any personnel from the Employer and Others, without prior acceptance of the Project Manager.
- The Contractor submits a fully detailed Quality Control Plan (QCP) for acceptance within one week of the Contract Date.
- The Contractor submits a schedule of unpriced orders to be placed and this is updated regularly.

5.1 Temporary works, Site services & construction constraints

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

The site is located in a part of an existing campus, with existing buildings all around, most buildings are currently occupied.

- The Contractor attends the site clarification meeting prearranged by the Employer prior to submitting tender.
- The Contractor ensures that he familiarizes himself with site conditions.
- Contractor's access is limited to the areas as indicated in the scope and Contractor's staff is prohibited from roaming in the rest of the facility.
- Eskom Holdings indemnifies themselves from any negligent events by the Contractor relating to the scope of the works within the contract period
- The Contractor, his staff and the Sub-contractors maintain identification at all times e.g. Uniforms etc.
- The Contractor is deemed to execute Safety Procedures to ensure the safety of his staff, Sub-contractors, Eskom staff during the Contract Period.
- Use of power and loud tools to be controlled and/or managed with Eskom office management team.
- The safety of the Contractors Employees, Subcontractors and building's tenants takes preference over the scope of the Works of this project.
- All site instructions to be approved and authorised in writing by the Project Manager. If this directive is not adhered to it could result in non-payment.

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

The Employer provides the Contractor with an Access Certificate to formally provide access to the site.
The Contractor ensures that he is familiar with conditions of access to the buildings, which includes constraints to limited parking and no goods lift is available in some of the blocks.
The Contractor adheres to all the requirements which include, but not restricted to:

i. Identity cards with photographs
ii. Cooperation to help Eskom provide the customer with a project schedule reflecting the period during which the construction and commissioning activities will take place.

The Contractor will be responsible for external disputes which may occur regarding the Works.
The Contractor is when necessary or needed, required to make all the necessary arrangements with the Local Authorities via the Building Manager and or Eskom Representative.

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

Working after normal working hours and on weekends requires special permission. The Contractor shall give the Employer adequate notice if this is planned.

5.1.4 Health and safety facilities on Site

A day clink for medical emergencies is available on site, should the clink not be able to attend to the emergency, the patient will be transported to a hospital at the *Contractor's* cost

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

The Contractor shall ensure that all fauna and flora is preserved and protected during his activity on site. All such fauna and flora will be reinstated after completion of the work.

5.1.6 Title to materials from demolition and excavation

The Contractor has no such title.

5.1.7 Cooperating with and obtaining acceptance of Others

Two weeks look-ahead schedule to be developed and submitted to Project Manager on a fortnight basis in order to make timeous arrangements for access into occupied buildings with the occupants concerned.

5.1.8 Publicity and progress photographs

The Contractor requests approval from Project Manager for any photography and progress photographs prior to undertaking.

5.1.9 *Contractor*'s Equipment

The Contractor keeps an inventory of equipment brought to site. This is verified and acknowledged by Eskom security to allow removal of such equipment when required by the Contractor
The Contractor provides own security on site and is held liable for excess of insurance in case of theft or loss

5.1.10 Equipment provided by the *Employer*

The Contractor provides all equipment and tools required to complete the Works.

5.1.11 Site services and facilities

The Employer will provide power and water. The Contractor shall make provision of waste disposal and submit proof in a form of Waste Disposal Certificates to the Employer for approval. The Contractor shall provide everything else necessary for providing the Works

5.1.12 Facilities provided by the *Contractor*

A clearly demarcated site establishment area will be provided by the Contractor for the following:

- Suitable facilities for Contractor to store all material and equipment
- Suitable facilities for his employees for changing
- Facilities for the consumption of food
- Site offices
- Toilet/Ablution facilities
- Other temporary facilities required by the Contractor

5.1.13 Existing premises, inspection of adjoining properties and checking work of Others

The Contractor is to investigate existence of any services before commencement of work. Care is to be taken when Contractor is doing demolitions so as not to damage the work of Others.

5.1.14 Survey control and setting out of the *works*

It is the Contractor's responsibility to ensure accuracy when performing setting out of the Works. The Contractor shall provide adequate fastening to existing connection points.

5.1.15 Excavations and associated water control

Where excavation is required, the Contractor takes the necessary precautions not to damage any existing services.

5.1.16 Underground services, other existing services, cable and pipe trenches and covers

There is no information regarding existing underground services.

Should the need arise for the Contractor to work on underground services, the Contractor is required to conduct scanning to determine the existing/underground services and provides this information as As-Build drawings to the Employer.

5.1.17 Control of noise, dust, water and waste

The Contractor takes all precautions necessary to prevent any noise and dust whilst carrying out the work

5.1.18 Sequences of construction or installation

The Contractor sequences execution in order of priority as per the sectional completion schedule and ensures all interfaces are coordinated and carried out without causing any disruptions.

5.1.19 Giving notice of work to be covered up

The Contractor to advise at least 4 weeks prior to starting work at that particular section so that proper notification is provided, including relevant authorisation to proceed.

5.1.20 Hook ups to existing works

The Contractor stipulates methodology for hooking-up when working in heights and provides notification to the SHE Officer in advance and obtain permission to proceed. The Contractor cannot not hook up for lifting, supporting or for any other reason to any position or existing works in the plant without a written approval by the Project Manager.

5.2 Completion, testing, commissioning and correction of Defects

5.2.1 Work to be done by the Completion Date

The contract is deemed complete when the following have been completed in accordance with the scope of work:

- The Plant is erected, and commissioned
- Signed erection and safety clearance certificates have been submitted.
- The final drawings have been submitted.
- All documentation has been submitted including testing reports and the associated certificates received. All Quality Control Plan (QCP) documentation received. Final Draft of the Technical,
- Operating, Maintenance manuals have been delivered
- The Plant and all documentation / drawings are coded and labelled.
- All special tools / spares have been supplied.

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	Within days after Completion
	Performance testing of the *works* in use as specified in paragraph of this Works Information.	See performance testing requirements.

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

On completion, commissioning and testing of plant, the Contractor may hand over completed section of the Works for certification and operation.

5.2.3 Materials facilities and samples for tests and inspections

The Contractor provides all Materials, facilities and/or samples required for tests and inspections.
The Employer reserves the right to call for samples of the Equipment offered to inspect the workmanship as the work proceeds and to either accept or reject the Equipment or workmanship.
The Employer's Acceptance of the workmanship or Equipment must in no way reduce the Contractor's liability to provide complete solutions.
The purpose of these inspections is to reduce the risk of non-compliant Equipment and Materials being transported to site. The presence of the Employer at the inspections does not reduce the Contractor's responsibility to comply with the contract.
The Contractor is to make arrangements that these inspections are carried out within the boundaries of South Africa. Should any tests or inspections be required outside of the Gauteng Area, the Contractor is to allow in his Tender price for all costs (travel, accommodation, subsistence, etc) for two persons to attend such tests or inspections. Accommodation and subsistence arrangements are to be submitted to the Employer for Acceptance in writing

5.2.4 Commissioning

When the system is ready for service; commissioning shall take place to check whether the correct quantities of equipment have been delivered, and the installation is in accordance with the specifications. Commissioning shall be performed in co-operation with the Contractor and representatives of the Employer and Supervisor.
Practical Completion certificates will only be issued once the whole of the system installation satisfies the operational performance requirements of the contract and the Supervisor is satisfied that all systems are capable of operating effectively.
Performance and acceptance testing to determine whether the system achieves the required level of performance will only be undertaken after all routine testing, adjusting, commissioning, approvals and building work associated with the contract are complete and the work have been fully tested and commissioned by the Contractor.
Details of the testing required for each system and equipment shall be included in the Contractor's quality plan.
The Contractor shall supply all labour, materials and equipment required to fully commission and test the installation.
All costs associated in demonstrating that the system performs as required by the contract, shall be borne by the Contractor. Equipment which fails to operate correctly or is found to be installed incorrectly shall be repaired or replaced by the Contractor. Where any test is unsuccessful the defective equipment shall be repaired appropriately and subjected to retesting.

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

In order to put the Works into operation the Contractor demonstrates that the systems comply with all standards and regulations referenced and specified in this document.

5.2.6 Take over procedures

The *Contractor* shall do his own complete commissioning tests before the actual first take-over tests are done. This is to satisfy himself that everything is working and is in accordance with the specification.

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

The Project Manager arranges the date and access to site for the Contractor to correct defects. The Contractor updates the site safety file and the records contained inside as per construction regulations. The Contractor will be responsible for ensuring that the area is barricaded before correcting any defects.

5.2.8 Performance tests after Completion

In accordance with clause X17, performance test will be conducted on completion.

5.2.9 Training and technology transfer

After Completion of the contract, the Contractor is required to provide training and transfer system knowledge to the building owner/manager by submitting documented Design Intent, As-built drawings, Operational and Maintenance Manual, Commissioning Records, Commissioning Report and by providing training on all the systems to the building management staff to ensure that they have all the information and understanding needed to operate and maintain the features and systems in the building.
The Contractor is to provide on-site training and training material to the Engineers, Operators and Maintenance personnel prior to taking-over of the Works. The training will preferable be offered during the commissioning and testing. The Contractor will, prior to handing over of the Works, satisfy the Employer or authorized representative that maintenance and operational personnel are competent and adequately trained to maintain and operate the Plant and Materials supplied.
Steps for Conducting On-site Training are to include, but not limited to:

i. Preparation
ii. Introduction
iii. Explanation
iv. Demonstration
v. Practice Under Supervision
vi. Conclusion

The Contractor shall accordingly take into the Works an agreed number of members of the Employer's staff for an agreed period. The Contractor shall give the staff workshop hands-on training as fitter-erectors on the plant and shall give instruction in the assembly, adjustment and works testing of main items of plant.
Subsequently the Contractor will have the assistance of Employer's staff in commissioning of the plant and shall give appropriate instruction during these periods. Whilst the personnel allocated by the Employer can be expected to contribute in some measure to the erection work, the Contractor shall, in the Tender and when determining the programme, take into account that these personnel are involved only for training purposes.

The Contractor shall include attendance of the Employer's staff during testing and witnessing and for key works inspections.
The Contractor shall provide detailed proposals setting out the key aspects of training which will be provided for the Employer's personnel, both in the manufacturers' works and on the Site, including the proposed training programmes.

5.2.10 Operational maintenance after Completion

The Contractor will be liable for maintenance of the equipment for 52 weeks after the completion date.

6 Plant and Materials standards and workmanship

The drawings include final general arrangements. Drawings include sections and details to fully identify design concepts, design loadings and any other special features.
Drawings are fully dimensioned and the dimension figures on the drawing are deemed to be correct, even if the drawings are not to scale. No dimensions are obtained from a drawing by scaling.
All drawings show full endorsement by a Professional Engineer.

6.1 Investigation, survey and Site clearance

Some contracts may require the *Contractor* to carry out further investigation of existing facilities or of the Site before commencing final design. There could be constraints on Site clearance especially in pipeline or transmission grid servitudes.

6.2 Building works

Reference could be made to the latest Model Trade Preambles published by the Association of South African Quantity Surveyors. However these have been developed for use with the JBCC series of contracts and an approach where description of the work is made part of the bill of quantities, which is not the case in other forms of contract. Only parts of the Model Trade Preambles could be referenced by an ECC contract, with a covering note dealing with the changes in terminology. Further changes are required depending on which parts are to be selected.

This subsection would typically comprise
a) Particular specifications provided by the *Employer*
b) List of standardised specifications applicable to the *works* and
c) Variations to the standardised specifications

6.3 Civil engineering and structural works

Reference could be made to the SANS1200 series of specifications developed and published by South African National Standards. However these are now very out of date and originally developed for use with SAICE general conditions of contract for works of civil engineering which have themselves been superseded twice.
All SANS 1200 specifications are in the process of being updated to make them more compatible with a wider range of contracts, including NEC, and users should check availability of the new SANS 2000 series of specifications.

Sections 3, 4 and 5 of SANS1200A are probably already covered in section 5 of this Works Information.

This subsection would typically comprise
a) Particular specifications provided by the *Employer*
b) List of standardised specifications applicable to the *works* and
c) Variations to the standardised specifications

If use is made of the 1200 series, users should include a covering note dealing with the changes in terminology, such as the one provided below. Further changes are required depending on which specifications in the 1200 series are selected.

6.4 Electrical & mechanical engineering works

These specifications are usually project specific and developed by the *Employer* to suit his operations. Either include these specifications here, or refer to them in attached Annexure.

Check the specifications for inconsistencies in terminology and that they do not contain any provisions already dealt with in the chosen NEC *conditions of contract* or clash with them in any way.

6.5 Process control and IT works

These specifications are usually project specific and developed by the *Employer* to suit his operations. Either include these specifications here, or refer to them in attached Annexure.

Check the specifications for inconsistencies in terminology and that they do not contain any provisions already dealt with in the chosen NEC *conditions of contract* or clash with them in any way.

6.6 Other [as required]

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

C3.2 *CONTRACTOR*'S WORKS INFORMATION

This section of the Works Information will always be contract specific depending on the nature of the *works*.
It is most likely to be required for design and construct contracts where the tendering contractor will have proposed specifications and schedules for items of Plant and Materials and workmanship, which once accepted by the *Employer* prior to award of contract now become obligations of the *Contractor* per core clause 20.1.

Typical sub headings could be

a) *Contractor*'s design
b) Plant and Materials specifications and schedules
c) Other

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

Eskom Megawatt Park is a formal corporate headquarters complex in Sunninghill, Sandton, under the City of Johannesburg Metropolitan Municipality (Region E), part of Gauteng Provincial Government oversight.

- Site: Eskom Megawatt Park is Eskom's national headquarters, located in Maxwell Drive, Sunninghill, Sandton, Gauteng, South Africa.
- Institution Type: Corporate headquarters and operations centre for Eskom Holdings SOC Ltd.
- Ownership: Eskom Holdings SOC Ltd (state-owned enterprise).

Regional Authority:

- District Municipality: City of Johannesburg Metropolitan Municipality (DC42 equivalent, Gauteng metro).
- Local Municipality: Sandton/Sunninghill falls under Region E of the City of Johannesburg.
- Provincial Oversight: Gauteng Provincial Government (CoGTA framework applies).
- National Oversight: Eskom Holdings SOC Ltd (state-owned utility, headquartered here).

Infrastructure:

- Utilities: Fully serviced by Johannesburg municipal water, electricity, and sanitation.
- Roads & Transport: Accessible via N1 Western Bypass, Maxwell Drive, Rivonia Road. Gautrain Sandton Station nearby (links to Pretoria, Midrand, Johannesburg).
- Air Access: Close to O.R. Tambo International Airport (~30 km southeast).
- Rail Access: Gautrain rapid rail system connects Sandton to Midrand, Pretoria, and Johannesburg.

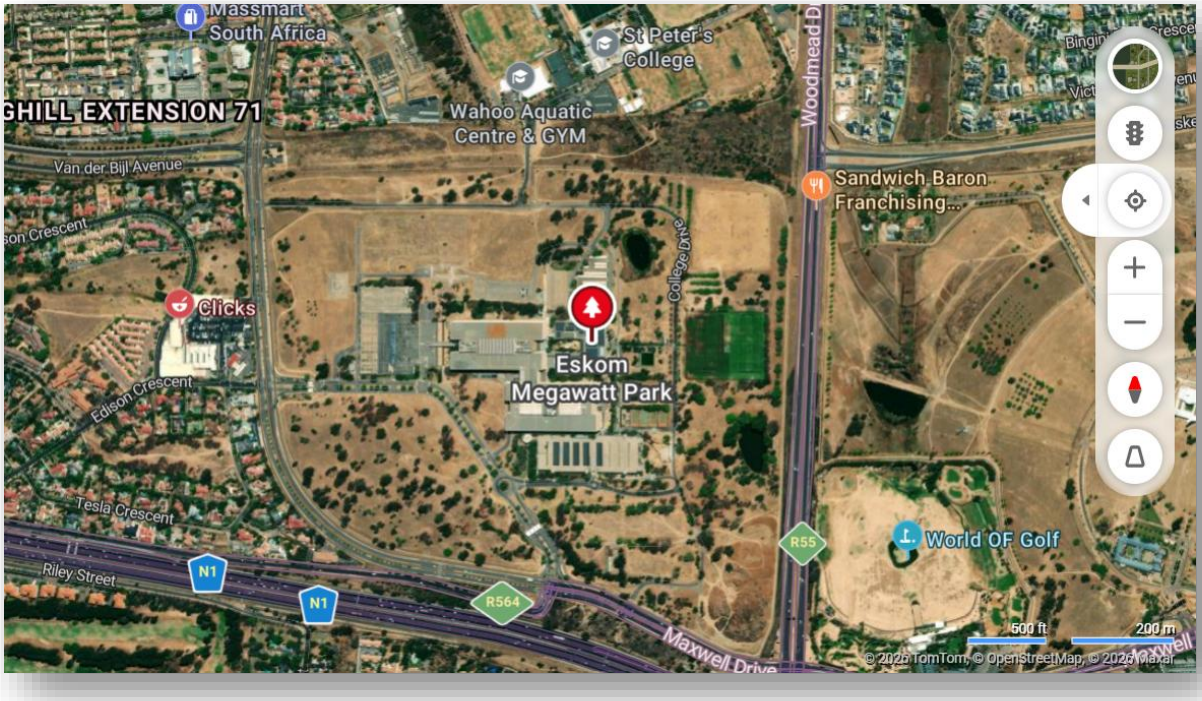
Environmental Context:

- Water & Pollution: Lies within the Jukskei River catchment, part of the Crocodile River system. Urban runoff and commercial activity contribute to localized pollution.
- Latitude & Longitude: Approx. –26.0315° S, 28.0603° E.
- GPS Listing: Maxwell Drive, Sunninghill, Sandton, Johannesburg, South Africa.

Contact & Institutional Details:

- Address: Maxwell Drive, Sunninghill, Sandton, Johannesburg, South Africa.
- Phone: +27 (0)11 800 8111
- Website: www.eskom.co.za
- Facilities: Office towers, boardrooms, national operations centre, corporate services.

Summary: Eskom Megawatt Park is the strategic headquarters of Eskom, located in Sandton/Sunninghill, Gauteng. It differs from the Eskom Academy of Learning in Midrand, which is focused on training and workforce development. Megawatt Park houses Eskom's executive leadership and national operations, while the Academy serves as the educational hub.


Massmart
South Africa
St Peter's
College
GHILL EXTENSION 71
Wahoo Aquatic
Centre & GYM
Van der Bijl Avenue
Woodmead D
Sandwich Baron
Franchising...
College Rd
Clicks
Eskom
Megawatt Park
Edison Crescent
Tesla Crescent
Riley Street
N1
N1
R564
R55
World OF Golf
Maxwell Drive
500 ft
200 m
© 2026 TomTom, © OpenStreetMap, © 2026 Maxar

General description

Provide a general description of the Site and its location. Reference would probably be made to a drawing showing the Site and its surroundings and the *boundaries of the site* as required by the Contract Data. It is particularly important that details of surrounding buildings be provided where crane operation is likely to be affected, or the *works* involve deep foundations adjacent to existing buildings.

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

If the *works* have interfaces or hook up points with existing facilities or comprise refurbishment of existing facilities, provide full details of these so that the tendering contractor can plan his design and construction to integrate with them as the Works Information requires. As built drawings of the existing facilities usually provide the necessary information; such drawings can be listed here stating where they are located for the *Contractor*'s use.

Subsoil information

Provide details of geotechnical reports, borehole records and test results for parts of the Site where earthworks are required by this contract. These details may be referenced as an Annexure to this document where they are extensive.

Hidden services

Provide details about and drawings showing hidden services and underground structures. If accurate details are not available state what assumptions are to be made by the *Contractor* concerning such services.

Other reports and publicly available information

This subsection may refer to mapping, hydro-graphic data, hydrological information, shipping movements, tides and published papers or Geological Surveys that the tendering contractor may need to be able to decide his method of working and programme and prepare any designs for which he would be responsible.