NEC3 Professional Services Contract (PSC3)

Contract between **Eskom Holdings SOC Ltd**
(Reg No. 2002/015527/30)

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

for **Professional Services Contract for Warehouse Facility Upgrades at Kusile Power Station for a period of 9 Months**

Contents:		**No of pages**
Part C1	**Agreements & Contract Data**	**[•]**
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CONTRACT No. **TBA**

PART C1: AGREEMENTS & CONTRACT DATA

Document reference	Title	No of pages
C1.1	**Form of Offer & 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 *Consultant***	[●]
	[to be inserted from Returnable Documents at award stage]	
C1.3	**Securities proforma**	[●]

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:

Professional Services Contract for the Warehouse Facility Upgrades at Kusile Power Station for a period of 09 Months

either	examined the documents listed in the Tender Data and addenda thereto as listed in the Returnable Schedules, and by submitting this Offer has accepted the Conditions of Tender.
or	examined the draft contract as listed in the Acceptance section and agreed to provide this Offer.

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 *Consultant* under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the *conditions of contract* identified in the Contract Data.

The offered total of the Prices exclusive of VAT is	**R**
Value Added Tax @ 14% is	**R**
The offered total of the Prices inclusive of VAT is	**R**
(in words)	

If Option E or G apply, for each offered total insert in brackets, "(Not Applicable – Cost reimbursable)"

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 *Consultant* 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 .....

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 Consultant 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: The Scope

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 and signed original copy of this document, including the Schedule of Deviations (if any).

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

Note:

1. To be completed by the Employer prior to award of contract. 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 PSC3 Contract Data

Part one - Data provided by the *Employer*

[Instructions to the contract compiler: (delete these two notes in the final draft of a contract)

1. Please read the relevant clauses in the conditions of contract before you enter data. 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.

2. The PSC3 options are identified by shading in the left hand column. In the event that the option is not required select and delete the whole row.

3. Where the symbol "**[•]**"is used data is required to be inserted relevant to the clause and statement which requires it.]

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	
		E: **Time based contract**
	dispute resolution Option	**W1:** **Dispute resolution procedure**
	and secondary Options	
		X2 **Changes in the law**
		X5: **Sectional Completion**
		X7: **Delay damages**
		X9: **Transfer of rights**
		X10 ***Employer*'s *Agent***
		X11: **Termination by the Employer**
		X18: **Limitation of liability**
		Z: **Additional conditions of contract**
	of the NEC3 Professional Services Contract (April 2013)[1]	
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**

[1] Available from Engineering Contract Strategies Tel 011 803 3008 Fax 011 803 3009 and www.ecs.co.za

	Address	**Registered office at Megawatt Park, Maxwell Drive, Sandton, Johannesburg**
	Tel No.	**013 699 7838**
	Fax No.	**086 718 0399**
11.2(9)	The *services* are	**Professional Services Contract for the Wearhouse facility upgrades at Kusile power station(once-off)**
11.2(10)	The following matters will be included in the Risk Register	**1. Employee safety during plant walkdowns** **2. Dust Inhalation** **3. Slip, Trip & Fall** **4. Falling Objects** **5. Electric Shock** **6. Permit to Work** **7. Working at heights** **8. Quality** **9. Time**
11.2(11)	The Scope is in	**Part 3: Scope of Work**
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	**3 days**
13.6	The *period for retention* is	**to be released once defects period has elapsed**

2 The Parties' main responsibilities

25.2	The *Employer* provides access to the following persons, places and things	**access to**		***access date***
		1	**Kick Off Meeting**	**After Contract Award**
		2	**Kusile Admin Building**	**After Safety File Approval**
		3	**Site Designs**	**2 Days after Site Establishment and Permit to work approval**

3 Time

31.2	The *starting date* is.	**Contract Signature date**	
11.2(3)	The *completion date* for the whole of the *services* is.	**To be updated accordingly once the contract is awarded**	
11.2(6)	The *key date*s and the *condition*s to be met are:	***Condition* to be met**	***key date***

		1	**Submit Programme for approval**	**2 Weeks after Kick off meeting**
		2	**Submit QCP's**	**2 Weeks after Kick off meeting**
		3	**SHEQ Requirements**	**2 Weeks after Kick off meeting**
		4	**Site Designs**	**6 After Contract Award**
31.1	The *Consultant* is to submit a first programme for acceptance within	**5 days after the Kick Off Meeting**		
32.2	The *Consultant* submits revised programmes at intervals no longer than	**5 days**		
4	**Quality**			
40.2	The quality policy statement and quality plan are provided within	**4 days of the Contract Date.**		
42.2	The *defects date* is	**52 weeks after Completion of the whole of the *service*s.**		
5	**Payment**			
50.1	The *assessment interval* is	**between the 25th day of each successive month.**		
50.3	The *expenses* stated by the *Employer* are	**Item**		**Amount**
		[•]		**[•]**
		[•]		**[•]**
		[•]		**[•]**
		[•]		**[•]**
51.1	The period within which payments are made is	**4 weeks.**		
51.2	The *currency of this contract* is the	**South African Rand**		

51.5	The *interest rate* is	**the publicly quoted prime rate of interest charged by [●] Standard Bank of South Africa Limited at the time an amount payable in SA Rand was due,** **and** **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**	**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.**
7	**Rights to material**	**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	**Indemnity, insurance and liability**	**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.**
82.1	**The *Consultant*'s total liability to the *Employer* for all matters arising under or in connection with this contract, other than the excluded matters, is limited to**	**The total of the Prices**
9	**Termination**	**There is no reference to Contract Data in this section of the core clauses and terms in italics used in this section are identified elsewhere in this Contract Data.**

10 Data for main Option clause

E	**Time based contract**	
21.4	The *Consultant* prepares forecasts of the total Time Charge and *expenses* at intervals no longer than	**1 week**

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 the ICE-SA Division (or its successor body) of the South African Institution of Civil Engineering. (See www.ice-sa.org.za).**
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

X2	**Changes in the law**			
X2.1	The law of the project is	**South African**		
X5	**Sectional Completion**			
X5.1	The *completion date* for each *section* of the *services* is:	***section***	**description**	***completion date***
		1	**Designs**	**09 Months After Contract Award**
X5 & X7	**Sectional Completion and delay damages used together**			
X7.1 X5.1	Delay damages for late Completion of each *section* of the *services* are:	***section***	**description**	**amount per day**

		1	**Project Execution & & Hand Over of Year 1**	**1% of Total Prices per day**
	The total delay damages payable by the *Contractor* does not exceed:	**10% of the Total Prices**		
	Remainder of the *services* The total delay damages payable by the Contractor does not exceed: 10% of the Total Prices			
X9	**Transfer of rights**	**There is no reference to Contract Data in this Option and terms in italics used in this Option are identified elsewhere in this Contract Data.** **Also Refer to Z1**		
X10	**The *Employer's Agent***			
X10.1	The *Employer's Agent* is			
	Name:	**Zanele Kubheka**		
	Address	**Kusile Power Station**		
	The authority of the *Employer's Agent* is	**Project Manager**		
X11	**Termination by the *Employer***	**There is no reference to Contract Data in this Option and terms in italics used in this Option are identified elsewhere in this Contract Data.**		
X13	**Performance bond**			
X13.1	The amount of the performance bond is	**5%**		
X18	**Limitation of liability**			
X18.1	The *Consultant's* liability to the *Employer* for indirect or consequential loss is limited to:	**R0.00 (Zero Rand)**		
X18.2	The *Consultant's* liability to the *Employer* for Defects that are not found until after the *defects date* is limited to:	**The total of the Prices**		
X18.3	The *end of liability date* is	**five years after Completion of the whole of the *services*/task order.**		
Z	**The *Additional conditions of contract* are**	**Z1 to Z14 always apply.**		

Z1 Cession delegation and assignment

Z1.1 The *Consultant* 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 *Consultant* 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 *Consultant* 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 *Employer* within two weeks of the Contract Date of the key person who has the authority to bind the *Consultant* on their behalf.

Z2.3 The *Consultant* 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 *Consultant* in writing.

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

Z3.1 Where a change in the *Consultant's* legal status, ownership or any other change to his business composition or business dealings results in a change to the *Consultant's* B-BBEE status, the *Consultant* notifies the *Employer* within seven days of the change.

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

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

Z3.4 Failure by the *Consultant* 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 those stated in core clause 91. The payment on termination includes a deduction of the forecast of the additional cost to the *Employer* of completing the whole of the *service*s in addition to the amounts due in terms of core clause 92.1.

Z4 Confidentiality

Z4.1 The *Consultant* 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 *Consultant*, enters the public domain or to information which was already in the possession of the *Consultant* at the time of disclosure (evidenced by written records in existence at that time). Should the *Consultant* disclose information to Others in terms of clause 23.1, the *Consultant* ensures that the provisions of this clause are complied with by the recipient.

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

Z4.3 In the event that the *Consultant* is, at any time, required by law to disclose any such information which is required to be kept confidential, the *Consultant*, 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 *Consultant* 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 *Employer*'s project works or any portion thereof, in the course of Providing the Services and after Completion, requires the prior written consent of the *Employer*. All rights in and to all such images vests exclusively in the *Employer*.

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, 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 Provision of a Tax Invoice. Add to core clause 51

Z6.1 The *Consultant* (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.

Z7 Notifying compensation events

Z7.1 Delete from the last sentence in core clause 61.3, "unless the *Employer* should have notified the event to the *Consultant* but did not".

Z8 *Employer's* limitation of liability

Z8.1 The *Employer's* liability to the *Consultant* for the *Consultant's* indirect or consequential loss is limited to R0.00 (zero Rand)

Z9 Termination: Add to core clause 90.1, at the second main bullet point, fourth sub-bullet point, after the words "against it":

Z9.1 or had a business rescue order granted against it.

Z10 Delay damages: Addition to secondary Option X7 Delay damages (if applicable in this contract)

Z10.1 If the *Consultant'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 *Consultant's* obligation to Provide the Services.

Z10.2 If the *Employer* terminates in terms of this clause, the procedures on termination are those stated in core clause 91. The payment on termination includes a deduction of the forecast of the additional cost to the *Employer* of completing the whole of the *service*s in addition to the amounts due in terms of core clause 92.1.

Z11 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 *Consultant* or a third party, such party's employees, agents, or Subconsultants or Subconsultant'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 means where two or more parties co-operate to achieve an unlawful or illegal

Action purpose, including to influence an Affected Party to act unlawfully or illegally,

Committing Party means, as the context requires, the *Consultant*, or any member thereof in the case of a joint venture, or its employees, agents, or Subconsultants or the Subconsultant'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.

Z11.1 A Committing Party may not take any Prohibited Action during the course of the procurement of this contract or in execution thereof.

Z11.2 The *Employer* may terminate the *Consultant*'s obligation to Provide the Services if a Committing Party has taken such Prohibited Action and the *Consultant* 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 *Consultant*'s obligation to Provide the Services for this reason.

Z11.3 If the *Employer* terminates the *Consultant*'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.

Z11.4 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 *Consultant* ensures that the Committing Party co-operates fully with an investigation.

Z12 Insurance

Z12.1 Replace core clause 81 with the following:

81.1 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.

81.2 The *Consultant* provides the insurances stated in the Insurance Table A 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**	**For the period following Completion of the whole of the *services* or earlier termination**
Liability of the *Consultant* for claims made against him arising out of his failure to use the skill and care normally used by professionals providing services similar to the *services*	Commercial and business to determine. [Delete this note after inserting]	Commercial and business to determine [Delete this note after inserting]

Liability for death of or bodily injury to a person (not an employee of the *Consultant*) or loss of or damage to property resulting from an action or failure to take action by the *Consultant*	**Loss of or damage to property:** The replacement cost where not covered by the *Employer*'s insurance The *Employer*'s policy deductible, as at Contract Date, where covered by the *Employer*'s insurance **Bodily injury to or death of a person:** The amount required by the applicable law.	Commercial and business to determine [Delete this note after inserting]
Liability for death of or bodily injury to employees of the *Consultant* arising out of and in the course of their employment in connection with this contract	The amount required by the applicable law	Commercial and business to determine [Delete this note after inserting]

81.3 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 limit 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

Z13 Nuclear Liability

Z13.1 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.

Z13.2 The *Employer* is solely responsible for and indemnifies the *Consultant* or any other person against any and all liabilities which the *Consultant* 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 *Consultant* or any other person or the presence of the *Consultant* or that person or any property of the *Consultant* 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*.

Z13.3 Subject to clause Z13.4 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 *Consultant* or any other person, or the presence of the *Consultant* or that person or any property of the *Consultant* 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*.

Z13.4 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.

Z13.5 The protection afforded by the provisions hereof shall be in effect until the KNPS is decommissioned.

Z14 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.

Z14.1 The *Employer* ensures that the Ambient Air in the area where the *Consultant* 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.

Z14.2 Upon written request by the *Consultant*, 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 *Consultant* may perform Parallel Measurements and related control measures at the *Consultant*'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 Z14.1. Control measures conform to the requirements stipulated in the AAIA-approved asbestos work plan.

Z14.3 The *Employer* manages asbestos and ACM according to the Standard.

Z14.4 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.

Z14.5 The *Consultant*'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.

Z14.6 The *Consultant* 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.

Z14.7 Any removal and disposal of asbestos, asbestos containing materials and waste, is done by a registered asbestos contractor, instructed by the *Employer* at the *Employer*'s expense, and conducted in line with South African legislation.

C1.2 Contract Data

Part two - Data provided by the *Consultant*

[Instructions to the tendering consultant: (delete these notes in the final draft of a contract)

1. The tendering consultant is advised to read both the NEC3 Professional Services Contract, April 2013 and the relevant parts of its Guidance Notes (PSC3-GN)[1] 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 158 & 159 of the PSC3 April 2013 Guidance Notes.
2. The number of the clause in the PSC3 which requires the data is shown in the left hand column for each statement however other clauses may also use the same data.
3. Whenever a cell is shaded in the left hand column it denotes this data is optional in PSC3 and would be required in relation to the option selected. The *Employer* should already have made the selection and deleted the rows not required.

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

Clause	Statement	Data
10.1	The *Consultant* is (Name): Address Tel No. Fax No.	
22.1	The *key people* are: 1 Name: Job: Responsibilities: Qualifications: Experience: 2 Name: Job Responsibilities: Qualifications: Experience:	
Only if required		**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 *services* is	
11.2(10)	The following matters will be included in the Risk Register	

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

11.2(13)	The *staff rates* are:	**name/designation**	**rate**
	Either complete here or cross refer to a schedule in Part C2.2		

25.2	The *Employer* provides access to the following persons, places and things	**access to**		***access date***
		1		
		2		
		3		

31.1	The programme identified in the Contract Data is	
50.3	The *expenses* stated by the *Consultant* are	**item** / **amount**
A	**Priced contract with activity schedule**	
11.2(14)	The *activity schedule* is in	
11.2(18)	The tendered total of the Prices is	**R (in figures)** **(in words), excluding VAT**
C	**Target contract**	
11.2(14)	The *activity schedule* is in	
11.2(18)	The tendered total of the Prices is	**R (in figures)** **(in words), excluding VAT**
G	**Term contract**	
11.2(25)	The *task schedule* is in	

PART 2: PRICING DATA

PSC3 Option E

Document reference	Title:Proffessional Services for the Wearhouse facility upgrades at Kusile Power station(once-off)	No of pages
C2.1	Pricing assumptions: Option E	
C2.2	*Staff rates* and *expenses*	

C2.1 Pricing assumptions: Option E

1. How work is priced and assessed for payment

From Option E:

Identified and defined terms	11 11.2	(16) The Price for Services Provided to Date is the Time Charge for the work which has been completed. (19) The Prices are the Time Charge.

From the core clauses:

Identified and defined terms	11.2	(13) The Time Charge is the sum of the products of each of the *staff rates* multiplied by the total staff time appropriate to that rate properly spent on work in this contract.

and

Assessing the amount due	50.3	The amount due is • the Price for Services Provided to Date, • the amount of the *expenses* properly spent by the *Consultant* in Providing the Services and • other amounts to be paid to the *Consultant* less amounts to be paid by or retained from the *Consultant*. Any tax which the law requires the *Employer* to pay to the *Consultant* is included in the amount due.

2. Staff rates and expenses

Tendering consultants are advised to consult the NEC3 Professional Services Contract Guidance Notes before entering *staff rates* into Contract Data, or in C2.2 below.

This is because *staff rates* can be established in one of three ways:

- rates for named staff,
- rates for categories of staff or
- rates related to salaries paid to staff.

Rate adjustment for inflation, if necessary, can be based either on actual salary adjustments or by using Option X1: Price adjustment for inflation. See pages 13 and 14 of the PSC3 Guidance Notes.

Expenses associated with employing a staff member in Providing the Services are listed separately either by the *Employer* in Contract Data provided by the *Employer* or by the *Consultant* in Contract Data provided by the *Consultant*. As only the *expenses* listed may be claimed by the *Consultant*, all other cost to the *Consultant* associated with Providing the Services must be included within the *staff rates*.

Rate adjustment for inflation of *expenses* is explained on page 15 of the Guidance Notes.

C2.2 Staff rates and expenses

This section can be used when the *staff rates* and *expenses* are considerable in number and more conveniently located here than in the Contract Data. Entries in the Contract Data should refer to this section of Part 2.

Remember to state whether the *staff rates* and *expenses* exclude or include VAT.

ITEM NO	DESCRIPTION	UNIT	NO OFF	QTY	RATE	AMOUNT
	ITEM 1					
1	**PRELIMINARIES AND GENERAL**					
1.1	Safety File	Once Off	1	1		
1.2	Entry Medicals	Once Off	1	12		
1.3	Exit Medicals	Once Off	1	12		
1.4	Security / Police Clearance certification	Once Off	1	12		
1.5	PPE	Once Off	1	12		
	Total Item 1 (Preliminary & General) Carried to Final Summary					
	ITEM 2					
2	**ENGINEERING DESIGN RESOURCES**					
2.1	Project Manager Registered with SACPCMP (Min 5 Years of Experience) (1 Off)	Hours	1	1050		
2.2	Architectural Professional professionally Registered with the SACA (Min 5 Years of Experience) (1 Off)	Hours	1	1050		
2.3	Structural Engineer/Technologist, Professionally Registered with ECSA (Min 5 Years of Experience) (1 Off)	Hours	1	1050		
2.4	Civil Engineer Professionally Registered with ECSA (Min 5 Years of Experience) (1 Off)	Hours	1	1050		
2.5	Geotechnical Engineer Professionally Registered with ECSA (Min 5 Years of Experience) (1 Off)	Hours	1	1050		
2.6	Land Surveyor Professionally Registered with the SAGC (Min 5 Years of Experience) (1 Off)	Hours	1	1050		
2.7	Electrical Designer Professionally Registered with ECSA (Min 5 Years of Experience) (1 Off)	Hours	1	1050		
2.8	Mechanical Engineer Professionally Registered with ECSA (Min 5 Years of Experience) (1 Off)	Hours	1	1050		
2.9	C&I Engineer/Technologist, Professionally Registered with ECSA (Min 5 Years of Experience) (1 Off)	Hours	1	1050		
2.10	Draughtspersons (Min 5 Years of Experience) (1 Off)	Hours	1	1050		
2.11	Quantity Surveying SACQSP. (Min 5 Years of Experience) (1 Off)	Hours	1	1050		
2.12	Planner (Min 3 - 5 Years of Experience) (1 Off)	Hours	1	1050		
	Total Item 2 (C&I Design Resources) Carried to Final Summary					
	FINAL SUMMARY					
ITEM 1	PRELIMINARIES AND GENERAL					
ITEM 2	ENGINEERING DESIGN RESOURCES					
					Final Summary Total (Excl. VAT)	

PART 3: SCOPE OF WORK

Document reference	Title	No of pages
	This cover page	1
C3.1	*Employer*'s Scope	
C3.2	*Consultant's* Scope	
	Total number of pages	

C3.1: EMPLOYER'S SCOPE

Contents

Content Page

Figures

1 Tables

1. Introduction

Facility assessments point to deficient building systems and infrastructure at Kusile Power Station's main warehouse building. The *Employer* intends to render professional services to address the identified deficiencies to maintain regulatory compliance and to ensure the continued safe use of the building facility.

2. Supporting Clauses

2.1 Scope

2.1.1 Purpose

The purpose of this document is to outline the project specifications for the mentioned scope of services at Kusile Power Station.

2.1.2 Applicability

This document shall to Kusile power Station

2.1.3 Effective Date

This document shall be effective from the date of its authorization.

2.2 Normative/Informative References

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

1.1.1 Table 1: Employer Standards

Code	Description
Applicable Standards	
240-4332798	Engineering policy
240-5311685	Design Review Procedure
240-53114026	Engineering Change Management Procedure
240-71432150	Plant Labelling Standard
240-93576498	Coding Standard

240-76992014	Project/Plant Specific Technical Document and Records Management Work Instruction
240-65459834	Gx Projects Documentation Deliverable Requirements Specification
240-57127953	Execution of Site Preparation and Earthworks Standard
240-57127955	Geotechnical and Foundation Engineering Standard
240-912523315	Standard for Bullet-Resistant Guard Huts
240-76368574	High Security Mesh Fencing Standard
203-1239	Kusile Power Station Conceptual Architectural Design Specifications for Structures and Other Buildings, Rev 2
240-107981296	Constructability Assessment Guideline Standard
240-56364545	Structural Design and Engineering Standard
203-770	Kusile Specification for Structural Concrete
240-84418186	Road Specification Manual
240-86973501	Engineering drawing Standard
240-66920003	Documentation Management Review and Handover Procedure for Gx Coal Projects
203-103437	Technical Document Submission and Review Work Instruction
203-770	Kusile Power station specification for structural concrete
240-106365693	Standard for the External Corrosion Protection of Plant, Equipment and Associated Piping with Coatings
240-76368574	High Security Mesh Fencing
240-55714363	Coal Fired Power Stations Lighting and small power installation standard
240-93576498	KKS Coding Standard
240-56227443	Requirements for Control and Power Cables for Power Stations Standard
240-56356396	Earthing and Lightning Protection Standard
240-55714363	Coal Fired Power Stations Lighting and small power installation standard
BS EN 62676-4	Video Surveillance Systems for use in Security Applications
240-91190304 -	Specification for CCTV Surveillance with Intruder Detection
SANS 10222-5	Electrical Security Installations Part 5: CCTV installations

240-102220945	Specification for Integrated Access Control System (IACS) for Eskom sites
240-86738968	Specification for Integrated Security Alarm System for Protection of Eskom Install and Subsidiaries
240-55410927	Cyber Security Standard for Operational Technlogy
240-78980848	Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) for Protection of Eskom Installations and its Subsidiaries
240-64720986	Emergency Preparedness Public Address System – For Large Area Deployment
240-131050729	Hybrid Coding Standard
240-109607732	Eskom Plant labelling Abbreviation Standard
240-106365693	Standard for the External Corrosion Protection of Plant, Equipment and Associated Piping with Coatings
240-91190304	Specification for CCTV Surveillance with Intruder Detection
240-56356396	Earthing and lightning Protection Standard.
240-91190304	Specification for integrated security alarm system for protection of Eskom installations and its subsidiaries
32-894	Eskom Server Rooms and Data Centres Standard
240-102547991	General Technical Specification for HVAC Systems Standard
240-56355731	Environmental conditions for process control equipment used at Power Stations
CIBSE	Commissioning Code A: Air Distribution Systems
CIBSE	Commissioning Code B: Boilers
CIBSE	Commissioning Code C: Automatic Controls
CIBSE	Commissioning Code M: Commissioning Management
CIBSE	Commissioning Code R: Refrigeration
CIBSE	Commissioning Code W: Water Distribution Systems
ASHRAE 15	Safety Code for mechanical refrigeration
ASHRAE 62	Ventilation for acceptable indoor air quality

ASHRAE55	Thermal environmental condition for human occupancy
SANS10147	Refrigeration systems including plants associated with air-conditioning systems
240-54937450	Fire Protection and Life Safety Design Standard
240-54937439	Fire Protection Detection Assessment Standard
240-54937454	Inspection, Testing and Maintenance of Fire Protection Systems Standard
SANS10400-T	National building regulation part T
SANS10400	National building regulation part W
-W 240-	Fire Detection and Life Safety Design Standard
56737448	

2.2.1 Normative

N/A

2.2.2 Informative

[1] 36-681: Eskom Plant Safety Regulations

[2] 474-58 (Rev1): Document and Records Management

[3] 240-105658000: Supplier Quality Management Specification

3 Description of the services

3.1 Executive Overview

The *Employer's* main warehouse building was designed for temporary use during construction of the Kusile Power Station site. The facility was subsequently repurposed as an additional storehouse for the power station site. Facility assessments point to deficient building infrastructure and systems that pose a safety risk. As such, the *Employer* requires a consultant to render professional services to address the detailed flaws. The *Consultant* notesthattheengineeringdesignsforthebuildinganditsassociatedsystemsdo notexist.

The project services include the following but not limited to:

- Site feasibility/evaluation study and planning services i.e. site and route locations etc.
- Surveying and setting out works for the scope elements
- Condition assessments and analysis of existing works i.e. structural assessment and analysis, subsurface utility mapping etc.

- Geotechnical services i.e. site investigations, earthworks and foundation design etc.
- Architechural design including restoration and renovation services on existing building
- Civil engineering design for warehousing & general building structures i.e. stormwater design, sanitary drainage, subsurface utility designs
- Structural engineering design for warehousing & general building structures; steel, masonry and concrete design, structural alterations and restoration
- Wet services design i.e. potable and fire water supply & distribution
- Heating, Ventilation and Air Conditioning (HVAC) system evaluation and design
- Electrical design i.e. power and lighting systems, power distribution, fire and life safety systems, electronic components, and voice and data communications infrastructure
- C&I engineering design i.e. access control and security systems, fire and life safety systems
- Landscape planning and design
- IT infrastructure design
- Construction and commissioning monitoring during project execution oversight
- Statutory Certification for existing and new works

3.2 Employer's objectives and purpose of the works

The proposed project scope will address risk conditions presented by existing system and infrastructure deficiencies and limitations within the warehouse space. Maintaining regulatory compliance will also ensure the business operates within legal and regulatory boundaries.

3.3 Consultant's obligations

The *Consultant* shall perform the *Services* in accordance with the Scope of Work with all reasonable care, diligence and skill in accordance with generally accepted professional techniques and standards. If the *Service Provider* is a joint venture or consortium of two or more persons, the *Service Provider* shall designate one person to act as leader with authority to bind the joint venture or consortium. Neither the composition nor the constitution of the joint venture or consortium shall be altered without the prior consent in writing of the *Employer*.

3.4 Interpretation and terminology

Table 2: Abbreviations

Abbreviation	Description
CBMS	Consolidated Building Management System
CCTV	Closed Circuit Television
C&I	Control and Instrumentation
ECSA	Engineering Council of South Africa
HVAC	Heating, Ventilation and Air-conditioning

Abbreviation	Description
ITP	Inspection and Test Plan
OHS Act	Occupational Health and Safety Act
O&M	Operating and Maintenance
PEC	Professional Engineering Certificate
SACAP	South African Council for the Architechural Profession
SACPCMP	South African Council for Project and Construction Management Professionals
SACQSP	South African Council for the Quantity Surveying Profession
uPVC	Unplasticized Poly Vinyl Chloride

3.5 Roles and Responsibilities

3.5.1 Consultant

a. Completes the services as outlined in the scope and service agreement.

b. Observes all relevant regulations, standards of professional conduct and industry norms established in relevant South African National Standards including standards recommended by relevant professional associations etc.

c. Demonstrate skill and care generally used by professionals

3.5.2 Employer

c. Provides all available information and data in the *Employer's* possession which may be required for the performance of the service.

4 Site Description

The Kusile Power Station site is located approximately 37km northwest of eMalahleni in the Mpumalanga Province. The site is accessed from the R686 road between highways, N4 and N12. The site has approximate coordinates 25° 55' 07.34''S and 28° 54' 43.30''E.

The location of the warehouse facility is given in Figure 1. The facility serves as the main storage area for material stock at the site. The warehouse is an open plan steel framed structure, approximately 23120 m^2 in area size.

Figure 1: Warehouse Location

5 Specification and description of the services

The *Consultant* provides engineering design services including construction and commissioning monitoring as well as statutory certification, in accordance with the Engineering Profession Act, 46 of 2000, Guideline for Professional Fees: Scope of services and Tariff of Fees for Registered Persons. The boundary of the scope of services is detailed. The *Consultant* co-ordinates the work of his subconsultants, as relevant. The *Consultant* co-ordinates interfaces to ensure design integration for all components of the *Works.*

5.1 Required services

The required services are detailed. The Consultant refers to section 5.2 for detailed requirements.

1.1.2 Inception

a. The *Consultant* liaises with the project team and stakeholders to assess and establish the user needs and requirements.

b. The *Consultant* inspects the project site. The *Consultant* establishes the need for specialist advice, studies, tests, investigations and surveys relevant to the scope of services, including assessing the availability and location of existing infrastructure and services. The Consultant is responsible for the appointment of such specialist resources and services. The *Consultant* performs and co-ordinates all studies, tests and surveys required for the scope of *services*. The *Consultant* collates outputs of specialist studies, surveys and advises on implications of the findings.

c. The *Consultant* investigates, and collates data and drawings relating to the scope of *services*

d. The *Consultant* assesses the existing infrastructural elements to ensure integration between existing and proposed new *works.*

e. The *Consultant* reviews design data prepared by others, that interface or may impact his designs, for purposes of delivering sound designs.

f. The *Consultant* arranges for all statutory/regulatory and other approvals related to the project

1.1.3 Concept & Viability

a. The *Consultant* develops the project concepts in accordance with the scope brief. An analysis criterion is established and a cost-benefit analysis is performed for concept options *– all scope elements are covered i.e. Civil & Structural, Mechanical, Electrical, C&I.* The *Consultant* prepares the concept designs and related documentation, which are suitable for costing. The *Consultant* coordinates the design interfaces with his *sub-Consultants.*

b. The *Consultant* conducts design reviews in accordance with the *Employer's* Design Review Procedure, 240- 5311685 for his designs in collaboration with the project team.

1.1.4 Design Development:

a. The *Consultant* develops the detail designs and related documentation per the project brief. The *Consultant*
incorporates the Employer's detailed requirements into the designs.

b. The *Consultant* coordinates and incorporates all design interfaces

c. The *Consultant* conducts design reviews in accordance with the *Employer's* Design Review Procedure, 240-5311685 in collaboration with the project team

d. The Consultant undertakes value (cost) engineering reviews. He reviews and adjusts design, drawings, schedules and documents, if necessary, to remain within budget.

e. The *Consultant* prepares detailed estimates of construction costs of all scope elements i.e. civil and structural, mechanical, electrical, C&I etc.

1.1.5 Contract Administration and Inspection

The *Consultants'* responsibilities include the following but not limited to:

a. Attendance of site, technical and progress meetings

b. Reviews quality assurance procedures

c. Assistance with site clarification and tender queries

d. Provide clarity on design details during construction as and when required

e. Witnesses and reviews test works on and off site

f. Reviews and approves *Contractor* drawings for compliance with contract documents

g. Update and issue drawing registers

h. Arranges and prepares test certificates and other statutory certification related to the project scope.

1.1.6 Close-out

a. The *Consultant* inspects and verifies the rectification of defects

b. Compiles and/or procure operating and maintenance manuals etc. related to the Works.

c. The *Consultant* prepares and submits record and/or as-built drawings and documentation upon project completion.

d. The *Consultant* issues statutory certification i.e. Certificates of Compliance/Professional Engineering Certificates to confirm design and construction compliance

1.1.7 Additional Services pertaining to all Stages of the Project

The *Consultant's* duties include the following:

a. Condition assessment of existing facilities, structures and infrastructure or forensic investigations into defects of buildings and structures

b. Perform topographical and environmental surveys, analyses, tests and site or foundation or other investigations, model tests, laboratory tests and analyses carried out on behalf of the *Client*.

c. Setting out or staking out the works and indicating any boundary beacons and other reference marks.

d. Preparation of drawings for manufacture and installation or detailed checking of such for erection or installation fit.

e. Detailed inspection, reviewing and checking of designs and drawings not prepared by the consulting engineer and submitted by any contractor, or potential contractor, as alternative to those embodied in tender or similar documents prepared by the consulting engineer

f. Inspection and testing, other than on site, of materials and plant, including inspection and testing during manufacture.

g. Compiling record drawings related to designs done by others or related to alterations to existing works

h. The *Consultant* reviews Contractor designs, shop drawings and other documentation to confirm conformity of design

i. The *Consultan*t reviews design data prepared by others, that interface or may impact his designs, for purposes of delivering sound engineering designs.

j. The *Consultant* is responsible for setting out or staking out the works and indicating any boundary beacons and other reference marks pertaining to the scope of *Services*

5.2 Boundary of Scope of Services

The boundary of the scope of *services* includes the following but not limited to:

1.2 Utility Surveys

The *Consultant* performs utility scan surveys to verify existing subsurface services. The assessment activities aim to identify and map utility mains that are below ground in the footprint of the project site. Mains to be evaluated include the following but not limited to stormwater drains, electrical cables. The Consultant proposes the detection and location methods. Survey and scanning methods may include but not be limited to the following:

- 3D utility scan/detection
- GPR scanning etc.

1.3 Geotechnical Services

The *Consultant* performs a detailed geotechnical investigation for the design of earthworks and infrastructure foundations. The scope covers the following but not limited:

- Security guardhouse
- Machine/equipment building
- Tank system supports
- Bund structures
- Trenches and tunnels
- Underground utilities i.e. stormwater, cabling, sewage
- Support and platform structures for mechanical, electrical, C&I components and equipment etc.

It is assumed that the new infrastructure will occupy an area of approximately 1 hectare (ha). The *Consultant* determines and confirms the extent of such an investigation, taking into consideration the area to be developed, extent of structures to be erected and the intended use of the structures. The geotechnical investigation shall be conducted in line with the latest national and/or international standards for site investigation and ground classification techniques (this includes sample acquisition and laboratory testing). The geotechnical investigation may involve the following activities but not limited to:

- *Desktop study i.e:*
  - A review of the existing geological and geotechnical maps
  - A literature study
- *Excavation of Test Pits*
- *Dynamic Cone Penetrometer (DCP) test*
- *Dynamic Probe Super Heavy (DPSH) test*
- *Laboratory Testing i.e:*
  - Grading (sieve & hydrometer analysis)
  - Maximum dry density (MOD AASHTO method)
  - California Bearing Ration (CBR)
  - Chemical analysis etc.

The *Consultant* evaluates the suitability of the in-situ materials for use as construction materials in the vicinity of the site.

The investigation results are presented in the form of a geotechnical report which will outline amongst others, the geotechnical conditions at the site, soil profiles, groundwater conditions, field and laboratory test results, information on the presence of expansive or collapsing soils, recommendations for foundation types and earthworks and identify other significant geotechnical issues and information that may be deemed necessary. The report shall be signed off by a professionally registered Geotechnical Engineer. The reports are submitted in electronic and hard copy formats.

1.4 Specialist Engineering Services and Studies

The *Consultant's* duties include the following but not limited to:

- Perform investigations and site feasibility analysis and studies for purposes of evaluating the suitability of site for the proposed works.
- Perform assessments of existing infrastructural elements with the objective to integrate existing

works with proposed new works. The *Consultant* performs modification/alteration designs, as necessary. The assessment scope includes the following elements but not limited to structural steelwork, masonry works, concrete works, sheeting, plumbing and drainage. The assessment activities may include the following but not limited to:

- Visual inspections
- Laboratory testing (i.e., extent of attack on structural elements).
- Non-destructive testing i.e:
  - 3D scan or shape survey using a laser scan.
  - Video inspections
  - Electromagnetic cover meter
  - Digi-Schmidt Hammer test etc.
- Destructive testing i.e:
  - Concrete core samples
  - Chemical tests
  - Carbonation depth tests

1.5 Architechural Design

- Perform architectural designs for new building structures. The building structures include the following but not limited to:
  - Security guardhouse
  - Machine/equipment room
- Perform building alterations or refurbishment designs, as necessary

2 Civil and Structural design scope

The *Consultant* performs the structural designs for all items forming part of the project scope i.e. foundations, slabs, plinths, walls, beams, columns, struts and ties, connections etc. The *Consultant* performs the civil designs for all items forming part of the scope i.e. stormwater, sewer, roads. The design scope includes the following but not limited to:

a. Security Guardhouse

- The Consultant perform building design and all related items forming part of the guardhouse facility.Perform related civil designs for all items forming part of the guardhouse facility i.e. surface and subsurface stormwater drainage, sanitary drainage, trenches and tunnels, servitudes etc.

2.1.1.1 Security Guardhouse Design Concept

The proposed site location of the security guardhouse is indicated in Figure 2. The *Consultant* notes that there is an existing temporary guardhouse at the proposed site. The *Consultant*

evaluates the suitability of the proposed site, as detailed. The *Consultant* identifies an alternative site, if deemed necessary.

2.1.2 Figure 2: : Proposed Site Location of the Security Guardhouse

The building consists of a reinforced concrete framed structure with a brick infill. The facility to be designed to accommodate at least 2 persons. The building dimensions shall be no less than 12m^2 and the room height shall be no less than 2.4m [SANS 10400 - C]. The ground slab or surface bed to be reinforced concrete and designed to carry all imposed loads. The slab thickness shall also suit the loadings and their usage. Building walls to be double brick, 220 mm (min) thick. Portholes to be provided in walling system to enable security personnel stationed in the guardhouse facility to return fire if necessary. Bullet resistant glass/glazing to be provided for the facility. The roof system and glazing to provide protection against

7.62mm x 51mm (R1/.308). Glazing to comply with SANS 1263 – 3 requirements etc. A solid security access door to be provided for the guardhouse facility. Solid doors to also be provided for interior doors. The building is fitted with a kitchenette and 1-off ablution. The kitchenette is equipped with a wash basin/sink. Wastewater and sewer to drain into the existing septic tank sited approximately ~30m from the proposed guardhouse site, or other proposed. The design of the guardhouse is carried out in accordance with the Kusile Power Station Conceptual Architechural Design Specifications for Structures and Other Buildings, 203-1239 as well as the Standard for Bullet-resistant Guard Huts, 240-912523315. The building architecture to align to the existing station building designs. The designs to integrate to the existing station systems and infrastructure, as far as possible.

The *Consultant* makes provision for the listed building services but not limited to:

- Fire & Potable water supply and distribution
- Sewer disposal

- Small power and lighting (interior and exterior)
- Earthing and lightning protection
- Access control
- Fire protection and detection,
- Heating, ventilation, and air-conditioning
- Camera surveillance
- IT infrastructure

Eskom's Corporate Identity Specifications: ESK AM AAA 1, Corporate Identity Manual and Interior specifications for Eskom: ESK PB AAQ 3, shall be adhered to for all designs to ensure that all architectural components are compliant to Eskom's corporate requirement.

The *Consultant* caters for stormwater drainage in his designs

b. Ablution Facility

- The *Consultant* performs a detailed inspection of the existing septic tank system to ascertain its adequacy for long term use and to confirm the need for alteration, repair or replacement. if deemed necessary, the *Consultant* performs a re-design of the septic tank system. The *Consultant* performs a feasibility study, to confirm the suitability of an alternative site for a new tank installation.
- Perform a redesign of the ablution block. The facility design adheres to the requirements of industry guidelines and norms. The design scope includes all associated facility services i.e. sanitary drainage
- Perform related civil and structural designs for all items forming part of the ablution facility and its associated drainage system

2.1.2.1 Ablution Block Design Concept

The *Consultant* re-designs the existing ablution block in accordance with SANS 10400:P,Q ,S, the Kusile Power Station Conceptual Architechural Design Specifications for Structures and Other Buildings, 203-1239. The building architecture to align to the existing station building designs. The designs to integrate to the existing station systems and infrastructure, as far as possible. The total occupancy number of the area can be assumed to be 60 people (30 females and 30 males). The drainage installations shall be so designed and constructed that such that an adequate number of sanitary fixtures is provided in relation to the population and class of occupancy of the building area. As a minimum, the required sanitary fixtures for female and male personnel include the following:

- Female Ablution – 3 toilet pans, 2 wash-hand basins
- Male Ablution – 1 toilet pan, 2 urinals, 2 wash-hand basin

Adequate access shall also be made for the inspection, cleaning and maintenance of drain and sewer installations.

c. Machinery/Equipment Housings

- Perform structural design of machine housing/s to house/store pumps, motors, electrical boards equipment etc.
- Perform related civil designs for all items forming part of the machine/equipment rooms i.e. fencing, stormwater drainage, trenches, tunnels/servitudes etc.

2.1.2.2 Equipment Room Concept

The equipment housing design to align to relevant SANS standards and Eskom specification documents i.e. 240-56355541: C&I Computer & Equipment Rooms Civil and General Building Requirements Guideline and 240-56355731: Environmental Conditions for Process Control Equipment Used at Power Stations Standard.

d. Spill Containments

- Perform design for spill containment systems and their associated drainage.

2.1.2.3 Spill containment concept

The bund designs shall align to the requirements and specifications set out in SANS 10131. The bunds will be adequately sized to accommodate the full tank volumes plus 10%. The volumetric capacity of the bunded area shall not be less than the greatest volume of oil product that can be released form the largest sized tank in the containment area. The bund shall be impermeable to liquids and its height shall be restricted to 1.8m.

Drainage shall be provided within the bunded area for drainage of rainwater via a valve (or similar). For tanks exceeding a volume of 1000L, a drain sump with an oil water separator shall be provided inside the bunded area. The spill containment designs caters for the following but not limited to access systems and platforms

e. HVAC, C&I, Potable & Fire Water Infrastructure

- Perform designs for equipment foundations and support structures for tank systems, pump machinery, access platforms, piping and electrical equipment, servitudes i.e., distribution boards, junction boxes, trunking, cable trays/racking, cable tunnels etc. The *Consultant* to design all civil and structural elements associated with the aforementioned systems

f. General

- Perform surveying and setting out activities for all items forming part of the project scope
- Perform temporary support structure designs, as necessary
- Perform design of servitudes, tunnels, trenches, manhole structures etc.

g. Specifications & Standards for Civil & Structural Works

The scope of *service* shall be performed in accordance with the South African National Standards, prescribed Eskom standards and any other applicable codes of practice, specifications, and regulations. Reference to standards or manuals, whether such reference is specific or by implication, shall mean the latest standard, manual, or code in effect at the time of the contract award. The *Consultant* adheres to the normative references in section 2.1.4. If there is any contradiction within the codes and standards, the *Consultant* liaises with the Employer for clarification. The *Consultant* adheres to the latest issue of the listed standards/codes/publications. The *Consultant* notes that the provided lists are not all-inclusive and does not relieve the *Consultant* from complying with all applicable codes.

h. Design Criteria

The general basis of structural design utilizes the partial factor limit states approach to achieve appropriate levels of reliability for the design of safe and sound structures. The requirements and procedures are formulated to achieve acceptable levels of safety, serviceability and durability of structures within the scope of the application of the SANS 10160 series.

The design of foundations, steel and concrete structures and their component parts are based on and conform to the following standards, or their equivalent:

- **Foundations:**

  The design of foundations are in accordance with SANS 10161, 10400-H etc.

- **Concrete:**

  Designs are in accordance with SANS 10100 series and the Kusile Power Station Specification for Structural Concrete.

- **Steel:**

  Designs are in accordance with SANS 10162, Red Book (2016), 240- 56364545 – Structural Design & Engineering Standard, 203-1239 Kusile Architectural Specification etc.

- **Masonry:**

  Designs are in accordance with the requirements of SANS 10164, 203-1239 Kusile Architectural Specification etc.

- **Sewer Infrastructure**

  The *Consultant* complies with the requirements of SANS 791, SANS 677, SANS 10400 P & Q, 240- 85549846 Standard for Design of Drainage and Sewerage Infrastructure, as relevant

- **Corrosion protection**

  All corrosion protection conforms to the requirements of 240-106365693 'Standard for the External Corrosion Protection of Plant, Equipment and Associated Piping with Coatings' as a minimum

- **Waterproofing**

Damp proofing and waterproofing comply with the specifications and requirements given. Waterproofing materials are applied in accordance with SANS 10021.

- **Cladding and sheeting**

The *Consultant* adheres to the latest issue of SANS 517, SANS 10237 etc

3 Electrical systems design scope

The *Consultant's* duties include the following:

- Perform design of power distribution systems covering all scope elements i.e. mechanical & electrical and C&I components etc.
- Cater for uninterrupted power supply (UPS) to support the facility area
- Perform designs for small power and lighting for the following building areas but not limited to:
  - Existing warehouse facility
  - Security guardhouse
  - Ablution block
  - Machine and equipment housings

The *Consultant* notes that HPS High Bay lighting is currently installed in the warehouse building. The *Consultant* redesigns the lighting to LED High Bay lighting – the design must clearly indicate compliance with interior lighting standards. The *Consultant* designs high mast lighting for the warehouse vicinity need for additional High mast lights outside the building and designs must show sufficient project of light

Electrical Concept Design:

The following are estimated loads that will be supplied from the mini substation.

a) High mast lighting (assuming six 1000W lights on each) – total load - 20kW
b) Interior lighting load totals approximately 50kW
c) Crane l oad totals approximately 200kW

d) 2-off fire protection pump motors ~180kW.

e) Power provision for MW Motors preservation (2kW being the highest space heater for MV Motors to be powered continuously while the motors are still stored). Looking at powering up to 50 Motors space heaters which total up to 100kW.

f) Provision for new distribution boards to be installed will be for 200kW which will be able to cater for:

- Welding plugs
- CBMS
- HVAC
- Other small power requirements

The total estimated load for all the systems requiring power supply is approximately 750kW. The existing mini-sub is rated 1000kVA/850kW. Thus, the existing mini-sub will be sufficient for the

expected load requirements at Ex-GE Stores.

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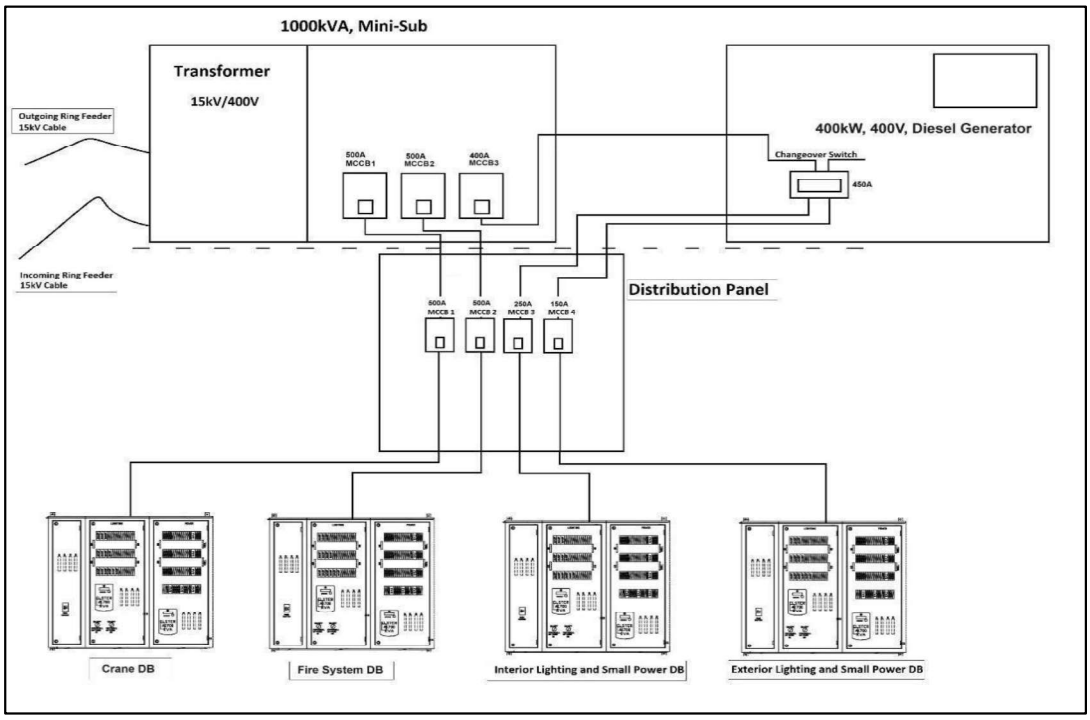


3.1.1 Figure 3: Power Supply with Essential Loads Back-up

The electrical loads will be distributed separately as shown in figure 5 above, where the Crane and Fire Protection system will have a dedicated DB, Small Power for welding plugs, MV Motors Space heaters (preservation) will be powered from the lighting and small power DBs.

There is also provision made for a backup system in cases where the main supply would be affected either byfaults along the line, power source, mini-sub, etc. The use of a 400kW Generator is proposed, to cater for essential loads i.e. lighting and small power (external and internal) and CBMS (see Figure3).

3.1.2 Distribution Boards

The *Consultant* notes the following:

a) Crane DB must have an incomer MCCB rated at 500A, to cater for 170kW Crane motor plus five (5) 3kW Crane Drive motors.

b) Fire System DB must have an incomer MCCB rated at 500A, to cater for two (2) 90kW Fire Motors.

c) Interior Lighting and Small Power DB must have an incomer MCCB rated at 250A to cater for all existing small power loads including any future additions.

d) Exterior Lighting and Small Power DB must have an incomer MCCB rated at 150A to cater for all existing small power loads including any future additions.

3.1.3 Cables

From Destination	To Destination	Cables Size	Cable Length (m)
500A MCCB 1 in Mini-Sub	500A MCCB 1 in Main Distribution Panel	2x 120mm^2, 1000V, 4-Core, Flexible Cable	30
500A MCCB 2 in Mini-Sub	500A MCCB 2 in Main Distribution Panel	2x 120mm^2, 1000V, 4-Core, Flexible Cable	30
400A MCCB 3 In the Mini- Sub	450A Changeover switch in the Generator	2x 95mm^2, 1000V, 4-Core, Flexible Cable	10
450A Changeover switch in the Generator	250A MCCB 3 in Main Distribution Panel	95 mm^2, 1000V, 4-Core, Flexible Cable	30
450A Changeover switch in the Generator	150A MCCB 4 in Main Distribution Panel	50 mm^2, 1000V, 4-Core, Flexible Cable	30
500A MCCB 1 in Main Distribution Panel	Crane CB 500A MCCB	2x 120mm^2, 1000V, 4-Core, Flexible Cable	100
500A MCCB 2 in Main Distribution Panel	Fire System DB 500A MCCB	2x 120mm^2, 1000V, 4-Core, Flexible Cable	150
250A MCCB 3 in Main Distribution Panel	Interior Lighting and Small Power DB 250A MCCB	95 mm^2, 1000V, 4-Core, Flexible Cable	250
150A MCCB 4 in Main Distribution Panel	Exterior Lighting and Small Power DB 150A MCCB	50 mm^2, 1000V, 4-Core, Flexible Cable	250

Routing of cables shall be as follows:

a) Cables from the Mini-Sub to the Main Distribution Board must be routed underground through cables sleeves,

b) Cables from the Mini-Sub to the Diesel Generator must be routed underground through the cable sleeves.

c) Cable from the Diesel Generator to the Main Distribution Board must be routed through the cable sleeves.

d) All Cables from the Main Distribution Board to other Distribution Board must be routed to cable rack system.

3.1.4 Earthing

Kusile Power Station has an earth mat that covers the whole station. Earthing for the warehouse must be tapped from the electric fence earthing as it is connected directly from the station earth mat. For functional earth, earth must be connected to the Mini-sub earth.All equipment such as motors, pumps, tanks etc. must be connected to the earth mat.

3.1.5 Uninterrupted Power Supply

A 230Vac, 5kVA Uninterrupted Power Supply is proposed for tor the warehouse area. This is to be installed in parallel with the power cable to the CBMS from the Interior Lighting and Small Power DB to ensure consistent supply of power to the CBMS.

4 Wet services design scope

The *Consultant's* duties include the design of potable and fire water supply and distribution systems to support the listed areas. It is proposed that the water supplies are terminated from the existing permanent infrastructure.

- Warehouse facility
- Security guardhouse
- Ablution block
- Machinery housings

a. Fire Protection Design Scope

i. The *Consultant* to Perform a Fire Risk Assessment (FRA) of the listed building areas, in accordance with the relevant Eskom Fire Protection Standards and SANS Codes.

ii. Based on the outcome for the FRA, perform the detail design of the required Fire Protection Systems applicable to the above listed areas etc.

iii. For all the above, the *Consultant* is responsible to design the potable water supply system to supply the fire protection system as per the chosen design.

iv. Care should be taken for interfacing systems such as HVAC and fire detection systems.

b. Potable Water System Design

The *Consultant* performs thedesign for thepotable water supply and distribution systems. An occupancy number of 60 personnel is assumed for the warehouse facility. It is assumed that two (2) personnel will occupy the guardhouse.

The scope includes the following but not limited to:

i. Potable water tap off from the nearest existing potable water line
ii. Potable water distribution to all applicable areas
iii. Hot water reticulation for all applicable areas

5 Heating, Ventilation and Air Conditioning system (HVAC) design scope

The *Consultant* shall design the HVAC systems within the scope of services. All items of works are included as part of the design i.e. civil, electrical, mechanical, control and instrumentation. The system design is to achieve the following but not limited to the following:

- To control environmental conditions within building structures for personnel comfort
- To control environmental conditions in building structures for correct operation and protection of equipment/plant/systems etc.
- To air pressurize building structures so as to improve indoor air quality by preventing infiltration of outdoor pollutants and contaminants including maintaining fire and smoke control etc.
- To supply fresh air and maintain the minimum air changes per hour
- To provide appropriate filtration etc.

5.1 Design Specification

The areas requiring HVAC systems include the following but not limited to:

- Warehouse storage area
- Office spaces
- Ablution facility
- Guardhouse facility
- Equipment rooms/housings

The indoor conditions are designed to be as followed:

Description	Indoor Temperatures	Relative Humidity	Pressurization Requirements
1. Offices	22°C±2°C	The relative humidity is to be controlled per ASHRAE 55: Thermal Environmental Conditions for Human Occupancy (latest edition).	Positive pressure (minimum positive pressure of 5Pa with all doors closed) with 2 ACH
2. Open storage area	6°C above ambient	Not Controlled	Slightly positive pressure with 10 ACH
3. Ablution facilities	Natural ventilated through openable windows	Not Controlled	Slightly negative pressure with 10 ACH
4. Server room	22°C±2°C	50%±10%	Positive pressure (minimum positive pressure of 5 Pa with all doors closed) with 2 ACH

I. Offices

The offices are currently equipped with split air conditioning without any fresh make-up. It is proposed that the existing units be replaced with a new air conditioning system. The new air conditioning system to provide filtered air from the outside at two air changes per hour.

II. Open storage area

The storage area is approximately 23120 m^2 and is currently equipped with multiple wind turbine roof ventilators installed at roof ridge level, without provisions for make-up air from the outside.

Storage areas are natural or mechanical ventilated based on their classification in terms of SANS 10400 (National Building Regulations). If mechanical ventilation is proposed, the criteria of ten air changes per hour to apply, as a minimum. It is proposed that the storage area ventilation be upgraded with wall- mounted louvres with primary filters for fresh air intakes, and multiple wind turbine roof ventilators will provide extraction.

SANS 10400-T: States that any room in which the floor area is more than 500 m^2 must be provided with mechanical ventilation or natural smoke ventilation. Smoke Roof ventilators will be provided to exhaust the smoke from the storage area during fire conditions. The smoke ventilation system will be interfaced with the fire detection system.

III. Sever Rooms

The HVAC requirements for server rooms are described in Eskom Server Rooms and Data Centres Standard (32-894). The server room is to be provided with 2-off split type cooling only air conditioning units on a running and standby mode together with a matching fresh air unit for pressurization purposes.

IV. Pump house

The HVAC requirements for pumphouses are mechanical ventilation with air extraction.

5.2 HVAC consultant requirements

a) The Consultant must provide the complete mechanical, civil, electrical and C&I designs with relation to the HVAC systems.

b) The Consultant must design the system as per SANS 10400 and it must adhere to the standards as per Table 1

c) It is recommended that a ducted HVAC system is designed and not necessarily a single ducted system to service the entire building. Temperature control must be provided for individual rooms.

d) The HVAC design must take into account the summer and winter climate conditions of the eMalahleni area.

e) A dedicated HVAC plant room must be designed which consists of the HVAC air handling units, condenser units, Motor Control Centre, and Local Control Panels. This must be serviced by the HVAC system to maintain the correct room temperature.

f) Redundancy must be provided for the major HVAC equipment as well as electrical equipment so that there would be easy access during maintenance.

g) Accessibility to HVAC equipment such as filters, valves, motors, and control boxes etc must be designed with due consideration to easy access.

h) A smoke extraction system must be provided for in the design.

i) The HVAC systems are to be interfaced with the fire protection system and CBMS.

j) The consultant must provide the following documentation on the HVAC systems during their submission.

- Detailed mechanical design report indicating calculations and the design methodology regarding selection of equipment such as for fans, dampers, valves etc.
- Heat load calculations including software simulations.
- Detailed Bill of Quantities for HVAC system
- Detailed and dimensioned drawings
- Air balancing diagrams for each zone/room
- Spares lists and confirmation of availability of spares with lead times.

k) The designs are subject to review of the Eskom engineering team.

6 Consolidated Building Management Systems (CBMS) design *scope*

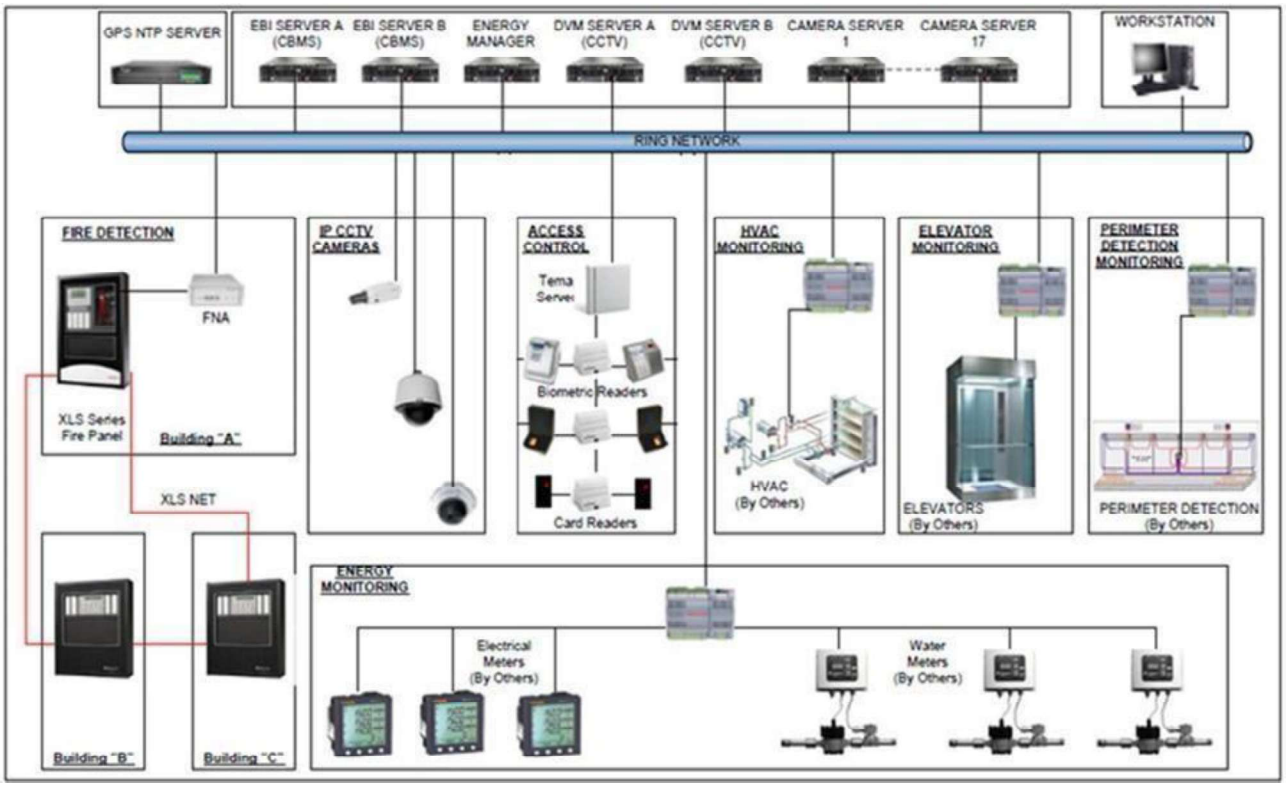
The scope of design for the Building Management System to cover the following areas but not limited to the warehouse storage, office and server room areas, guardhouse facility, ablution block and machinery housings. The system design includes the following but not limited to:

- CCTV monitoring system
- Access control system
- Fire detection system
- Intrusion detection system
- UPS system for C&I equipment

The design scope includes integration to the existing

CBMS. The *Consultant's* duties include the following:

The *Consultant* to design a fire detection system, access control system, and CCTV system. The fire detection, access control, and CCTV systems shall be interfaced to the existing site consolidated building management system (CBMS) which is based on Honeywell Enterprise Building Integrator (EBI). All systems shall be provided with all necessary software, licensing, and configured parameters. Systems with periodic licenses are not recommended. Systems used for security shall comply with the requirements of the National Key Point ACT 102 of 1980. The following is a high level Kusile power station CBMS architecture:



6.1.1 Figure 4: Kusile CBMS High Level Architecture

The following are the minimum relevant standards applicable for designing the systems:

Table 3: C&I Standards

NFPA 72	National Fire Protection Association
SANS10139:2012	South African National Standards
BS5839	British Standards
EN54	European Norms
36-776 (Previously GGS 1426)	Environmental Conditions for Process Control Equipment Used At Power Stations
36-963	Alarm System Performance of Digital Control Systems Applied in Fossil Plants
39-60	Eskom Quality Requirement Standard
200-11757	Earthing and Lightning Protection
200-11764	Lighting and Small Power Installation
200-11768	Station Cabling and Racking Standard
GGS 0386	Requirements for Control and Power Cables for Power Stations
32-123	Emergency Planning Standard
240-64720986	Emergency Preparedness Public Address
	SYSTEM – FOR LARGE AREA DEPLOYMENT
ISO 7240 – 16&19	South African National Standard for Voice Alarm Systems
32-123	Emergency Planning Standard
SANS 2220-2	Access control systems Part 1 – Part 7
SANS 61000-1-2	Electromagnetic compatibility (EMC) Part 1-2
240-86738968	Specification for Integrated Security Alarm System for Protection of Eskom Installations and its Subsidiaries
240-55410927	Cyber security standard for Operational Technology
240 – 56872313	Radio Station Earthing and Bonding
240-70413291	Specification for Electrical Terminal Blocks
240-64636794	Standard for Wiring and Cable Marking in Substations
240-91190304	Specification for CCTV Surveillance with Intruder Detection

Fire detection

The system shall monitor all Fire Detection System components on a continuous basis for fire, smoke and fault conditions. Alarms shall be annunciate/indicated both audibly and visually. All fire and fault alarms, as well as a change in the status of any field device shall be recorded locally at the panel's logbook and also to the CBMS server. The panel displays shall indicate time, date, power status, and loop alarm status. For ease of maintenance and spares holding, the proposed fire detection systems shall use the same equipment as the existing fire detection system. The *Consultant* shall design, install, commission, and integrated a fire detection system into the existing fire detection system.

the existing fire detection system is controlled by one of the following types of fire detection control panels and fire network equipment:

a) Fire Control Panel (XLS-3000)
b) Fire Control Panel (XLS-120)
c) Fire Control Panel (XLS-140)
d) Fire Network Adapter (Q7055C1035)
e) Network Communication Module (NCM-F)

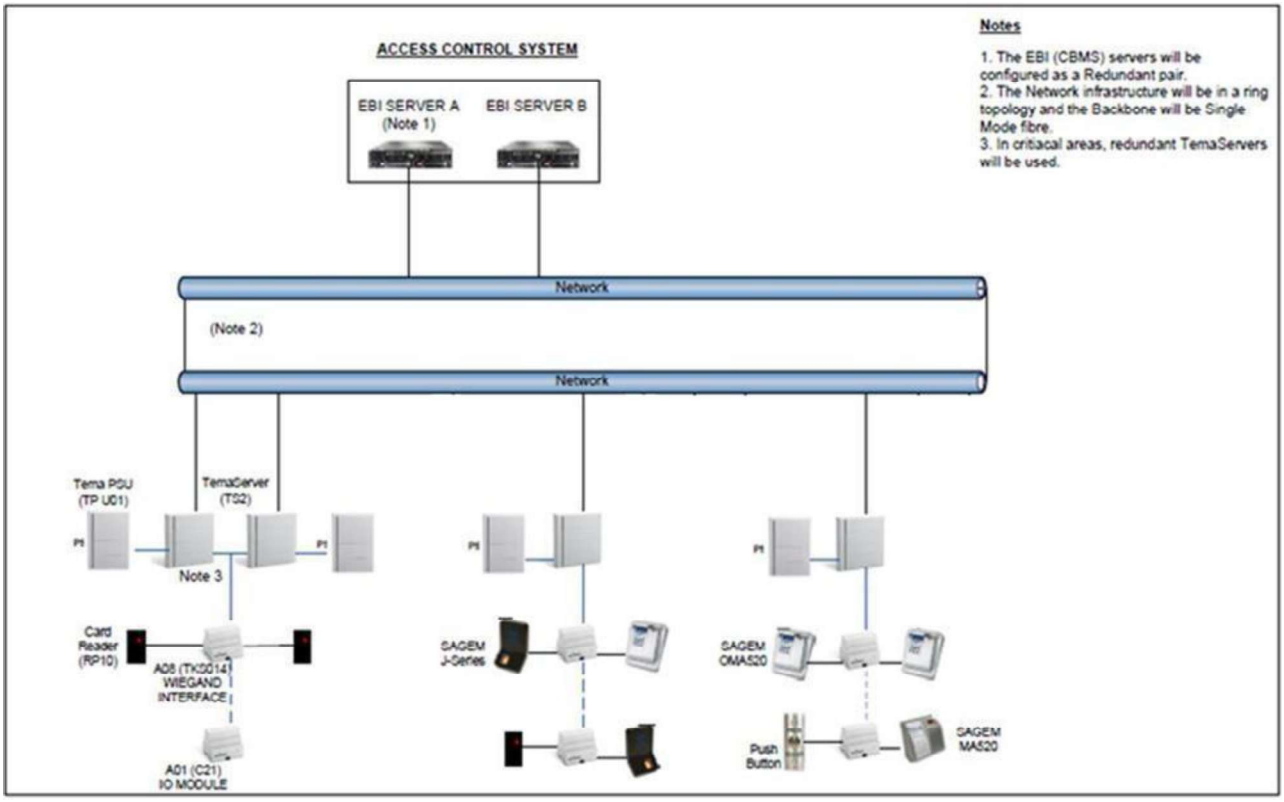
The existing fire detection system consists of the following field devices:

a) Intelligent photoelectric smoke detector (TC806B1076)
b) Intelligent Heat Detector (TC808B1041)
c) Intelligent Manual Pull Station (S464G1007)
d) Intelligent Supervised Control Module (TC810N1013)
e) Intelligent Relay Module (TC810R1024)

f) Intelligent Monitor Module (TC809A1059)
g) Intelligent Analog Input Module (TC809C1004)
h) Interface Module (TC841A1000)
i) Intelligent Fault Isolator Module (TC811A1006)
j) Galvanic Isolator (MTL5561)
k) Pressure Switch (EPS10-2)
l) Horn/Strobe (CHSR)
m) Remote Power Supply (HPF24S8E)
n) 2 Core SLC Cable
o) 2 Core 24 VDC Cable
p) 2 CORE (4-20) ma SIGNAL CABLE
q) 2 CORE NAC CABLE

6.1.2 Access Control

The use of access control systems is to enhance the access monitoring of sites, as well as data storage of access for litigation purposes. An access control system provides a means to restrict access in certain suites/facilities for operational requirements and management of entry/exit incidents within the site which can then be reviewed and analysed in detail. For ease of maintenance and spares holding, the proposed access control systems shall use the same equipment as the existing access control system. The following is the high level architecture for ACS:



6.1.3 Figure 5: High Level Architecture for ACS

The ACS comprises of redundant EBI servers, Temaline Access Control System and range of different hardware involved in the solution to prevent unauthorized access into restricted areas in the Kusile Power Station project. EBI system is a one-window, web-enabled system that allows the user to control everything on security systems. Built on Open standards EBI can easily integrate with other Honeywell open control system. The *Consultant* shall design, construct, and commission an access control system that is based on the Temaline access control system. The access control system shall be integrated in to the Kusile central system which is based on the Honeywell Enterprise Building Integrator (EBI) and fire detection system for the purpose of unlocking specific doors in case of fire alarm event. A suitable medium shall be utilised for integration the ACS into the site EBI which is based on an ethernet network.

The ACS will control all security gates, gate access, as well as the all door access in the building. All personnel working at the plant will be issued a proximity card. Access to the site or any controlled entry or exit will be allowed or disallowed according to rules set up within the Access Control System. Readers and door control mechanisms will be installed on building entrances, as well as specific rooms within the building. All the doors will have magnetic contact alarms to indicate when a door has been left open or opened without authority. This will give alarm / event in the control rooms.

The proposed ACS solutions shall consist of the following where required:

a) Temaline Controller (TS2)
b) Temaline Power Supply Unit (TP U01)
c) RTU/Lock Power Supply Unit
d) RTU-A08 (TK_S014)
e) RTU-A01 (TK_C21P)
f) Multi Technology Smart Card Readers (RS-10)
g) MorphoAcess Biometric Readers
h) Electromagnetic Door Locks
i) Egress Push Button
j) Magnetic Door Contacts
k) Break Glass Units

6.1.4 CCTV

The existing CCTV system is be based on Digital video manager (DVM) software for Video surveillance, real time monitoring and recording of events throughout the entire site. The system shall comply with the requirements of 240-91190304-Specification for CCTV Surveillance with Intruder Detection as a minimum. For ease of maintenance and spares holding, the proposed CCTV systems shall use the same equipment as the existing CCTV system.

Following are the main components of the existing CCTV system:

a) Fixed Indoor Network Cameras (Honeywell-HD4MDIPX)
b) Thermal Network Cameras for monitoring perimeter area (Axis-Q1921/E)
c) PTZ Cameras for Monitoring perimeter areas (Honeywell – HDZ302LIW)
d) Bullet IR Cameras for monitoring perimeter areas (Honeywell – HCD95534)
e) EBI Servers (DVM system is integrated with EBI.)
f) DVM Database & Camera Servers
g) Storage Devices
h) DVM software & license
i) DVM operator workstations

CCTV System is centrally monitored by Digital Video Manager (DVM) which is integrated with Enterprise Buildings Integrator (EBI). The *Consultant* shall design, construct, commission, and integrate the building CCTV system into the existing DVM and EBI systems and configure it for the following:

a) Intelligent recording
b) Standard Video Motion Detection
c) Video collection, storage, and retrieval
d) Advanced search capabilities
e) Video storage=
f) Digital signatures and audit trail
g) Multiple view
h) Sequence view

i) Intruder detection
j) Alarm monitors
k) Internet Explorer (IE) Clients
l) Allows you to simultaneously record and view live video from a camera and playback recorded video
m) Quality assurance of the image between the camera and the recording system
n) There is no quality degradation in recorded videos through time
o) The video recordings can be digitally signed for security purposes
p) Video images can be sent through the computer networking (LAN, WAN)

The *Consultant* shall make provision for expanding the DVM storage and additional software licences, EBI if required.

6.1.5 EPPA

The *Consultant* to design, install, commission an emergency preparedness public address system to meet the requirement of the EN54 for voice alarms. Only equipment certified under EN54 Standard by an authorized certification body may be proposed where applicable. The system shall be equipped with EN54 compliant stand-by batteries to cater for a minimum stand-by period of 24 hours and a continuous broadcast of 30 minutes at full power. The Eskom EMERGENCY PREPAREDNESS PUBLIC ADDRESS SYSTEM – FOR LARGE AREA DEPLOYMENT standard

shall be adhered. For ease of maintenance and spares holding, the proposed EPPA systems shall use the same equipment as the existing EPPA system.

The proposed system shall interface to the existing public address system which is based on the following equipment:

a) Public address and voice evacuation system (Ateis IDA8)

b) Touch screen console with microphone (Ateis PSS-AS)

c) Power amplifiers (Ateis DPAfour125 and DPAfour250))

d) Loudspeakers (Penton)

e) Strobe (Penton)

f) Battery Charger (Ateis Sonaes)

The system shall be capable of accommodating any external inputs from stand-alone panels such as fire detection and access control panels. The system shall also be capable of providing outputs to trigger indicating equipment such as buzzers and lights. The system shall have an Ethernet port for the purposes of connecting a service terminal as well as connection to a LAN port for remote access. The system shall be capable of logging a minimum of 10 000 event logs on a CF card in text format which can be accessed even after a total system failure, events shall be remotely accessible.

The system speakers shall meet the following requirements:

a) Ceiling-mount & Wall-mount speakers: 90dB - 94dB @ 1w @ 1m.

b) Projection speakers: 91dB - 97dB @ 1w @ 1m.

c) Horn speakers: 109dB @ 1w @ 1m.

d) Speaker cabling shall be a minimum PH120 class as per EN50200/SANS10139. All fire-rated speaker equipment must comply with EN54-54 specifications.

IT Infrastructure Design

The *Consultant* performs the IT infrastructure design associated with the project scope elements.

5.3 Engineering and the *Consultant's* design

5.3.1 Consultant's responsibility for his design

The *Consultant's* responsibilities include the following but not limited to:

a) The *Consultant* is mandated in terms of the Construction Regulations 2014: Duties of Designer, 6(1) g to fulfil the duties described therein. Any risks associated with the *Consultant's* design is highlighted to the *Employer* together with the mitigation measures

b) The *Consultant's* design is required to be in accordance with all National Standards and Specifications referenced in this scope document as well as the *Employer's* Standards.

c) The *Consultan*t assumes full design accountability and liability for his designs (temporary works included)

d) All designs, design reports and construction drawings prepared by the *Consultant* are signed off by an Architectural Professional (registered with SACAP) and Professional Engineers or Technologists (registered with ECSA), who take full professional accountability for the designs.

5.3.2 Procedure for Submission and Acceptance of *Consultant's* Design

The *Consultant* shall conduct design reviews in accordance with the *Employers* Design Review Procedure, 240-53113685 and participate in all reviews as specified by the *Employer.*

The *Consultant* notes that he is the Design Authority as defined in the *Employer's* Design Review Procedure for the project scope. The design authority remains responsible and accountable for the correctness of the design documents, irrespective of whether these documents have been reviewed by the *Employer*.

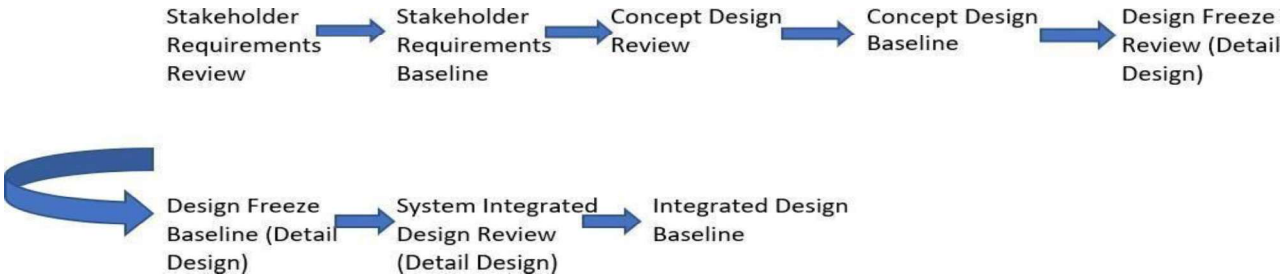
The following documentation review process is followed for submission of documents:

- The *Consultant* submits the documents to the *Project Manager* for review. The *Consultant* shall allow the *Project Manager* 21 days to review and respond to the *Consultant*'s document submission i.e., from time of receipt by the *Project Manager*

- The *Employer's* project team reviews the design documentation and submits all comments to the *Project Manager*. On receipt of the reviewed documentation, the *Consultant* makes any modifications requested *by the project team and resubmits the revised documents to the Project Manager within two (2) weeks of receipt. Queries regarding comments/changes made by the Employer's project team are addressed with the Project Manager prior re-submittal of documentation. Document re-submittals which have not included the comments identified, will be returned to the Consultant for correction. The Consultant shall re-issue the revised documentation incorporating all comments and details not included in the previous document issue, within 2 (two) working days of receipt.*

  The *Consultant* notes that no costs arising from any revisions, which are a result of the *Consultant's* omission, may be claimed from the *Employer*. This includes costs incurred by the *Consultant* in completing such designs and drawings

- The *Consultant* organises review sessions once all noted comments have been addressed and documents revised. If any further issues are found during the review process or further actions are required, the *Consultant* records all concerns and revises the documents accordingly. The *Consultant* compiles an end- of phase design review report and submits to the *Project Manager* for acceptance, upon completion of the review stage. The design review process follows the below process flow;



5.3.3 Change Management

Engineering design changes are performed in accordance to the latest revision of the Eskom Project Change Management Procedure [240-53114026]. The *Employer* ensures that *Consultant* is provided with latest revision of this procedure. Any uncertainty regarding this procedure should be clarified with the *Employer*.

5.3.4 Acceptance of the *Consultant's* Design

The *Consultant* implements the following for design acceptance:

a) The *Employer* accepts the *Consultant's* design upon completion of reviews by the *Employer's* project team.

b) The *Consultant* stamps, dates and signs his designs, to signify approval of his designs.

c) The *Consultant informs* the *Employer* in writing of any deviation in the *Consultant's* drawings, from the scope requirements.

6 Constraints on how the *Consultant* Provides the Services.

6.1 Management meetings

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

Title and purpose	Intervals	Location	Attendance by:
Project kick-off meeting	Once-off	Virtual meeting	Employer, Employer's engineering representatives and Design consultants
Project progress meeting	Monthly	Virtual meeting	Employer, Employer's engineering representatives and Design consultants
Risk register and compensation events	Bi-weekly	Virtual meeting	Employer, Employer's engineering representatives and Design consultants
Engineering design interface meetings – progress one engineering deliverables	Bi-weekly	Virtual meeting	Employer, Employer's engineering representatives and Design consultants
End of Phase review meetings: (Interim and final) – ascertain if all design requirements as set out in the scope of work are met .	Ad hoc basis as the design packages are completed, with the final Integrated design review once all the packages are complete.	Virtual meeting	Employer, Employer's engineering representatives and Design consultants

Meetings of a specialist nature may be convened. If not specified, the locations are to suit the parties concerned. Records of meetings are submitted to the *Employer's* agent by the person convening the meeting within five (5) 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

6.2 *Consultant's* key persons

The Principal *Consultant* shall submit a Personnel Schedule detailing Key Persons who will perform the Service. The service provider shall provide all data pertaining to his Key Persons including their qualifications, experience and estimated periods of engagement on the performance of the service.

Key persons shall have the necessary competencies and work experience necessary to perform the service. The services shall be performed by the personnel listed in the Personnel Schedule for the periods of time indicated therein. The *Consultant's* key persons become a contractual obligation upon contract award

Where the principal *Consultant* proposes to utilize a person/s not named in the Personnel Schedule, he shall submit the name, relevant qualifications and experience of the proposed replacement person to the Employer for approval.

The Principal *Consultant* may, subject to the *Employer's* approval, make adjustments to the data, as may be appropriate, to ensure the efficient performance of the services, provided that the adjustments will not cause payments to exceed any limit placed on the contract price. Any proposed change should be

handled formally through a written request to the *Employe*r for approval.

The project personnel required in the management and delivery of the project, include the following but not limited to:

- Project Manager registered with SACPCMP
- Architectural Professional professionally registered with the SACA, with 5 years related experience in architectural design. Resource has a formal engineering degree (or equivalent qualification) in the relevant discipline i.e. BSc/B.Tech (Architecture)/MArch,
- Structural Engineer/Technologist, professionally registered with ECSA with 5 years related experience. Resource has a formal engineering degree (or equivalent qualification) in the relevant engineering discipline
  i.e. BSc/BEng/BTech/Meng, with demonstrable experience in structural design
- Civil Engineer/Technologist, professionally registered with ECSA with ECSA with 5 years related experience. Resource has a formal engineering degree (or equivalent qualification) in the relevant engineering discipline
  i.e. BSc/BEng/BTech/Meng, with demonstrable experience in civil design
- Geotechnical Engineer, professionally registered with ECSA with 5 years related experience. Resource has a formal engineering degree (or equivalent qualification) in the relevant engineering discipline i.e. BSc/BEng/BTech/Meng, with demonstrable experience in conducting geotechnical site investigations and design
- Professional Land Surveyor professionally registered with the SAGC
- Electrical Engineer/ Technologist, professionally registered with ECSA with 5 years related experience. Resource has a formal engineering degree (or equivalent qualification) in the relevant engineering discipline
  i.e. BSc/BEng/BTech/Meng, with demonstrable experience in electrical system design
- Mechanical Engineer/ Technologist, professionally registered with ECSA with 5 years related experience in the following:
  - Heating, Ventilation and Air Conditioning Systems

- Wet services i.e., potable and fire systems

Resource has a formal engineering degree (or equivalent qualification) in the relevant engineering discipline i.e. BSc/BEng/BTech/Meng, with demonstrable experience in design of the aforementioned systems

- C&I Engineer/Technologist, professionally registered with ECSA with 5 years related design experience in the following:
  - Access control systems
  - Closed Circuit Television (CCTV)
  - Fire detection systems (SAQCC accreditation required)
  - Public address systems

- Draughts persons to produce mechanical/civil/structural/architectural/C&I drawing designs, with 5 years draughting experience. Resource to have at least a Grade 12 qualification or equivalent.
- Planner with 3 years related experience in a technical field. Resource to have a Grade 12 qualification or equivalent
- Professional quantity surveying service provider/s, in good standing with SACQSP. Resource to have 5 years working experience in engineering projects

The *Consultant* notes that all project resources shall be compliant in terms of the Construction Regulation (2014) pertaining to competency, skills, responsibility and professional registration.

6.3 Site hours

The *Consultant* notes the Employer's working hours. The *Consultant* takes due cognizance of the *Employer's* working hours whilst providing the service.

Monday – Thursdays: 07:00am – 16:15pm
Fridays: 07:00am – 12:00pm

Documentation control and retention

6.1.6 Documentation requirements

The *Consultant* ensures that the Technical Documents and Records Management Work Instruction, [240- 76992014] is adhered to for all documentation requirements. The *Consultant* is responsible for the compilation and the supply of all documentation during the various project stages.For consistency, it is important that all documents used within the project follow the same layout, style and formatting as described in the Technical Documents and Records Management Work Instruction.

Each revision of a document or drawing shall be accompanied with a list of comments made by the *Employer* on previous revisions, if applicable. The responses/corrective actions taken by the *Consultant* to be recorded in a revision table contained in each drawing/document.Documents and drawings to indicate the *Employer's* unique identification number as allocated by the *Employer*. The *Consultant* may also have his own internal document or drawing number on the document or drawing.

6.1.7 Document Identification

The *Consultant* shall ensure that documents have the following minimum attributes on the cover page:

a) Document title
b) Document unique identification number (Eskom number)
c) *Consultant* document number, if applicable
d) Document status

e) Revision number
f) Document type
g) Document revision table/history
h) Page number on the footer
i) Document author/authorizer
j) Document originator

The following additional attributes are important for technical documents:

a) Package/system name/sub-system name
b) Unit number
c) *Consultant* name
d) Contract number
e) Plant identification codes

Format and Layout of Documents

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

6.1.8 Layout and Typography

Every document should comply with the following font specifications:

a) Font Colour: Black
b) Main Headings Font Type: Arial, Bold, Capital Letters
c) Main Heading Font Size: 12pt
d) Subheadings Font Type: Arial, Bold, Title Case
e) Subheadings Font Size: 11pt
f) Body Font Type: Arial, Sentence Case i.e., only the first letter of the first word is a capitalletter.
g) Body Text Font size: 11pt
h) Line Spacing: 1.5 line spacing.

i) Margins: Standard
j) Alignment: Full justification to be used
k) Paragraphing: One line skip between paragraphs
l) Pagination: Centred page numbers (about 0.5 inches from bottom)
m) Indentations: Standard tab for all paragraphs (about 0.4 to 0.5 inches)

6.1.9 Document Headers

The header should include the project name, document title, document number, revision numberand page number.

6.1.10 Naming of files

The *Consultant* complies with the Eskom standard for naming documentation files. The standard is as follows:

For documents that have an approval date and signature; (YYYYMMDD_DocType_DocumentTitle_UniqueIdentifier_Revision.FileExtention)

For documents that do not necessarily require the 'Approved Date' and 'Revision & Versioning', use the date of update: (YYYYMMDD_DocType_DocumentTitle_UniqueIdentifier_Revision.FileExtention)

6.1.11 Document Submissions

The *Consultant's* program allows a minimum of 21 days for mailing, processing, and review of drawings and data by the *Employer*. All documents and records must be submitted and managed according to the Project/Plant Specific Technical Document and Records Management Procedure, 240-76992014 as well as the Generation (Gx) Projects Documentation Deliverable Requirements Specification,240-65459834. The *Employer* shall ensure that the *Consultant* is provided with the latest revisions of the mentioned documents.

All documentation submitted by the Consultant is accompanied by a transmittal note.

6.1.12 Information Requirements

The *Employer* requires information and data from the *Consultant* for management and execution of the Contract as well as the operation, maintenance, and support of the *works*. The *Consultant* to supply all information required in terms of the Contract including all information necessary for:

a) Design reviews and interface management of the *works*,

b) Quality assurance and control,

c) Operations, maintenance, training etc.

The scope of supply of information from the *Consultant*, to include the following but not limited to:

6.1.13 Table 4: Typical Document Requirement List (As-built) (where applicable)

Document Group	Description of document type (includes information data sets)
General	Equipment arrangement drawings Piping & Instrument Diagrams (P&ID's) 3D model Equipment list Isometric Drawings Valve list Pipeline list Hanger list Equipment specifications & data sheets Drawings and data for all equipment and material Installation, Operation, and Maintenance (IOM) Manuals
Civils & Structures	Site layouts Architectural drawings Structural drawings Drainage layouts Foundation drawings Access platforms Geotechnical report Survey report Design reports Assessment reports
Operations	Operating procedure Maintenance procedures and schedules Operating and maintenance manuals Etc.

Document Group	Description of document type (includes information data sets)
Logistic Support	Maintenance concept Plant maintenance documentation ISI plan/program Spare parts assessment Plant RAM analysis Equipment access and removal paths assessment Fault finding diagrams Etc.
Training	Training plan Training manuals and instructions Etc.
Safety & Protection	Fire hazard analysis Waste management plan Etc.
Design Analyses	Reliability model and analysis Air flow analysis and schematics Heat load calculations HVAC equipment sizing calculations Transient / Transition Analysis Flow dynamics analysis Thermo-hydraulic analysis Pipe Stress Analysis Maintainability analysis FMECA / FMEA analysis HAZOP analysis 3D model interference checks , Etc

Document Group	Description of document type (includes information data sets)
Electrical	Motor list Electrical load list Circuit list Raceway list Single line diagram Protection schematic diagram Electrical load flow and fault studies report Cable block diagrams Cabling routing and cable racking layout diagrams Cable termination diagrams EMC and earthing standards report Earthing layout drawings Lighting layout drawings Design reports Etc.
C&I	Alarm and set-point schedule Instrument schedule Instrument data sheets Mechanical hook-up drawings Electrical hook-up drawings Cable Schedule Termination Schedules Junction Box GA and Internal Layout Junction Box and Instrument location drawings Instrument Stand GA Maintenance Manuals and procedures Operating and Control Philosophies Functional Logic diagrams Field device calibration certificates Level measurement installation report

In addition to the official documentation submittals listed, the *Consultant* shall provide additional information for review and design coordination as requested by the *Employer* from time to time.

The *Consultant* shall use the *Employer's* SmartPlant Environment and all design tools as the delivery mechanism for all project data and document deliverables. The EDMS and design tools shall be provided to the *Consultant* pre-configured based on *Employer's* data handover requirements. Any project data and document deliverables not generated from design tools provided by the *Employer* shall be supplied in a format specified by the *Employer*.

6.1.14 Drawings

The creation, issuing and control of all Engineering Drawings shall be in accordance to the latest revision of the Engineering Drawing Standard, 240-86973501 - to be supplied as part of the enquiry documents. Drawings issued to the *Employer* will be a minimum of one hardcopy and an electronic copy. The *Consultant* is required to submit drawings electronically in both native CADD format and PDF format. Drawings issued to the *Employer* may not be "Right Protected" or encrypted.

6.1.15 Retention of documents

The *Consultant* retains copies of drawings, specifications, reports and other documents which record the *service*s for a minimum period of five (5) years.

6.1.16 The Parties use of material provided by the *Consultant*

The *Consultant* notes that all his design data, that is presented to the *Employer* in relation to the *service,* become the property of the *Employer*. The *Employer* has total rights to use the *Consultant's* designs, as the *Employer* requires i.e., construction, refurbishment, repair, maintenance etc.

Other Requirements of the *Consultant's* Design

8.1.1 Construction & Commissioning Monitoring

Construction & Commissioning Monitoring Including Engineering Support

- The *Consultant* provides construction and commissioning monitoring *services* in accordance with Level 3 of the ECSA Guideline Scope of Services and Professional Fees for Registered Persons [Engineering Profession Act, 46 of 2000]. The *service* includes the provision of on-site personnel during construction and commissioning activities, as deemed necessary by the *Consultant*. These services shall be required for the duration of the construction and commissioning works. The duties of the *Consultant* include the following but not limited to:

- Maintain a full-time presence on site for purposes of performing the service. The *Consultant* makes available all resources necessary to conduct the service
- Perform technical oversight and assurance i.e., provide design/technical clarifications and support

including but not limited to the review of construction work procedures, repair methodologies, quality control plans, material samples and/or construction material, survey results, requests for information, concessions, data books etc. The *Consultant* attends technical meetings and provides input to Engineering Changes/Modifications and Engineering Responses

- Respond to technical queries raised by executing contractor/s during construction and commissioning execution
- Provide the executing contractor with updated design documentation etc. where changes to the design/s are required
- Attend site meetings (technical, quality assurance, construction progress)
- Management of project interfaces with other discipline engineers, construction contractor etc.

- The *Consultant* performs inspection and testing activities, other than on site, of materials and plant, including inspection and testing during manufacture.
- If required, the *Consultant* conducts follow up geotechnical studies to confirm the current site conditions
- The *Consultant* co-ordinates and monitors rectification of defects

6.1.17 Functional and Value-Add Design Changes

Proposed design changes are performed prior start of the *works*, by the *Consultant*. The design changes are classified as "Functional" or "Value-Add" changes. Functional changes are driven by changes to design functionality to address design flaws, omissions and/or deficiencies. Value-add changes primarily focus on cost and time reductions through design efficiency. Engineering design changes that arise during construction are catered for separately by the *Consultant*.

The *Consultant* makes provision for a minimum of 200 hours of Engineering Design Support and 150 hours for Draughtsperson Support for "Functional Changes" as defined above. These hours will be used on an as-required basis based on the outcome of the design review of existing design data. The *Consultant* obtains approval from the *Employer* before making use of the allocated hours. These hours are over and above the hours provided for by the *Consultant* for changes required during construction as a result of contractor queries etc.

The *Consultant* makes provision for a minimum of 200 hours of Engineering Design Support and Draughtsperson Support for "Value-Add Changes" as defined above. These hours will be used on an as-required basis based on the outcome of the design reviews. The *Consultant* obtains approval from the *Employer* before making use of the allocated hours. These hours are over and above the hours provided for by the contractor for changes required during construction as a result of contractor queries etc.

The *Consultant* provides motivations, in the form of a Technical Report, any proposed engineering design modifications, as well as the time and cost implications of such changes. Only changes that will prohibit the *Consultant* from issuing Statutory Certification and/or Completion Certificates, changes that impact execution of the works or changes that will have significant value-add impact for the *Employer*, will be considered for acceptance by the *Employer*.

In addition, the *Consultant's* duties include the following:

- Undertake duties resulting from project scope changes, alterations and/or instructions by the *Client*, requiring the *Consultant* to advise, review, adapt and/or alter designs and/or other documentation of the project scope. This is applicable for all works forming part of the project scope

- All designs, design reports and construction drawings prepared by the *Consultant* are signed off by a professionally registered Architect, Engineer or Technologists who take full professional accountability for their designs.

6.1.18 As-built Drawings and Documentation

The *Consultant* shall manage and prepare record drawings/as-built drawings and documents, related to designs done by others and/or related to alterations and additions of existing works. The *Consultant* is required to manage and complete all drawings forming part of the project scope i.e. Architectural, Civil & Structural, Mechanical and C&I drawings. The designs to embody all modifications made during construction. The *Consultant* notes that drawings issued to the *Employer* will be a minimum of one hardcopy and an electronic copy. The *Consultant* is required to submit drawings electronically in both native CADD format and PDF format. Drawings issued to the *Employer* may not be "Right Protected" or encrypted. The *Consultant also* notes that the design DGN files will be issued by the Employer at contract award stage.

6.1.19 Operating Manuals and Maintenance Schedules

Where required, The *Consultant* shall prepare and submit operating and maintenance manuals (O&M) for plant, equipment, systems and installation items under this contract. The manuals shall provide a detailed record of the safe operation and maintenance of the items. The *Consultant* submits the documentation to the *Employer* for review and acceptance. The *Consultant* submits the O&M manuals prior undertaking test and commissioning activities.

The manuals shall provide comprehensive information on the following but not limited to:

a) Equipment technical data
b) Detailed drawings of equipment items
c) Operating procedure of equipment items
d) Prescribed maintenance schedule or routine maintenance procedures/instructions per manufacturer requirements
e) Commissioning procedures
f) Preservation and storage requirements

6.1.20 Statutory Certification

The *Consultant* issues statutory certification and certificates of compliance for new works or portions of works forming part of the scope of *services*. The *Consultant* ensures that any work approved or certified by them, has been reviewed or inspected to the extent necessary to confirm the correctness of the approval or certification.

Furthermore, the *Consultant* issues statutory certification for structural, fire protection and electrical systems and any other applicable systems or components forming part of the works, to certify that the installation, erection or construction of the systems has been approved in terms of section 14(2A) of the National Building Regulations and any other applicable codes of practice. The persons who issue such certification assume full liability and responsibility for such installation, erection or construction.

8.2 Surveying and Setting Out of the *Works*

a) The *Consultant* is responsible for the complete surveying and setting out

of the *works* including establishment and protection of any benchmarks required to complete the *works.*The *Consultant* is required to submit as-built and/or red-line data and drawings of the completed *works* to the *Project Manager* upon handover. As-built drawings are submitted in PDF and native CAD (.DGN) formats.

b) The *Consultant* is responsible for the verification of all survey data relating to setting out and to immediately inform the *Project Manager* of any discrepancies as soon as these are discovered.

c) The final position of the new infrastructure i.e., ablution block, guardhouse, potable and fire water infrastructure is determined by the *Consultant r* with the ideal location indicated on the issued drawings.

8.3 Excavations and Associated Water Control Excavations & Scanning of Underground Services

No excavations are permitted without an excavation permit obtained from the *Project Manager.*

The *Consultant* complies with the requirements of the Construction Regulations, Execution of Site Preparation and Earthworks [19] and the Kusile Trench and Excavation Procedure [203-13626]. Scanning of underground services shall precede all excavation works. The *Consultant* performs geophysical assessments for detection of subsurface utilities, prior undertaking excavations. The geophysical scanning method employed is at the discretion of the *Consultant* . The *Consultant* therefore considers the work area prior to selection of test methodology and equipment. The *Consultant* submits the results of the scans to the Project Manager and indicates possible services which may interfere with the works. The *Consultant* shall obtain all relevant drawings,

indicating the position of potential underground services around the work area. Care shall be taken by the *Consultant* to properly demarcate and protect all underground utilities. If any service or structure is damaged by the *Consultant* , that should have been located or protected by the *Consultant* , the *Consultant* shall be liable for the repair works.

8.4 Temporary *Works*

The *Consultant* is responsible for the design of all temporary works and is mandated in terms of Construction Regulations 2014: Duties of Designer, 6(2) a – d, to fulfil the duties described therein for all temporary work designs.

8.5 C*onsultant 's* Programme

The *Consultant* submits for acceptance, an integrated and detailed programme within the time period set out in the Contract Data and whenever a programme is amended or revised. The programme includes timing of operations of his subconsultants. The *Consultant submits* an electronic copy of his programme in MS Project (MPP) format. The programme shall, inter alia, include:

a) the order and timing of operations by the *Consultant* and any other actions required of the *Employer* and others;

b) the planned completion date of the services

c) provisions for float;

d) other information as required in terms of the Scope of Work or Contract Data.

8.5.1 Submission Of Revised Programmes and Progress Reporting

The *Consultant* submits his revised programme on a monthly basis, unless otherwise stated in the Contract data or as instructed by the *Employer*. The *Consultant* indicates on each revised programme:

a) Actual progress achieved on each operation and reprogramming of future operations, if necessary

b) Management of delays encountered etc.

8.5.2 Progress Reporting

The *Consultant* submits to the Employer a monthly report by no later than the last day of the month. The reports contains the following information as a minimum;

- Executive summary of overall project progress
- Project programme indicating actual work progress against accepted programme for all disciplines. Reporting on deviations from plan and recovery plans
- Project risks
- A four (4) week look ahead
- Early warning log
- Compensation event log
- Finance and cost controlling etc.

8.6 Quality management

8.6.1 System requirements

The *Consultant* and his *subconsultants* adhere to the provisions and requirements of ISO 9001 when providing the service.

Plant Codification

Plant Coding shall be undertaken by the *Consultant.* The *Employer* will assign a technician who will interact with the *Consultant* to assist with this process. The *Consultant* is required to include allocated codes to all design documentation.

The KKS system shall be used for classifying and designating both plant and related documentation The *Consultant* complies with the requirements of the technical documentation classification and designation standard [240- 54179170],

Eskom Hybrid Coding Standard [240-131050729], publication KKS power plant classification (B105e) 5th Edition 2003 and the KKS Applications: Guideline and explanations A, B1- 4 (B106e) etc.

All maintainable plant shall be coded up to KKS breakdown level 3 (i.e., Mechanical, Electrical, C&I and Civil systems)). Omissions or deviations from the latter requirements shall not be permitted without approval from the *Employer*.

The *Consultant* shall use Eskom – specific interpretations of the KKS standards, which will be reviewed and agreed on after Contact Award. The following variations relating to 240-93576498 are noted.

a) Breakdown level 3 component code -> not used in P&ID's and PFUP's, only used by control hardware supplier.

b) Breakdown level 0: will be shown as a general remark on the P&ID not on the individual KKS

c) number.

d) F0-level is not used; FN level is free -> no general decoding system.

The *Consultant* shall code all plant within the scope of *service*. KKS codes shall appear on all plant related documentation, drawings, lists and correspondence.

The *Consultant* shall be responsible for ensuring accuracy, completeness, and consistency of all plant and document designations.

6.1.21 Project Deliverables

The *Consultant* shall be responsible for the handover of all *Works* associated with the contract. The handover submissions shall include but not limited to the following:

a) Assessment reports

b) Detailed design reports for entire *Works*. Report to be signed off by an ECSA Professionally Registered Engineer (civil/structural, mechanical, electrical, C&I packages)

c) Approved construction drawings for the entire *Works* signed off by an ECSA Professionally Registered Engineer (civil/structural, mechanical, electrical, C&I packages)

d) As-built drawings and all handover documentation is required to be submitted within 6 weeks of construction completion. (civil/structural, mechanical, electrical, C&I packages)

e) Bill of quantities for construction (civil/structural, mechanical, electrical, C&I packages)

f) PECs and/or CoCs for completed *Works* is required to be submitted within 6 weeks of construction completion

g) Geotechnical investigation and survey reports

h) All construction supervision related documentation as detailed in this scope

6.2 Stage 1 Preparation

The appointed Consultant provides design assurance of the Professional Services Contract of management of civil works and takes full accountability and professional liability for design changes. The Consultant takes full responsibility and accountability as the NEC Consultant NEC3 PSC and as detailed herein.

The Contractor is to assist an Eskom appointed Employer's Agent to ensure that Others (appointed Contractors, mainly construction Contractors) comply with their respective contracts and no unnecessary compensation events are incurred by the Employer during the execution of construction projects for the designs completed by the Contractor.
• The Contractor conducts investigations and inspections on the Power Station infrastructure with the Employers representative as scheduled in the Civil and Maintenance Strategy for Kusile Power Station. Upon completion, the Contractor submits a detailed report highlighting the condition of the asset inspected with recommendations for remedial work. All findings shall be as per Eskom's condition monitoring categories, refer the Civil Manual [21] and section 3.2.2.

The items/structures to be inspected on a yearly basis are listed, but not limited
• The Contractor together with the Employer's representative conducts civil and structural engineering investigations, concept designs and detailed designs. A design report with all design calculations, a bill of quantities and works information for all problems brought forward by the Contractor in respect of the Power Stations requirements and where necessary are to be provided for acceptance by Generation Engineering. Further, the Contractor shall provide geotechnical investigation for the civil and structural designs.

• The Contractor shall ensure that the execution of repair works within the power plant is planned such that safety of all personnel is not compromised. He/she shall advise where tasks shall be carried out only when the Units are offline and assist the Employer's Agent plan accordingly.
• The Contractor shall identify and provide mitigation measures for risks associated with the infrastructure on site including all structures.
• The Contractor shall assist Others (appointed Contractors, mainly construction Contractors) by Eskom to ensure that all Civil Engineering contracts are carried out to comply with the specifications, procedures, good maintenance practices and quality in accordance with the requirements of the specific contract.
• The Contractor shall identify all waste-full and unsafe practices and co-ordinate and implement cost saving suggestions with Others (appointed Contractors, mainly construction Contractors).
• The Contractor shall advise the Employer with any changes in government regulation and legislation with regards to all Civil Infrastructural requirements as listed in this contract.
• The Contractor is to assist any Candidate Engineers of the Employer to acquire their ECSA Professional Registration within the contract period. Training is to be completed through problem solving of all issues solved during the contract period where the engineer may be required to be seconded to the facilities of the Consultant for a period of time.
• All documents developed during the period of this contract relating to Kusile Power Station will belong to the Employer.

Detailed structural inspection.
Inspection activities for the structures shall include, but not limited to:
a) Visual Inspections
b) Laboratory Tests (i.e., extent of attack on structural elements).
c) Non-destructive testing may include, but is not limited to:
i). 3D scan or shape survey using a laser scan.
ii). Video inspections

iii). Electromagnetic cover meter
iv). Digi-Schmidt Hammer test
d) Destructive testing may include, but is not limited to:
vi) Concrete core samples (test will be as determined in the Task Order)
vi). Chemical tests
vii). Carbonation depth tests

Reporting
The Contractor must inform the Employer of any issues identified during the engineering inspections. A report must be compiled by the Contractor on the matters raised during the inspection. The content of the written report must confirm what is pointed out in the inspection and if necessary, discussed with the Plant Engineer. A signed and dated copy of the report must then be submitted to the Employer. The report must be signed by a Professional Engineer/Technologist. Inspection reports must detail amongst others the following:
a) The date of the inspection, name and affiliation of the Contractor.
b) Name of Plant Engineer personnel present during the inspection.
c) The assets inspected (accurate location to be provided).
d) Photographic records of the inspections showing the condition of the assets.
e) Provide remedial and/or monitoring recommendations for the findings.
f) Table 1 and Table 2 from the Inspection Manual for Civil Works at Eskom's Power Stations [21] shall be used to classify the condition of findings (i.e., condition of assets).
g) Trending of findings (i.e., condition of asset) to be included in subsequent inspection reports.
h) Evaluation of the Employer's operating and maintenance programme.

Periodic inspections of these structures are required to render the structures safe for continued use. The station also comprises of many civil infrastructures, the below list mentions a few of the critical structures. Project deliverables must include the following:

Chimneys (West and East) & Associated Structures, i.e., ducts and structural steelwork
• Silo's (Coal and Fly Ash Silos)
• ACC Columns & Associated Structures, i.e., structural steelwork
• Boiler House
• Turbine House
• All Conveyor structures (Coal, Ash, and Gypsum conveyors)
• Transfer Houses (Coal, Ash, and Gypsum)
• Water Treatment Plant Structures
• Sewerage Treatment Plant Structures
• Auxiliary Bay and Boiler Structures
• Coal plant Structures
• Ash plant Structures (PJFF support structures)
• Steam Turbine Hall
• ACC Auxiliary Building
• ACCCT Building
• H2/CO2 Gas Storage Building
• Auxiliary Cooling Structures
• Substation Buildings
• General Buildings incl. Security Building
• Process Buildings
• Storage Buildings and Workshops
• Admin Buildings
• Dams
• Ash Dumps
• Stormwater drainage systems
• Station Roads

6.3 Stage 2 Concept

The Consultant is required produce two preferred options that adequately address the Civil and structural design requirements. The chosen design concept report must cater for all units at Kusile power station. The Consultant must establish a complete design, i.e., to produce all the component specifications, engineering drawings and other design documentation for procurement, fabrication, installation, construction and commissioning.

6.4 Stage 3: Design development

The Consultant is required to perform a due diligence review of two selected options, the design (incl. investigative reports) for the Civil structures including all supporting infrastructure
This assessment is performed by means of a comprehensive review of the following receivables:

1) All related design reports.
2) Investigation reports
3) DWS technical advisory notes.
4) Design drawings (detailed design report);
5) Bills of Quantities.
6) Works Information and Specifications.
7) Operating and Maintenance Manuals.
8) Construction Quality Assurance Plans.

9) DWS checklists.

6.5 Stage 4: Production information

Refer to the Scope of work, designs for each drawing will be provided as per request.

6.6 Stage 5: Manufacture, Installation and Construction Information:

Not Applicable

6.7 Stage 6: Post Practical Completion

The Consultant to address any outstanding design issues and feedback and assisting with familiarising Project users with the design works.

7 Constraints on how the *Consultant* Provides the Services.

7.1 Management meetings

Regular meetings of a general nature may be convened and chaired by the *Employer's Agent* as follows:

Title and purpose	Approximate time & interval	Location	Attendance by:
Project Kick-off Meeting	3 days Contract Award	Kusile Power Station	Employer, Contractor and Others
SHEQ Requirements Clarification Meeting	3 days after Kick – off meeting	Kusile Power Station	Employer, Contractor and Others
Execution Progress Meeting	Daily	Kusile Power Station	Employer, Contractor and Others
Overall contract progress and feedback	Weekly on Thursdays	Kusile Power Station	Employer and Contractor
Risk register and compensation events	Daily	Kusile Power Station	Employer, Contractor and Others
Other	as and when required		Employer, Contractor and Others

Meetings of a specialist nature may be convened as specified elsewhere in this Scope or if not so specified by persons and at times and locations to suit the Parties, the nature and the progress of the *services*. Records of these meetings shall be submitted to the *Employer's Agent* 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.

7.2 *Consultant*'s *key persons*

The Consultant is to provide an organogram showing the following as a minimum:

- Consultant company management organogram including key personnel contact details
- Consultant project team organogram indicate the lines of authority and contact details

7.3 Provision of bonds and guarantees

Not Applicable

7.4 Documentation control and retention

7.4.1 Identification and communication

Communication
All contractual communication between the Employer's Agent and Consultant to be in a document format according to PSC3 attached to emails and not a message in the email itself.

Each communication letter is to indicate the type of notification in the subject and the period of reply thereof.
Other Key personnel (if any) for official communication between the Employer and the Consultant will be agreed upon in writing at the Kick-off Meeting.

Documentation
Document Identification and relevant report templates to be issued by Employer's Agent after contract award.

Documentation Requirements
The following is required from the Contractor:
a) Submit proposal on how he/she intends to conduct the works for approval by the Employer.
b) Submit a work schedule/programme for the works.
c) Submit all required reports as per the contractual agreements once works are completed.
The Contractor shall submit all relevant and necessary documentation requested by the Employer and both electronic and hard copy versions of all required documentation.

To ensure clear communication and effective management of records, all documentation related to this project shall adhere to the following protocol:

- Document Identification: Each document shall carry a unique alphanumeric identifier. This code will indicate the document source, recipient, and communication number, making the document easily traceable.

- Document Format: All contractual communications must be in the form of properly compiled letters or forms attached to emails. Messages within the body of an email will not be considered formal communication. Documents should be formatted as PDFs unless otherwise specified.

- Document Routing: Specific routing requirements must be adhered to. All contractual documents must be issued directly to the relevant party as stipulated in the ECC. The project manager will ensure the documentation is appropriately disseminated and acknowledged.

- Record Keeping: All communications must be logged in a communication register maintained by the Contractor. The register will document the date, source, recipient, communication number, and a brief summary of the document content.

- Revision Control: Any changes or revisions to the documents should be clearly marked and issued with a new revision number. All previous versions should be archived for reference.

- Confidentiality: All documents should be treated as confidential and should not be shared outside the project team without appropriate authorization.

7.4.2 Retention of documents

Clause 13.6 states that the Consultant retains copies of drawings, specifications, reports and other documents which record the services in one (1) electronic copy and one (1) hardcopy.
The time period for which the Consultant is to retain such documents is the period for retention stated in the Contract Data.

7.5 Records and forecasting of *expenses*

Refer to clause 21.4 (Option E) no additional requirements

7.6 Records and forecasting of the Time Charge

Not Applicable

7.7 Invoicing and payment

The following details shall be shown on or attached to each Invoice to show how the amount due has been assessed:
[List them]

The *Consultant* shall address the tax invoice to invoiceseskomlocal@eskom.co.za and include on it the following information:

- Name and address of the *Consultant* and the *Employer's Agent;*
- The contract number and title;
- *Consultant's* VAT registration number;
- The *Employer*'s VAT registration number 4740101508;
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT;
- (add other as required)

7.8 Contract change management

Standard PSC3 forms to be used for communication for contract change between the Employer's Agent and Consultant.

7.9 Inclusions in the programme

The Consultant submits a revised programme to the Employer for acceptance within the period for reply after the Employer has instructed him to,

7.10 Quality management

7.10.1 System requirements

The Consultant shall comply with the system requirements contained in Annexure A to this Scope

7.10.2 Information in the quality plan

The Consultant shall comply with the system requirements contained in Annexure A to this Scope

7.11 The Parties use of material provided by the *Consultant*

7.11.1 *Employer*'s purpose for the material

Clause 70.1 states that the *Employer* has the right to use the material provided by the *Consultant* for the purpose stated in the Scope.

7.11.2 Restrictions on the *Consultant*'s use of the material for other work

The Consultant's is restricted the use of material provided by him for any other third party.

7.11.3 Transfer of rights if Option X 9 applies

There is no exception from X9.

The Consultant provide to the Employer the legal documents which transfer these rights to the Employer. The Consultant to submit an applicable format of transfer notification.

The Consultant shall not challenge or assist any other party challenging at any time the validity or ownership of any of the intellectual property rights relating to the material created and developed for this contract.

7.12 Management of work done by Task Order

Not Applicable

7.13 Health and safety

A Safety, Health, Environment and Quality (SHEQ) specification is Kusile Power Station's minimum requirements detailing also constraints, which are required to be met for the specific contract and for the duration of the contract period by the Contractor.
The Contractor is expected to develop a SHEQ plan which meets these requirements as well as relevant and other legal and other requirements applicable to the issued scope of work.
Kusile Power Station in no way assumes the contractor's legal responsibilities. The contractor is and remains accountable for the quality and the execution of his/her health and safety programme for his/her employees and appointed contractor employees.
This SHEQ specification reflects minimum requirements and should not be construed as all encompassing. The Contractor shall comply with (SHEQ) requirements contained in Annexure A of this Works Information.

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

7.14 Procurement

7.14.1 BBBEE and preferencing scheme

Specify constraints which *Consultant* must comply with after contract award in regard to any Broad Based Black Economic Empowerment (B-BBEE) or preferencing scheme measures.

7.14.2 Other constraints

Not Applicable

7.14.3 Preferred subconsultants

PSC3 does not make use of nominated sub consultants but the Employer may list which sub consultants or suppliers the Consultant is required to enter into subcontracts with. This is usually only required where very specialist services need to be obtained from a particular supplier or group of suppliers in order to comply with operational standards.

7.14.4 Subcontract documentation, and assessment of subcontract tenders

Not Applicable

7.14.5 Limitations on subcontracting

Not Applicable

7.14.6 Attendance on Subconsultants

Not Applicable

7.15 Correction of Defects

No additions or exclusions from clause 41.2

7.16 Working on the *Employer*'s property

- Applicable plant permits are required prior to plant access.
- Reflectors to be always worn onsite for clear visibility
- Detailed activities schedule including date and time and updates are required for plant access.
- Toilet facilities are available within the Power Station boundaries.
- Potable water supply.
- Medical services are available at the medical centre in case of emergency and expenses incurred are for the Consultant's account.
- Employer's entry and security control, permits, and site regulations are to be adhered to.
- The Consultant complies with the access and controls procedures issued by Kusile Power Station.
- The Consultant shall obtain copies of such requirement from the Employer's Agent

7.16.1 People restrictions, hours of work, conduct and records

People Restriction
People are restricted to the Affected Property only

Hours of Work
The Consultant is restricted to hours only applicable to site access from 07h00 to 16h15. Any other remote work can be carried out remotely after these hours.
The Consultant keeps records of his people working on the Employer's property. The Employer's Agent shall have access to these records at any time.

Conduct
The Consultant and his employees are required to always maintain professional and ethical conduct, which upholds the Eskom Values to the highest standard.Should the Consultant's employees be found to contravene the Eskom Values, Life Saving Rules and /or any of the aforementioned regulations, the Consultant must institute disciplinary action, which may include removal from site, until the disciplinary process is concluded.

7.17 Cooperating with and obtaining acceptance of Others

This sub-paragraph could be used to deal with two issues.
1) The cross reference from core clause 23.1 about cooperation generally as well as details about Others with whom the *Consultant* may be required to work. See clause 11.2(7) for the definition of Others.
2) Requirements for liaison with and acceptance from statutory authorities or inspection agencies.

7.18 Things provided by the *Employer*

- Water
- Ablution Facilities
- Electricity

7.19 Cataloguing requirements by the *Consultant*

Technical Information for each proposed equipment to be handed over by the Consultant as part of technical reports for cataloguing by the Employer.

8 List of drawings

8.1 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.

The drawings will be provided as per request since its different structures.

Drawing number	Revision	Title