NEC3 Engineering & Construction Contract

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

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

for **Manufacture, supply, installation, and commissioning of Primary and**
Secondary Clarifiers' Valve Automation and associated works for Medupi Power Station

---

Contents:		**No of pages**
Part C1	**Agreements & Contract Data**	**32**
Part C2	**Pricing Data**	**4**
Part C3	**Scope of Work**	**116**
Part C4	**Site Information**	**4**

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

Part C1: Agreements & Contract Data

Contents:

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:

Medupi Power Station Primary and Secondary Clarifier Valve Automation

The tenderer, identified in the Offer signature block, has examined the documents listed in the Tender Data and addenda thereto and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance the tenderer offers to perform all of the obligations and liabilities of the *Contractor* under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the *conditions of contract* identified in the Contract Data.

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

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

Signature(s)

Name(s) .....

Capacity .....

For the tenderer:

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

Name & signature of witness .....

Date .....

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

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

Acceptance

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

The terms of the contract, are contained in:

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

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

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Returnable Schedules as well as any changes to the terms of the Offer agreed by the tenderer and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Form of Offer and Acceptance. No amendments to or deviations from said documents are valid unless contained in this Schedule.

The tenderer shall within two weeks of receiving a completed copy of this agreement, including the Schedule of Deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the *conditions of contract* identified in the Contract Data at, or just after, the date this agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

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

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

Signature(s)		
Name(s)		
Capacity		
for the Employer		
	(Insert name and address of organisation)	
Name & signature of witness		Date

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

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

Note:

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

No.	Subject	Details
1		
2		
3		
4		
5		
6		
7		

By the duly authorised representatives signing this Schedule of Deviations below, the Employer and the tenderer agree to and accept this Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules, as well as any confirmation, clarification or changes to the terms of the Offer agreed by the tenderer and the Employer during this process of Offer and Acceptance.

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

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

C1.2 ECC3 Contract Data

Part one - Data provided by the *Employer*

Clause	Statement	Data	
1	**General**		
	The *conditions of contract* are the core clauses and the clauses for main Option		
		A:	**Priced contract with activity schedule**
	dispute resolution Option	**W1:**	**Dispute resolution procedure**
	and secondary Options		
		X2	**Changes in the law**
		X5:	**Sectional Completion**
		X7:	**Delay damages**
		X13:	**Performance Bond**
		X16:	**Retention**
		X18:	**Limitation of liability**
		Z:	***Additional conditions of contract***
	of the NEC3 Engineering and Construction Contract, April 2013 (ECC3)		

10.1	The *Employer* is (Name):	**Eskom Holdings SOC Ltd (reg no: 2002/015527/30), a state owned company incorporated in terms of the company laws of the Republic of South Africa**
	Address	**Registered office at Megawatt Park, Maxwell Drive, Sandton, Johannesburg**
10.1	The *Project Manager* is: (Name)	**Jimmy Mphela**
	Address	**Medupi Power Station, H - Block**
	Tel	**014 762 2272**
	Fax	**N / A**
	e-mail	**mphelalj@eskom.co.za**
10.1	The *Supervisor* is: (Name)	**Khuthadzo Mphephu**
	Address	**Medupi Power Station**
	Tel No.	**N /A**
	Fax No.	**N / A**
	e-mail	**N / A**
11.2(13)	The *works* are	**Mechanical Works** The Contractor will procure, manufacture, supply, install and commission Primary and Secondary Clarifiers Valve Automation and associated works. For the Oil Skimmer, The Contractor design, procure, manufacture, supply, install and commission its associated works. Replace damaged equipment in the Primary and Secondary Clarifiers Degrit sumps. **Electrical Works** The installation on the actuators will require power supplies at the Secondary and Primary Clarifiers from the Secondary Clarifier Sub and SSB Sub respectively. The works include the modification of the main LV Switchgear to supply the actuators directly from MCBs The electrical contractor shall be responsible for the provision of all the electrical interface and ensure that work is done with good quality, and all new installation or modification must fit to the existing system or plant. The plant where the works will take place has already been safety cleared; the Contractor shall follow the Plant Safety Regulations (P.S.R) and High Voltage (H.V) Regulation to do any work. Thus, the Contractor shall have trained personnel

for Mechanical, Electrical (both Low and High Voltage) as well Control and Instrumentation.

Control and Instrumentation Works

The C&I system forming part of the Works shall provide all information, alarms, protections, process interlocks, control and local control facilities to enable the operator (located in the Outside Plant Control Room) to execute operating tasks safely, reliably and consistently.

All C&I, protection system and control components supplied as part of the Works, shall be supported and maintainable for a minimum of 25 years.

The Contractor's design shall provide for later expansion of the control and instrumentation system such that future changes and enhancements can be readily incorporated

All C&I cubicles shall be supplied from reliable UPS feed.

The availability of the complete C&I system (including interfaces to DCS) consisting of the individual sub-systems over its life in percentage of time shall be 99,99% or greater

The Contractor is fully responsible for integrating the operation, monitoring, control and process management of the C&I Works with existing installed C&I plant and material.

Civil Works

General condition assessment of civil and structural existing works shall be carried out by the Contractor.
The condition assessment report and constructability report shall be submitted to indicate the needed modifications, assessment results, repairs, new designs that align to making the mechanical systems are automated.

Contractor shall execute design and construction of the works to ensure the newly designed/refurbished/installed and automated mechanical systems and supporting civil structures are fit for purpose.

Contractor shall execute all works in accordance with the various aspects contained in this SoW document while integrating and fully complying with all specifications and regulations.

Contractor shall carry out geotechnical and geohydrological assessments as deemed required by the Designer, this may include but not be limited to conducting excavations, investigations, above or below ground

		tests/studies, test pits, sampling, laboratory testing The Contractor shall submit the concrete and grout mix designs including but not limited to trial test cube results and all other required test results as indicated in the Medupi Power Station Specification for Structural Concrete (84CIVL053) prior to the placement of any concrete and grout.
11.2(14)	The following matters will be included in the Risk Register	• Adverse Weather (Rain, Wind, Hailstorm, Heatwave) • Earthworks planning needs to take into Consideration the rain. • Normal construction hazards working with machinery. • Industrial Action • Labour Strike • Community Unrest • Security of equipment, materials and resources • Substantial procurement of materials when required. • COVID 19 impact on labour force / Disease Outbreak. • Access to existing areas • Unavailability of Generation plant due to electricity demand (plant not made available to work on) • Non-compliance to approved Environmental Management Programme • Contractor's poor performance during project execution • Working at heights • Hazardous gas • Electrocution • Power supply interruptions or failure • Uncertain integrated schedule. • Interface and Integration of the works with the running plant and other

Contractors
- Non- compliance to the Permit to Work System
- Dehydration (Hot Weather Conditions)
- Fire and Smoke
- Snakes
- Normal construction hazards for Mechanical work
- Ash dust

11.2(15)	The *boundaries of the site* are	• Medupi Power Station Primary and Secondary Clarifiers Valve Automation		
11.2(16)	The Site Information is in	Part 4: Site Information		
11.2(19)	The Works Information is in	Part 3: Scope of Work and all documents and drawings to which it makes reference.		
12.2	The *law of the contract* is the law of	the Republic of South Africa		
13.1	The *language of this contract* is	English		
13.3	The *period for reply* is	2 weeks (14 Calendar days)		
2	**The *Contractor's* main responsibilities**	Data required by this section of the core clauses is provided by the *Contractor* in Part 2 and terms in italics used in this section are identified elsewhere in this Contract Data.		
3	**Time**			
11.2(3)	The *completion date* for the whole of the *works* is	12 Months after Contract start date		
11.2(9)	The *key date*s and the *condition*s to be met are:	***Condition* to be met**		***key date***
		1	Unit 6 Degrit sump, TH7 and Primary Clarifiers	To be Completed 6 Months after Contract award
		2	Secondary Clarifiers, Unit 5 Degrit Sump and Oil Skimmers	To be Completed 9 Months after Contract award
		3	Unit 4-1 Degrit Sumps and TH8	To be Completed 11 Months after Contract award
30.1	The *access dates* are:	**Part of the Site**		**Date**

		1	Medupi Power Station Site (Mobilisation to Medupi Site)	TBA
		2	Medupi Power Station Primary and Secondary Clarifiers Valve Automation	TBA
31.1	The *Contractor* is to submit a first programme for acceptance within	**Two (2) weeks after Contract award.**		
31.2	The *starting date* is	**TBA**		
32.2	The *Contractor* submits revised programmes at intervals no longer than	7 (Seven) calendar days.		
4	**Testing and Defects**			
42.2	The *defects date* is	52 (Fifty-Two) weeks after Completion of the Section of the *works* as per the Accepted Programme		
43.2	The *defect correction period* is	08 hours for emergencies or breakdowns and 4 working days for normal defects		
5	**Payment**			
50.1	The *assessment interval* is	between the 20th day of each successive month.		
51.1	The *currency of this contract* is the	South African Rand.		
51.2	The period within which payments are made is	60 Calendar days after final assessment approval.		
51.4	The *interest rate* is	the publicly quoted prime rate of interest (calculated on a 365 day year) charged from time to time by the Standard Bank of South Africa Limited (as certified, in the event of any dispute, by any manager of such bank, whose appointment it shall not be necessary to prove) for amounts due in Rands and (ii) the LIBOR rate applicable at the time for amounts due in other currencies. LIBOR is the 6 month London Interbank Offered Rate quoted under the caption “Money Rates” in The Wall Street Journal for the applicable currency or if no rate is quoted for the currency in question then the rate for United States Dollars, and if no such rate appears in The Wall Street Journal then the rate as quoted by the Reuters Monitor Money Rates Service (or such service as may replace the Reuters Monitor Money Rates Service) on the due date for the payment in question, adjusted *mutatis mutandis* every 6 months thereafter and as certified, in the event of any dispute, by any manager employed in the foreign exchange department of The Standard Bank of South Africa Limited, whose appointment it shall not be necessary to prove.		

6	**Compensation events**	
60.1(13)	Assumed values for the ten year return *weather data* for each *weather measurement* for each calendar month are:	**As stated in Annexure A to this Contract Data provided by the *Employer*.**
7	**Title**	**There is no reference to Contract Data in this section of the core clauses and terms in italics used in this section are identified elsewhere in this Contract Data.**
8	**Risks and insurance**	
9	**Termination**	**There is no reference to Contract Data in this section of the core clauses and terms in italics used in this section are identified elsewhere in this Contract Data.**
10	**Data for main Option clause**	
A	**Priced contract with activity schedule**	**There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.**
11	**Data for Option W1**	
W1.1	The *Adjudicator* is	**the person selected from the ICE-SA Division (or its successor body) of the South African Institution of Civil Engineering Panel of Adjudicators by the Party intending to refer a dispute to him. (see www.ice-sa.org.za). If the Parties do not agree on an Adjudicator the Adjudicator will be appointed by the Arbitration Foundation of Southern Africa (AFSA).**
	Address	**N / A**
	Tel No.	**N / A**
	Fax No.	**N / A**
	e-mail	**N /A**
W1.2(3)	The *Adjudicator nominating body* is:	**the Chairman of ICE-SA a joint Division of the South African Institution of Civil Engineering and the London Institution of Civil Engineers. (See www.ice-sa.org.za) or its successor body.**
W1.4(2)	The *tribunal* is:	**arbitration.**
W1.4(5)	The *arbitration procedure* is	**the latest edition of Rules for the Conduct of Arbitrations published by The Association of Arbitrators (Southern Africa) or its successor body.**

	The place where arbitration is to be held is	**[South Africa**
	The person or organisation who will choose an arbitrator - if the Parties cannot agree a choice or - if the arbitration procedure does not state who selects an arbitrator, is	**the Chairman for the time being or his nominee of the Association of Arbitrators (Southern Africa) or its successor body.**

12 Data for secondary Option clauses

X2 Changes in the law

X5 Sectional Completion

X5.1 The *completion date* for each *section* of the *works* is:

Section	**Description**	***Completion date***
1	Unit 6 Degrit sump, TH7 and Primary Clarifiers	To be Completed 6 Months after Contract award
2	Secondary Clarifiers, Unit 5 Degrit Sump and Oil Skimmers	To be Completed 9 Months after Contract award
3	Unit 4-1 Degrit Sumps and TH8	To be Completed 11 Months after Contract award

Contractor to submit data books upon each sectional completion to the Employer

X5 & X7 Sectional Completion and delay damages used together

X7.1
X5.1 Delay damages for Completion of the whole of the *works* are

Section	**Description**	***Amount per day***
1	Unit 6 Degrit sump, TH7 and Primary Clarifiers	R25 000.00 up to a limit of 10% of the total Contract Price.
2	Secondary Clarifiers, Unit 5 Degrit Sump and Oil Skimmers	R25 000.00 up to a limit of 10% of the total Contract Price.

		3	Unit 4-1 Degrit Sumps and TH8	R25 000.00 up to a limit of 10% of the total Contract Price.
X13	**Performance bond**			
X13.1	The amount of the performance bond is	10% of the contract value		
X16	**Retention**			
X16.1	The *retention free amount* is The *retention percentage* is	R0.0 5 % of the total of the Prices		
X18	**Limitation of liability**			
X18.1	The *Contractor*'s liability to the *Employer* for indirect or consequential loss is limited to:	**R0.0 (zero Rand)**		
X18.2	For any one event, the *Contractor*'s liability to the *Employer* for loss of or damage to the *Employer*'s property is limited to:	**the amount of the deductibles relevant to the event**		
X18.3	The *Contractor*'s liability for Defects due to his design which are not listed on the Defects Certificate is limited to	**The greater of** • **the total of the Prices at the Contract Date and** • **the amounts excluded and unrecoverable from the *Employer*'s assets policy for correcting the Defect (other than the resulting physical damage which is not excluded) plus the applicable deductible as at contract date.**		
X18.4	The *Contractor*'s total liability to the *Employer* for all matters arising under or in connection with this contract, other than excluded matters, is limited to:	**the total of the Prices other than for the additional excluded matters.** **The *Contractor's* total liability for the additional excluded matters is not limited.** **The additional excluded matters are amounts for which the *Contractor* is liable under this contract for** • **Defects due to his design which arise before the Defects Certificate is issued,** • **Defects due to manufacture and fabrication outside the Site,** • **loss of or damage to property (other than the *works*, Plant and Materials),** • **death of or injury to a person and** • **infringement of an intellectual property right.**		
X18.5	The *end of liability date* is	**(i) Three years after the *defects date* for latent Defects and**		

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

Z1 Cession delegation and assignment

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

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

Z2 Joint ventures

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

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

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

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

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

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

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

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

Z4 Confidentiality

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

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

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

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

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

Z5 Waiver and estoppel: Add to core clause 12.3:

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

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

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

- accepts that the *Employer* may appoint him as the "Principal Contractor" (as defined and provided for under the Construction Regulations 2014 (promulgated under the Occupational Health & Safety Act 85 of 1993) ("the Construction Regulations") for the Site and furthermore shall sign a section 37(2) agreement between the Employer and Principal Contractor;
- warrants that the total of the Prices as at the Contract Date includes a sufficient amount for proper compliance with the Construction Regulations, all applicable health & safety laws and regulations and the health and safety rules, guidelines and procedures provided for in

this contract and generally for the proper maintenance of health & safety in and about the execution of *works*; and

- undertakes, in and about the execution of the *works*, to comply with the latest Construction Regulations and with all applicable health & safety laws and regulations and rules, guidelines and procedures otherwise provided for under this contract and ensures that his Subcontractors, employees and others under the *Contractor's* direction and control, likewise observe and comply with the foregoing.

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

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

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

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

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

Z8 Notifying compensation events

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

Z9 *Employer's* limitation of liability

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

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

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

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

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

Z11.1 If the amount due for the *Contractor*'s payment of delay damages reaches the limits stated in this Contract Data for Option X7 or Options X5 and X7 used together, the *Employer* may terminate the *Contractor*'s obligation to Provide the Works using the same procedures and payment on termination as those applied for reasons R1 to R15 or R18 stated in the Termination Table.

Z12 Ethics

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

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

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

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

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

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

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

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

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

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

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

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

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

Z13 Insurance

Z 13.1 Replace core clause 84 with the following:

Insurance cover 84

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

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

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

INSURANCE TABLE A

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

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

INSURANCE TABLE B

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

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

Z14 Nuclear Liability

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

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

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

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

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

Z15 Asbestos

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

AAIA means approved asbestos inspection authority.

ACM means asbestos containing materials.

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

Ambient Air	means breathable air in area of work with specific reference to breathing zone, which is defined to be a virtual area within a radius of approximately 30cm from the nose inlet.
Compliance Monitoring	means compliance sampling used to assess whether or not the personal exposure of workers to regulated asbestos fibres is in compliance with the Standard's requirements for safe processing, handling, storing, disposal and phase-out of asbestos and asbestos containing material, equipment and articles.
OEL	means occupational exposure limit.
Parallel Measurements	means measurements performed in parallel, yet separately, to existing measurements to verify validity of results.
Safe Levels	means airborne asbestos exposure levels conforming to the Standard's requirements for safe processing, handling, storing, disposal and phase-out of asbestos and asbestos containing material, equipment and articles.
Standard	means the *Employer*'s Asbestos Standard 32-303: Requirements for Safe Processing, Handling, Storing, Disposal and Phase-out of Asbestos and Asbestos Containing Material, Equipment and Articles.
SANAS	means the South African National Accreditation System.
TWA	means the average exposure, within a given workplace, to airborne asbestos fibres, normalized to the baseline of a 4 hour continuous period, also applicable to short term exposures, i.e. 10-minute TWA.

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

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

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

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

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

Z15.6 The *Contractor* continues to Provide the Services, without additional control measures presented, on presentation of Safe Levels. The contractually agreed dates to Provide the Services, including the Completion Date, are adjusted accordingly. The contractually agreed

dates are extended by the notification periods required by regulations 3 and 21 of the Asbestos Regulations, 2001.

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

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

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

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

Lephalale (One-In-Ten-Year)

South Africa Weather Servi

Lephalale- (1983-2025)

Comp No: 7888

	One-in-ten-year-return			
Month	**Cumulative rainfall (mm)**	**Number of days with rain more than 10mm**	**Number of days with min air temp < 0 °C**	**Number of days with snow lying at 08:00 CAT**
JAN	155.8	4	0	No Data
FEB	120.4	5	0	No Data
MAR	108.5	3	0	No Data
APR	56.0	2	0	No Data
MAY	24.4	1	1	No Data
JUN	12.1	0	1	No Data
JUL	5.0	0	6	No Data
AUG	3.2	0	0	No Data
SEP	6.7	1	0	No Data
OCT	66.3	4	0	No Data
NOV	123.7	4	0	No Data
DEC	152.4	5	0	No Data

C1.2 Contract Data

Part two - Data provided by the *Contractor*

Clause	Statement	Data
10.1	The *Contractor* is (Name): Address Tel No. Fax No.	
11.2(8)	The *direct fee percentage* is The *subcontracted fee percentage* is	**%** **%**
11.2(18)	The *working areas* are the Site and	
24.1	The *Contractor's* key persons are: 1 Name: Job: Responsibilities: Qualifications: Experience: 2 Name: Job Responsibilities: Qualifications: Experience:	**CV's (and further key persons data including CVs) are appended to Tender Schedule entitled .**
11.2(3)	The *completion date* for the whole of the *works* is	
11.2(14)	The following matters will be included in the Risk Register	
11.2(19)	The Works Information for the *Contractor*'s design is in:	
31.1	The programme identified in the Contract Data is	
A	**Priced contract with activity schedule**	
11.2(20)	The *activity schedule* is in	

11.2(30)	The tendered total of the Prices is	**(in figures)** **(in words), excluding VAT**		
	Data for Schedules of Cost Components	*Note "SCC" means Schedule of Cost Components starting on page 60, and "SSCC" means Shorter Schedule of Cost Components starting on page 63 of ECC3 (April 2013).*		
A	**Priced contract with activity schedule**	**Data for the Shorter Schedule of Cost Components**		
41 in SSCC	The percentage for people overheads is:	**%**		
21 in SSCC	The published list of Equipment is the last edition of the list published by The percentage for adjustment for Equipment in the published list is	**Minus %**		
22 in SSCC	The rates of other Equipment are:	**Equipment**	**Size or capacity**	**Rate**
61 in SSCC	The hourly rates for Defined Cost of design outside the Working Areas are **Note: Hourly rates are estimated 'cost to company of the employee' and not selling rates.** **Please insert another schedule if foreign resources may also be used**	**Category of employee**	**Hourly rate**	
62 in SSCC	The percentage for design overheads is	**%**		
63 in SSCC	The categories of design employees whose travelling expenses to and from the Working Areas are included in Defined Cost are:			

C1.3 Forms of Securities

Pro formas for Bonds & Guarantees

For use with the NEC3 Engineering & Construction Contract

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

Option X13: Performance Bond

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

Option X16: Retention

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

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

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

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

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

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

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

Dear Sirs

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Contract.

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

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

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

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

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

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

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

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

8. This Guarantee:

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

8.2 is, save as provided for in 7 above, personal to Eskom and is neither negotiable nor transferable;

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

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

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

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

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

Signed at _____ Date _____

For and behalf of the Bank

Bank Signatory: _____ Bank Signatory: _____

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

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

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

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

Dear Sirs

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

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

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

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

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

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

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

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

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

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

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

"Project" - means the……..

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

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

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

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

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

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

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

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

The Bank's obligations in terms of this Guarantee:

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

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

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

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

This Guarantee:

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

is, save as provided for in **7** above, personal to Eskom and is neither negotiable nor transferable;

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

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

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

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

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

Signed at _____ Date _____ Bank's seal or stamp

For and behalf of the Bank

Bank Signatory: _____ Bank Signatory: _____

Witness: _____ Witness: _____

Pro forma ASGI-SA Guarantee – To be Verified

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

Eskom Holdings Limited
Megawatt Park
Maxwell Drive
Sandton
Johannesburg Date:

Dear Sirs

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

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

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

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

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

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

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

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

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

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

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

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

1.9 "Project" – means the ……

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

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

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

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

in the Contract.

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

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

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

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

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

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

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

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

8. This Guarantee:

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

    8.2 is, save as provided for in **7** above, personal to the *Employer* and is neither negotiable nor transferable;

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

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

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

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

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

Signed at _____ Date _____

For and behalf of the Bank

Bank Signatory: _____ Bank Signatory: _____

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

PART 2: PRICING DATA
ECC3 Option A

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

C2.1 Pricing assumptions: Option A

How work is priced and assessed for payment

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

Identified and defined terms	11 11.2	(20) The Activity Schedule is the *activity schedule* unless later changed in accordance with this contract. (27) The Price for Work Done to Date is the total of the Prices for • each group of completed activities and • each completed activity which is not in a group. A completed activity is one which is without Defects which would either delay or be covered by immediately following work. (30) The Prices are the lump sum prices for each of the activities on the Activity Schedule unless later changed in accordance with this contract.

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

Function of the Activity Schedule

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

Link to the programme

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

Preparing the *activity schedule*

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

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

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

- Has taken account of the guidance given in the ECC3 Guidance Notes pages 19 and 20;
- Understands the function of the Activity Schedule and how work is priced and paid for;
- Is aware of the need to link the Activity Schedule to activities shown on his programme;
- Has listed and priced activities in the *activity schedule* which are inclusive of everything necessary and incidental to Providing the Works in accordance with the Works Information, as it was at the

time of tender, as well as correct any Defects not caused by an *Employer's* risk;

- Has priced work he decides not to show as a separate activity within the Prices of other listed activities in order to fulfil the obligation to complete the *works* for the tendered total of the Prices.
- Understands there is no adjustment to the lump sum Activity Schedule price if the amount, or quantity, of work within that activity later turns out to be different to that which the *Contractor* estimated at time of tender. The only basis for a change to the Prices is as a result of a compensation event.

An activity schedule could have the following format:

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

C2.2 the *activity schedule*

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

Manufacture, Supply, Installation and Commissioning of Primary & Secondary Clarifiers Valve Automation and Associated Works for Medupi Power Station.		**Activity Amount**
1	PART A: PRELIMINARY AND GENERAL (ALL WORKS)	R
2	DEGRIT SUMP	R
3	TH7	R
4	TH8	R
5	PRIMARY CLARIFIERS	R
6	SECONDARY CLARIFIERS	R
7	ELECTRICAL AND C&I	R
8	EMERGENCY MOBILE DEGRIT PUMPS	R
9	OIL SKIMMER	R
10	CENTRIFUGE STATION	R
11	DESIGN AND MONITORING	R
TOTAL AMOUNT		**R**

PART 3: SCOPE OF WORK

Document reference	Title	No of pages
	This cover page	1
C3.1	*Employer*'s Works Information	114
C3.2	*Contractor*'s Works Information	1
	Total number of pages	116

C3.1: EMPLOYER'S WORKS INFORMATION

Contents

1. INTRODUCTION

The Medupi Ash Washdown System is a supplementary system that is designed to collect and clean up spilled ash, coal and oil from the Boiler House floor, the Fabric Filter Plant (FFP), Ash Conveyers and other areas. The six de-gritting sumps, one in each boiler house, collect the overflow from the Submerged Scraper Conveyor (SSC) as well as the boiler house and FFP floor wash down. From the de-gritting sump (Wet Sump) the slurry gets pumped to the primary treatment plant.
Water and slurry from the degrit sump are conveyed to the primary clarifiers conveyed to dams and pump station. The primary clarifier consists of an agitator rake to agitate the settled coal and ash particles, a pump to allow for back and forward flush on the lines. During backward and forward flushing of the lines and flushing of the pump, a series of valves are to be open and closed manually which requires one Operator to be on-site and communicate with an Operator at the Balance of Plant (BOP) control room via a radio for instructions. The BOP Operator controls the agitator rake, the pump and knife gate while the operator on site manually operates the valves which isolates during back flush, forward flush, pump flushing and slurry pumping. This was found to be an unsafe working environment for the Operator and very complicated and thus a reason to automate.

2. SUPPORTING CLAUSES

2.1. SCOPE

This scope applies to the Ash Washdown system (Primary and Secondary Clarifiers plant and the ash conveying sump plant).

a. The scope includes the replacement of the existing diaphragm valve with either butterfly or gate valves. The replaced valves are to be supplied and installed with electrical actuators while others will be free issued.
b. In addition, the scope includes the modification to allow strainer flush into clarifier, forward wash and pump flush. The actuation of the valves will allow for operation from the control room.
c. The scope includes the replacement of damaged equipment on the boiler house degrit sumps for unit 1-6, Transfer House 7 and upgrades on Transfer House 8. Emergency mobile pumps.
d. The scope includes the replacement of the slurry delivery pipe work on the Primary Clarifier 1, 2, 3 & 4 while for the flushing system, the pipework will be reused.
e. Design, Procure, Supply, and Install a new Oil Separation system on Clarifier 3 and 4 (80 Cube Drizzt oil separator.
f. Upgrade the Centrifuge system for the Primary and Secondary Clarifiers.
g. Replacing of flooded equipment in the Primary and Secondary Clarifiers pits.

2.2. NORMATIVE/INFORMATIVE REFERENCES

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs. Caveat: listed documents are not exhaustive.

2.2.1. NORMATIVE

GENERAL

[1] Occupational Health and Safety Act (Act 85 of 1993) with associated Regulations
[2] 348-10125752 SHE Specification
[3] Compensation for Occupational Injuries and Diseases Act, No 130 of 1993 (COIDA).
[4] Basic Conditions of Employment Act No 75 of 1997.
[5] National Road Traffic Act 93 of 1996.
[6] 32-37 Eskom Substance Abuse Procedure.
[7] 240-62196227 Life- saving Rules.
[8] 32-726 Contract and Contractor OHS Management Standard.
[9] 240-150642762 Generation Plant Safety Regulations.
[10] 32-1126 Eskom Smoking Policy.
[11] 32- 418 Working at Heights Standard.
[12] 240-62196227 Life- saving Rules.
[13] 32-726 Contract and Contractor OHS Management Standard.
[14] 348 681011 Environmental Management Plan Rev 2, 2010.
[15] 348-631731 Medupi Record of Decision (RoD).
[16] 348-31313 Medupi Amended Water Use License.
[17] 348-859607 Medupi Amended Water Use License.
[18] 348-629765 Atmospheric Emission Licence
[19] 348-630732 Waste Management Licence
[20] National Environmental Management Act, 1998 (Act 107 of 1998) as amended.
[21] National Environmental Management Waste Act, 2008 (Act 59 of 2008) as amended.
[22] National Water Act,1998 (Act 36 of 1998) as amended.
[23] Government Notice 704, National Water Act 1998.
[24] 240-82410629 Eskom Holdings Environmental Management Strategy
[25] South African National Standards (SANS), relevant and applicable
[26] National Building Regulations and Building Standards Act No. 103 Of 1977
[27] 240-53113685 - Design review procedure
[28] 200-1689 - Medupi Quality Specifications
[29] 240-86973501 - Engineering Drawing Standards – Common Requirements
[30] SSZ_45-17 - Medupi Power Station Corrosion Protection Specification
[31] ISO 9001 Quality Management Systems.
[32] SANS 10142-Part 1 - The Wiring of Premises Part 1: Low-voltage installations
[33] 0.84-17600 SHEET 1 MH0048-0.84-17600 REV 8 CARS TH8 Sump
[34] 0.84-26142-Sheet 1 J26182-A-ASH-02-01-05 Rev 11 Boiler House Sumps Unit 1
[35] 0.84-26143-Sheet 1 J26182-A-ASH-02-01-05 Rev 11 Boiler House Sumps Unit 2
[36] 0.84-26144-Sheet 1 J26182-A-ASH-02-01-05 Rev 11 Boiler House Sumps Unit 3
[37] 0.84-26145-Sheet 1 J26182-A-ASH-02-01-05 Rev 11 Boiler House Sumps Unit 4
[38] 0.84-26146-Sheet 1 J26182-A-ASH-02-01-05 Rev 11 Boiler House Sumps Unit 5
[39] 0.84-26147-Sheet 1 J26182-A-ASH-02-01-05 Rev 13 Boiler House Sumps Unit 6
[40] 0.84-26150-SHEET 2 J26182-A-ASH-07-02-06-01 REV 7 Secondary Treatment Plant-Centrifuges
[41] 348-390359_1_1-0.84-28173 J26182-A-ASH-01-01-03-05-00 SHEET 1 REV 2 Boiler House Sumps
[42] Pipework Detail Sump No 6
[43] 348-390392_0_1-0.84-39092 SHEET 1 J26182-A-ASH-01-01-03-06-03 REV 0 Ash Washdown
[44] Collection Boiler House Sumps
[45] 348-390392_0_1-0.84-39092 SHEET 2 J26182-A-ASH-01-01-03-06-03 REV 0 Ash Washdown
[46] Collection Boiler House Sumps
[47] 348-390402_2_1-0.84-28173-SHEET 5 J26182-A-ASH-01-01-03-05-04 REV 3 Boiler House Sumps
[48] Pipework Detail Sump No 6

[49] 348-390528_17_1-0.84-26150-SHEET 1 J26182-A-ASH-07-02-06-00 REV 17 Ash Washdown
[50] Collection and Treatment Secondary Treatment Plant
[51] 348-390838_19_1-0.84-26148-SHEET 1 J26182-A-ASH-03-02-06 REV 20 Ash Washdown
[52] Collection and Treatment Primary Treatment Plant
[53] 348-391082_2_1-0.84-28173-SHEET 4 J26182-A-ASH-01-01-03-05-03 REV 3 Boiler House
[54] Sumps Pipework Detail Sump No 6
[55] 348-391248_12_1-0.84-26152-SHEET 1 J26182-A-ASH-09-01 REV 12 Ash Washdown Collection
[56] and Treatment Transfer House No7 Sump P&ID
[57] 348-391448_2_1-0.84 34659 SHEET 2 J26182 A ASH 01 01 01 11 01 REV 2 Boiler House Sumps
[58] Flush Water Pipework Detail Sump No 6
[59] 348-391849_7_1-0.84-26148-SHEET 2 J26182-A-ASH-03-02-06-01 REV 9 Secondary Treatment
[60] Plant-Centrifuges

[61] 348-392474_2_1-0.84-28168-SHEET 1 J26182-A-ASH-01-01-03-00-06 REV 2 Ash Washdown an
[62] Collection Boiler House Sumps Sump 1-6 Benching in Wet Sumps
[63] 348-392481_4_1-0.84-28173-SHEET 3 J26182-A-ASH-01-01-03-05-02 REV 5 Boiler House Sumps
[64] Pipework Detail Sump No 6
[65] 348-393877_6_1-0.84-26149-SHEET 1 J26182-A-ASH-04-01-06 REV 6 First Flush Diversion
[66] Works
[67] 240-49230046 Failure Mode and Effects Analysis Guideline
[68] 240-52844017 System Reliability, Availability and Maintainability Analysis Guideline
[69] 240-55410927 - Cyber Security Standard for Operational Technology
[70] 240-56227443 Control and Power Cables
[71] 240-56355466 - Alarm Management System Guideline
[72] 240-56355535 Process Calibration
[73] 240-56355541 C&I Computer and Equipment Rooms Civil and General Building Requirements
[74] 240-56355728 Human Machine Interface Design Requirements Standard (Rev 2)
[75] 240-56355729 - Plant Control Modes Guideline
[76] 240-56355731 - Environmental Conditions for Process Control Equipment
[77] 240-56355754 - Field Instrument Installation Standard
[78] 240-56355815 - Junction Boxes and Cable Termination Standard
[79] 240-56355843 - Pressure Measurement Systems Installation Standard
[80] 240-56355888 - Temperature Measurement Systems Installation Standard
[81] 240-56737448 Fire Detection and Life Safety Design Standard
[82] 240-56737654 Inspection Testing and Maintenance of Fire Detection System
[83] 240-61379718 Instrument Schedule
[84] 240-61379755 drive and Actuator Schedule
[85] 240-72344339 Virtual Signal List
[86] 240-72344727 C&I Control System Architecture Guideline
[87] 240-72350241 Panel Interface List
[88] 240-129014618 Cyber Security Guidelines
[89] 348-393877_6_1-0.84-26149-SHEET 1 J26182-A-ASH-04-01-06 REV 6
[90] C&I documentation description
[91] Cold Commissioning Report Template
[92] 240-113413710 Impact Assessment Template
[93] 200-46525 Operating Philosophy
[94] 240-55714363 Coal Fired Power Stations Lighting and Small Power Installation Standard
[95] 240-56227443 Electrical Cabling Works and Cable Racking Standard.
[96] 240-55714363 Coal Fired Power Stations Lighting and Small Power Installation Standard.
[97] 240-56356396 Earthing and Lightning Standard
[98] 348-389211 Ash Washdown - Collection Treatment Operating Philosophy
[99] GIBB-J26182-MM-01 Degrit Sump Maintenance Manual
[100] 348-390301 Instrument Schedule
[101] 348-394606 Equipment Schedule
[102] 200-94117 Control Logic
[103] 240-86973501 Eskom Drawing Standard
[104] GGR0992 Plant Safety Regulations
[105] 240-114967625 Operations Regulations of High Voltage Systems
[106] 348-880042 Medupi Concrete specification for structural concrete (84CIVL053)
[107] 240-56364545 Structural Design and Engineering Standard
[108] 240-53114026 Generation Project Engineering Change Management Procedure
[109] 240-57127951 Standard for the Execution of Site Investigations
[110] 240-57127955 Geotechnical and Foundation Engineering Standard

[111] 240-85549846 Standard for Design of Drainage and Sewerage Infrastructure

2.2.2. Informative

GENERAL

[1] ISO 9001 Quality Management Systems
[2] ISO 14001:2015 Environmental Management Systems
[3] ISO 45001: Health and Safety Management systems – Requirements.
[4] Constitution of the Republic of South Africa No 108 of 1996.
[5] SANS 1186 Symbolic Safety Signs.
[6] Tobacco Products Control Act 83 of 1993.
[7] All relevant South African legislation-provincial, municipal by-laws.
[8] 200-46362 - Site Inspections Procedure
[9] 200-15406 - Issue Takeover Certificate
[10] 32-727 SHEQ Policy.
[11] 32-421 - Eskom Life Saving Rules
[12] 348-9979102 ECP Primary and Secondary Clarifiers Valves Automation
[13] 240-103414344 - Summary of corporate identity manual

STRUCTURAL & CIVIL

[14] SANS 3001-C03-1 Part CO3-1: Concrete durability index testing — Preparation of test specimens
[15] SANS 3001-C03-2 Part CO3-2: Concrete durability index testing — Oxygen permeability test
[16] SANS 3001-C3-3 Part CO3-3: Concrete durability index testing — Chloride conductivity test
[17] Policy ESK PB AAQ 3 - Interior Specifications for Eskom

CONFIGURATION MANAGEMENT

[18] ISO 10007 Configuration Management
[19] VGB – B 106 E Part A– KKS Application Commentaries Part A – General
[20] VGB – B 106 E Part B1 – KKS Application Commentaries Part B1_ Mechanical Engineering
[21] VGB – B 106 E Part B2 – KKS Application Commentaries Part B2 - Civil Engineering
[22] VGB – B 106 E Part B3 - KKS Application Commentaries Part B3_Electrical and C&I Engineering
[23] VGB-S-811-01-2018-01-EN (eBook -VGB-OM)

2.3. GENERAL DEFINITIONS

Definition	Description
Automation	The use of machinery, software, and other technologies to perform tasks that were previously done manually by workers.
Clarifier	Settling tank built with mechanical means for continuous removal of solids being deposited by sedimentation. A clarifier is used to remove solid particulates or suspended solids from liquid for clarification and/or thickening.
Dirty Beds	aid in separating solids from wastewater, reducing volume and facilitating disposal.
Centrifuge	A device that uses centrifugal force to separate components of a mixture based on their density or size
Sump	A pit or reservoir designed to collect and hold liquids, particularly in drainage or circulation systems
Separator	A system installed to treat wastewater (trade effluent) from industrial processes, vehicle washing, cleansing of oil covered parts or other sources, for example petrol station forecourts, to treat oil-contaminated rainwater
Valve	A mechanical device that regulates or controls the flow of liquids, gases, or slurries by opening, closing, or partially obstructing a passageway.

2.4. ABBREVIATIONS

No.	Abbreviation	Description
1	AHP	Ash Handling Plant
2	ECP	Engineering Change Proposal
3	URS	User Requirements Specifications
4	FFP	Fabric Filter Plant
5	SSC	Submerged Scraper Conveyor
6	DB	Distribution board
7	LV	Low Voltage
8	BOP	Balance Of Plant
9	C&I	Control and Instrumentation
10	DCS	Distributed Control System
11	LoSS	Limits of Supply and Services
12	IO	Inputs and Outputs
13	POC	Point of Connection
14	CMBS	Consolidated Building Management System
15	VDSS	Vendor Document Submittal schedule

2.4.1. Disclosure Classification

a. **Controlled disclosure:** controlled disclosure to external parties (either enforced by law, or discretionary).

2.5. GENERAL ROLES AND RESPONSIBILITIES

1. The following roles and responsibilities apply:

Technical Responsibility
an entity who performs construction work on behalf of client.
He/she co-ordinates the design work provided by the discipline Design Engineering roles and integrates this work into a final integrated design product. He/she is the custodian of the requirements set, and the interface register between packages and part of his/her role is to maintain this information. He remains responsible for the integrity of the engineering product and is accountable for the overall management of interfaces and delivery of an integrated product.
The role of the Lead Discipline Engineering role is to manage the technical integrity of the design and be accountable for the management of the interfaces within their specific engineering domain
The *Project manager* is the delegated authority from the *Employer* representing the *Employer* to manage the defined scope of work. The *Project manager* coordinates the execution of the Works to achieve the required cost, schedule, and quality objectives. The *Project manager* is Eskom's representative that officially communicates with the *Professional Service Provider*

2.6. PROCESS FOR MONITORING

As per the Eskom Design Review Procedure 240-53113685

2.7. RELATED /SUPPORTING DOCUMENTS

Not Applicable

2.7.1. Project Programme

The estimated duration of construction period is 12 (1 Year) months upon the appointment of the construction Contractor.

A programme for the performance of the *Contractor* / *Service Provider* shall be submitted by the *Contractor* to the *Project Manager* within a period of two (2) weeks following the project briefing meeting. The programme will be the result of the coordination of all appointed *Contractor's* inputs and shall be in sufficient detail describing key milestones, events, and activities linked to the fastest realistic timeframes in which the service can be delivered. Milestones and events are to be listed based on the scope of services described in the scope of service document. No milestones may, at the coordination stage, be extended beyond the timeframes outlined in the project programme without acceptable reasons.

2.7.2. Target Dates and Times

The *Contractor* will be expected throughout to give preference to the execution of the work involved in this commission. The work of all service providers will be coordinated by the *Project Manager.*

1.7.1

2.7.3 Information available from Eskom

All necessary information needed by the *Contractor* regarding the project may be received from *Project Manager* on request, if available.

3. SCOPE OF WORK

3.1. MECHANICAL WORK

The works shall include the procurement, manufacturing, supply, installation and commissioning of the mechanical works listed below.

3.1.1. Clarifiers Valves Actuation

The works include the installation and commissioning the actuated valves listed in Table 1, 2, 3 & 4 for the Primary and Secondary Clarifiers. The works include supply and pulling of cabling (both power and control) as well as the termination of such cables. The preferred selection of actuators is to ensure there is no additional support required (weight of the actuator on the valve) and where supports are deemed required, piping, the contractor is to supply and install. The actuators shall be subjected for compliance to Eskom C&I and Electrical Standards.
Below is a Table 1 showing a list of valves to be actuated for clarifier 1, clarifier 2, clarifier 3 and clarifier 4. Each clarifier valve set has different plant coding (KKS names). Refer to P&IDs (0.84/26148 SHT 1 and 0.84/26150 SHT 1 for more details. These items are to be free issued to the Contractor.
Table 2 shows actuated valves that still needs to be procured, installed and commissioned on the Primary and Secondary Clarifiers.

Table 1: Actuators with knife gate and butterfly valves for clarifiers to be free issued.

Item	**Clarifier 1, 2, 3& 4**
DN 50 Knife Gate valves	4
DN 65 Knife gate Valves	20
DN 50 Butterfly valves	12
DN 65 Butterfly Valves	10

Table 2: knife gate valves for secondary clarifiers to be procured.

Item	**Clarifier 3**	**Clarifier 4**
Knife Gate Valves (50NB) with multi turn Actuator (SA 0.72-0.76)	7	7
Manual Knife gate Valves (50 NB)	6	7
Manual Knife gate Valves (65 NB)	6	7

3.1.2. Flushing Modification

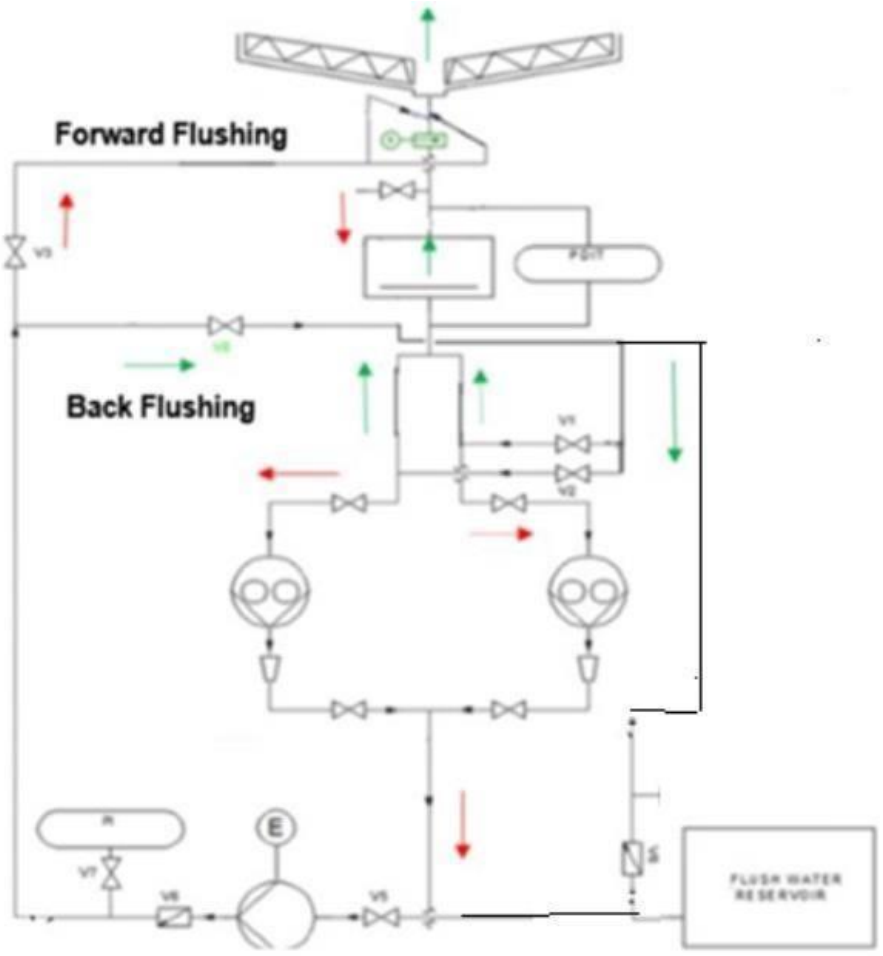

Figure 1: Flushing Modes Schematic.

The current design is comprised of three flushing modes. Each mode is achieved by opening or closing of certain valves. The following are the existing flushing modes:

- Flushing of the pipework from the sludge pump back to the clarifier.
- Flush forward through the sludge pump to the centrifuges.

Flushing modifications shall be retrofitted into all the clarifiers (Clarifier 1-4). The Contractor shall supply re-use the old flushing pipes and install modifications to the flushing line as a retrofit to existing plant.

The flushing line shall have isolation valves and NRV that will be linked to the operation of the clarifiers to allow forward and backward flushing. The valves shall be actuated using automation process from an Operator desktop. Figure 1 shows the two flushing modes that are being proposed for the system to function properly without complexity. The strainer is to have plate that divides into 2 compartments as this will aid agitation during flushing and to avoid directly feeding on to the running sludge pumps.

3.1.3 Screw Pump Station

All the dirty water processed from the dirty water primary clarifiers and other parts of the station is fed to the to the pump station by gravity and then via the screw pumps positively displaces the water to the level of the secondary clarifier inlets. Currently this plant is manually operated; the plant is to be updated to reflect and to be observed via DCS as well as to provide warning alarms prior to startups. Equip with level indicators.

3.1.4. Oil Skimmer/Oil removal system (Clarifier 3 and 4 only)

The oil collected by the clarifiers is normally of the floating limited volume. The old design requires the oil to be decanted by a rolling decant pipe once every rotation of the scrapper. The decanted oil normally contains a large proportion of water, which then is transferred to the oil separator via gravity. The oil from the separator is then "skimmed" from the separator water surface using a multi-disc oil skimmer at a rate of 5 m3/hour. However, this system was inefficient.

The oil skimmer/oil removal system in the secondary clarifiers previous design was not fit for purpose. From previous consultation with a specialist company in environmental pollution control by the name of Drizit, it was recommended that Oil/Water separator 80 cubic meters was required to reduce on the oil contaminations in expected in the secondary clarifiers.
The works include:

a) all requirements (civil, mechanical, electrical, control and instrumentation) to ensure a functional, safe operating and automated oil removal system is employed.
b) The new oil skimmer is to be a floating oil skimmer type, the floating oil skimmer should be capable of removing all the oil in the clarifier system.
c) The new oil skimmer shall seamlessly tie into the existing oil recovery system, which consists of pumping system that transfer the skimmed oil into drums for collection.

3.1.5 Degrit Sump Equipment

The works include the supply, installation and commissioning of the equipment listed below.
Table 3: Degrit Sump Equipment to be Free Issued.

	Unit 6	**Unit 5**	**Unit 4**	**Unit 3**	**Unit 2**	**Unit 1**
Pumps	Pumping Length-260m. Flow rate-20.7 l/s. Static Head-10.7m. **2 Pumps, 22 KW**	Pumping Length-371.7m. Flow rate-21.3 l/s. Static Head- 10.7m. **2 Pumps, 30 KW**	Pumping Length-483.5m. Flow rate-21.0 l/s. Static Head- 10.7m. **2 Pumps, 37KW**	Pumping Length-655.2m. Flow rate-30.6 l/s. Static Head-10.7m. **2 Pumps, 37 KW**	Pumping Length-706.9m. Flow rate-31.3 l/s. Static Head-10.7m. **2 Pumps, 55KW**	Length-818.6m. Flow rate-31.1 l/s. Static Head-10.7m. **2 Pumps, 55KW**
Level transmitter	2 X Level transmitters (Wet and Dry sump)	2 X Level transmitters (Wet and Dry sump)	2 X Level transmitters (Wet and Dry sump)	2 X Level transmitters (Wet and Dry sump)	2 X Level transmitters (Wet and Dry sump)	2 X Level transmitters (Wet and Dry sump)
Submersible pump(Dry Sump)	1 X 1.3 kw	1 X 1.3 kw	1 X 1.3 kw	1 X 1.3 kw	1 X 1.3 kw	1 X 1.3 kw

Knife Valves + Actuator	5	5	5	5	5	5
Butterfly Valve + Actuators	2	2	2	2	2	2

Table 4: Degrit Sump Equipment listing to be Procured.

	Unit 6	Unit 5	Unit 4	Unit 3	Unit 2	Unit 1
Manual Butterfly Valve (100NB)	1	1	1	1	1	1
Flow meters (H8049120000)	1 X Slurry discharge flowmeter with cabling & 1 X flush flowmeter	1 X Slurry discharge flowmeter with cabling & 1 X flush flowmeter	1 X Slurry discharge flowmeter with cabling & 1 X flush flowmeter	1 X Slurry discharge flowmeter with cabling & 1 X flush flowmeter	1 X Slurry discharge flowmeter with cabling & 1 X flush flowmeter	1 X Slurry discharge flowmeter with cabling& 1 X flush flowmeter
Agitator motor	1 X 37Kw motor, test and if not ok refurbish	1 X 37Kw motor, test and if not ok refurbish	1 X 37Kw motor, test and if not ok refurbish	1 X 37Kw motor, test and if not ok refurbish	1 X 37Kw motor, replace	1 X 37Kw motor, test and if not ok refurbish
Agitator Gearbox (Mixtec series 4000, Model 4006)	Service gear oil, filters & breather, replace if it is not working	Service gear oil, filters & breather, replace if it is not working	Service gear oil, filters & breather, replace if it is not working	Service gear oil, filters & breather, replace if it is not working	Service gear oil, filters & breather, replace if it is not working	Service gear oil, filters & breather, replace if it is not working
Actuato + Knife Gate Valves (SA0.72-76 utli turn, 100NB knife gate valve)	2	2	2	2	2	2
SPRAY NOZZLE ("FULLJET" BRASS SPRAY NOZZLE DESIGNATION: B1 - HH - BRASS - 12)	6	6	6	6	6	6

3.1.6 Slurry Pumps

Slurry pumping should be selected based on the following.

a) The pumps shall fit and be compatible with existing configuration of pipes and valves in the degrit sumps, supply all missing spool pieces and new modifications. See Table 5.

Works on Degrit sump shall also include:

a. Breaking up of bricks (about 100mm X 300mm X 3 m x 3 (sides), each unit) covering the openings into the wet sump,
b. Cleaning, dewatering and removing of ash slurry from all the drainage trenches around the boiler floor (This may require use of a vacuum truck together with manual labour),1. from the DHP deep trench, 2 on the trenches closest to the wet sump)
c. This works should include continuous cleaning (pumping, draining of water and slurry, disposal) until handover, removing as well as transport to the ash dump of ash slurry in both the wet and dry sumps.
d. Due to some of the equipment being submerged for a long time, the cabling on the equipment may need to be replaced.
e. The equipment listed in Table 3 are mainly for the dry sump and do not include the 3 actuators that are above the sump. It is assumed that these should still be functional as they were not flooded. The Contractor is required to re-use these actuators.
f. The valves on the final slurry discharge line and the wet sump level transmitter flush line need replacing on all units.
i. Preparation of the base at the bottom of the sump will be required for the pumps mentioned.
j. Introduce temporary means to stop water ingress into the degrit sump so that the wet sump can be cleaned.
k. Replacement of 6 nozzles per degrit sump.

Table 5: Missing Spool pipe pieces and spares.

Medium	**Description**	**Quantity**
Slurry	100 NB Straight Pipe, FBE 149 mm long	6
Flushing Water	100 NB Straight Pipe, FBE 1694 mm long	2
Flushing Water	100 NB Straight Pipe, FBE 286 mm long	8
Flushing Water	100 NB Straight Pipe, FBE 690 mm long	2
Slurry	100NB Equal T-piece, flanged, equal FBE (300mm long side)	12
Slurry	100NB Straight Pipe, FBE 319 mm long	12
Slurry	100NB Straight Pipe, FBE 447 mm long	6
Flushing Water	100NB Sweeping T-piece, flanged, FBE (400mm long side),200mm	8
Flushing Water	100NB, 90 degrees elbow long radius, Flanged	6
Slurry	100NB, 90 degrees elbow, Radius 200mm	24
Slurry	100NB, 90 degrees elbow, R 200mm, 453mm (15 mm socket welded 200 mm) X 313 mm	2
Dirty water	40 NB Fllexible Pipe, TBE 1200 mm long +Clamps	4
Dirty water	40 NB Straight Pipe, FBE 444 mm long	4
Dirty water	40 NB Straight Pipe, FBE 444 mm long	4
Dirty water	40NB, 90 degrees elbow long radius,	4
Dirty water	40NB, 90 degrees elbow long radius, Flanged special (300mm long side)	4
Slurry	Reducer 75 NBX100NB,248 mm FBE	4

Flushing Water	100 NB Straight Pipe, FBE 1000 mm long	2
Slurry	Reducer 80 NBX100NB,231mm FBE	4
Slurry	Reducer 100 NBX80NB,360mm FBE	4

3.1.7 Transfer House 7 Sump Equipment

The works include the refurbishment or supply, and commissioning of the equipment listed below. The equipment listed below was removed and some sent for refurbishment. The equipment must be tested, installed and commissioned.
Table 6: TH7 Sump Equipment listing

Item	**Equipment**	**Status**
Pump motors	Slurry Pumps 2x15 kW, Pumping Length- 260m. Flow rate-20.7 l/s. Static Head-10.7m.	supply
Submersible Pump	1.3-1.75 kW	Free issue
Motors (Agitators)	22 kW	supply
Agitator Gearbox (Mixtec series 1000, Model 1137)	Service gear oil, filters & breather, replace if it is not working	supply
Actuated Knife gate valves	5 X (Actuators (SA0.72-0.76 multi-turns) &Knife gate valves (100NB) unit set).	supply
Level transmitters	2 X (rod type: 1m and 3m)	supply
Flowmeters((H8049120000))	2 X (Slurry discharge + flushing flowmeter with cabling)	supply
Actuated Butterfly Valves	2 X (Actuators (SA0.72-0.76 Quarte-turns /SQ05) & 100NB butterfly valves unit set).	supply
Spray Nozzle (1/8” NPT ORBSPT (M))(Type HH)	6	supply

The Contractor will be responsible for the full commissioning of this equipment.

a) This works should include continuous cleaning (pumping, draining of water and slurry with vacuum trucks) until plant handover, removing as well as transport to the ash dump of ash slurry in both the wet and dry sumps.
b) Configure the existing pumps with pipes and valves.
c) Agitation rake and drive unit to be checked and if defective, should be replaced or refurbished.
d) 2X level transmitter missing (Probe versions need to be used instead of Radar).
e) Replacement of the nozzle at the bottom of the wet sump.

Transfer House 8 Sump Equipment

The works include the supply, installation and commissioning of the equipment listed below. The equipment listed below was removed and some sent for refurbishment. The equipment must be tested, installed and commissioned.
work includes the procurement, supply, installation and commissioning of the equipment listed below.

a) Pumps shall be capable to handle lumps of up to 25mm diameter.
b) Pumped slurry shall on occasion contain up to 50% solids by volume and the relative density of the pumped slurry is 1.25
c) The pumps are fitted with pressure devices on suction and discharge (pressure transmitters on the discharge)
d) The chosen pumps shall be able to meet the pump duty as specified in the table below.

Table 7: TH8 Sump Equipment Listing.

Items	**Equipment**	**Status**
Submersible pumps	2 X Upgrade from 11KW to 20-30 KW, 14-20 m Head, 20 l/s	Supply
Actuated Knife gates valves	2 X Actuators (SA0.72-0.76 Multi-turns) &Knife gate valves (100NB) unit set.	Supply
Pressure Indicators	Flanged Type	Free issue
Level Transmitters	2 x Level Transmitters (rod type: 1 m and 2.5 m),	Supply
Actuated butterfly Valves	1 X Actuators (SA0.72-0.76 quarter turns) & butterfly valve (50NB) unit set.	Supply
Pipe work	100 NB galvanized steel Pipe 600 m, from TH8 sump to Primary Clarifiers running along the length of the Overland Link Conveyor. 50 NB pipe x 10 m for flushing pipe with nozzle sprays (8). U- bolts (>200) supports and pipe support (>10 with plinths) where applicable	Supply

a. This works should include continuous cleaning (pumping, draining of water and slurry with vacuum truck and TLB) until, removing as well as transport to the ash dump of ash slurry in both the wet and dry sumps.
b. New electrical cables are to be pulled from the nearest substation (30m away) while C&I will remain the same.
c. Paving of the surrounding area (50 m X 50 m) and overland ash conveyor temporary wash bay to improve the drainage of wastewater into the TH08 sump.
d. Floor Cracks at the TH08 Sump.
e. Cracks on the top surface of Transfer House 8.

3.1.8. Centrifuge Station

The control system for the Primary and Secondary clarifiers was designed to have an interface between the mechanical equipment as well the Distributed Control System (DCS). To achieve this the OEM supplied centrifuges that interface with a DCS via a Junction Box. The centrifuges are currently not working due to being exposed to elements.
The work includes the supply and installation of the following replacement equipment. The equipment shall be compatible with existing equipment on site.

a. 6 X CPU set to be replaced
b. 6 X HMI panels to be replaced with simpler designs.
c. 75m of Cat5e cables need to be replaced.

The works include the supply and installation of sheeting around the centrifuge station to protect the equipment against the elements as well as against the surrounding environment and steel floor plates. The works include interfacing with existing equipment.

3.1.9 Clarifier 1 & 2 Damaged Equipment (Primary)

The works include the refurbishment or supply (see below Table), and commissioning of the equipment listed below. The equipment listed below was removed and some sent for refurbishment. The equipment must be tested, installed and commissioned. The equipment is to be verified during clarifications and confirmed at site (See Table 7 and 8).
work includes the procurement, supply, installation and commissioning of the equipment listed below.
a. 4 X installation Sludge Bredel model 65 pumps, 4 X fluid drive and 4 X motors and 4 X additional flushing pumps and drive units.

a) Replacement of old pipework 50 NB discharge lines from sludge pumps to decanter and dirty beds to 65 NB piping, see Table 8 which is to be supplied and installed by contractor.
b) Modification on old flushing pipework (with 2 X butterfly valve and 2 X NRV on the flushing system).
c) Install 23 automated knife valves & butterfly valves and 13 manual controlled knife valves upstream the pumps to decanter and dirty beds.
d) Repairs of cracks on the Clarifier concrete floor and Walls.
e) Procuring 2X sump pumps for draining water from the Clarifier pits.
f) Pulling and termination of Power supply cables from Panel boxes to the flooded equipment points.

Pulling and termination of C&I cables from Junction boxes to the flooded equipment points

a) Replacement of all flow switches and pressure transmitters.
b) VSD inspection, testing and replacement if damaged.
c) Damaged equipment to be verified.
d) Supply of labour to monitor and pump the Clarifiers constantly.
e) Installation of 2 X lednova beka lights or similar lighting per clarifier pit.
f) Modification to strainer or Supply of new one fitting the intended designs.
g) This works should include continuous cleaning (pumping, draining of water and slurry) until handover, removing as well as transport to the ash dump of ash slurry in both the wet and dry sumps.

Table 7 Primary Clarifier Flooded equipment to be procured

Items	**Manufacturer**	**Quantity**
Cerabar S PMP75, PMP75-26CE5/101(PMP75-ABA1KB1B31BU+Z1)	Endress +Hauser	8
Levelflex FMP51, FMP51-4DX82/125(FMP51-AAACCABAA4GGJ+AAF4JALAPBZ1	Endress +Hauser	8
Bredel65 - Peristaltic hose pump Bredel65 with 2 oil level switches per pump	S&A PUMP PRECIZION (PTY) LTD	5
MOTOR 5.5KW 2P 380V B3 WEG W20 CI, COUPLING F60 HF 24X38, BASEPLATE 950X400X100 TOPHAT	KSB	5
200 NB knife Gate valve + multi turn actuator 0.72-0.76	Clarkson + Auma	5
2X 50 NB non return valve		3
please note quantities were increased by 1 to create room for spares which will be issued to Medupi Power Station		

Table 8: Pipework for the Primary Clarifier Sludge pumps.

Medium	ITEM NO	QTY	DESCRIPTION
Slurry	CLA/1/AP/2	2	65NB SWEEPING T-PIECE, FLANGED
Slurry	CLA/1/AP/4	2	65NB STRAIGHT PIPE (238MM) JOINED TO 65NB 90 LONG RADIUS BEND (3D), FLANGED
Slurry	CLA2/AP/2	2	65NB SWEEPING T-PIECE, FLANGED
Slurry	CLA2/AP/4	2	65NB STRAIGHT PIPE (238MM) JOINED TO 65NB 90 LONG RADIUS BEND (3D), FLANGED
Slurry	CLA1/CDB/1	6	REDUCER (65x50)
Slurry	CLA1/CDB/2	2	65NB 90 LONG RADIUS BEND
Slurry	CLA1/CDB/4	2	65NB STRAIGHT PIPE (1340MM)
Slurry	CLA1/CDB/5	11	65NB 90 LONG RADIUS BEND
Slurry	CLA1/CDB/6	2	65NB STRAIGHT PIPE (1320MM)
Slurry	CLA1/CDB/7	1	65NB T-PIECE
Slurry	CLA1/CDB/8	1	65NB SWEEPING T-PIECE
Slurry	CLA1/CDB/9	1	65NB STRAGHT PIPE (10780MM)
Slurry	CLA1/CDB/10	12	65NB STRAGHT PIPE (6480MM)
Slurry	CLA1/CDB/11	2	65NB STRAGHT PIPE (3280MM)
Slurry	CLA1/CDB/12	4	65NB 45 LONG RADIUS BEND
Slurry	CLA1/CDB/13	2	65NB STRAIGHT PIPE (7110MM)
Slurry	CLA1/CDB/14	2	65NB STRAIGHT PIPE (16290MM)
Slurry	CLA1/CDB/15	1	65NB T-PIECE
Slurry	CLA1/CDB/16	4	65NB STRAIGHT PIPE (2570MM)
Slurry	CLA1/CDB/17	4	65NB STRAIGHT PIPE (9110MM)
Slurry	CLA1/CDB/18	4	65NB STRAIGHT PIPE (6680MM)
Slurry	CLA1/CDB/19	4	65NB STRAIGHT PIPE (6210MM)
Slurry	CLA1/CDB/20	1	65NB STRAIGHT PIPE (24860MM)
Slurry	CLA1/CDB/21	1	65NB STRAIGHT PIPE (6680MM)
Slurry	CLA1/CDB/22	1	65NB STRAIGHT PIPE (1190MM)
Slurry	CLA1/CDB/23	1	65NB T-PIECE
Slurry	CLA1/CDB/24	1	65NB STRAIGHT PIPE (600MM)
Slurry	CLA1/CDB/25	1	15MM SAUNDERS VALVE FOR PIT
Slurry	CLA2/CDB/1	2	REDUCER (65x50)
Slurry	CLA2/CDB/2	2	65NB 90 LONG RADIUS BEND
Slurry	CLA2/CDB/4	1	65NB STRAIGHT PIPE (148MM)
Slurry	CLA2/CDB/5	12	65NB 90 LONG RADIUS BEND
Slurry	CLA2/CDB/6	2	65NB STRAIGHT PIPE (1320MM)
Slurry	CLA2/CDB/7	1	65NB T-PIECE
Slurry	CLA2/CDB/8	1	65NB SWEEPING T-PIECE
Slurry	CLA2/CDB/9	12	65NB STRAIGHT PIPE (7580MM)
Slurry	CLA2/CDB/10	10	65NB STRAIGHT PIPE (6480MM)
Slurry	CLA2/CDB/11	2	65NB STRAIGHT PIPE (3180MM)

Slurry	CLA2/CDB/12	4	65NB 45 LONG RADIUS BEND
Slurry	CLA2/CDB/13	2	65NB STRAIGHT PIPE (6970MM)
Slurry	CLA2/CDB/14	2	65NB STRAIGHT PIPE (16210MM)
Slurry	CLA2/CDB/15	1	65NB T-PIECE
Slurry	CLA2/CDB/16	2	65NB STRAIGHT PIPE (2370MM),
Slurry	CLA2/CDB/17	2	65NB STRAIGHT PIPE (7900MM),
Slurry	CLA2/CDB/18	2	65NB STRAIGHT PIPE (6680MM),
Slurry	CLA2/CDB/19	2	65NB STRAIGHT PIPE (6210MM),
Slurry	CLA2/CDB/20	2	65NB STRAIGHT PIPE (24260MM),
Slurry	CLA2/CDB/21	2	65NB STRAIGHT PIPE (6680MM),
Slurry	CLA2/CDB/22	2	65NB STRAIGHT PIPE (1600MM),
Slurry	CLA2/CDB/23	2	65NB STRAIGHT PIPE (600MM),
Slurry	CLA2/CDB/24	1	15MM SAUNDERS VALVE FOR PIT
Slurry	CLA2/CDB/870	1	65NB STRAIGHT PIPE (1070MM)
Slurry	CLA2/CDB/400	1	65NB STRAIGHT PIPE (900MM)
Slurry	CLA2/CDB/90	1	65NB STRAIGHT PIPE (7780MM)
Slurry	CLA2/CDB/100	1	65NB STRAIGHT PIPE (6680MM)
Flushing Water	CLA1/FW/400	4	65NB STRAIGHT PIPE (755MM)
Flushing Water	CLA1/FW/140	4	65NB STRAIGHT PIPE (190MM)
Flushing Water	CLA1/FW/240	4	50NB STRAIGHT PIPE (800MM)
Flushing Water	CLA1/FW/14	2	50NB STRAIGHT PIPE (190MM)

3.1.10. Clarifier 3 & 4 Damaged Equipment (Secondary)

The *works* include the refurbishment or supply (see below Table), and commissioning of the equipment listed below. The equipment listed below was removed and some sent for refurbishment. The equipment must be tested, installed and commissioned. The equipment is to be verified during clarifications and confirmed at site (See Table 9 and 10).
work includes the procurement, supply, installation and commissioning of the equipment listed below.

a. Refurbishment / replacing of 4 X Hose pumps and their relative fluid drives and motors.
b. 4 X replacing Sludge Bredel model 50 pumps, 4X fluid drive and 4X motors and 4X additional flushing pumps and drive units.
c. Replacement of old pipework 50 NB discharge lines from sludge pumps to decanter and dirty beds with new one 65 NB pipelines, see Table 10 which is to be supplied and installed by contractor.
d. Modification on old flushing pipework (with 2 X butterfly valve and 2 X NRV on the flushing system).
e. Install 23 automated knife valves & butterfly valves and 13 manual controlled knife valves upstream the pumps to decanter and dirty beds.
f. Repairs of cracks on the Clarifier concrete floor and Walls.
g. Procuring 2 X sump pumps for draining water from the Clarifier pits.
h. Pulling and termination of Power supply cables from Panel boxes to the flooded equipment points.
   Pulling and termination of C&I cables from Junction boxes to the flooded equipment points
i. Replacement of all flow switches and pressure transmitters.
j. VSD inspection, testing and replacement if damaged.
k. Damaged equipment to be verified.
l. Installation of 2X lednova beka lights or similar lights per clarifier pit.
m. Supply of labour to monitor and pump the Clarifiers constantly.
n. Modification to strainer or supply of new one fitting the intended designs.
o. This works should include continuous cleaning (pumping, draining of water and slurry) until handover, removing as well as transport to the ash dump of ash slurry in both the wet and dry sumps.

Table 9: Secondary Clarifier Flooded Equipment to be procured.

Item	**Manufacturer**	**Quantity**
Cerabar S PMP75, PMP75-26CE5/101(PMP75-ABA1KB1B31BU+Z1)	Endress +Hauser	8
LevelflexmFMP51, FMP51-4DX82/125(FMP51 AAACCABAA4GGJ+AAF4JALAPBZ1	Endress +Hauser	8
Bredel50 - Peristaltic hose pump Brede50 with 2 oil level switches per pump	S&A PUMP PRECIZION (PTY) LTD	5
MOTOR 5.5KW 2P 380V B3 WEG W20 CI, COUPLING F60 HF 24X38, BASEPLATE 950X400X100 TOPHAT	KSB	5
200 NB knife Gate valve + multi turn actuator 0.72-0.76	Clarkson + Auma	5
2X 50 NB non return valve		3
please note quantities were increased by 1 to create room for spares which will be issued to Medupi Power Station		

Table 10: Pipework for the Secondary Clarifier Sludge pumps.

Medium	**ITEM NO**	**QTY**	**DESCRIPTION**
Slurry	CLA3/CDB/1	2	50NB STRAIGHT PIPE (218 MM)
Slurry	CLA3/CDB/2	10	50NB 90 LONG RADIUS BEND
Slurry	CLA3/CDB/3	2	50NB STRAIGHT PIPE (760MM)
Slurry	CLA3/CDB/5	2	50NB STRAIGHT PIPE (200MM)
Slurry	CLA3/CDB/6	2	50NB STRAIGHT PIPE (1474MM)
Slurry	CLA3/CDB/7	1	50NB STRAIGHT PIPE (198MM)
Slurry	CLA3/CDB/8	1	50NB T-PIECE
Slurry	CLA3/CDB/9	1	50NB STRAIGHT PIPE (350MM)
Slurry	CLA3/CDB/10	1	50NB SWEEPING T-PIECE
Slurry	CLA3/CDB/11	1	50NB STRAIGHT PIPE (14648MM)
Slurry	CLA3/CDB/12	1	50 NB STRAIGHT PIPE (6870MM)
Slurry	CLA3/CDB/13	2	50NB STRAIGHT PIPE (6571MM)
Slurry	CLA3/CDB/14	4	50NB 45 LONG RADIUS BEND
Slurry	CLA3/CDB/15	2	50NB STRAIGHT PIPE (4028MM)
Slurry	CLA3/CDB?16	2	50NB STRAIGHT PIPE (27367MM)
Slurry	CLA3/CDB/17	3	50NB OFF-SET
Slurry	CLA3/CDB/18	1	50NB STRAIGHT PIPE (11132MM)
Slurry	CLA3/CDB/19	1	50NB STRAIGHT PIPE (3112MM)
Slurry	CLA3/CDB/20	1	50NB STRAIGHT PIPE (12894MM)
Slurry	CLA3/CDB/21	1	50NB STRAIGHT PIPE (24395MM)
Slurry	CLA3/CDB/22	1	50NB SWEEPING T-PIECE

Slurry	CLA3/CDB/23	1	15MM SAUNDERS VALVE FOR PIT
Slurry	CLA3/CDB/120	1	50NB STRAIGHT PIPE (7070MM)
Slurry	CLA3/CDB/110	1	50NB STRAIGHT PIPE (14848MM)
Slurry	CLA3/CDB/500	1	50NB STRAIGHT PIPE (140MM)
Slurry	CLA4/CDB/1	2	50MB STRAIGHT PIPE (218MM)
Slurry	CLA4/CDB/2	12	50NB 90 LONG RADIUS BEND (12)
Slurry	CLA4/CDB/3	2	50NB STRAIGHT PIPE (760MM)
Slurry	CLA4/CDB/5	2	50NB STRAIGHT PIPE (370MM)
Slurry	CLA4/CDB/6	2	50NB STRAIGHT PIPE (1522MM)
Slurry	CLA4/CDB/7	2	50NB STRAIGHT PIPE (200MM)
Slurry	CLA4/CDB/8	1	50NB T-PIECE
Slurry	CLA4/CD/9	1	5ONB STRAIGHT PIPE (350MM)
Slurry	CLA4/CDB/10	3	50NB SWEEPING T-PIECE
Slurry	CLA4/CDB/11	1	50NB STRAIGHT PIPE (10950MM)
Slurry	CLA4/CDB/12	2	50NB STRAIGHT PIPE (6870MM)
Slurry	CLA4/CDB/13	2	50NB STRAIGHT PIPE (6510MM)
Slurry	CLA4/CDB/14	4	50NB 45 LONG RADIUS BEND
Slurry	CLA4/CDB/15	2	50NB STRAIGHT PIPE (4736MM)
Slurry	CLA4/CDB/16	2	50NB STRAIGHT PIPE (27180MM)
Slurry	CLA4/CDB/17	2	50NB STRAIGHT PIPE (12082MM)
Slurry	CLA4/CDB/18	2	50NB STRAIGHT PIPE (2915MM)
Slurry	CLA4/CDB/19	2	50NB STRAIGHT PIPE (550MM)
Slurry	CLA4/CDB/20	2	50NB STRAIGHT PIPE (12808MM)
Slurry	CLA4/CDB/21	2	50NB STRAIGHT PIPE (24395MM)
Slurry	CLA4/CDB/22	2	50NB SWEEPING T-PIECE
Slurry	CLA4/CDB/23	1	15MM SAUDERS VALVE FOR PIT
Slurry	CLA4/CDB/120	1	50NB STRAIGHT PIPE (7160MM)
Slurry	CLA4/CDB/110	1	50NB STRAIGHT PIPE (1200MM)
Slurry	CLA4/CDB/500	1	50NB STRAIGHT PIPE (310MM)
Slurry	CLA4/CDB/890	1	50NB STRAIGHT PIPE (770MM)
Slurry	CLA3/AP/2	2	50NB SWEEPING T-PIECE
Slurry	CLA3/AP/3	2	50NB STRAIGHT PIPE (200MM)
Slurry	CLA3/AP/4	2	50NB 90 LONG RADIUS BEND
Slurry	CLA4/AP/2	2	50NB SWEEPING T-PIECE
Slurry	CLA4/AP/3	2	50NB STRAIGHT PIPE (200MM)
Slurry	CLA4/AP/4	2	50NB 90 LONG RADIUS BEND
Slurry	CLA1/CDB/1	4	REDUCER (65x50)
Slurry	CLA3/FW/240	4	50NB STRAIGHT PIPE (800MM)
Slurry	CLA3/FW/14	2	50NB STRAIGHT PIPE (190MM)
Flushing Water	CLA3/FW/400	4	65NB STRAIGHT PIPE (755MM)
Flushing Water	CLA3/FW/140	4	65NB STRAIGHT PIPE (190MM)

3.1.11 E, C & I Cables for Degrit Sumps X 7, TH 7, TH8, Screw Pumphouse and Clarifiers X 4

The table below should the amount of Electrical, Control and Instrumentation cables that will need replacement if damaged and new installation.
Table 11:Project Cabling E, C &I cabling

Discipline	Cable Type	Length (m)
Electrical	BVV04DCM	14120
Electrical	BVX04CCM	990
Electrical	BVX02DCM	360
Electrical	BVX03ECM	350
C&I	UVG02ACM	7000
C&I	UVG16AEM	11500
C&I	UVG08ACM	2000

3.1.12 Configuration Management

The contractor shall complete KKS coding as per the KKS Key Part standard Rev.6 (348-694071), VGB guidelines and List of Abbreviations Rev.11 standard on the provided equipment list template, insert the codes on the drawings, label the plant following the KKS Coding and Labelling standard Rev.7 (348- 630398) and apply for KKS inspections. Eskom will only review and accept the codes. The contractor shall remain liable for the codes provided by them even though Eskom has accepted the codes.

3.1.13. Commissioning

The Contractor will be responsible for the commissioning of the integrated plant. The Contractor shall provide the commissioning with relevant activities and supporting statements for a need of such activity.
The Commissioning Book shall record interventions for acceptance and rejection for a repetition of such failed activity. Eskom commissioning will provide support for interfacing disciplines and plant.

3.1.14 Remedial Works

a. Temporary works:
   i. Pumping water while working especially in the degrit sumps
   ii. Clearing of pipes that could be filled with ash
   iii. Temporary Power for the works
b. Pump Extraction house
   ii. Coverage for inspection, maintenance and/or replacement of equipment should there be any breakdown during commission

3.1.15. Plant Safety Regulations

The plant where the works will take place has already been safety cleared; the Contractor shall follow the Plant Safety Regulations and High Voltage Regulation to do any work. Thus, the Contractor shall have trained personnel for Mechanical, Electrical (both Low and High Voltage) as well Control and Instrumentation.

3.2 ELECTRICAL WORKS

The electrical contractor shall be responsible for the provision of all the electrical interface and ensure that work is done with good quality, and all new installation or modification must fit to the existing system or plant.

The electrical scope covers the following:

- Primary and Secondary Clarifier
- De grit sumps
- Transfer house 7 & 8
- Oil Skimmers

3.2.1. Primary clarifier 1 and 2 scope

The scope of works includes but not limit to the following:

- The contractor shall be responsible for the installation of 23 free issued actuated valves,
- Upon receiving the free issued actuated valves the contractor shall submit power requirements using an Aux power schedule to the Project manager for acceptance by the Engineer,
- Post acceptance of the Aux power, the contractor shall submit termination, cable, load list and load schedule for all the loads to be supplied.
- POC will be allocated by the employer, in areas where MCB are required, the contractor will install MCB on the existing 400V Switchgear as communicated by the employer adhering to the Low Voltage switchgear and control assembly standard 240-56227516.
- The employer will provide details of the switchgear together with the POC details.
- The contractor shall design, supply and install cables racks to the respective loads, this should be inline with Requirements for Control and Power Cables for Power Stations Standard (240- 56227443)
- The contractor must use existing routing or racks to run their cables, unless agreed with the employer for any secondary racking.
- The contractor shall supply all associated tools and equipment to earthing installation and testing in line with Eskom Earthing and Lightning Protection Standard (240-56356396).

- Testing of cables, racking and earthing and shall be conducted with respect to SANS and Eskom Standard, all tests conducted (earthing, insulation resistance etc.) shall be submitted to the employer for approval and will form part of the data books
- All equipment shall be labelled in line with Eskom KKS standard, this included labelling on the existing switchboard where additional cables have been added.
- Where new cables have been pulled, the contractor shall reseal any damage fireproofing.
- Safety clearance of all electrical equipment (Cabling, earthing, racking, DB's, LV switchgear) shall be followed and results will build up the data book for submission.
- In areas where lighting will be replaced due to flooding, the contractor shall replace lights with similar or better light fitting, if design is changed, the contractor will need to submit data sheet of the new lights together with illuminance test result.
- Lux survey must be conducted in line with SANS 10114 and the Occupational health and safety act of 93.
- The contractor to test and certify the VFD panels and issue out a report. Refurbishment or replacement of the Variable Speed Drive for the sludge pumps. There are 2x sludge pumps per clarifier. The supplier/will need to complete the VSD technical A& B schedule and submit to the employer prior to purchasing the VSD. VFD Technical A & B template (240-132875144).
- The contractor shall ensure that all additional works or new works is interfacing with all the other system.

3.2.2 Secondary clarifier 3 and 4 scope

- The contractor shall be responsible for the installation of 23 free issued actuated valves, Upon receiving the free issued actuated valves the contractor shall submit power requirements using an Aux power schedule to the Project manager for acceptance by the Engineer,
- Post acceptance of the Aux power, load list the contractor shall submit termination, cable and load schedule for all the loads to be supplied.
- POC will be allocated by the employer, in areas where MCB are required, the contractor will install MCB on the existing 400V Switchgear as communicated by the employer adhering to the Low Voltage switchgear and control assembly standard 240-56227516.
- Due to limited Connection point on the Secondary clarifier, the contractor shall modify the existing Electrical Switchgear and install buckets on unequipped spare circuits that will cater for all loads.
- A downstream Electrical distribution board to be installed to power all the 23 valves. The Electrical DB shall adhere to the Coal fired lighting and small power installation standard (240- 55714363) together with the Filed instrument junction box standard (240-56355815)
- Upon completion with electrical DB, the contractor shall certify the DB and issue out a COC
- The contractor shall design, supply and install cables racks to the respective loads, this should be in line with Requirements for Control and Power Cables for Power Stations Standard (240- 56227443)
- The contractor must use existing routing or racks to run their cables, unless agreed with the employer for any secondary racking.
- The contractor shall supply all associated tools and equipment to earthing installation and testing in line with Eskom Earthing and Lightning Protection Standard (240-56356396).
- Testing of cables, racking and earthing and shall be conducted with respect to SANS and Eskom

Standard, all tests conducted (earthing, insulation resistance etc.) shall be submitted to the employer for approval and will form part of the data books

- All equipment shall be labelled in line with Eskom KKS standard, this included labeling on the existing switchboard where additional cables have been added.
- Where new cables have been pulled, the contractor shall reseal any damage fireproofing.
- Safety clearance of all electrical equipment (Cabling, earthing, racking, DB's, LV switchgear, KKS cert etc.) shall be followed and results will build up the data book for submission.
- The contractor to test and certify the VFD panels and issue out a report. Refurbishment or replacement of the Variable Speed Drive for the sludge pumps. There are 2x sludge pumps per clarifier. The supplier/will need to complete the VSD technical A& B schedule and submit to the employer prior to purchasing the VSD. VFD Technical A & B template (240-132875144).
- The contractor shall ensure that all additional works made fit with the existing system.

3.2.3. Degrit sumps works

The contractor to ensure that the system is functional as per the employer's requirement.

- There are pumps and motors, the contractor shall assess all the electrical cable through a visual inspection, conducting insulation resistance and continuity test and provide a report to the employer for approval.
- The contractor shall also assess all the motors and provide a report
- The contractor to connect all power cables to the pumps and motors, safety clear the cables, install labelling, and earthing installation.
- The contractor shall ensure that the plant runs as per the design.
- Where earthing is corroded, the contractor shall repair and certify the earthing integrity in line with Eskom Earthing and Lightning Protection Standard (240-56356396).
- Data books to be submitted as agreed upon the employer and quality department.

3.2.4. Degrit temporally works (Emergency mobile pump).

The works are as follows:

- The contractor shall buy the required pumps as per section 3.1.3 (3 X (2X1.5B-AH) slurry pump (pumps set to remove 10-20l/s) type keeping the DOL panels for the 15 KW motor (rated at 380- 400V).
- The contractor shall connect the pumps to the nearest welding socket onsite,
- Existing welding 63A, 400V welding are in strategic areas onsite, therefore it is the responsibility of the contractor to have enough cable slack to power the pumps whenever required.
- The contractor shall ensure that they system is functional.

3.2.5 Oil Skimmers works

The works are as follows:

- The contractor shall submit an Aux power schedule to the employer for approval.
- POC will be allocated by the Employers Engineer.
- Post acceptance of the Aux power, load list the contractor shall submit termination, cable and load schedule for all the loads to be supplied.
- POC will be allocated by the employer, in areas where MCB are required, the contractor will install MCB on the existing 400V Switchgear as communicated by the employer adhering to the Low Voltage switchgear and control assembly standard 240-56227516.
- Due to limited Connection point on the Secondary clarifier, the contractor shall modify the existing Electrical Switchgear and install buckets on unequipped spare circuits that will cater for all loads.
- A downstream Electrical distribution board to be installed to power all the loads The Electrical DB shall adhere to the Coal fired lighting and small power installation standard (240-55714363) together with the Filed instrument junction box standard (240-56355815).
- Upon completion with electrical DB, the contractor shall certify the DB and issue out a COC
- All supporting certificate (KKS, Earthing) to form part of the final inspection for the DB.
- The contractor shall install secondary racking where required.
- The contractor shall design, supply and install cables racks to the respective loads, this should be in line with Requirements for Control and Power Cables for Power Stations Standard (240- 56227443).
- The contractor must use existing routing or racks to run their cables, unless agreed with the employer for any secondary racking.
- The contractor shall supply all associated tools and equipment to earthing installation and testing in line with Eskom Earthing and Lightning Protection Standard (240-56356396).
- Testing of cables, racking and earthing and shall be conducted with respect to SANS and Eskom Standard, all tests conducted (earthing, insulation resistance etc.) shall be submitted to the employer for approval and will form part of the data books.
- The Contractor shall dig half meter deep, +-10 m long trench from substation to the Tar Road before the cables enter the tunnel for both Armoured C&I and Electrical cables to Clarifiers.

3.2.6. Transfer houses Works

Transfer House 8

There are 2 pumps that need to be upgraded from 11kW to 30KW, the electrical scope includes:

- Removal of existing pumps and installation of bigger pumps (30kW).
- Design and sizing of cables to power the new motors.
- Procurement and installation of the sized correct cables for bigger motors.
- Subsequently, all actuator pumps cables to be installed.
- Switchgear modification for installation of bigger circuits to accommodate bigger pumps
- POC will be allocated by the employer, the contractor will install the correct circuit on the 400V Switchgear as communicated by the employer adhering to the Low Voltage switchgear and control assembly standard 240-56227516
- The contractor shall ensure that new installation fit onto the existing system.
- Earthing installation and testing inline with the Earthing standard. The contractor shall also ensure that the earthing integrity of the system is still intact.
- Supporting document such as earth results to be submitted with the data and must be reviewed

prior by the Employers Engineers.

Transfer House 7

The works are as follows:

- The contractor shall assess the existing cables to the pumps and provide a report to the employer for approval.
- The contractor shall conduct cabling tests such as insulation resistance (Megger), continuity and provide the results to the employer for approval.
- The contractor shall reconnect all the cables and ensure that the is functional
- They shall also verify the earthing integrity and fix as required.
- Configure with existing DCS system.

3.2.7 Compliance with Electrical Standards and General requirements

The Contractor shall comply to the following electrical standards for execution of the electrical works, or any international standard stipulated in deviation schedule:

a) The electrical designs, manufacturing, construction, and installations are done in accordance with SANS 10142-1 (The wiring of premises part 1: Low voltage installation).
b) The power cables and cable racks are done in accordance with 240-56227443 (Requirements for Control and Power Cables for Power Stations Standard).
c) Earthing and lightning protection is done in accordance with the Earthing and Lightning Protection Standard (240-56356396).
d) LV Modifications shall be done in accordance adhering to the LV Switchgear control and assembly 240-56227516
e) Test the motors and provided certificates as per the procurement of power station low voltage motors specification 240-57617975.
f) Earthing and Lightning Protection Standard (240-56356396).
g) The high-level general scope of work for electrical includes:
    - Ensure new equipment is interfacing with all the other system requirements of the plant/installation.
    - Test the motors and provided a certificate as per the Procurement of Power Station Low voltage motors specification (240-57617975)
    - Conduct an earth continuity test and provide certification for quality controls.
    - Conduct insulation resistance and provide certification for quality records
    - Produce all documentation and drawings for approval by the employer

3.3 CONTROL AND INSTRUMENTATION WORKS

The C&I system forming part of the Works shall provide all information, alarms, protections, process interlocks, control and local control facilities to enable the operator (located in the Outside PlantControl Room) to execute operating tasks safely, reliably and consistently. All C&I, protection system and control components supplied as part of the Works, shall be supported and maintainable for a minimum of 25 years. The Contractor's design shall provide for later expansion of the control and instrumentation system such that future changes and enhancements can be readily incorporated.

3.3.1. System Architecture

The C&I plant forming part of the Works shall be integrated into the Employer's C&I plant by Contractor.

3.3.2. SUMMARY DESCRIPTION OF C&I WORKS

i. The Contractor shall perform engineering, design, procurement, manufacturing, factory acceptance testing, delivery, off-loading at site, storage, installation, testing, commissioning, optimization and as-built documentation for the complete C&I plant and material. The limit of supply is as per Limit of Supply and Services (LoSS) Diagrams
ii. Contractor shall supply documentation and information as per the C&I VDSS – clarification of the referenced documents in the C&I VDSS can be found in the C&I Documentation Description document.
iii. The Contractor shall implement the operating and control of the plant in the Employer's Distributed Control System (DCS) based on the information provided by the Contractor as per C&I VDSS.
iv. The Plant shall be operated from the Employer's Outside Plant Control Room with HMI supplied by the Employer.
v. The Plant shall also be operated and controlled by C&I equipment supplied by the Contractor.

vi. The C&I system forming part of the Works shall provide all information, alarms, protections, process interlocks, control and local control facilities to enable the operator (located in the Outside Plant Control Room) to execute operating tasks safely, reliably and consistently.
vii. The Contractor shall integrate the C&I plant forming part of the Works to the Employer's C&I plant.
viii. The Contractor shall ensure that the C&I plant forming part of the Works is supplied and standardized as per Employer's requirements.
ix. The Contractor shall ensure that the C&I plant forming part of the Works meets the dynamic and static operation, reliability, availability and safety requirements and does not affect adversely the Employer's C&I plant performance.
x. All C&I, protection system and control components supplied as part of the Works, shall be supported and maintainable for a minimum of 25 years.

xi. The Contractor is fully responsible for integrating the operation, monitoring, control and process management of the C&I Works with existing installed C&I plant and material.
xii. The Contractor shall be responsible for obtaining all relevant information of plant and material outside their supply where it affects design or plant and material within the Contractor's scope of supply.
xiii. The Contractor shall provide proof and evidence of compliance to this specification for approval by the Engineer.
xiv. The Contractor shall use only proven technology with references accepted by the Employer prior to the commencement of the design phase.

3.3.3. Standards

i. The additional standards applicable to the C&I Works are listed in List of Additional Standards Applicable to C&I Works as per below table.
ii. The Contractor shall notify the Engineer of any conflict within this Specification with any referenced standards, specifications or technical guideline.
iii. Substitutions of any standards in Standards shall be approved by the Employer.
iv. Additional standards proposed by the Contractor shall be submitted for approval by the Employer.

3.3.4. BACKGROUND ON EMPLOYER'S CURRENT C&I SYSTEM DESIGN

i. The Employer's control system is based on the Alspa Series 6 Distributed Control System (DCS) supplied by Alstom
ii. The DCS Input-Output Functional Blocks as implemented by the Employer are as per IO Function Blocks.
iii. MFC3000 Controllers are used throughout the Balance of Plant (BoP).
iv. The Employer's DCS cubicles are distributed throughout the outside plant in C&I equipment rooms adjacent to electrical substations.
v. All field equipment is HART-enabled to allow for interfacing with Employer's Asset Management System.
vi. Go-switches are used in the place of proximity switches that are hardwired to the DCS.

3.3.5. STANDARDIZATION REQUIREMENTS

i. The Contractor shall standardize similar plant components with the rest of the power plant to ensure simplified operation and maintenance, and reduced lifecycle management costs.
ii. The system shall employ a uniform approach across all plant areas as per the rest of the power plant with respect to design philosophy, basic functional characteristics, system interfaces, documentation, standard function blocks and engineering tools.

iii. The requirements of standardization shall be applicable to all C&I plant and material including the PLCs. The Contractor shall supply a standardization strategy document for the Engineer's approval during concept engineering design phase.

3.3.6. SYSTEM PERFORMANCE REQUIREMENTS

i. The availability of the complete C&I system (including interfaces to DCS) consisting of the individual sub-systems over its life in percentage of time shall be 99,99% or greater. The availability shall include for all software updates and upgrades, and planned and unplanned maintenance, but exclude hardware upgrades. This would require an emphasis on on-line maintenance of all C&I system components.
ii. The availability of the complete protection systems over its life in percentage of time shall 99,999% or greater. The availability shall include for all software updates and upgrades, and planned and unplanned maintenance, but exclude hardware upgrades. This would require an emphasis on on- line maintenance of all protection system components, without putting the plant at risk.
iii. Field devices availability shall as a minimum match that of the C&I system forming part of the Works so that it does not constitute a weak link. This will require an emphasis on matching the MTTF and MTTR of the field device with that of the overall C&I system forming part of the Works, on-line maintenance of field device, functional distribution of equipment, and matching of redundancy philosophies with mechanical and electrical systems.
iv. All field instrumentation shall have a minimum MTTF of 100 years.

v. All transmitters shall have a minimum long-term stability of 0.15% drift in 6 years guaranteed for at least 6 years from the date of Taking-over. If, during the 6-year guarantee period the methodology for testing shows that the drift limit has been exceeded, the Contractor shall replace the device within 24 hours.

3.3.7. ENVIRONMENTAL CONSIDERATIONS

The Contractor shall guarantee the maximum sound power level (in watts) of each item of plant shall not exceed a noise level (sound pressure level) of 85 dB (A) according to SABS 083/1970, at 3m from any such item in its permanent location site. This guarantee applies to normal site

operating conditions with the item fitted with standard silencing equipment. For items of the Works that operate periodically, the guarantee applies to the time when they are operating.

3.3.8. C&I PLANT AND MATERIAL ENVIRONMENTAL AND HAZARDOUS LOCATION PROTECTION REQUIREMENTS

i. The Contractor shall provide equipment protection ratings and certificates for the Engineer's approval.
ii. Field equipment and devices shall be minimum IP65 rated.

iii. The equipment supplied by the Contractor shall be immune to electromagnetic interference according to internationally accepted EMC standards for power plant.

3.3.9. DOCUMENTS AND INFORMATION EXCHANGE

i. The Contractor shall supply all necessary documents or information to ensure proper design, operation and maintenance of the plant.
ii. The Contractor shall supply documentation and information as per the C&I VDSS and templates provided. A C&I documentation description document that clarifies the C&I documentation requirements is provided.

3.3.10. DCS ENGINEERING CONTRACTOR INVOLVEMENT REQUIREMENTS

i. The Contractor shall allow for involvement in the DCS software development phase through to commissioning phase to assure proper interfacing and implementation of the control and operating philosophy of the plant forming part of the Works in the DCS.
ii. The Contractor shall verify and approve the DCS interfacing and implementation of the Works' operating, and control philosophy as detailed in documents provided by the Contractor as per C&I VDSS.

3.3.11. CONTROL SYSTEM DETAILED REQUIREMENTS

i. The Contractor's control system shall be incorporated in the Balance of Plant control system. It is the Contractor's responsibility to develop a system architecture for the C&I Works that conforms to the Employer's Requirements.

ii. The control system should be structured such that the whole system forming part of the Works can be operated and controlled independent from the DCS if required.
iii. All control equipment and cubicles shall be housed in equipment rooms which meet the requirements and the conditions of the environment it is located in to ensure that the system meets the operating life expectancy of the plant.
iv. Where integrated field localized equipment is required, the equipment and its enclosures shall meet the requirements and the conditions of the environment it is located in to ensure that the system meets the operating life expectancy of the plant. The minimum requirements shall be as per enclosures prescribed but not limited by Eskom Standard.
v. All cubicles forming part of the Works shall be provided as follows:
- bottom cabling access.
- Floor mounted with suitable dust and vermin proofing.
- earthing (as per applicable Eskom Standards).
- front and rear access.
- remote temperature monitoring per cubicle.
- Powder coated RAL 7035.

vi. The integrity of all Binary input signals from field devices shall be checked and system shall have capability to detect wire break. All field contacts shall be interrogated using 24 V DC.
vii. All analogue and digital signals shall be continuously monitored for validity, whether used for operator information, control, protection, interlocking, calculations or plant history. Data validation shall include:
- signals monitored for wire break (change over contacts),
- out-of-range values,
- same measurement discrepancies,
- abnormal rate-of-change,
- contact bounce,
- invalid process operating ranges
- power supply failure,
- card removal,
- out-of-scan,
- simulated inputs,
- short circuit,
- pole disagreement (changeover binary contacts).

viii. The Contractor shall provide galvanic isolation between the source of the signal and the controller or at interfaces to other C&I systems.
ix. The Contractor's design shall provide for later expansion of the control and instrumentation system such that future changes and enhancements can be readily

incorporated. The spare capacity shall be demonstrated to the Engineer at design freeze. At design freeze, the Contractor shall provide for the following without the necessity for reconfiguring the design:

- 10% spare installed I/O of each type in the control and instrumentation system cubicles spatially distributed throughout the cubicle throughout the I/O modules.
- 20% reserve physical space in all cubicle racks (I/O, signal conditioning etc.), field panels, marshalling racks and cable racks.
- 10% spare installed terminals per cubicle.
- 20% spare installed capacity in all multi-core cables (rounded up)
- 20% reserve power availability at full load use per area.

x. The Contractor shall provide for the following at Completion without reconfiguring the design:

- The utilization of all CPUs shall not exceed 45% loading during normal operation
- The Contractor must cater for full expandability range for bus loading
- 30% spare memory capacity for software expansions

xi. The Contractor shall provide a report on the control and instrumentation system expandability confirming each of the above parameters as tested by the Contractor before Taking-Over is certified.

3.3.12. Building or facility layout Design

All C&I cubicles shall be housed in C&I equipment rooms that comply to Eskom's environmental conditions as stipulated in Eskom standards.

3.3.13. C&I DESIGN

All C&I cubicles shall be supplied from reliable UPS feed.

3.3.14. CBMS Design

The substations and equipment rooms shall have Fire Detection System (FDS), Access Control System (ACS), HVAC and Closed-Circuit Television (CCTV) integrated to Employers CBMS.
The fire protection supplied shall also be interfaced to the CBMS.

3.4 CIVIL AND STRUCTURAL REQUIREMENTS

3.4.1. Overview of works

The following overview describes the civil and structural works for this project:

Investigation and testing:

a) General condition assessment of civil and structural existing works shall be carried out by the Contractor.
b) The condition assessment report and constructability report shall be submitted to indicate the needed modifications, assessment results, repairs, new designs that align to making the mechanical systems are automated, fit for purpose as well as increase the efficiency of existing systems within civil infrastructure as intended per Employers main objective through this SoW
c) The following areas (as a minimum) shall be investigated/assessed by the Contractor and included in the condition report and constructability analysis report.

- Geohydrology in specific areas where ground water could be the potential source into certain existing structures.
- Integrated systems, trenches and tunnels

- Degrit sumps
- TH7
- TH8
- Clarifiers

Design and Construction

Contractor shall execute design and construction of the works to ensure the newly designed/refurbished/installed and automated mechanical systems and supporting civil structures are fit for purpose.

a) General works and repairs,
   - Demolishing and cleaning works (as a minimum)
   - Contractor to make provision for repairs (brickwork, concrete, pressure washing cleaning, dewatering/pumping out, temporary works, reinstalling joints/sealants, grouting works, corrosion protection works, NDTs, checking and replacing of bolts or welds) to be executed by Contractor per Designers requirements.

b) Specific Modifications,
   - Where replacement of mechanical components requires breaking and/or modifying existing civil infrastructure, the needed civil and structural modification works shall be assessed (design analysis/verification) by the appropriate qualified Designer and reinstated/modified by Contactor under the per Designers requirements and supervision.

c) New Designs,
   - Designs shall require Contractor and Designer/s to comply with Eskom procedures, specifications, relevant ECSA code of conduct, ECSA Overarching code of practice, applicable SANS codes and all regulations set out in this document (as a minimum).

d) All new designs and design modifications shall be conducted in accordance with, but not limited to, the following Eskom standards:
   - 240-53113685 Design review procedure
   - 240-53114026 Generation Project Engineering Change Management Procedure
   - 240-56364545 Structural Design and Engineering Standard
   - 348-880042 Medupi Concrete specification for structural concrete (84CIVL053)
   - 240-57127955 Geotechnical and Foundation Engineering Standard
   - 240-85549846 Standard for Design of Drainage and Sewerage Infrastructure

Specialist Reporting and Inputs:

a) Provision for Specialist civil input/reporting/studies for the following (as deemed required on critical civil and structural aspects of the SoW):
   - Concrete testing.
   - Corrosion protection, protective coating and sealants.
   - Geotechnical investigations and Geotechnical report.
   - Geohydrological and hydrology studies.
   - Specifying of products (locally produced as far as possible)Submission of operational documentation and manuals: O&Ms to be created for life cycle checks as well as operational and maintenance aspects
- Reporting and creation civil and structural O&Ms by the relevant Designer/s

Execution, Construction Monitoring and Handover,

Contractor shall execute all works in accordance with the various aspects contained in this SoW document while integrating and fully complying with all specifications and regulations.

3.4.2 General requirements

a) Eskom/Generation policies, processes, standards and procedures to also be complied with as a minimum
b) The Contractor to consider but not be limited to adhering to the following legislative documents/standards during the designs of all water related infrastructure, namely The National Water Act (Act No. 36 of 1998), The Environmental Conservation Act (Act No. 73 of 1989), Government Notice 704, National Water Act 1998, the latest Medupi SHEQ, Environmental Procedures and Medupi Water Use license (01/A1042/ABCEFGI/5213).
c) Civil and Structural: The Contractor shall ensure all works comply (as a minimum) with 240- 56364545, 240-107981296, all relevant SANS including SANS but not limited to 10 400 and Employer's Corrosion specification.
d) Architectural: The design and construction aspects of the building shall (as a minimum) be in accordance with the 84CIVL007 / 348-884646, 200-26680 / 348-361813, all relevant SANS including but not limited to SANS 10 400 (All parts of these standards). Additionally, the Contractor's architectural designer shall be responsible to ensure the design meets the requirements of SANS 10400 and follow the Architectural Profession Act No. 44 of 2000.
e) General Storm-Water and Drainage: The Contractor shall ensure that all works (as a minimum) comply with 240-85549846 and all relevant SANS including but not limited to SANS 10 400. The plant generated effluent drainage systems and storm water designs shall interface with all existing infrastructure and new designs for the roads and structures. Levels and positioning shall be considered to ensure that no flooding occurs in any existing and new buildings. The natural ground levels shall be assessed, and terracing or localised reshaping may be required to ensure that no ponding occurs in any of the affected areas.
f) General Earthworks and Road Design: The Contractor shall ensure that all works (as a minimum) comply with 240-84418186, 240-57127955, 240-57127951, 240-57127953, 200-6166 (348-355152), 240-57127955, 240-107981296, 240-144332407, SAICE Code of Practice for Geotechnical Investigations and all relevant latest SANS codes including but not limited to SANS 10 400.
g) KKS codification: The Contractor shall label the plant according to Medupi Power Station Plant coding which is KKS Plant Codification Standard – 200-94660. All documentation, drawings, diagram and lists shall refer to the area of plant by means of the required plant labelling in accordance to the Eskom plant labelling procedures and drawing standards.
h) Signage: Safety signage and escape routes shall be as a minimum be in accordance with Eskom Fire Protection and Life Safety Design Standard (240-54937450) and SANS 1186.

3.4.3. Civil and Structural Design and Construction Requirements 2.4.3.1 Surveying and scanning

a) The Contractor shall be responsible for providing surveying and scanning works. The Contractor shall make provision for, including but not limited to, pre-development surveys, pre-design topographical surveys, setting out of all works, post construction topographical surveys, surveys during construction, survey verification of existing infrastructure and interfaces, underground and above ground surveys of existing services, and all other required survey studies deemed necessary.
b) The Contractor shall be responsible for the accuracy, correctness, completeness and appropriate of all surveys and as built data submitted. The Contractor shall also appoint suitably qualified and compete Lead surveyor(s) registered with South African Council of Registered professionals.
c) The Contractor shall be responsible for the identification of local trig beacons and obtaining Surveyor General cadastral information which is included on the deliverable survey data.
d) The topographical survey requirements and associated activities shall include but are not limited to:
    - Topographical survey for all works,
    - Survey shall be conducted in 0.5m intervals,
    - The survey shall be conducted using the WGS 84 coordinate system,
    - All levels relate to the mean average sea level,
    - The Contractor shall be responsible for the identification of local trig beacons and obtaining Surveyor General cadastral information, which is included on the deliverable survey data
    - The Contractor shall be responsible for the survey and placement of additional control points as required.
e) The Contractor shall be responsible for providing the following (as a minimum):
    - Coordinated electronic survey drawing incorporating all the above (Section 19.1.1) in MicroStation format including legend to identify point references and table of all survey beacons and trig beacons
    - Drawings shall be submitted in native DGN format and PDF; and
    - An XYZ file, incorporating all reference descriptions, relating to all the above requested survey data is submitted to the Employer
    - A comprehensive full-scale marked-out survey including level, location and route of both conductive and non-conductive underground services. All detected services shall be easily identifiable by a legend or suitable description.

- Every point of detail shall be fixed in Y, X and Z and shall be presented on the drawings by standard feature descriptions. The density of the survey shall be adequate to enable cross- sections to be extracted at 0.5m intervals.
- Include the legend showing the abbreviations

Geotechnical

a) Contractor shall carry out geotechnical and geohydrological assessments as deemed required by the Designer, this may include but not be limited to conducting excavations, investigations, above or below ground tests/studies, test pits, sampling, laboratory testing (carried out by a South African National Accreditation System (SANAS) accredited laboratory).

b) All materials arising from demolition and site clearance work except materials specified for re-use or as otherwise specified via the Project Manager shall be removed from site as the work progresses and shall be disposed of and/or stockpiled for re-use. Disposal of material shall also align with the existing Medupi environmental and waste disposal procedures and requirements. Therefore, the Contractor shall be required to establish their own plans (including but not limited to Site establishment Plan, Environmental management plan (EMP), Project Quality Control Plan, Waste management plan and Site Disestablishment plan) that complies with Eskom and Medupi Procedures, legislation and regulations.

c) The Contractor shall submit the following, as a minimum, deliverables for the Geotechnical investigations:

- Geotechnical investigations proposal outlining all investigations required
- Drawing(s) indicating Test pit layout with co-ordinates.
- Laboratory and material testing schedule
- Comprehensive report on available construction
- Comprehensive Geotechnical Investigation report with including but not limited to field work, laboratory testing and results, discussions, evaluations, analysis, recommendations, slope stability, construction material sources, soil and rock logging, geological and geotechnical hazards:
- Appendices including all field data (raw data), detailed calculations, laboratory test results
- Borrow area licensing (where applicable) including cut/fill material balance.

Architectural

The Contractor shall indicate all necessary architectural details (including but not limited to colour) of all works on the appropriate architectural drawings. Additionally, the Contractor shall comply with the Medupi Architectural specification listed in the normative section of this document.

Painting and Corrosion Protection

a) The painting and corrosion protection requirements are to be included in the relevant design drawings and drawing notes to be produced by the Contractor. All of which should comply with the corrosion requirements stipulated in the Medupi Power Station Corrosion Protection Specification, SSZ_45-17 Revision 2 and Identification of the Contents of Pipelines and Vessels, 200-3583 (348-912995).
b) The Contractor Designers shall add all necessary design and construction notes to all drawings, O&Ms and ensure that all drawings for all works include associated product datasheets/specification.

Structural

a) The Contractor shall ensure that all conceptual, detailed and final construction drawings are approved as per Eskom's review processes prior to beginning construction and that compliance is maintained to all specifications for material grades that are fabricated and erected. This includes fabrication and erection tolerances, testing parameters and corrosion protection required for steel structures and their supporting elements. The Contractor is also required to submit to the Employer, steel grade certificates, fabrication drawings, welder's certificates and quality and test plans for review prior to fabrication.
b) All structural steel work must be manufactured and erected in accordance with relevant national standards and specifications.
c) All structural steel elements, metal grating, stair treads and fasteners are required to be hot dipped galvanized to SANS 121.
d) Only coded welders are to perform all welding works. Supporting welding documentation must be submitted to the Employer for review and acceptance prior to construction. Note: All welding is required to comply with AWS D1.1.
e) All welding joints are required to be inspected using visual aids and/or non-destructive tests as indicated below:
- Butt welds 100% ultrasonic NDT
- Fillet welds 20% MPI.

- Or as directed by the Designer

f) The Contractor shall also submit construction method statements for acceptance by the Employer for all works, inclusive of risk assessments per area of construction.

Concrete

a) The Contractor shall submit the concrete and grout mix designs including but not limited to trial test cube results and all other required test results as indicated in the Medupi Power Station Specification for Structural Concrete (84CIVL053) prior to the placement of any concrete and grout.

b) The Contractor shall also submit detailed construction method statements and a quality and test plan to the Employer for review prior to the casting of concrete. All method statements shall also encompass risk assessment, environmental and waste management in compliance to the Employer procedures and applicable legislation/regulations.

c) The Contractor shall submit all inspection and test plans (ITP's) for acceptance. The Employer will indicate his\her hold and witness points on the ITP. All specified tests and required interventions to be itemized on the ITPs and should be easily linked/referenced to all other technical documents.

d) All of the above-mentioned documents, mix designs, material test results, material certificates and reports shall be submitted to the Employer for acceptance once approved by the Contractor's Designer. The Contractor's Designer shall discuss and submit necessary information, recommendations and/or possible solutions to the Project manager and Employer's team when test results are not within limits/thresholds specified within the relevant Eskom, Medupi, regulations and national specifications.

Material and Concrete Testing

a) The Contractor shall discuss and agree with the Employer regarding the frequency of all testing to be conducted. All test results to be submitted to the Employer for review in accordance with the specification. The Contractor shall submit a Quality Assurance and Quality Control plans and concrete mix design/s with trial mix test results for acceptance by the Employer.

b) In addition to the tests specified in the specification (84CIVL053) and all durability index tests shall be performed (SANS 3001-CO3-1, SANS 3001-CO3-2, SANS 3001-CO3-3), if required by the Employer, on already constructed concrete works to confirm the durability of concrete placed. The durability index tests are developed to assess the transport properties of the concrete cover zone. There are three durability tests, namely Oxygen Permeability Index, Chloride Conductivity test and

the Water Sorptivity test. Table below and on the next page provides the acceptance criteria for the three different test results as defined below:

Table 12: Acceptance criteria for durability index test results

Type of Index test **Result Rating**	**Oxygen Permeability Index**	**Sorptivity Index**	**Chloride Conductivity Index**
Excellent	> 10	< 6	< 0.75
Good	9,5 - 10	6 - 10	0.75 - 1,5
Poor	9,0 -9,5	10 - 15	1,5 - 2,5
Very Poor	<9,0	>15	> 2,5

Adverse weather conditions

For clarity on the Medupi Power Station specification for structural concrete, rev 3, the Contractor shall note the following:

a) When ambient temperature is above 36 ºC, the temperature of the concrete when deposited/poured shall not be allowed to exceed 32 ºC and when ambient temperature is below 36
ºC, the temperature of the concrete when deposited shall not be allowed to exceed 35 ºC.

b) The Contractor should note that concrete works placed during hot weather conditions, exposed to direct sun and wind is particularly prone to undergoing plastic-shrinkage and the Contractor shall adapt construction processes and methods to prevent the occurrence of plastic-shrinkage cracks.

Exposure of concrete to aggressive environment conditions

a) All works constructed shall consider the aggressive site environment conditions. In particular, the design and construction of all concrete works shall ensure resistance to the aggressive environment the works are exposed to.

b) The Contractor shall ensure that concrete placed is of good quality, dense and well-compacted. As specified in Employer specifications and SANS codes, including but not limited to SANS 10100-1 structural concrete, exposed to aggressive environment, shall be designed and detailed to ensure concrete crack widths, under serviceability conditions, are limited to 0,004 times the nominal cover to the reinforcement.

c) The Contractor’s construction methods shall ensure plastic-shrinkage cracks are limited, that special precautions are taken to ensure crack widths are within acceptable limits and that placed concrete is of good quality.

Documentation, Construction Monitoring and Professional Engineering Certification

a) The Contractor shall take full professional accountability/responsibility for all the works set out in this scope document and shall submit the necessary proof of professional registration and experience, as well as submit a completed Competency Declaration form, for the professionally registered, accountable, and certifying Designer.

b) The Contractor shall produce and submit all information including a Master Document List (MDL), 3D model (in a format/software file that the Employer can open and review), layouts, calculations, detailed drawings, method statements, product specifications, risk assessment, constructability assessment, KKS Equipment lists, register and verification record templates for the various works (including QC/QA documentation) as well as a bill of quantities, all of which are required for the timely planning, design and construction of all outstanding and new civil and structural works.

c) Detailed drawings for construction shall be submitted timeously by the Contractor for Employer review prior to commencement of works. Contractor to note that all drawings shall also be submitted in the correct templates. CAD and PDF formats, all of which shall follow the Employers quality specifications and document control procedures

d) All review durations shall be agreed with Project Manager over and above the general contractual periods due to the nature and intricacy of this project.

e) Submission of consolidated detailed design and calculation reports signed by a Professional ECSA Registered Civil Engineer which includes all survey results, outcomes of geotechnical investigations, testing and sampling deemed necessary by Designer. Reports shall also include but not be limited to listing/detailing all Designer selected design criteria/parameters, specifications and standards used, loadings, assumptions, calculations results including detailed design calculations, design models, credible sources of information and any record of other information associated with the completed works.

f) The Contractor shall submit As-built data (inclusive of QC and QA databooks) for the entire scope. All As-built drawings produced for the completed works shall be submitted upon handover, this includes but is not limited to provision of all relevant certificates (inclusive of a PEC, COC's and project completion certificate). All data and records for the QC and QA databooks shall however be submitted progressively as works are carried out and in accordance with the Employer's Quality procedures.

g) All submitted design calculations and drawings shall be signed by an accountable Professional Civil Engineer with both ECSA registration number and signature.

h) Review and acceptance of all construction documentation (includes but is not limited to method statements, ITP's, material approvals and approval of all other quality verification records), as well as fabrication records shall be the responsibility of the Designer, prior to being submitted to the Employer for review per the relevant quality procedures.

i) The Contractor's designer shall perform the necessary construction monitoring, as required by the Construction Regulations (Act No. 85 of 1993), to ensure design intend is achieved
j) The Contractor shall issue the Professional Engineering Certificates for completed structures/buildings in line with National Building Regulations (Act No. 103 of 1977), SANS 10400 and Construction Regulations (Act No. 85 of 1993).
k) In the event where the Contractor's designer is not in a position to confirm that design intent, of works already constructed, was achieved during construction due to lack of information, test results, inspection records and\or professional declaration certificates; the designer shall submit a risk assessment and make recommendations to the Employer.
l) In cases where the Contractor is uncertain of which specifications are applicable to the execution of particular works defined in this scope of work, the Contractor is required to follow due processes to request clarification from Eskom prior to executing such works.
m) All investigations and required testing of existing and new works shall comply with the civil and structural specifications outlined this document. Additionally, the Contractor is expected to keep records of tests conducted and submit to Employer for review in line with Employer's quality procedures.
n) The Contractor's Designer shall provide all the necessary design integration, while ensuring that all works are inspected, constructed, and monitored in accordance with latest approved design drawings and as per the requirements outlined in this civil and structural section.
o) The Contractor's civil designer shall be responsible to ensure design intent is achieved during construction. Construction monitoring shall be done in accordance with the Construction Regulations (Act No. 85 of 1993), SANS 10400, ECSA Code of Conduct (Act No. 46 of 2000), environmental and legislative standards.
p) All method statements, reports, documentation, risk assessments, material certificates, planning, program schedules, resources and labour force from Contractor shall consider the following listed aspects, while also being in accordance with relevant Eskom specifications, procedures, SANS codes and regulations and submitted to the Employer for review:

- Construction/installation methods and plans
- Survey and Site clearance
- Demolition/removal requirements
- Building works
- Civil engineering and structural works
- Electrical & Mechanical engineering works
- Process control and IT works

- Welding requirements
- Material specifications
- Waste Management requirements
- Temporary works

3.4.4 Civil and Structural Deliverables

Investigation, Testing, Specialist Reporting and Design deliverables

a) Organogram for this project with confirmation letters of all resources and where applicable updates submitted formally to the Employer to review when requested by the Project manager.
b) Investigation and testing report (inclusive of all results, pre-condition assessments, NDT Contractor data and both reports, results from accredited service providers and Designer approved supporting documentation)
c) Comprehensive feasibility assessment report/s (where applicable)
d) Constructability report/s
e) Design calculation files and other design reports that cover the following as a minimum:
    - Alternative options considered supplemented by a high-level cost analysis and trade-off study to support the final design solution to be implemented.
    - Assessments and verification of existing systems, where such interface exists;
    - Assumptions made;
    - Calculation methodologies adopted;
    - Design criteria/ parameters used;
    - Design Philosophy;
    - Design results and calculations for all elements;
    - Loads and forces;
    - Materials used;
    - References/ sources of information, data and records of any other information associated with the completed works;
    - Software input and output files incl. design models (all models and calculations etc. must be submitted in their native file format as well as PDF); and
    - References to specifications, codes and standards used in the designs;
f) Site development plan
g) Concept, Detailed and “For Construction” drawings (signed and dated with ECSA Pr. number of the accountable Designer) as well as the drawings needed formats (PDF and DGN/DWG).
h) Concrete and grout mix design/s in accordance with the Medupi Specification for Structural Concrete (84CIVL053) [86]

i) Concrete testing results
j) Stormwater Management Plan and Philosophy (where applicable);
k) Detailed Stormwater management plan demarcating dirty and water catchments
l) Water balance model (if applicable), geohydrological studies and associated hydrology reports
m) Pre-construction material analysis
n) Approved Inspection Authority reports and documentation
o) Submit results of all surveys including the raw survey data, detailed contour survey plans, detailed as-built surveys of existing infrastructure, ASCII files, triangular data and a detailed survey report;
p) Submit results all geotechnical investigations including all raw data and geotechnical report;
q) Provide Terminal Point Data Sheets for each of the interfaces.
r) Detailed design report calculation file/ report documenting all:
    - Assessments and verification of existing systems, where such interface exists;
    - Assumptions made;
    - Calculation methodologies adopted;
    - Design criteria/ parameters/tolerances used;
    - Design Philosophy;
    - Design results and calculations for all elements;
    - Loads and forces;
    - Materials used;
    - References/ sources of information, data and records of any other information associated with the completed works;
    - Software input and output files incl. design models (all models and calculations etc. must be submitted in their native file format as well as PDF); and
    - References to specifications, codes and standards used in the designs.
s) Design specification(s) and technical data sheets
t) Operating and maintenance manuals
u) Works information describing the works
v) Construction quality assurance and control plans (QCPs) and Inspection and Test Plans (ITPs)
w) Comprehensive Method statements
x) Construction sequencing plans and updated bi-weekly schedule/program of works
y) Risk assessments and SHEQ file that encompasses all needed documentation for this project and all required updates as the project is carried out.
z) Master Document lists (MDL) that also aligns with the project VDSS

Fabrication, Manufacturing, Construction and Certification deliverables

a) Regularly updated Master Document List (MDL), Note: A minimum monthly submission.
b) All H1, H2 and H3 Databooks
c) All records and Quality Control Plans (QCPs) and Inspection and Test Plans (ITPs) for each phase of this project
d) Method statement including associated risk assessments
e) Material Quality Assurance records (Material approvals, data sheets, conformance test results approved by the Designer/s)
f) Construction Quality Control check sheets and quality verification records (QVRs)
g) All Test results and certificates (signed and approved by accredited service providers and relevant Designers)
h) Submit Data Books/Data Packs including providing sign off, where applicable. Data books shall include but are not limited to the following, as a minimum (where applicable):
    - Approved Design Calculations And Data;
    - Approved Drawings And As Built Data;
    - Approved Non-Destructive Test (NDT) Procedures;
    - Batch Plant Certificates;
    - Bolt Grade Certificates;
    - Calibration Certificates;
    - Corrective Actions and Concessions;
    - Certificates Of Manufacture;
    - Chemical Test Results And Certificates;
    - Compaction Test Results And Certificates;
    - Completion And Handover Certificates;
    - Concrete Mix Designs Including All Required Test Results (E.G. Aggregate Test Results, 7 Day And 28 Day Cube Test Results) And Certificates;
    - Construction Completion Reports;
    - Corrosion Protection Consumables Certificates;
    - Construction completion reports
    - Certificates of Completion (CoCs)
    - Detailed Piping And Valve Lists;
    - Document List;
    - Equipment Specifications and Certificates;
    - Fabrication And Shop Drawings;

- Factory Acceptance Tests;
- Grout Designs Including All Required Test Results (E.G. Material Test Results, 7 Day And 28 Day Cube Test Results Etc.) And Certificates;
- Hydrostatic Test Results For Pipes And Tanks/Pressure Vessels;
- Inspection Reports;
- Instruction For Work/ Purchase Order;
- Internal Release Notes;
- Maintenance Manuals;
- Manufacturing Drawings;
- Material Certificates;
- Material Summary That Gives Full Traceability Between Components Used, Drawings And Material Certificates;
- Method Statements And Specifications Adhered To;
- Modifications / Engineering Changes;
- NDT Contractor Data and Reports/ Results;
- NDT Technician Qualifications;
- Non-Conformance Reports;
- Notifications;
- Operating and maintenance Philosophy;
- Updated Operating and maintenance Manuals.
- Parts Catalogue;
- Pre-Concrete And Post-Concrete Surveys;
- Approved Inspection Authority reports and documentation
- Pressure Test Procedures, Certificates And The Calibration Certificates Of The Gauges Used;
- Professional Engineering Certificate/s;
- Risk Assessment/s;
- Site Acceptance Tests;
- Slump Test Results And Certificates;

3.5. GENERAL REQUIREMENTS

3.5.1 Safety Requirements

a. No individual C&I fault shall endanger the safety of the people or plant or jeopardise the integrity of major plant.
b. The earthing concept applied by the Contractor shall be based on recognised best engineering practices and shall ensure the safe and reliable operation of the C&I systems and the protection of the electronic equipment against damaging transients.

3.5.2 Earthing, Lightning and Electrical Protection

a. All C&I system equipment shall be earthed to the station earth point.
b. All metal instrument casings shall be properly earthed (grounded) to the earth mat to avoid any electromagnetic interference which may arise from portable RF transmitters, cell phones and other equipment used on the plant.
c. All earthing required to eliminate any interference shall be provided.
d. All field cables and network cables shall be earthed (grounded). The cables shall be earthed at one end or both ends depending on the interference signal and shall comply with an overall recognized earthing arrangement.
e. Lightning and Surge protection shall be included in all the circuits where there is exposure to potential lightning.
f. All earthing and surge protection shall as a minimum be in accordance with 240-56356396 Earthing and Lightning Standard.

3.5.3 Requirements Related to Maintainability

a. The components installed shall be protected from the harsh or hazardous power plant environment.
b. The Contractor shall ensure that the installation of the transmitters:
c. Allow for safe and easy access for maintenance and calibration.
d. Allow for the environmental conditions.
e. Allow for the removal of equipment for maintenance in the vicinity of the transducer.
f. Emergency plans shall be provided for system failures and faults such that appropriate measures can be taken immediately without having to first analyse the cause of the failure.

3.5.4 GENERAL

a. Actuators to be able to work in a dusty and damp environment. Rating should be IP68.
b. No changes to the design parameters.
c. All pipework to be SANS 062.
d. Corrosion protection to be implemented, corrosion protection specification to be approved by the Employer.
e. All Plant shall be designed to fail-safe. Sudden power losses shall not have an adverse effect on Plant and shall not unduly delay return to operation after power is restored.
f. Unless otherwise specified all electrical Plant necessary for the safe and efficient working of this Plant shall be provided in terms of the electrical Employer's Requirements in section 3.6 table 2.
g. Unless otherwise specified all process and control Plant necessary for the safe and efficient working of this Plant shall be provided in terms of the electrical Employer's Requirements.

3.5.5. TESTING REQUIREMENTS AND PROCEDURES

Unless otherwise stated in these Employer's Requirements, the Works shall be tested in accordance with the requirements and procedures approved by the Engineer. To this end the Contractor shall submit his proposed requirements and procedures for all tests (including for the Tests on Completion and the Tests after Completion) to the Engineer, for approval, within 90 days of the Contract Date. These requirements and procedures shall be developed to suitably and properly demonstrate that the Works meet the Employer's Requirements and shall:

a. be in accordance with the details (if any) stated in the Contract; and
b. be further developed or amended and re-submitted at the expense of the Contractor until they are approved by the Engineer.
c. Valves and actuators to be tested to verify their functionality.
d. Test of all the C&I and Electrical works for full operation.
e. Full testing of the oil separators

Each actuator shall be factory tested. Tests shall be performed in accordance with the IEC standards as and where applicable. A final inspection record shall be supplied with each actuator. This shall include the following information:

f. General actuator data.
g. Nominal current (continuous).
h. Nominal current (short time overload).
i. No load currents.
j. Starting current.
k. Power factor at rated torque.
l. Output speed.
m. Torque switch setting.
n. Limit switch setting (turns/stroke).
o. High voltage test.
p. Visual Test & Functional Test (Including all option).

4. MAINTENANCE

The Contractor shall conduct maintenance of the completed works until the works is handed over to Eskom Generation. The Contractor to make provision of maintenance for a period of 3 months.

5. SPARES

The Contractor shall submit a schedule of, and include in the offer, all spares that are considered necessary for the long-term operation and maintenance of the Plant, considering the life expectancy and lead time of the components. The Contractor shall identify, and include in the offer, all special tools required for ongoing operation and maintenance.

6. TRAINING

The Contractor shall be responsible for training of the Employer's Operating Personnel on the operating of the entire plant.

7. AUTHORISATION

This document has been seen and accepted by:

Name & Surname	Designation
Prince Lepota	BMH Lead Engineer
Jimmy Mphela	Project Manager
Penuel Malatji	Senior Quantity Surveyor
Zak Jiyane	Chief Engineer
Mdu Shozi	C&I Lead Engineer
Banele Mbendane	Lead Electrical Engineer
Justin Padiachy	
Mdu Dlamini	Configuration Manager
Keoagile Tiro	Arrangement Design Chief Engineer

8. REVISIONS

Date	Rev.	Compiler	Remarks
June 2021	0		First Draft
August 2021	1		Updated the Primary Clarifier Piping Diameter from 50 NB to 65 NB.
August 2021	2		Additional of the Degrit Sump scope, include the works on TH7.
February 2022	3		Removal of the brand names for the replacement equipment.
September 2022	4		General updates to the scope.
June 2025	5	MM Molabe	Additional scope; Installation of slurry piping for each sludge pump, emergency pumps for Degirt sumps and TH 8 upgrades.

9. DEVELOPMENT TEAM

The following people were involved in the development of this document:
E Hlatswayo
T Mudamburi
M Radebe
K Mphephu
T Keadirile
M Mphanga
E Hlatswayo
M James
T Chambale

10. ACKNOWLEDGEMENTS

10.1 APPENDIX A: NOT APPLICABLE

11. Management and start up.

11.1 Management meetings

Meetings will be held monthly between the *Project Manager* and the *Contractor,* and any person instructed by the *Project Manager* to attend. The *Contractor* is represented at each meeting by the appropriate member of the staff. Additional ad hoc meetings may also be called to address urgent issues.

The *Project Manager* will, as and when necessary, require the *Contractor* to attend meetings with Other *Contractor*s on the Project. This requirement does not constitute a compensation event.

The venue for these meetings is as determined by the *Project Manager*. The *Project Manager* writes the minutes of meetings and circulates to attendees within five working days.

Any action of the *Project Manager* and the *Contractor* implied in the minutes of meetings is confirmed by a separate formal communication between the *Project Manager* and the *Contractor*.

The *Contractor* reports the overall progress and as a minimum requirement, the following is addressed:

a) *Contractor's* current activity progress and planned finish dates
b) *Contractor's* planned start and finish dates for the works
c) *Contractor* and *Project Manager*'s programme agenda current and projected manpower by class
d) Health, Safety and Quality issues
e) The progress of any Other relevant activities
f) Discussion on any technical and commercial issues
g) Problem areas or concerns

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

Table 1: Meetings Schedule

Title and purpose	**Approximate time & interval**	**Location**	**Attendance by:**
Risk register and compensation events	Weekly on Wednesday at Medupi *Employer* Offices	Venue determined by the *Project Manager*	Relevant appointed members of a Risk or and Compensation event committee that will include Contractors PM, Construction Manager, Engineering Manager, Quality Manager, Safety Manager, Environmental Manager
Overall contract progress and feedback	Monthly	Venue determined by the *Project Manager*	*Employer*, *Contractor*, *Supervisor*,

Overall contract progress and feedback during execution	Weekly	Venue determined By the *Project Manager*	*Employer, Contractor*, Supervisor as determined by the *Project Manager*
Planning Meetings	Weekly	Venue determined By the *Project Manager*	*Employer*, *Contractor*, Supervisor, Planner and Others as determined by the *Project Manager*
Integration meetings with Others	Weekly	Venue determined By the *Project Manager*	*Employer, Contractor*, *Supervisor,* Planners and Others as determined by the *Project Manager*
Safety Meetings	Monthly	Venue determined By the *Project Manager*	*Employer, Contractor Construction Manager,* Safety Officers/ Managers and Others as determined by the *Project Manager*

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

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

11.2 Documentation control

The contractor is required to manage documentation in line with the requirements outlined below.

Document Submission

All submissions to the *Employer*, the language of all documentation is to be in English. Documentation submissions must be through either email or walk-in to documentation centre with CD and/or hard copies. In case submission of documentation is through email, take note of the following:

a) Email submissions, one must direct them to the proxy email and copy all recipient(s) as per the distribution matrix, which will be provided by the project manager.
b) Use emails strictly as a channel for submitting documentation.
c) All information required and intended for use by the *Employer*, may not be part of the body of the email, one must document it.
d) Email must not be used as a transmittal, one must use a transmittal template
e) The email subject must always include the transmittal number, package number/contract number.

Large file transfer: Documentation submission with the file size that exceeds the outlook maximum size, contractor must submit via the *Employer's* large file transfer portal, CD/DVD, and/or hard drives to the Eskom Project Documentation Centre. The contractor/vendor must notify the employer in advance via email, with the transmittal note attached, to confirm the date, time and method of submitting large files. Method option may be CD/DVD and/or hard drives, which is a walk into Documentation centre or large file transfer portal.

All submissions, the receiver must acknowledge by sending back a signed transmittal to the sender within two working days upon receipt. Every submission must have the PDF version and the Native (Editable) version. The file name for both the PDF and the Native must be the same, and as minimum contain Documentation Number and revision. One must list all items intended for submission, on the transmittal.
If the pack contains 10 documentations, therefore the transmittal must contain 10 items on the list. The listing must include as minimum documentation number, title and revision. The example of 10 items, will equate to a pack of 10 PDF files and 10 Native files, because each PDF files must have a native file.

Identification

Documentation must have a unique documentation identifier for audit trail. The transmittal must also have the unique identifier. All other documentation properties must be on the document; to supplement the document number. Minimum properties that must be on the document is the package number, contract, revision number, KKS code, functional area (example Unit 1), document type, document status, compiler, reviewer(s), approver, and approval date.

The primary documentation identifier is the Eskom Documentation Management System Generated number, except for the drawings. The primary number for the drawing is the Eskom drawing number with a prefix of 0.84. The contractor\vendor must request in advance the drawings number(s) from the employer, to populate on the drawing before submission. The contractor/vendor must request pre-location of drawing numbers via the pre-allocation form (348-684677)

All letters exchanged between the Employer and contractor/vendor will contain a secondary numbering system which is sequential, to account for the audit trail. Example, Eskom compiled letters must use this format P00-ESK-MED-0001,

- P00 = package number
- ESK = Eskom
- MED = Medupi
- 0001 = sequential number.

Contractor/vendor format must be P00-XXX-MED-0001, which is as follows:
- P00 = Package number
- XXX = Contractor name abbreviation
- MED = Medupi
- 0001 = sequential number.

The employer will allocate the Eskom documentation number upon submission from the contractor/vendor, except for drawings and data books. The contractor/vendor must request Eskom documentation number via the pre-allocation form (348-684677), for both the drawings and data books. The secondary or alternative documentation number is the contractor/vendor Documentation identifier.

Revision control

One must use only numeric revision control, and not alpha or alphanumeric. One may not skip revisions, track internal changes via version control, but submission to the employer must maintain a sequential revision control, without skipping numbers. First submission must be revision 0.

Do not revise a record. A document must contain revision control. Design/drawing composed of multiple sheets (example sheet 1 to 10); one must revise all sheets as a batch, even if one only made changes to one sheet. The contractor/vendor must maintain revision control on the entire batch at all times and submit the entire batch always.

Drawing Management

Use the *Employer*'s Drawing template and ensure that all the fields on the title block are populated and all signatures completed. Maintain the revision audit trial on the title block. The last submission of the drawing must be the final as-built drawing, both in PDF and native. The creation, issuing and control of Engineering Drawings are in accordance *Employer's* Drawing Standard and Common requirements 240-86973501. The *Contractor* submits as minimum one hardcopy and an electronic copy to the *Employer*.

The *Contractor* submits editable electronic drawings in Micro Station (DGN) format, and scanned drawings in pdf format. Drawings issued to the *Employer* must not be "Right Protected" or encrypted as the *Employer* has to do the necessary configuration management on these documents upon receipt. Electronic drawings must have a watermark indicating the approval phase of a drawing and one must stamp the hardcopies to indicate the phase.

Any additional drawings requested by the *Employer* do not constitute a compensation event. All drawing types including but not limited to the following (General Arrangement, Isometrics, P&IDs, detail drawings), one must submit in the following formats:

- One (1) hard copy.
- One (1) electronic copy in .pdf format
- One (1) electronic copy in the native CAD format, preferably .dwg format

Drawings must be done according to Eskom Drawing Standard and Common requirements 240-86973501. Drawings are submitted in sufficient time to permit review, comment and/or modifications being made, if such are considered necessary by the *Project Manager*, without delaying the Contract Delivery and Completion Dates.

Report

The *Contractor* shall submit the Vendor Documentation Submission Schedule for review to the *Employer,* within 30 days after the contract is award. After the Employer informs the contractor of the decision to accept or reject the schedule, the *Contractor* revises and submits the updated schedule within 48 hours. The VDSS is revisable, and one must discuss any change to reach agreement between all parties, and then properly document the changes. Changes in the VDSS include additional documentation for submission; submission dates; documentation descriptions and document numbers; etc. The *Contractor* shall be responsible for the management of the schedule.

The Contractor must compile a documentation register, to track the documentation submission progress, in line with Contractor-committed dates on the VDSS. The register for tracking submission progress is the master documentation list (MDL); *Contractor* must submit it monthly to the *Employer*. The MDL must list all other submissions not specified on the VDSS, example letters.

Retention of Documentation

The contractor must retain all documentation, specified on the VDSS. This includes data books. The contractor must keep the documentation for a minimum of 10 years post contract close out. This is in line with the Rules of Conduct for Registered Persons, Engineering Professional Act, paragraph 4(a): "Registered Persons, may not without satisfactory reasons destroy or dispose of, or knowingly allow any other person to destroy or dispose of, any information within a period of 10 years after completion of the work concerned"

The contractor must retain the documentation in electronic format. The contractor must also keep the original ink signed hard copies for the minimum of 10 years post contract close out.

When the 10 years end, the contractor must inform the employer in writing prior to disposal, to confirm if the employer is not in need of any documentation. The correspondence must include the master documentation register, which outlines all retained documentation. It is the contractor's responsibility to ensure that the correspondence has reached the employer, by requesting acknowledgement of receipt. The employer has the

maximum of 6 months to respond in writing to the contractor, failure to do so, the contractor may proceed and dispose the documentation after the six months has passed.

Governance

Contractor must comply with the following governance. 348-883860: Medupi Format and Layout Specification; 348-883808 Medupi Document and Records Management Work Instruction; 240-86973501 Engineering Drawing Standard; 348-885429 Engineering Change Management Work Instruction; 36-943 Engineering Drawings Office and Engineering Documentation Standard; 240-53114186 Eskom Project/Plant Specific Technical Document and Records Management Procedure, 240-83561037 Reporting and Data Requirements Specification for Contractors, 348-942820 Transmittal Template, 200-616427 Data Book Checklist.

11.3 Configuration Management

11.3.1. Configuration Management Plan

The *Contractor to* prepare a Configuration Management (CM) plan utilizing ISO 10007 as a reference guide for the scope of work. The CM plan shall include the following:
The process of managing documentation for the project works will be supported by the following.

a) According to process functions: All plant shall be coded to KKS Breakdown Level 3.
b) According to points of installations: Electrical and Instrumentation devices installation units (e.g. cabinets, panels, consoles) shall be coded to KKS Breakdown Level 3.
c) Location codes: Plant structures shall be coded to KKS Breakdown Level 2.
d) Cables coding: Cables shall be coded with either source or destination equipment KKS code followed by sequential four-digit number and optional four alpha numeric characters.

The *Contractor* to codify all equipment, and any components which are required to be codified as per the guidelines and standards referenced in this document. The *Contractor* to indicate equipment and component codification in drawings and documents indicating or referencing such plant.

The *Contractor* to submit all KKS codes designated by the *Contractor* in an Equipment List format with equipment descriptions, with the documents in which they were originally designated, to the *Employer* for review. Any description abbreviations shall be done according to the List of Abbreviations (200-24473).
The *Contractor* will remain responsible for ensuring that the codes designated are unique, not duplicated and meet the requirements established by the various standards applicable to the project. Where any ambiguities or doubts with regards to KKS codification exist, the *Contractor* to engage the *Employer* for resolution.

11.3.2. Plant Designation

- The *Contractor* shall apply the Kraftwerk-Kennzeichensystem (KKS) codification system to uniquely identify the systems, sub-systems and components constituting the Plant.
- The *Contractor* shall apply the following guidelines and standards when codifying plant:
  - The application of KKS plant coding (NMP 45-7) – 200-4190
  - KKS Key Part – Fossil power station (NPSZ 45-45) – 200-18202
  - Issuing of KKS certificate – 200-94660
  - VGB – B 106 E Part A– KKS Application Commentaries Part A – General
  - VGB – B 106 E Part B1 – KKS Application Commentaries Part B1_ Mechanical Engineering
  - VGB – B 106 E Part B2 – KKS Application Commentaries Part B2 - Civil Engineering
  - VGB – B 106 E Part B3 - KKS Application Commentaries Part B3_Electrical and C&I Engineering
  - VGB – B 106 E Part B4 - KKS Application Commentaries Part B4 Identification of C&I and Control Tasks
- The *Contractor* shall identify all plant indicated or referenced by documentation by the plant's unique KKS codes within the documentation itself.

- The *Contractor* shall ensure that the codification assigned to plant is consistently maintained throughout the design cycle, e.g. the KKS codes indicated in the O&M manuals are consistent with the KKS codes indicated in the original process and instrumentation diagram.
- The *Employer* shall supply the *Contractor* with a system-level plant breakdown structure (PBS) of the existing plant at the Site, as well as a preliminary system-level plant breakdown structure of the plant within the *Contractor*'s scope at contract initiation. The *Contractor* shall review the PBS to ensure alignment with the *Contractor*'s design philosophy and shall expand the PBS to the complete system level (Fn level of the KKS hierarchy). The *Contractor* shall provide a complete system-level PBS with the submission of the process flow diagrams of the plant within the *Contractor*'s scope.
- The *Contractor* shall codify all equipment, and any components which are required to be codified as per the guidelines and standards referenced in this document. The *Contractor* shall indicate equipment and component codification in drawings and documents indicating or referencing such plant.
- The *Contractor* will submit all KKS codes designated by the *Contractor*, with the documents in which they were originally designated, to the *Employer* for review. The *Contractor* will remain responsible for ensuring that the codes designated are unique and meet the requirements established by the various standards applicable to the Project. Where any ambiguities or doubts with regards to KKS codification exist, the *Contractor* will engage the *Employer* for resolution.

Plant Labelling

- The *Contractor* shall manufacture and install labels according to the Medupi Label specification, 200-3340.
- Any abbreviations to plant descriptions shall be prepared in accordance to the *Employer*'s abbreviation standard, 200-5343
- Detailed nameplate or label lists with the service legends and including the KKS Code shall be prepared by the Contractor and submitted to the *Employer* for review and comment before commencing the manufacture of the labels. On plant areas where labels do not make ergonomically sense please consult site configuration management for guidance.
- The Electrical and C&I equipment installed are fully labelled and labelling should be maintained as is. The *Contractor* should make provision for replacement of any lost or damaged labels.
- The *Contractor* should label all new equipment procured.

Plant Designation within Documentation

- The *Contractor* shall prepare a list of KKS designations allocated to components for each scope of delivery or system (this list will be referred to as equipment list in the rest of this document for simplicity's sake, but includes documents such as cable schedules, valve schedules, etc.). The equipment list shall be submitted with the original implementation documentation describing the design of the system (e.g., process and instrumentation diagram, single line diagram, etc.). The *Contractor* shall ensure that the equipment list accurately represents the implementation documentation which it accompanies. The content of the lists will be agreed to per discipline with the *Employer*. As a minimum, the equipment list shall include:
    - The KKS designation of all components within the relevant scope or system.
    - The full verbal description of each component, compiled according to the standards referenced in this document.
    - The abbreviated description of each component, utilising abbreviations as listed in the referenced project abbreviation list, and abbreviated to a number of characters as required by the project digital control system (DCS) and as per the label requirements in, 200-3340.
    - The approval status of each component, in alignment with the list of approval statuses specified for document.

Design and Construction criteria:

a. The *Contractor* shall design and construct the Works in accordance to this Technical specification/SOW, all final reviewed and approved construction drawings, Construction Regulations, Medupi Quality control specifications and the SANS 2001 specifications, as well as all other relevant design and construction SANS and Eskom specifications.

b. The *Contractor* shall ensure alignment with respect to degree of accuracy for every interface and where the *Employer*'s standards are limited on information shall make use of the relevant SANS and design standards.
c. The Works to be provided by the *Contractor* shall include, but is not limited to all scaffolding, site cranes, lifting equipment and construction vehicles. All excavations, earthworks and terracing as required; all signage required; any modifications required for the use of existing infrastructure (including analysis and certification) ; and all materials, facilities and samples required to perform inspections, tests and commissioning as per the relevant statutory and regulatory standards and as per this Technical Specification.

Construction Monitoring by *Contractor's* Designer and Professional Engineering Certification by C*ontractor's* Designer

11.3.3. Plant Labelling and KKS Classification

The KKS system is used by the *Contractor* for classification and designation of both plant and associated documents. The *Contractor* uses *Employer*-specific interpretations of the KKS standards, which will be reviewed and agreed upon after Contract Date.
The *Contractor* shall manufacture and install labels according to the Medupi Label specification, 2003340.
Any abbreviations to plant descriptions shall be prepared in accordance to the *Employer's* abbreviation standard, 200-24473.
Detailed name plate or label lists with the service legends and including the KKS Code shall be prepared by the *Contractor* and submitted to the *Employer* for review and comment before commencing the manufacture of the labels. On plant areas where labels do not make ergonomically sense please consult site configuration management for guidance.

11.3.4. Documentation to be supplied by the *Contractor*

The following documentations are to be supplied to the *Employer* by the *Contractor* as a minimum where applicable:

a) All Engineering clearance charts
b) Technical specifications for the spares, part numbers and the stock levels required
c) Commissioning procedures
d) Performance test procedures
e) Installation reports
f) Supply of end of manufacturing reports for all components
g) Documentation for new/modified auxiliaries
h) List with new components KKS numbering
i) As-built drawings:
    i. Single Line Drawings
    ii. Works Information
    iii. Schematic Drawings
    iv. Operating Philosophy
j) Quality Control Plan
k) Installation Procedure
l) Maintenance Manual
m) Operating Manual
n) Technical Manual

o) Instruction Manuals and/or Catalogues

p) List of Recommended Spares

q) Test procedure, Certificates and/or Report

r) Test Instruments Calibration Certificates

s) Design Review Packages

At the end of the process design phase, the *Contractor* is expected to deliver the following updated documentation specific to the Works:

- Piping and Instrumentation diagrams (P&ID's)
- Valve lists
- Instrument schedule
- Control Narrative
- Operating philosophy
- Design calculations (i.e., NPSH, velocity, pressure drop/ 100m etc.)
- Hydraulic Model input file, results and report
- HAZOP study report
- FMECA study report
- Reliability, Availability and Maintainability (RAM) study Report
- Equipment data sheets
- Loading calculation

At the end of the Mechanical design phase, the *Contractor* is expected to deliver the following updated documentation specific to the Works:

- Plot plans and GA drawings showing the positions of all pipe supports, and details of the
- supports
- Isometric drawings for the pipeline, and piping accessories
- Mechanical design calculations and any model input file, and reports

On completion of the C&I design the *Contractor* shall submit the following documentation to the *Employer* for approval.

- Instrument location diagram
- Signal list
- I/O Block diagram
- Control Narrative or detailed functional description
- Alarm list and rationalization
- Functional block diagram (FBD)
- Instrument data sheets

The *Contractor* is also required to submit, steel grade certificates, fabrication drawings, welder's certificates and quality and test plans for review prior to fabrication.

Once the construction work is completed, the *Contractor's* designer will issue the necessary certificates (inclusive of geotechnical and structural PE certificates) and as-built documentation (drawings, native files as well as structural and foundation design reports that includes all calculations).

11.4 Health and safety risk management

The Contractor shall comply with the health and safety requirements contained on the latest Occupational Health and Safety Act (OHSA Act 85 of 1993) and its regulations, Employer Policies and Procedures as well as contract requirements. It is essential that the Contractor is conversant with Eskom safety procedures training prior commencing any work on site. Failure to comply shall result in the Employer suspending execution of services and removing the Contractor from site until compliance is achieved. The Employer may cancel a Task Order and/or terminate the contract depending on the situation and risks to people, plant and equipment, reputation, and the Employer's business of electricity supply.

The Contractor, shall at all times, considers itself to be the "Employer" for the purposes of the OHSA and shall not consider itself under the supervision or management of the Employer with regard to compliance with the SHEQ Requirements, the Contractor shall furthermore not consider itself to be a subordinate or under the supervision of the Employer in respect of these matters. The Contractor is at all times responsible for the

supervision of its employees, agents, Sub Contractors, and mandataries and takes full responsibility and accountability for ensuring they are competent, aware of the SHEQ Requirements and execute the Works in accordance with the SHEQ Requirements.

Note: The OHSA and the Employer's Regulations are collectively referred to as the "SHEQ Requirements".

Should the Contractor appoint Subcontractors, Contractor shall carry responsibilities of a client as per Construction Regulation 2014.

The Contractor shall ensure that all statutory appointments and appointments required by the management system are in place, and that all appointees fully understand their responsibilities and are trained and competent to execute their duties. The Contractor supervises the execution of their duties by all such appointees.

The Contractor shall appoint a Safety Officer who will be responsible for the premises relevant to this contract and liaise with the Eskom Safety Department accordingly to ensure compliance to Health and Safety Requirements. As a minimum the appointed Safety Officer shall have a National Diploma in Safety Management or Environmental Health and be registered with SACPCMP in the relevant category.

The Employer, or any person appointed by the Employer, may at any stage during the period of this contract:

- Conduct health and safety audits regarding all aspects of compliance with the SHEQ Requirements, at any off-site place of work, or the site establishment of the Contractor.
- Refuse any employee, Sub Contractor, or agent of the Contractor access to the premises if such person has been found to commit an unsafe act or any unsafe working practice or is found not to be qualified or authorised in terms of the SHEQ Requirements.
- Issue the Contractor with a stop order should the Employer become aware of any unsafe working procedure or condition or any non-compliance with any provision of the SHEQ Requirements.

The Client expects the Contractor to engage in safety culture initiatives in line with the Eskom SHEQ Policy and value, Zero Harm.

The Contractor shall implement their OHS management system and requirements and incorporate the applicable Eskom requirements into their system.

The *Contractor* shall ensure:

a) Compliance with all requirements of the Occupational Health and Safety Act no 85 of 1993 and its regulations so as to ensure the health and safety of persons carrying out the Works.

b) Compliance with Eskom's SHE policies, procedures, standards, guidelines, specifications and site regulations.

c) All employees are medically, physically, and psychologically fit to perform the Works. Employees shall have a valid medical certificate of fitness specific to the work to be performed.

d) All employees undergo the relevant training as per their function requirement.

e) All employees working at heights must be in possession of valid training certificates.

f) Employees are informed of hazards identified in the risk assessment before commencement of Works. The Method Statement shall also be communicated to the employees on the work activity before commencement of Works.

g) The emergency rescue plan shall also be communicated to personnel undertaking the Works.

h) Prevention of risk and threats as reasonably practical. All safety and health related incidents should be reported as soon as possible but before end of shift and managed as per Incident management procedure 32-95 (latest revision);

i) Sufficient health and safety information as well as resources are made available.

j) All employees undergo safety induction on-site prior commencement of work.

k) All power tools shall be inspected, and colour coded as and when required.

l) Prescribed PPE for the specified Works shall be worn at all times. The provision of PPE shall be the responsibility of the Contractor.

m) Correct site drawings are obtained and communicated to the employees undertaking the Works.

n) All legal appointments should be done in writing and have relevant competency where applicable.

o) All necessary precautions are taken to manage any health pandemic or disaster.

p) That letter of good standing shall be valid at all times.

11.4.1. Compliance with legislation and other requirements

It is required that all Contractors on the project comply with the relevant applicable legislation, specifications, and standards in accordance with the scope of the project.

It is the duty of the Contractor to ensure that they are familiar with the necessary OHS legislation required. Applicable Acts/regulations should be displayed or available for employees, client and inspector when required.

Note: When there is an amendment to the Acts and/or to the Regulations, the OHS plan must be reviewed, updated accordingly, and send through to the client. Changes must be communicated to all relevant employees.

11.4.2. Mandatory agreements

A section 37(2) agreement must be signed between the Client and the Contractor at the time of awarding the contract. A signed copy of this agreement is submitted to the Client prior to commencement of any activity on site. The Contractor must ensure that a section 37(2) agreement is signed between them and all their appointed Subcontractors/suppliers for the contract.
Copies of all agreements must form part of the Contractor's OHS file.

The Contractor confirms that it has been provided with sufficient written information regarding the health and safety as well as Environmental arrangements and procedures applicable to the works to ensure compliance by it and all employees, agents, Sub-contractors, or mandataries with the SHEQ Requirements while providing the Works in terms of this contract. As such, the Contractor confirms that this contract and the relevant Employer's Regulations referred to in this contract constitute written arrangements and procedures between the Contractor and the Employer regarding health and safety for the purposes of section 37(2) of the OHSA.

The Contractor agrees that the Employer is relieved of any and all of its responsibilities and liabilities in terms of Section 37(1) of OHSA in respect of any acts or omissions of the Contractor, and the Contractor's employees, agents, or Sub-contractors, to the extent permitted by the OHSA.
The Contractor hereby indemnifies the Employer and holds the Employer harmless in respect of any and all loss, costs, claims, demands, liabilities, damage, penalties or expenses that may be made against the Employer and/or suffered or incurred by the Employer (as the case may be) as a result of, any failure of the Contractor, its employees, agents, Subcontractors and/or mandataries to comply with their obligations, and/or the failure of the Employer to procure the compliance by the Contractor, its employees, agents, Sub-contractors and/or mandataries with their responsibilities and/or obligations in terms of or arising from the OHSA.

11.4.3. COID and UIF requirements

The Contractor shall be registered with an appropriate employment compensation fund or a licensed compensation insurer and submit proof of good standing with the commissioner. The Contractor shall, before the commencement with work on site, furnish Eskom Medupi Power Station Project Management with proof of a valid registration through a certificate of good standing in terms of the Compensation for occupational Injuries and Diseases Act, (COID Act), 130 of 1993 and that all payments due to the Commissioner are discharged. This cover shall remain in force during the contract and shall be the responsibility of the Contractor to ensure validity. The letter of good standing shall reflect the name of the Contractor.

11.4.4. Occupational health and safety policy

The Contractor shall have a OHS/SHEQ Policy authorised by their Chief Executive (OHS Act Section 16(1) appointee) that clearly states overall SHE/Q objectives and commitment to improving Safety and Health of its employees. The policy should also include the description of the organisation scope and the arrangements for carrying out and reviewing such policy.

Eskom has a SHEQ Policy (32-727) that clearly states the policy principles by which Eskom operates and the commitment to SHEQ excellence and is authorised by the Chief Executive.

Contractors shall support Eskom SHEQ policy.

11.4.5. Cost Allocation for OHS Compliance

The Contractor shall ensure that there is provision for the cost of Occupational Health and Safety measures.

Note: the costing for OHS must be detailed, that is itemised based on the overall scope of the project (i.e., medical surveillance (Medicals), OHS Trainings, provision of PPE, first aid and emergency equipment, safety equipment purchases, resources, safety signages/symbols, occupational hygiene surveys… etc).

11.4.6. Annexure B: Eskom SHE Rules and Requirements

Annexure B is the acknowledgement of Eskom's SHE rules, and requirements form signed and submitted by the Contractor.

11.4.7. SHE organogram

The Contractor is required to compile their company organogram for the contract, highlighting the reporting structure from their Senior Management down to their project employees. The organogram must include relevant OHS legal appointment as well as appointments requirement by the OHS management system. This diagram must be kept up to date, a copy of which must be given to the client and copy filled in the relevant project SHE files.

11.4.8. SHE Induction and Access to Site

All the employees of the Contractor must attend an Eskom SHEQ induction course provided by the Client before commencement of the contracted work or before they will be allowed to work on the Site. It is the responsibility of the Contractor to ensure that all employees have attended the safety induction. Contractor shall further develop and train all its employees on company specific SHEQ induction. Proof of yearly induction should be easily identifiable/available at all times.

Only once this induction has been received, will each employee receive a site access permit.

11.4.9. Designer: Roles, Accountabilities and Responsibilities

A designer is the person responsible for the overall management of the project design as well as ensuring the management of the compliance of the completed works to the design during and after construction on site.

Designers should ensure compliance with the Occupational Health and Safety Act in terms of Construction Regulations of 2014, Regulations 6, and all other applicable regulations, standards, and legislations.

The designer shall consider the hazards associated with the future maintenance of the designed structure(s) and make provision in the design(s) for the necessary maintenance work to be performed such that the associated risks are minimised.

Designers should ensure that when they design for construction work, they consider foreseeable health and safety risks during construction and eventual maintenance and cleaning of the structure in the balance with other design considerations, such as aesthetics and cost.

Inform the *Employer* in writing of any known or anticipated dangers or hazards relating to the *works* and make available all relevant information required for the safe execution of the *works* upon being designed or when the design is subsequently altered.

The designer should apply the hierarchy of risk control. This means designers need to identify the hazards inherent in carrying out the *works* and where possible alter the design to avoid them. If the hazards cannot be removed by design changes, the designer should minimize the risks and provide information about the risks that remain.

Make available in a report to the *Employer* all relevant health and safety information about the design of the relevant structure, geotechnical science aspects where appropriate and the loading structure is designed to withstand.

Designer should describe any matters that require particular attention by a Contractor. Enough information should be provided to alert Contractors and Others to matters which they could not be reasonably expected to know about.

Take into consideration and ensure compliance of health and safety specification.
In cases where the *Employer* uses offshore designers, the appointed designers must indicate and submit to the *Employer* the legislative requirements/documentation with which they comply to verify whether they meet the South African SHE legislative requirements.
An offshore designer can appoint a local designer to conduct the inspections required by the construction regulations.

Designers must communicate changes with the *Project Manager* on designs that affect environmental authorisations/approval issued. Final designs and layout maps must be approved by relevant authorities before the commencement of the *works*.

11.4.10. Contractor: Roles, Accountabilities and Responsibilities

The Contractor carries primary accountability and responsibility for the health and safety of his/her employees within his/her working area, as contemplated by Section 37(2) of the OHS Act No. 85 of 1993 and Regulations. None of the additional safety requirements specified by the Client reduces the Contractor's accountability and responsibility for the health and safety of his employees within his working area.

The Contractor shall have a disciplinary process and an organisational structured procedure to deal with employees who have transgressed organisational and legal requirements.
The Contractor shall provide a list of names and contact telephone numbers of all his employees on site. This list shall be updated as and when new employees commence on site.
The Contractor shall keep a record of all employees, including date of induction, relevant skills and licenses, and be able to produce this list at the request of the relevant officials. These records shall be filed in the OHS File.

Employees are responsible for their own health, safety, and that of their co-workers in their respective areas of work on the project.
Employees must be made aware of their responsibilities during induction and awareness sessions some of which are:

- Familiarising themselves with their workplaces and health and safety procedures.
- Working in a manner that does not endanger them or cause harm to others.
- Keeping their work area tidy.
- Reporting all incidents/accidents and near misses.

- Protecting fellow workers from injury.
- Reporting unsafe acts and unsafe conditions.
- Reporting any situation that may become dangerous.
- Carrying out lawful orders and obeying health and safety rules.
- Declaring to the employer if taking medication, which may have intoxicating effects.

If an employee has a reasonable belief that the work to be undertaken is likely to endanger him/her or any other person/s due to sub-standard acts or conditions, inadequate precautions or a lack of protective equipment or clothing, he/She has the right to refuse to work and shall report such situation to the employer.

An employee does have the right not to work in any area or perform any task where that employee has reasonable justification to believe that the work situation presents a serious danger to his/her health and safety, organizational assets, or the environment.

It must be highlighted to all employees, that anyone who becomes aware of any person disregarding a health & safety notice, instruction or regulation shall immediately report this to the person concerned. If the person persists, stop the person from working and report the matter to the Eskom Site/Project Manager immediately.

The Contractor appointed personnel shall be registered in their respective levels as professionals in terms of the legislative requirements (SACPCMP).

OHS professionals (which include Safety Officers) are required to register as professionals with the SACPCMP.

11.4.11. Health and safety (SHE) file

The Contractor shall compile a SHE (health and safety) file as per Eskom Medupi Power Station Project's safety file requirements. The Contractor shall also ensure that the health and safety file; which shall include all documentation required in terms of the provisions of the Act and these Regulations; is opened and kept on site and made available to an inspector, client or client agent upon request.

The Contractor at the end of the project shall submit health and Safety file via the *Employer's* documentation management department in the form of hard and soft copy

11.4.12. Health and safety management plan

A Contractor shall provide and demonstrate to the Client a suitable and sufficiently documented health and safety plan, based on the Client's health and safety specification contemplated in regulation 5(1)(b) provided by the client.

All Contractors must use the applicable OHS information to develop a suitable and sufficient OHS plan, submitted with tender documents, which will indicate to the Client the level of compliance to the OHS requirements. The occupational health and safety plan shall identify each activity to be undertaken by the Contractor, the foreseeable internal and external hazards, the specific precautions, and controls that shall be necessary to ensure that the works proceeds safely and without risks to health or adjacent operations.

Upon discussions with the Contractor, a final accepted OHS plan would be signed and approved.
The plan shall demonstrate management's commitment to OHS.

The safety plan shall be reviewed to ensure that it fully addresses all the issues and complies with the requirements of the OHS Specifications and contract. If necessary, the Contractor shall amend the OHS Plan as required by the Client.

11.4.13. Hazard identification and Risk assessments

It is a legal requirement in terms of Section 8 (2)(d) of the OHS Act for an employer to continuously carry out risk assessments, to establish which risks and hazards are attached to the health and safety of persons due to any work which is performed, any article or substance which is, handled, stored, transported.

The Contractor shall prepare and provide to the Client a Baseline Risk Assessment as well as activity-based risk assessments for an intended work.

11.4.14. Medical programs

The Contractor shall ensure that the employees are registered on a medical surveillance programme and are in possession of a valid medical fitness certificate, completed in South Africa. The certificate of fitness should be relevant to the type of work (risk based) that the employee will be exposed to. This will require each employee to have a risk-based person job specification that will be used as a basis for medical examination.

The Contractor must ensure that his employees have undergone pre-entry medical examination before starting work on site, no employee will access site without a valid medical fitness certificate. Periodic medical examination shall be done for all employees as work progresses. Upon completion or as and when employees' leave the project, an exit medical examination must be done for all employees involved in the project.

11.4.15. Emergency Care

The Contractor shall develop emergency procedure in line with Eskom Medupi Emergency Protocols. Contractor shall further ensure that Emergency response service is available at all times to attend to any emergency cases that may arise during the duration of the contract.

The Contractor shall be responsible to familiarise himself with local municipal disaster management portfolios.

A list of emergency numbers must be displayed at notice boards and public areas for ease of access to all employees and visitors. The Contractor shall ensure that his employees are familiar with the emergency numbers. Emergency numbers will also be part of the OHS induction.

Contractor shall have one first aid box for the first five (5) persons and thereafter one for every 50 or team of workers on site or part thereof. There should be a trained and appointed person to render first aid service when required. The first aider(s) shall be in possession of a first aid level two (2) training as minimum requirement as per Eskom Emergency planning procedure 32-123.
More first aid boxes shall be provided if the risks, distance between work teams or workplace requirements require it (it should be available and accessible for the treatment of injured persons at that workplace).

Minimum contents of a first aid box: (Refer to GSR 3 Annexure of the OHS Act).
A prominent notice or sign shall be erected in a conspicuous place at a workplace (SANS1186 approved signs to indicate location of first aid boxes), indicating where the first aid box or boxes are kept as well as the name and contact details of the First Aider of such first aid box or boxes.

The Contractor shall ensure that alternative arrangements shall be made for possible incidents occurring after normal working hours.

11.4.16. Eskom lifesaving rules

A Contractor shall comply with Eskom's Lifesaving rules. Violation of these rules will be viewed in a serious light and the consequences will be dealt with via the respective disciplinary processes
Five Life Saving rules have been developed that will apply to all Eskom Employees, agents, contractors, Consultants, suppliers and visitors. Failure to adhere to these rules will be considered a serious transgression. These rules are being implemented to prevent serious injury or death of any employee, labour broker or contractor working in any area within Eskom.

Eskom Life-saving Rules are non-negotiable health and safety rules which must not be broken under any circumstances. It must be highlighted that Eskom takes a ZERO TOLERANCE stance to violation of these rules. These rules are applicable to any person entering Eskom sites.

The rules are as follows:

Rule 1	**OPEN, ISOLATE, TEST, EARTH, BOND AND/OR INSULATE BEFORE TOUCH** Any person who performs work on an electrical installation shall ensure that it is isolated, tested and earthed before starting any work. (That is plant, any plant operating above 1000 V) With the aim to ensure a safe electrical work environment, no person may work/operate on, around or near any electrical network, line, or apparatus, electrically connected to the power system and/or electrically charged and/or not electrically charged unless: a) He/she is trained and authorised as competent for the task to be done. b) There is a valid permit to work, where required. c) A pre-task risk assessment to identify all risks and hazards has been conducted prior to any work commencing. d) He/she follows the requirements on OPEN, ISOLATE, TEST, EARTH, BOND and/or INSULATE BEFORE TOUCH, correctly based on applicable/related standards, procedures and outcome of risk assessment fit for the type of work or task to be performed. e) The authorised person (team leader) has certified and physically shown all team members that the apparatus is safe to work on. f) He/she makes the specific electrical environment safe prior to performing the work; and g) All the appropriate PPE (including face shield and insulated gloves for low voltage work) are worn.
Rule 2	**HOOK UP AT HEIGHTS** Working at height is a significant part of work in Eskom Holdings and is regarded as a high-risk activity, and as a result all precautions must be taken to prevent incidents while working at height. Wherever reasonably practicable, preference must be given to the performance of work at ground level as opposed to work in an elevated position. Where work in an elevated position is necessary, the requirements below shall apply. No person may work at height where there is a risk of falling unless: a) He/she is medically fit to work at height. b) A pre-task risk assessment to identify all risks and hazards has been conducted prior to commencing any work of this nature. c) He/she is appropriately trained as determined by the risk assessment. d) He/she is appropriately secured during ascending and descending; and e) He/she is using an Eskom approved fall arrest system where applicable.
Rule 3	**BUCKLE UP** Where required, the proper wearing of seat belts for any driver, operator and passenger is mandatory in all vehicles/equipment when driving and/or travelling for Eskom business purposes. The driver is obligated to ensure that he/she as well as all passengers are properly seated and wearing their seatbelts at all times while being transported in the vehicle, as per Eskom specifications. No person may drive any vehicle on Eskom business and/or on Eskom premises: Unless the driver and all passengers are wearing seat belts (Seatbelts shall be used at all times whilst driving). **Note:** This rule is applicable on any road or parking lot, irrespective of the speed, and when the vehicle moves in a forward or backward direction.

Rule 4	**BE SOBER** No person who is under the influence or who appears to be under the influence of intoxicating liquor or drugs will be permitted to enter or remain on an Eskom site or conduct Eskom business or drive/operate a vehicle/equipment for Eskom business purposes. This includes any level of alcohol or the presence of any drugs, controlled substances, and/or illegal substances in the body that impairs or could impair mental and physical functioning, irrespective of when the substance was used.
Rule 5	**PERMIT TO WORK** Where an authorisation limitation exists, no person shall work without the required Permit to Work (PTW), which is governed by for example the: a) Plant Safety Regulations; or b) Operating Regulations for High Voltage Systems (ORHVS); or c) Any other activity where a permit is required. No plant is to be returned to service without the cancellation of all permits on that plant in accordance with procedure, unless permission is granted for a particular plant to be returned to service with permits still open, like in the case of redundant systems. **Note:** In the case of live work, a "live work declaration form" is to be completed by the authorised person, who is the person responsible for the safe execution of work according to relevant standards and procedures. Outline the key principles or rules to support the implementation of the standard statement.
Rule 6	**ENSURE SAFE LIVE WORKING** To ensure safe live work, each live worker shall: Ensure all live work basic principles are adhered to, as outlined (for the method being used) in the High Voltage Live Working Standard for the respective division. Observe and maintain the minimum approach distance (MAD). Only perform live work (never mix live and dead work on the same site at the same time – Refer to ORHVS Section 7 and 5 handouts respectively). Perform tasks they are authorised for and only undertake tasks that are documented in the respective Task Manual (TM). Only work on one potential (voltage) at a time.

11.4.17. Personal Protective Equipment (PPE)

In terms of Section 8 of the OHS Act, the duty of the employer is to take steps to eliminate or mitigate (hierarchy of control measures) any hazard or potential hazard to the safety or health of employees before resorting to PPE.

Contractor's employees on site, including visitors, shall use SANS approved risk-based PPE at all times, as a minimum:

- Head protection hard hat (with chin straps).
- Steel toe capped safety boots.
- Eye protection. Wearing of impact Safety Spectacles with side shields. Prescription glasses must comply with the same standard or cover impact safety spectacles must be worn over them.
- Long sleeved and long pants protective clothing.
- High visibility vests.
- Dust mask and/or Cloth masks.

Refer to General Safety Regulation 2 of the OHS Act
.
The Contractor shall ensure that his employees understand why the personal protective equipment is necessary and that they use them correctly. Training should be provided to employees on the use, care, replacement, and limitation of the provided PPE. Records of training to be kept and made available to the Client or inspector upon request.

Strict non-compliance measures must be administered to any employee not complying with the use of PPE and that employee shall be removed from the Site.

Note: Certain areas will be subjected to specific/extra PPE requirement.

11.4.18. Health Pandemics and Disaster Management

The Contractor shall ensure proper management and control of any disaster and or pandemics that may come forth during the course of the contract. Contractor shall submit a documented plan or procedure outlining how the organisation will manage any health-related pandemic or disaster on site. The plan must address the workplace protective measures.

11.4.19. Behavioural Based Safety Observation (BBSO)

Contractor shall incorporate BBSO or VFL programmes within their Health and Safety Management System.

The objective of behavioural safety observations is to assess and address the actual safe and unsafe behaviours of people in the workplace; as well as workplace conditions - which are caused by the actions or non-actions of employees, Contractor, or their personnel.

11.4.20. Employees' Right of refusal to work in an unsafe situation

Employees have a duty to take reasonable care of their own as well as other person's health and safety at work and to cooperate with the employer, carry out lawful orders, including reporting unsafe situations and incidents.

Refer to Eskom Procedure 240-43848327- Employees' right of refusal to work in an unsafe situation. The aim of the procedure is to ensure that an environment is created that promotes zero harm by empowering employees and Contractors to take responsibility for their own safety and that of others.

11.4.21. OHS Audits

During the course of this contract, the Contractor shall be subjected to scheduled or monthly audits by the client to monitor compliance.

Eskom reserves the right to monitor and conduct unannounced audits to ensure compliance and provide assurance to the Client representatives and their key stakeholders.

11.4.22. Incident management

The Contractor shall report and investigate all incidents/accidents as required in terms of the legislation.

All incidents reporting, recording, classification, and investigation will be done according to the requirements set out in the Eskom document 32-95 (latest revision).

11.4.23. OHS Performance Status Reports

The Contractor shall provide OHS statistical and non-statistical reports, dashboards, presentations on weekly and monthly basis.

11.4.24. Meetings

The Contractor shall attend the monthly safety meeting scheduled by the Client. Ad-hoc meetings shall be scheduled to address any Health and Safety related issue. Principal Contractor's Construction Managers shall also attend at determined specific intervals.

11.4.25. Work Co-ordination/interface Process

Work coordination process is designed for monitoring and coordination of activities for contractors working within the same area. It allows work to proceed without risk to the health and safety of contractor personnel, visitors, Principal Contractors and client personnel.

The following shall be taken into consideration:

- Whenever there is more than one contractor working in one area, there shall be a documented interface process.
- Where there are agreements between different contractors, those agreements shall be written and signed off by the client and site/plant owner.
- It is crucial that there is link between the risk assessment required for the permit to work in terms of PSR and the task risk assessment, as these risk assessments identifies critical controls required to execute the work.

11.4.26. Housekeeping

The Contractor shall maintain a high standard of housekeeping within the site. Prompt disposal of waste materials, scrap and rubbish is essential.

The Client requires the Contractor to conduct housekeeping on a daily basis and perform housekeeping inspections (at least weekly) to ensure maintenance of satisfactory standards. The Contractor shall document the results of each inspection and shall maintain records for viewing.
Housekeeping must be done before and after every shift. After completion of every task, the Contractor must conduct a proper housekeeping and keep evidence of housekeeping in that area.

Note: Nails protruding through timber shall be bent over or removed so as not to cause injury.
In cases where an inadequate standard of housekeeping has developed, compromising the health, safety and cleanliness, all employees have the responsibility to bring it to the attention of the Client.

The Client will have the authority to instruct the suspension of relevant works until the area has been tidied up and made safe. Neither additional cost nor extension of time to the Contract shall be allowed as a result of work stoppage. Emphasis on housekeeping and general safeguarding on construction site CR 27 and stacking and storage on construction site CR 28 is mandatory and must be complied with at all times

11.4.27. Inspection Colour Codes

The below table should be used for colour coding on site for monthly and quarterly inspections on tools and equipment. Material to be used on colour coding should be cable ties. The colour coding should be

implemented as soon as on the first day of the respective month. Previous month colour coding should be removed and replaced with new ones for the present month.

Wrong colour coding on tools and equipment shall be deemed as proof that inspection was not conducted for the month on that particular item. Colour coding does not replace the need of daily inspection checklist being conducted daily and kept in the file on site.

Monthly Inspection Colour lode			**Quarterly Inspection Colour Code**	
January	Blue	Blue	January	Green
February		White	February	
March		Black	March	
April	Grey	Grey	April	Red
May		White	May	
June		Black	June	
July	Pink	Pink	July	Blue
August		White	August	
September		Black	September	
October	Brown	Brown	October	Yellow
November		White	November	
December		Black	December	

11.4.28. Work Stoppage

The temporary stoppage of an activity/activities or task(s) may be due to SHE concerns, including the following circumstances which shall not warrant any financial compensation:

- Ad hoc safety intervention by Eskom management: All work of a similar nature may be stopped as the result of an occurrence of a serious incident. The Contractor shall be required to comply with, and/or verify, the conditions stipulated in the work stoppage instruction pack and.
- Ad hoc safety intervention by any person, especially SHE functionaries, may be due to unsafe work or unsafe behaviour by the Contractor. The conditions that gave rise to the work stoppage will determine the corrective measures to be taken urgently to protect the health and safety of employees and protect the environment and plant or equipment, etc.

NOTE: Work stoppages that are initiated due to SHE related incidents shall not warrant any financial compensation claim lodged against Eskom.

Further note Eskom do have two compulsory work stoppages per annum. Safety discussions will be held on those days and no financial compensation claim lodged against Eskom. This is in line to support our safety culture of Zero Harm.

11.4.29. Hours of Work

All work conducted on site shall fall within the legal requirements in accordance with the Basic Conditions of Employment Act.

The Contractor will notify their Eskom responsible manager/supervisor of any work that needs to be performed after hours according to the agreed arrangements. (The application needs to be submitted timeously). Where applicable, the notification should include proof of application, for overtime, to the Department of Employment and Labour and/or the letter of approval from the Department of Employment and Labour.

11.4.30. OHS Post-Contract Review

At the end of the contract, an evaluation will be conducted and will be supported by the objective evidence documented during the term of the contract. The evaluation criteria will include, but not limited to: Accident and injury data for the contract; OHS non-conformances; Legal compliance with OHS requirements; Close-out of Incident Investigations; contravention of the Eskom Lifesaving Rules; Prohibition and contravention notices issued by Department of Employment and Labour, Dept. of Mineral Resources, Department of Forestry, Fisheries and the Environment (DFFE) etc. The evaluation report shall be filed in the contract documents.

11.4.31. Project Close-out

On completion of the project or service rendered, the Contractor shall close out their project documentation and OHS files and handover to the Eskom Project Manager. All required documentation shall be submitted and handed overusing relevant medium as per the procedure (Project Closeout and H&S documentation, 348-9942695). A checklist shall accompany the submission to verify that all documents are submitted/or handed in to the client. All exit medicals shall be performed prior contract close out.

11.5. Environmental constraints and management

The *Contractor* shall comply with the environmental criteria and constraints stated in Annexure _____
Refers to 348-10125752 Health Safety and Environmental Specification

The Principal Contractor and Contractor is required implement an Integrated Environmental Management (IEM) principles or guidelines through-out project lifespan. Medupi Power Station Project is ISO 14001:2015 Certified and the Principal Contractor and Contractor must conform to all Environmental Management Systems requirements and Protocols. All applicable Medupi PS Project's Environmental Management System Procedure are listed on a Record Master Register with SPO. No. 348-646829 and copies will be shared with the Principal Contractor and Contractor for consideration and implementation.

Medupi Power Station Project (the Project) acquired numerous environmental approvals which must be complied with during implementation of the scope of work. Approvals referred to amongst others include Environmental Management Plan (EMP), Environmental Authorisations, Waste Mangement Licence, Water Use Licence, Tree Removal permits. All environmental approvals for the Project are populated on a register with SPO. No. 348-687483.

Minimum requirements for compliance by contractors:

- Ensure that the Method Statements are submitted to the ECO and Eskom for approval before undertaking any work/activity onsite. Any lack of adherence to this will be considered as non-compliance to the specifications.
- Ensure that any instructions issued by the Eskom, on the advice of the ECO, are adhered to.
- Contractor must maintain the environmental legal register.
- Ensure that there must be communication tabled in the form of a report at each site meeting, which will document all incidents that have occurred during the period before the site meeting.
- Ensure that a register is kept at the site office, which lists all the transgressions issued by the ECO.
- Ensure that a register of all public complaints is maintained.
- Ensure that all employees, including those of sub-contractors receive training before the commencement of construction in order that they can constructively contribute towards the successful implementation of the environmental requirements of the Contract.
- Ensure compliance with the environmental requirements, relating to the provision of adequate resources for the implementation and monitoring of the requisite environmental controls.
- Compile an Environmental monitoring plan outlining all the construction activities, associated environmental impacts and how they will be mitigated.
- Ensure that the project pricing makes provision for environmental costs.
- Contractor shall attach a company waste management plan including the typical waste inventory and templates used for keeping waste records.

- Include environmental considerations as an item on the agenda of the monthly site meetings.
- Compile and implement the necessary Method Statements; and undertake environmental awareness training of all site staff during the commencement of each Contract, with regular refreshers for the duration of the Contract.
- Appropriate measures shall be undertaken to minimise the generation of dust from work activities
- The work area is kept clean, tidy and free of waster/rubbish. Waste shall be disposed of in designated bins
- Adherence to Water Use License (SPO No. 348-31313) and applicable legislative requirements e.g. National Water Act and Regulation 704 of the National Water Act (Act 36 of 1998).
- Plant and machinery shall be equipped with drip trays. Oil refills for plant and machinery shall take place in designated areas.
- Ensure that the permit required in terms of the Waterberg Emergency Services By-Laws is in sought prior to storage of hazardous chemical substances/agents/dangerous goods and use fuel bowser/tanker onsite.

11.5.1. Spillage of Hazardous Chemical Substances

- Any spillages that occur shall be treated in accordance with the requirements indicated on the MSDS.
- Identify appropriate storage areas for stockpiling of materials, storage of hydrocarbons and storage of hazardous substances and ensure that these areas are appropriately prepared for their purpose.
- Disposal of hazardous substances shall be done in terms of the relevant legal requirements.
- Limit spillage of hazardous substances or substances with the potential to cause contamination of the environment.
- Develop emergency protocols for dealing with spillages particularly where these pose a pollution risk or involve hazardous substances.
- Compile and implement the necessary Method Statements; and undertake environmental awareness training of all staff.
- Spill Preventative Control and Countermeasures Plan must be compiled and implemented.

11.5.2. Herbicide and/or Pesticides usage

Only registered pest control operators may apply herbicides/pesticides on a commercial basis. All staff applying herbicides/pesticides shall be trained in the application thereof and shall be provided with suitable PPE.

The application of herbicides/pesticides shall be in accordance with the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act No. 36 of 1947. Only approved and tested herbicides/pesticides with a low environmental risk shall be used.

Herbicide/pesticides register for usage shall be compiled and maintained, and a copy handed to the project leader / environmental advisor on completion of the project / contract.

11.5.3. Fire hazard

The Contractor shall develop emergency protocols for dealing with fires, which may include a Fire Management Plan in accordance with the National Veld and Forest Fire Act (No 101 of 1998) and ensure that all staff is educated in fire prevention and will be held responsible to avoid the risk of fire. Firebreaks shall be created to prevent fires from spreading. No open fires are allowed on site. The contractor shall ensure that operations are in compliance with statutory requirements at all times. The Contractor Environmental Officer shall ensure that in areas with a high fire danger rating, staff are made aware thereof. Smoking shall be restricted to designated areas or shall not be allowed, particularly in areas that have a high fire danger rating.
Contractor shall ensure that adequate Fire Fighting equipment is available on site, particularly near hot work.

11.5.4. Waste

All waste generated shall be disposed of at a licensed landfill site and/or waste management facility. Contractor to ensure that requirements stipulated in the Medupi Waste Management Work Instruction (348-22367) and implemented. Waste stream analysis followed by development of the waste inventory must be completed at the initial stages to ensure integrated waste management approach. Contractor must be able to remove all the hazardous waste generated during the construction period. A waste management plan shall be compiled before commencement of work. No waste, be it biodegradable or not, shall be left on site once work has ended. Industrial general waste and hazardous waste generated shall not be burned, buried, or disposed of on Eskom or Landowner property, but will be controlled and removed to a registered and/or licensed waste facility on a regular basis (Daily / Weekly). The Principal Contractor and contractor working on site shall ensure that oil, fuel, and chemicals are confined to specific and secure areas throughout the construction period. These materials shall be stored in a bunted area with adequate containment for potential spills and leaks.
Waste may be collected by the relevant Municipality or alternatively taken by the Contractor to a registered landfill site. Where the municipality does not have a weighbridge, the Contractor is responsible for obtaining a formal notification to this effect.
Contractors shall ensure that sufficient clearly labelled scavenger waste bins/receptacles are provided onsite. Waste must be segregated at source, bins provided must be per categories of waste generated. The contractor shall comply with the requirements of NEM: Waste Act 59 of 2008.
Quantities of waste disposed/treated/recycled shall be recorded and submitted to Eskom as part of the Contractors Environmental Compliance Report due on the 26th of each month. Set up system for regular waste removal to an approved facility and minimize waste by sorting wastes into recyclable and non-recyclable wastes. Improve waste management efficiency by prioritising reduction, reuse, and recycling while actively implementing principles of circular economy.

Equipment maintenance and storage:

- Ensure that all plant is in good working order.
- Undertake maintenance within specified area (workshop); and use drip trays for all stationary or parked plant and when servicing equipment away from designated areas.

11.5.5. Material requirement

The use of any material or property belonging to any landowner shall not be permitted prior to arrangements with the relevant landowner. Written proof of such agreement shall be handed to project leader / co-coordinator for record keeping.

11.5.6. Dust and Noise

The Contractor shall monitor dust and noise caused by mobile equipment, generators and other equipment during construction. Factors such as wind can often affect the intensity to which these impacts are experienced. To ensure that noise does not constitute a disturbance during construction activities, all construction works shall occur between specific working hours.
Mitigation measures to be implemented as required / agreed upon with the project leader / environmental advisor.
Dust suppression measures shall be in place to reduce the dust caused by the movement of heavy vehicles and other contractor activities. Requirements stipulated in the Waterberg Air Quality Bylaws must be adhered to.

11.5.7. Environmental Incidents

All environmental incidents such as pollution (air, water, land, noise, etc.), bird kills, and animals killed, plants destroyed, public complaints etc. shall be reported to the project leader, Environmental Control Officer and/or environmental advisor as soon the Contractor is aware of the incident or latest before end of the shift.
All environmental incidents occurring on site shall be addressed according to Medupi Environmental Incident Management Work Instruction 348-693723, detailing how each incident was dealt with. Proof thereof must be kept in an incident register.
The Contractor must submit incident management procedure in line with Eskom requirements.

The Contractor shall be held liable for any infringement of any Environmental statutory requirements.
All environmental incidents are reported as guided by 348-693723.

11.5.8. Water

Requirements stipulated in the Medupi Power Station's Water Use Licence and applicable legislations and guidelines e.g. National Water Act must be complied with.
No construction shall be allowed within the 1:100-year flood lines. Should any pollution of the watercourse occur, the Department of Water Affairs and Forestry must be notified immediately.
Water usage on site shall be verified with Eskom's responsible person e.g. the project leader, environmental advisor to ensure compliance with requirements. All incidents related to water contamination shall be reported before end of shift. Records of water quantities abstracted or used when undertaking activities must be kept and submitted to Eskom as part of the Monthly Environmental Compliance Report that is due on the 26th each month.
Chemical toilets shall not be stored within proximity of the drainage lines / ways and must be anchored to prevent potential incidents. Environmentally friendly chemicals should be used to control odour and to kill microorganisms. Method statement and associated risk assessment must be submitted and approved prior rolling-out of mobile toilets onsite.
Contractor must submit Rain Readiness Plan stating mitigation controls that will be implemented during rainy season.

11.5.9. REPORTING AND SHE GOVERNANCE

Weekly Inspection

Principal contractors and contractors should conduct inspections and document the outcome in a report which should amongst others include photographic evidence. All deviations recorded should be addressed using an action plan that include root cause, corrective action, responsible person and timelines at minimum. Weekly reports must be submitted to Eskom on Fridays on or before 10H00.

Monthly Reporting

Environmental Management reports to be submitted on the 26th of each month or as per timelines determined and agreed upon by project Environmental Department. Eskom's Contractors Monthly Environmental Template (Document No. 200-84052) should be used as minimum information when developing Contractors Environmental Compliance Report Template.

Emergency Coordinators Meeting

The Project Emergency coordinators meet on an agreed basis to discuss emergency activities, changes on the acts and bylaws and any other feedback from activities conducted by the Employer on various Contractors as well as lessons learnt.

Contractors Environmental Meetings

Contractors Environmental/SHE Meetings are held at intervals as determined by project Environmental Department, such meetings are chaired by the project SHE Manager/Senior Environmental Advisor and attended by the ECO, project Environmental Practitioners as well as designated environmental resources of all contractors. In some cases, Contract Managers will be required to attend.
Attendance registers shall be kept for all the health and safety meetings

11.5.10. Environmental File

Environmental file including the following but not limited to must be approved by the client. Ensure the file is updated regularly.

- Comprehensive aspect and Impact register specific to the scope of works.
- Submit the Establishment Method statement for approval prior commencement on site.

- Site demobilisation and rehabilitation plan to be submitted for approval during closure phase.
- SHE policy recently signed.
- Environmental Management Plan that addresses all the potential environmental risks as per aspect and impact register.
- Submit the following Waste Management Plan, Medupi Spill Prevention, Control and Countermeasures Management Plan, Water Management Plan, Medupi Environmental Incident Management Procedure, Non-Conformance Procedure, and Internal Auditing Procedure and others as required related to the scope of work.
- Method statements that include environmental impact and mitigations measures. Include all activities in sequence as per the project scope and aspect and impact register.
- Appointment letter (as per requirements stipulated under Section 2.1.1. of the Construction Environmental Management Plan) and the CV of the Competent Environment Officer shall have a minimum qualification of a National Diploma/Degree in Environmental Management/Sciences with a minimum of 2 years' experience in environmental management construction field. Candidate must have knowledge and experience on waste management, incident management and environmental legislations. In addition, have attended training on Implementation of ISO14001:2015 Standard recognised as Environmental Management Systems (EMS).

11.5.11. Environmental legislations and other requirements

Ensure compliance to all relevant environmental legislations and other requirements.
Ensure compliance to the project available licences, authorisations and permits.
Ensure that the legal register is maintained and legislatives changes/updates are shared. Training on Environmental Liability should be shared.

11.6 . Quality assurance requirements

11.6.1

The Supplier shall demonstrate, provide and maintain a Quality Management System (QMS) that is ISO 9001:2015 certified or compliant thereto as well as the contractor quality requirements (240-105658000) and Medupi Contractor Quality Specification (348-389557). Compliance with the provisions of this clause in no way relieves the Supplier of the final responsibility to furnish acceptable services. *Contractors* QMS that includes:

a) Ensuring that processes, plans and procedures needed for the QMS are established and maintained and the integrity of the QMS is maintained when changes are implemented.
b) Ensuring that Quality Assurance and Quality Control Depts. are sufficiently manned with competent resources to effectively implement quality requirements.
c) Reporting to top management on the performance of the quality management system and any need for improvement.
d) Ensuring the awareness of customer requirements throughout Contractors organization.

Quality management shall ensure that the *Employer's* requirements as specified in the Contract are met in full, and verified as such to Employer satisfaction. Quality management shall be in accordance with ISO 9001:2015 and related ISO 9000 series of Standards, and is to provide full documentary and Objective evidence that the Works have been designed, manufactured, executed, completed and maintained in accordance with the Contract.

The quality management system shall apply to the *Contractor* and all persons real or juristic working for or on behalf of the Contractor on or in connection with the Works and regardless of the form of employment contract.

Quality management shall ensure that the Quality Control Plans, Inspection and Test Plans and

procedures/instructions/method statements/ECNs/FCNs developed or adopted provide stages at which the *Employer* may witness what is being done or require what is being done to be subject to inspection before the execution continues

Contractor shall list all documentation needed for the effective implementation of the project quality management system (QMS) and shall, as a minimum, prepare, maintain and implement throughout the life cycle of the project, as part of the project quality management system. The project specific

documentation are as follows:

a) Project Quality Policy
b) Project Quality Strategy
c) Project Quality Objectives
d) Project Quality Management Plan
e) Project Organisation Chart.
f) Project RACI Matrix – may be split by Dept. /Phase/Discipline as required.
g) Job Descriptions including performance requirements and measurements.
h) Equipment and Process Criticality Ratings,
i) Project Quality Assurance Plans – per project phase:
    (i) Design
    (ii) Manufacturing, Inspection and Testing
    (iii) Construction, Inspection and Testing
    (iv) Commissioning and Taking-Over
(j) Project Quality Control Procedures - per discipline:
    (i) Civil and Structural works.
    (ii) Mechanical, Piping, Painting and Insulation works.
    (iii) Electrical works.
    (iv) Control and Instrumentation works.

Project Quality Control Procedures per individual activity identifying specific inspection and test methods and acceptance criteria.

Project Inspection and Test Plans (ITP's) per individual activity that plan, assure quality, and define inspection intervention levels.

Project Quality Verification Records per individual activity - as referenced in ITP's.

Manufacturing, Construction and Commissioning Record Books

Except where otherwise stated, all documents that constitute the Quality Management System, including proforma Quality Verification Records, shall be complete, in accordance with the Contract, and ready for use and submitted to Engineer not less than 30 days before the work governed by the documents is planned to start.

Throughout the lifecycle of the project, on a monthly basis, the contractor shall maintain and submit an MDL (Master Documentation List), to the *Project Manager* for review and approval. Each document on the Master Document List shall have the following marked against it:

a) The planned and actual date of submittal to the *Project Manager*
b) The classification of documentation (for approval, for review, or for reference) based upon the classification guidelines of Quality specification document.

(i) Class 1 - for the Engineer's approval - where the Contractor may not proceed with the Works that are the subject of the document until it has been approved by the Engineer.

(ii) Class 2 - for the *Project Manager*'s Review - where the Contractor may proceed with the works that are the subject of the documentation if the *Project Manager*'s has made no comment after seven (7) days from the receipt by the *Project Manager*

(iii) Class 3 - for the Engineer's Reference - where the *Project Manager* reserves the right to comment, but the *Contractor* may proceed with the works that are the subject of the documentation.

Where there is an ambiguity or where a document is produced that is not referenced therein clarification as to classification shall be sought from the *Project Manager*.

The Master Document List shall be submitted to the *Project Manager* electronically via email in native file format on a monthly basis.

The Contractor submits as a minimum the following documents, as required by the Employer, which requirement does not constitute a compensation event, during the execution of the Works:-:-

a) Updated QCP register
b) Inspection notifications accompanied by their inspection report
c) Non-conformance and Defects registers and reports
d) Updated Site and off -site inspection schedules.
e) Inspection and or FAT dates.
f) Inspections completed/outstanding.
g) Inspection and test reports
h) Monthly contract quality progress report
i) Data books for the completed Works, before commissioning can commence (refer to the Record books section 2.5.2 and data books hand over timelines)

- The Supplier agrees to control and professionally preserve and store appropriate documents, records and recordings for a period of 5 years after termination of the agreement to guarantee the traceability of the services rendered and inspection thereof.
- The Supplier agrees to regularly update and implement all the latest technology available as well as the necessary improvements for the installation, production and organisation deemed necessary to meet the requirements of the agreement and in order to enhance capabilities and effectiveness to deliver high quality, cost-effective security services.
- The delivered or services shall be uniform in Quality and condition, consistent with good industry practices and adhere to requested Eskom requirements, without deviation.
- The Employer shall have the right to regularly conduct inspections, assessments , audits and surveys and perform surveillance of the Supplier's and/or Sub-Supplier facilities, sites, premises, records and documentation (including but not limited to data books) to evaluate their capability to comply with the requirements necessary to conform to contractual and QMS requirements.
- The Employer reserves the right to inspect, at reasonable times, any or all of the services performed at the Supplier's or Sub-Supplier's premises or elsewhere. Verification by Eskom shall not absolve the Supplier of the responsibility to provide acceptable product and / or services, nor shall it preclude subsequent rejection by Eskom.
- The services must comply with the agreed specifications and requirements and the applicable directives and standards set out in the Contract. Defects notified by the Employer shall be remedied by the Supplier upon demand by the Employer without undue delay and at no extra cost. The Supplier shall continuously monitor and identify non-conformances, both internal and external, as signals of opportunities for improvement making process and other relevant changes to prevent recurrence.
- The Supplier shall further identify potential problems before they occur by identifying deviations in patterns or trends in product, service or process performance.

- Nothing contained in the Contract and/or purchase order and/or scope of work and /or works information shall relieve in any way the Supplier from the obligation of Quality control thereof.
- The Supplier guarantees that the Quality of the delivered services will comply with the requirements of the contract and/or relevant specifications.
- The Supplier shall, on request, prove its ability to relate to the proposed scope of work which establishes the manner in which the Supplier intends to perform the Contract.
- The Supplier shall, on request, prove its organisational, logistics and support resources to ensure the requirements of the contract can and will be achieved.
- The Employer reserves the right to assess and measure, during the existence of the agreement the qualifications, capability and competence of the key staff (assigned personnel) in relation to the scope of work and to interview any / all of them to confirm the Quality evaluation.
- The identified professional personnel who will be managing the service will be available and accessible on a continuous basis until the conclusion of the project.
- The Supplier shall demonstrate experience in comparable projects or specific aspects of the project and / or performance in similar projects, on request.
- The Quality of the services and the contents thereof will always be in accordance with professional standards.
- For the duration of the Contract, the professional staff managing the service, must be and remain a member of his/her Professional Society
- The Supplier must, at all relevant times, scrutinise and be aware of Eskom's requirements with specific focus on , inter alia, its philosophy, principles, strategies, practises, mission, vision, models, policies and practises.
- The Supplier shall exercise reasonable professional skill, care and diligence in the performance of his obligations in terms of this agreement.
- On awarding of the Contract to the successful Supplier, such Supplier shall present to the Employer an acceptable Quality Control Plan (QCP). The QCP shall comply with the requirements of ISO 10005

The Contractor shall employ sufficient qualified and knowledgeable quality assurance and quality control and inspection staff. These staff members shall be independent from those responsible for construction and commissioning activities and report directly to the Site Quality Department Manager and not the production team as referenced on Medupi Quality Specification (348-389557 sub-clause 3.4.1).

11.6.2 Quality Payment Schedule

1) The Contractor shall ensure that Quality Assurance is performed at all levels and phases of work carried out for the Employer.

2) The Contractor shall use processes to ensure that quality is built into their products/services i.e., its business processes are organized such that quality is built into the process of producing goods and rendering services. The Contractor shall work according to processes.

3) The Contractor shall ensure that it can be relied on to deliver quality goods and services without the need for the Employer to have to inspect all the time.

The Contractor shall keep the Quality Table of Payments (Quality Payment Schedule) updated with progressive Employer sign-off (as the work is done and payments applications are submitted). This means that as the Contractor completes an activity and has the related ITP/QCP signed by the Employer, the Contractor shall bring the Quality Table of Payments to the Employer's Quality representative to sign off for that activity.

The updated Quality Table of Payments shall accompany all payment applications (proforma invoices). The Contractor shall attach the signed (or partially signed if applicable) ITPs/QCPs to the payment application. Payment will only be made if the ITPs/QCPs are signed by the Employer

11.7. Programming constraints

1) Programmes shall be in Primavera P6 format and shall be submitted weekly in electronic format (XER) together with two printed copies.
2) Unless otherwise directed in writing by the Employer, the level of detail required is level 4 and programmes shall include work break-down structure (WBS):
    a) Show activity quantities and units.
    b) Show activity durations.
    c) Show late and early start dates, late and early finish dates and total float.
    d) Include activities codes and XER export of layout used by the contractor.
    e) Clearly identify and indicate milestones, key events and the critical path.
    f) Activity ID's will not change during the contract period.
    g) Any addition or deletion of activities to be clearly reported on with reasons.
    h) All activities shall be resource loaded and shall be aligned with the costing report.
    i) Activities exceeding thirty (30) days in duration shall be broken down into detailed sub-tasks.
    j) Commissioning activities shall be scaled in days.
    k) Contractor activities shall be fully detailed to show clearly all times of delivery to the site of construction, First Programme.
    l) Progress Override shall not be used in schedules but Retained Logic.
    m) Total Float shall be calculated as "Finish Float = Late Finish – Early Finish".
    n) Free Float shall not be used in the schedules but Total Float.

4. The first programme shall be consistent with the programme submitted with the Tender but shall include any alterations or additions negotiated and agreed to between the Parties as at the Contract Date.

5. If, under Sub-Clause [Programme] of the Conditions of Contract, the Contractor is required to submit a first programme more than 28 days after the Contract Date, the Contractor shall in any event submit a preliminary first programme within 28 days of the Contract Date. This preliminary programme shall comply with the requirements of the first programme and with the requirements set out above, except that the level of detail required therein shall be that of level 2 and not level 4. This preliminary programme is not considered to be a formal programme under (Programme) of the Conditions of Contract but is submitted for information purposes in order to enable the Employer, at his discretion, to raise comments with a view to avoiding delays when the first programme is submitted.

6. Together with the first programme, the Contractor shall submit a cash flow diagram (S-Curve) directly produced from the programme detailing the estimated financial expenditure over the Contract period based appropriate quantitative information.

Commissioning Plan

To the extend the Contractor is responsible for the design of the Works under the Contract, the Contractor shall prepare and submit to the Employer for his approval a detailed commissioning plan for such Works, which commissioning plan shall:

1) Comply with the Employer's Requirements and other applicable requirements of the Contract (the Contractor acknowledging that his commissioning plan will need to be integrated by the Employer into a detailed commissioning plan for the related Project Works, which will include the works of Other Project Contractor).
2) Be amended and re-submitted at the expense of the Contractor until approved by the Employer; and
3) Be amended, updated and re-submitted for the approval of the Employer as necessary and when required by the Employer.
4) Compliance with the commissioning plan shall not relieve the Contractor of any responsibility, undertaking warranty or other obligation under the Contract.

Unless the Employer directs otherwise, the detailed commissioning plan shall be submitted at least six months prior the scheduled start date of commissioning and a preliminary commissioning plan shall be submitted within 56 days after Commencement Date.

Monthly Progress Reports

The Contractor shall submit monthly progress reports to the Employer. The reports shall be submitted in writing in a form approved by the Employer. The comparison of actual and planned progress referred to below shall, however, also be submitted in electronic XER format. An electronic copy and two hard copies of each progress report shall be submitted to the Employer.

Each report shall cover a period of a calendar month save that the first report shall cover the period up to the end of the first calendar month following the Commencement Date. Reports shall be submitted by the 4th (fourth) day of the month following the month to which the report relates.

Each report shall include:

1) An executive summary.
2) Charts and detailed descriptions of the status of the Works in narrative format, including each stage of design, Contractor Documents, procurement, manufacture, deliver to the Project Site, Contractor, erection commissioning and testing.
3) For the manufacture of each main item of Plant, the name of the manufacturer, manufacturer's location, percentage progress and the actual or expected dates of commencement of manufacture, inspections, pre-delivery tests and delivery to the Project Site.
4) One month and three-month look-ahead schedule.
5) Comparisons of actual and planned as against the programme, detailing activities completed, the percentage progress of each activity in progress completed and not completed and activities not started.
6) Colour photographs in digital format showing progress in the course of manufacture and on the Site, with each set comprising at least 20 colour photographs, individually marked with the date taken, a description of the subject and the direction of view.
7) Updated cash flow S-curve and S-curve on forecast and progress.
8) Details of actual and planned resources including number of each class of Contractors Equipment at the Project site for the relevant period
9) A report of quality demonstrating compliance with the quality assurance requirements of the Contract, including a schedule identifying all quality control documents, test results and certificates issued during the reporting period.
10) A list of proposed Variations and the status thereof.
11) A list of Variations detailing their reference numbers.

12) A list of site instructions and other instructions received by the Contractor listing the date of receipt and the nature of the instruction.

13) A list of notified claims for extensions of time or compensation detailing their reference numbers, the date on which the underlying cause, circumstances of event arose and it first came to attention of the Contractor, the claimed additional Cost (and reasonable profit where applicable) and/or extension to the Time of completion, the dates on which notice and the details thereof were given to the Employer under 'Claims, Disputes and Arbitration' of the Conditions of Contract and status thereof;

14) A risk register and assessment dealing with all areas of concern including detail of all notified early warnings and detail of other events and circumstances not dealt with above, which may have an impact and/or cause delays and details of the corrective or other measures being adopted, r to be adopted mitigate or overcome such cost impact and/or delay.

15) A current register of drawings and other documents submitted to the Employer during the reporting period and the prior reporting period, detailing the date of issue to the Employer and, if applicable, the date by which the Employer's approval is required.

16) A current list of all drawings and document issued to the Contractor (including the applicable revisions) detailing the date of issue and transmittal thereof.

17) A report on health & safety and environmental matters demonstrating compliance with the health & safety requirements of the Contract.

18) A report on industrial relations relevant to the works including relations at the Project Site and at places of manufacture.

19) Status report on payments made and outstanding applications for payment.

20) A copy of the Contractor's daily Project Site diary for the period in question; and such other matter and information (including schedules and charts) as the Employer may require to be included in the Progress Report from time to time.

Additional Weekly and Daily Report

Following mobilisation at the Project Site, the Contractor office shall, in addition submit to the Employer (in electronic copy and two hard copies):

1) Weekly reports which shall summarise Project Site activities, including numbers of each class of Contractor's Personnel and of each type of the Contractor's Equipment on the Project Site, the plant and Materials on the Project Site and record any areas of concerns and details of corrective action being taken; and

2) Daily activity reports summarizing the main activities to be undertaken each day, noting any special activities that require witnessing, together with full particulars and details of obstructions, modified or additional work, incidents, health and safety matters and he number of men employed in each several positions of the work in progress.

Daily Project Site Diary

The Contractor shall maintain an up-to-date daily diary of all Works related activities at the Project Site. The daily diary shall be available for inspections by the Employer at all times.

Report on Disputed Work

For work in respect of which the entitlement of the Contractor is disputed or of an uncertain nature, the Employer may require the Contractor to submit work detail sheets, for the approval of the Employer, as a record of work done. The sheets shall be" for record purposes only" and shall not give rise to the evidence and entitlement to an extension to the Time to Completion of any addition compensation.

Additional Reports

The Contractor shall be entitled to request the Employer to provide additional reports when in his option they are warranted to monitor the progress of the work.

Meetings

During the execution of the Works, various weekly and monthly meetings shall be held.

Inter alia, these meetings are to be discussed and review in detail the up-to-date progress of the Works, without limiting the nature of the matters to be discussed at these meeting.

If the actual progress of the work is at any time unsatisfactory, the Employer shall be titled to call on the Contractor for advice for the reasons for the foregoing and to make proposals for corrective action to be taken.

The Employer shall be entitled to call meetings required by the applicable Law or otherwise required by the Employer in connection with the Project Works. These meetings shall be conducted at the Project Site or at another location directed by the Employer. The agenda for the meeting shall be determined by the Employer. The Contractor shall be entitled to propose matters for inclusion on the agenda of any meeting which he is required to attend. The minutes shall be kept by the Employer and submitted to the Contractor for comments prior to the subsequent meeting and such minutes shall thereafter be formally approved at such subsequent meeting as an accurate record of the issues discussed at the previous meeting, such minutes shall not necessarily be a verbatim transcript of the discussions at meetings.

Unless otherwise approved by the Employer, meetings were the Employer requires the Contractor to be present, whether scheduled or otherwise called by the Employer, shall be attended by the Contractor Representative.

The Employer will furthermore conduct sessions with the Contractor in order to determine any gaps in the schedules and to coordinate the works in a more structured way. The outcome of these sessions will be discussed with the Employers representative and the Contractor schedule will be adjusted accordingly before the next submission to the Employer.

Photographs for Progress Reporting Requirements

The taking of photographs of the Medupi Power Station including the Project Works is restricted and subjected to the approval of the Employer as provided for under the Contract.

For the purpose of the Progress Reporting Requirements, the Employer shall be entitled, at any time to prohibit the taking of such photographs and/or require that all such photographs been taken by the supervisors. In the latter events, the Contractor shall be required to make arrangements directly with the Employer for the taking of the photographs required by the Contractor for the purpose of the Progress Reporting Requirements and for the payment thereof

11.8. *Contractor*'s management, supervision and key people

Proof of qualifications to be submitted to the *Project Manager* for approval and acceptance for the *Contractor* and Subcontractor's key people, including appropriate registrations.

The *Contractor* to submit an operational plan, including organogram for approval and acceptance by the Project *Manager*.
Below are the key persons referred to in clause 24 of the contract. The *Contractor* should on his organogram include the below listed key persons.
The *Contractor* provides the following key people as a minimum
:

a) Dedicated *Project Manager*
b) Dedicated Project Planner
c) Dedicated Site Manager
d) Dedicated Quality Manager
e) Dedicated Quality Control Supervisors
f) Dedicated Site Safety Professional
g) Dedicated Site Safety Representatives

h) Dedicated Engineer
i) Dedicated Technical Field Advisors / Specialist
j) Dedicated Commissioning Engineers

For the purposes of this Contract, "dedicated" means that the person is allocated only to this Contract, full time, must not be working on any other contract, must be available at Site as and when required, must be available at Site full time during the construction phase, must respond promptly to instructions.
In the *Contractor's* tender response, the *Contractor* states how many of the key people are required for this Contract. The *Contractor's* pricing for this provision of this activity must be stated in such a way that the *Employer* is able to assess the number of dedicated persons, their job function and the extent of their availability. If the *Employer* finds that the key people are not a "dedicated" resource, the *Employer* makes a pro rata deduction from the Prices.

11.9. Invoicing and payment

At each *assessment interval*, the *Contractor* submits to the *Employer* a forecast rate of invoicing that includes all the expected payments by the *Employer* to the *Contractor* on a month-by-month basis.
The invoice needs to have all supporting documentation attached to the invoice, rental sheets per *Contractor's* equipment registers, any other relevant information and signed off by both parties.

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

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

Eskom Holdings SOC Limited
Medupi Power Station
P. Bag 7502
ONVERWACHT
0557

and include on each invoice the following information:

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

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

1. Submit a pro forma on 20th of each month to the *Employer*
2. The *Employer* will verify and return a payment certificate to the *Contractor* around 25th of the month
3. Following receipt of the payment certificate the *Contractor* would be required to submit a tax invoice to the *Employer* and the following email address invoicesgrpcapitalMHP@eskom.co.za

Invoices should be addressed as below.

Eskom Holding SOC Limited
Medupi Power Station Project
Private Bag X7502
Onverwacht
0555

Eskom VAT no: 4740101508

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

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

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

11.10. Insurance provided by the *Employer*

As stated for in the *Employer`s* Construction All Risk Insurance Policy available on request from Eskom Group Insurance.
To be dealt with in accordance with ECC3 Core Clause 87.1, 87.2 and 87.3 and additional requirements are also stipulated in Z Clauses
The insurance policies and procedures will form part of the Contract Data and any reference to this will be contained in the Contract Data.

11.11. Contract change management

Changes during a term of the Contract are inevitable and when they occur, they need to be managed within the policies and procedures of the *Employer*. Changes can be minor which are administrative or substantial which may affect the price and delivery. There are two ways to change a contract:

a) Bilateral
b) Unilateral

Bilateral is when both Parties (*Contractor* and *Employer*) agree that a change is necessary. The second one is the unilateral whereby the *Employer* may exercise a right to modify the contract without the *Contractor'*s consent. In case of latter one, the Eskom procurement and supply chain management procedure 32-1034 must be followed.

11.11.1. Contract changes and contract Scope

Employer's commercial policy requires a competitive process, any change upon the type of goods or services needed must be consistent with what was asked during the tender stage. A contract change needs to be within the scope of what was provided during tender stage. A significant difference will not be allowed because it had not been subjected to fair competition. Transparency is one of PPPFA requirements and as a government owned organisation had to comply with.

11.11.2. Administrative changes

These are the changes that are within the scope of contract and do not affect the originally signed contract. These changes are typically executed via a unilateral amendment. Examples include:

a) Changes in address
b) Correction of typographical errors not affecting the substance of the contract
c) Changes as permitted by the language of the contract
d) Changes in personnel assigned to the contract (exclusion of Key People, these are dealt with as per the contract).

11.11.3. Substantive changes

These are the changes that affect both Parties. They require bilateral amendments. These changes may require one of the Parties to be compensated for such changes as stated in the contract clause 60.1

11.11.4. General Principles of contract change management

Engineering change will be dealt with as per 3.3.1. If either party is in doubt about whether a change fall
within the definition of engineering change then it will be processed as a contract change.
Under this contract change management:

a) Either party may request a contract change. All changes need to be formally communicated prior to the implementation of that change.
b) Neither party makes a request that is not made in good faith or for good reasons
c) The *Project Manager* assesses and documents the potential impact of a proposed contract change before presenting it to Medupi Compensation Events Committee
d) The *Project Manager* has the right to request reasonable amendments to a contract change request.
e) The *Project Manager* has the right to reject a change and specify his reasons.
f) No proposed contract change will be implemented by the *Contractor* without prior approval of the *Project Manager*.
g) If the proposed change is of emergency in nature, approval of emergency instructions will be followed as per paragraph 2.10.7,
h) Any contract changes necessary to comply with a Change in Law will be implemented as set out in paragraph 2.10.3 & 2.10.4.
i) Until a change is approved, signed and issued to the *Contractor*, then

    a). Unless the *Project Manager* expressly agrees otherwise in writing, the *Contractor* continues to provide the *works* in accordance with the signed contract as if the proposed contract change does not apply; and

    b). Any discussions, negotiations or other communications which may take place between the *Project Manager* and *Contractor* in connection with any proposed contract change, including submission of any change communications, is without prejudice to each party's other rights under this Contract.

j) The *Project Manager* notifies in writing the *Contractor* stating the reasons why the *Contractor* has not reasonably demonstrated the need or justification for the contract change in connection with the specified event. If the *Contractor* disputes the notice, then the matter is resolved in a risk reduction meeting.
k) Where the *Contractor* does not approve a contract change in respect of a specified event, the *Contractor* notifies his decision within period of reply.

11.11.5. Costs

a) Each party bears its own costs in relation to the preparation and agreement of each change request and impact assessment.
b) All contract changes are calculated in accordance with the principles set out in Price Schedule. Any cost savings resulting from the contract change will be passed on to the *Project Manager* by way of reduction in the charges.2.10.6 Contract Change Request.
c) Either party may issue a contract change request to the other party at any time during the term of the contract. The change request is substantially in the form of Appendix 10, and must state a relevant clause and specify if it is categorised as an emergency change.
d) If the *Contractor* provides a contract change request, he also needs to provide an impact assessment in terms of cost, schedule, and quality.

11.11.6. Impact Assessment

a) Each impact assessment includes (without limitation):
   i. Details of the proposed contract change where the contract change is proposed by the *Contractor* including the reason for the contract change and
   ii. Details of the impact of the proposed contract change on the contract and the *Contractor's* ability to meet its other obligations under this contract, including without limitation changes to:
      - The Works Information
      - Accepted Programme
      - Other *Works* provided by Others to the *Employer* including any changes required by the proposed contract change to the *Project Manager*.
      - Interface
   iii. Details of the estimated cost of implementing the proposed contract change
   iv. A schedule for the implementation, together with any proposals for the testing of the contract change
   v. Where applicable details of how the proposed contract change will ensure compliance with any applicable Change in Law and
   vi. Such other information as the Project Manager may reasonably request in (or in response to) the change request.

b) The *Project Manager* reviews the Impact Assessment and responds within the period of reply or as agreed with the *Contractor*.

c) If the *Project Manager* requires further information regarding the proposed contract change so that it may properly evaluate the change request and impact assessment, then with the period of reply or as agreed with the *Contractor*, the *Project Manager* notifies the *Contractor* of this fact and details the further information that is required. The *Contractor* provides the relevant Impact assessment within the period of reply or as agreed with the *Project Manager* of such notification. The parties may repeat the process described in this paragraph until the *Project Manager* is satisfied that it has sufficient information to properly evaluate the change request and impact assessment.

11.11.7. *Project Manager's* right of acceptance of contract changes

Within period of reply of receiving the impact assessment from the *Contractor*, or further information, the *Project Manager* evaluates the change request and the impact assessment in good faith and

a) Submits all the details of the event to the Secretariat of Medupi Compensation Events Committee (CEC) which meets on weekly basis.
b) Presents the details of the event to Medupi CEC
c) Implements the recommendations of the CEC.
d) Notifies the *Contractor* of the rejection of the proposed change. If the Project Manager rejects a proposed change, then he may explain his reasons in writing to the *Contractor* within period of reply or as agreed with the *Contractor.*
e) Require further details on the change request and/or impact assessment in which the *Contractor* makes changes and respond within period of reply or as agreed with the *Project Manager* of such request.

f) If the proposed contract change is recommended by the Compensation Events Committee, the *Project Manager* notifies the *Contractor* in writing. The *Project Manager* signs off on all deviation to the contract (drawings, specifications and other relevant documents) before the implementation of such deviations may take place

11.11.8. *Contractor's* right of acceptance of proposed changes

The *Contractor* has a right to reject a proposed change if he believes any proposed contract change which is requested by the *Project Manager*:

a) Would materially and adversely affect the risks to the health and safety of any person
b) Would require the works to be performed in a way that infringes any Law.
c) Is technically impossible to implement provided that
    i. The *Contractor* can demonstrate to the *Project Manager* that the proposed contract change is impossible to implement
    ii. Neither the Accepted Programme nor the Works Information state that the *Contractor* has technical capacity and flexibility required to implement the proposed change.
d) Would materially and adversely affect the *Contractor's* ability to deliver the works.
e) Would not be possible to implement before contract completion date.
f) Would cause the *Contractor* to breach any of the Insurances
g) Would cause the *Contractor* to be in breach of any existing licence, consent or permit
h) Would require the consent of Others to enable the contract change to be implemented and the *Contractor* is unable to obtain the consent of the Others.
i) Would result in additional cost to the *Contractor* that is not proposed to be paid to the *Contractor* as part of change

11.11.9. Emergency Instruction contract ch*anges*

a) The emergency instruction contract change may cover technical, financial, safety and strategic aspects.
b) The only person who can instruct the *Contractor* to implement such changes is the *Project Manager*. Such instructions need to be subsequently followed by a written formal communication. All changes must be documented, and no payment will be made to undocumented change.
c) The *Project Manager* is given restricted authority to cover instructions to the *Contractor* that are of an emergency in nature, and which will result in a contract change. Such contract changes are presented to the Compensation Events Committee, by the *Project Manager*, for its retrospective recommendation and ratification by the *Employer*.

11.11.10. Authorisation of Contract Change

Any proposed contract changes are not authorised, and the *Contractor* does not implement any proposed contract change until the signed letter and other signed documents (e.g., drawings, specifications) are sent to the *Contractor*.

11.11.11. Communications

a) For any contract change communication to be valid, it must be sent to the *Contractor* as applicable.
b) All *Contract* change communications may be hand delivered or sent by first class post or facsimile. Contract change communications are deemed to have been received at the following times:

i. If hand delivered, then at the time of delivery or, if delivered after 16.00 hours on the next Working Day
ii. If posted first class within South Africa at 10h00 on the second Working Day after it put into the post.
iii. If sent by facsimile, then at the expiration of four (4) hours after the time of despatch, if despatched before 15h00 on the next Working Day, and in any other case at 10h00 on the next Working Day following the date of despatch.

c) In proving delivery of a contract change communication, it will be sufficient to prove that the delivery was made, or that the envelope containing the contract change communication was properly addressed and posted (by prepaid first class recorded delivery post) or that the facsimile was properly addressed and despatched, as the case may be.

11.12. Provision of bonds and guarantees

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

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

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

The *Contractor* submits the following for compensation event assessment:

a) Quotation indicating Current market rate if not included in the short schedule of cost components
b) Labour time sheets
c) Early warning to the Project Manager
d) Project Manager's Instruction
e) Percentage fee applied
f) CPA Calculation where short schedule of cost components rates were utilised
g) Signed Record of decisions (ROD) or design change request form for Engineering design changes
h) Revised program where key date and completion date is affected
i) Revised programs were instructed to accelerate by the Project Manager
j) Invoice from supplier and service providers

11.14. Training workshops and technology transfer

Refer to the detailed scope document number 348-9988014where training requirements will be tabled if applicable. The *Contractor* provides training for each unit on the Plant regarding Operating, Maintenance and Engineering aspects of the equipment they provided to the *Employer.*

The *Contractor* provides training material and a training course for operating, maintenance and engineering personnel where it is applicable and required. For more detailed requirements on the training required refer to Section 5.2.7 of this *Works* Information

11.15. Documentation and drawing management

11.15.1. Drawing requirements

- Drawings shall be provided for the required equipment. Typical drawings supplied with the Tender shall show only the equipment supplied. The drawings supplied by the *Employer* are for Tender purposes only and will form the basis for the design and also the formatting.
- The creation and control of all Engineering Drawings shall be in accordance with the latest revision of Engineering Drawing Standard 240-61227631.
- All required drawings shall be prepared in accordance with the requirements as specified in the Engineering Drawing Office and Engineering Drawing Standard 240-61227631.
- A drawing register which records the drawing's information shall be maintained by the *Contractor*.

- All Design change management shall be performed in accordance to the latest revision of the Medupi Engineering Change Management Procedure 200-5664 found. And the *Employer* shall ensure that *Contractor* is provided with latest revisions of this procedure.
- Reproductive drawings for Acceptance shall be supplied according to the Vendor Document Submittal Schedule (VDSS).
- The specific VDSS and delivery timeline requirements of design drawings will be agreed with the *Contractor* upon contract award.

11.15.2. General Documentation

- All documents shall be submitted to the Eskom Documentation Centre in a form of a transmittal, the submission address will be advice by the *Employer*.
- The *Contractor* shall submit Master Document List (MDL), with document titles, document revision, status, transmittal details and project phase. The *Contractor* shall maintain this MDL through the life cycle of the Contract.
- Documents and drawings shall indicate the *Employer*'s drawing number as allocated by the *Employer*. The *Contractor* may have his own internal document or drawing number on the document or drawing, but where reference is made among documents or drawings, the *Employer*'s number shall be used.

11.15.3. General Arrangement Drawings

- General Arrangement drawings shall be completely dimensioned, showing as a minimum, the following:
    - Arrangement of equipment offered.
    - Plan, front view, and other elevation views.
    - Required clearances for opening doors and for removing components.
    - Conduit or cable entrance locations for bottom entrance.
    - Cable racking layouts.
    - Incoming and Outgoing cable termination positions.
    - Earthing connections.
    - Mass of equipment. Individual mass of stationary units, if transported separately.
    - Details and position of the holding down bolts.
    - Floor layout/equipment layout
    - Floor slot arrangement
    - All structural arrangements drawing
    - Fire layout drawing

11.15.4. Schematic Drawings

- Schematic diagrams shall as a minimum show the following:
    - All protection and control devices and their contacts, each of which shall be labelled with its correct ANSI device function number, or reference.
    - Device terminal numbers, terminal block numbers and terminal numbers.
    - All internal interconnections, bus wiring, inter panel wiring and connections to external equipment.
    - All control and protection switches.
    - Power supply connection.

11.15.5. Wiring Diagrams

- Detailed wiring diagrams shall be drawn to show as a minimum the following:
    - Approximate physical locations of all items in each control panel on a panel arrangement drawing.
    - All interconnecting wiring between control panels.

- Identification of all terminals, terminal blocks, and wires by numbers.
- Clear identification, by some distinguishing method, of all wiring which will be installed by the site installation *Contractor*. This shall include, but not be limited to, trip circuits from remote devices and auxiliary contacts to remote devices.
- This shall also include spare circuits which shall be wired to terminal blocks for future use.

11.16. Quality Management System

All work should be done in accordance with the quality management system of Medupi Power Station as set out in the quality manual, in addition to the ISO 9001:2015 quality management system. High quality standards are also assured by conforming to the following:

- a) The use of sound design and engineering principles,
- b) The design process uses a good performance and functional specification,
- c) It is ensured that the installation conforms to the User Requirement Specification and Works Information.
- d) Design Review Procedure is followed.
- e) Engineering Change Procedure
- f) Electrical Asset Creation Process
- g) QA/QC on project (manufacturing, installation, commissioning)

.

11.16.1 Inspection

- Inspection activities during manufacturing shall be managed according to the Medupi Manufacturing Inspection and Testing Procedure 348-.860843
- Inspection activities during construction shall be managed according to the Medupi Site Quality Assurance Control and Verification Procedure .Document number: 348-106610
- The *Contractor* shall be required to maintain inspection databases where all records of inspection are maintained as required in the Medupi Quality Specification Document Number 348-389557

11.16.2. Record Books or Data Books

- The *Contractor* shall develop and implement a system for collation of quality verification records, including change management records, Manufacturing, Construction and Commissioning Record Books (Data Books) as specified in the Medupi Quality Specification Document number 348-389557.
- Data Books shall be maintained by the *Contractor* to substantiate conformance to product specifications and requirements. All records shall be safely stored (easily retrievable) following the final completion of the works at takeover. These records shall include as a minimum:

    - Quality Management documentation as specified in the Medupi Quality Specification 348-389557
    - Safety clearances (to be granted prior commissioning)
    - Test certificates
    - Construction and as-built drawings and approvals
    - Statutory certification
    - Commissioning Documentation.

- The data books shall be reviewed by the *Employer* for 30%, 70% and 100% completeness. These reviews shall be agreed and included in the ITP.
- All manufacturing and construction data books shall be completed and approved when the *Contractor* apply for final inspection at construction completion.
- At takeover application, all manufacturing, construction and commissioning data books shall be completed and approved and handed over to the *Employer*.
- Refer to section 13.3.1 for more details

12. Engineering and the *Contractor*'s design

12.1. *Employer*'s design

Not applicable

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

The *Contractor* to provide Works as stated in Clause 21 of the Contract.

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

The *Contractor* is expected to submit an organogram with relevant experience and qualifications of the execution team. In addition to the above, project cost and schedule estimates need to be submitted to the *Project Manager* for his acceptance. The *Contracto*r shall submit procedures, method statement, Inspections and Test Plan prior commencement of works where design work is required.

12.3.1. Engineering Changes

Engineering change is any change to an established baseline related to the plant system, such as its configuration documentation, design requirements, technical operating documentation, operating margins and set points, replacement of alternative components with equivalents.
Any change on the Contract must be recorded and correct procedure must be used to implement the change on the project.

Engineering Change Procedure

The *Contractor* takes note of the *Employer's* Engineering Change Procedure (240-53114026). The Engineering change procedure applies to the *Employer's* personnel or *Contractors* performing engineering or engineering related work where the quality of the engineering work performed is the direct responsibility of Eskom.

Design Change Procedure

The *Contractor* is the Design Authority (this is only applicable to the oil skimmer) as defined in the Design Review Procedure (240-53113685). The *Contractor* is responsible for following this design procedure and conducts all the design reviews as specified in this procedure. The *Contractor* is responsible for conducting the following design reviews where applicable:

a) Design Freeze Review
b) Integrated Design Review
c) Construction Completion Review
d) Acceptance Testing Review

Procedure for Submission of Change Documents

The *Contractor* must complete the engineering/design change [report/request] within [5 days] or such other time period that the *Project Manager* and *Contractor* agree is reasonable in the circumstances, of the *Project Manager*'s instruction changing the Works Information.
In completing the engineering change report, the *Contractor*:

a) Takes into account the impact of the *Project Manager's* instruction on the *Contractor's* works, in accordance with the Works Information and the Contract.

b) Provides the *Project Manager* with the impact on the *Contractor's* detailed design, programme, costs, Completion Date, Key Dates, execution and methodologies.

This information from the *Contractor* will be sent to the Others on the Project in order to integrate the system and ensure that the *Employer*'s objectives in relation to the Project are achieved. Likewise, the

Contractor may during the *Contract* receive such information, via the *Project Manager*, from Others. The *Contractor* assesses this information to:

a) Assess the impact of this on the *Contractor's* works, in accordance with the Works Information and the Contract.

b) Provide the *Project Manager* with the impact on the *Contractor's* detailed design, programme, costs, Completion Date, Key Dates, execution and methodologies.

Within [5 calendar days] or such *Other* time period that the *Project Manager* and *Contractor* agree is reasonable in the circumstances of the *Contractor* submitting (or receiving this information), the *Contractor* attends a meeting with the *Employer* and Others on the Project to align the *Employer*, *Contractor* and Others' works and ensure compatibility and integration of the Project.
The *Contractor* submits its revised information within [5 calendar days], or such other time period that the *Project Manager* and *Contractor* agree is reasonable in the circumstances, taking into account all information received from the *Employer* and Others.

Where the *Contractor* is unable to comply with the Contract or Works Information, he promptly notifies the *Project Manager* of:

a) Details of the non-compliance.

b) Impact of non-compliance on his and *Others.*

c) Remedial steps to be taken.

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

12.4.2. General

The *Contractor* provides all plant, equipment, materials and services and executes all work necessary to fulfil all requirements specified in this Works Information. The *Works* complies with Professional Engineering practices and standards for fossil fuel power plants and is designed for the environmental conditions prevailing at Medupi Power Station.
The *Contractor* liaises with the *Employer* and Other *Contractors* to ensure the successful completion of both contract requirements. This is a site activity and is coordinated by the *Project Manager*.

The contract includes the provision of the following:

a) KKS labels (*Employer* provides the KKS codes)

b) Contract management including site management and Subcontractors

c) Contract programming

d) Provision of draftsman (drawing) services

e) Cost control and progress reporting

f) Quantity surveying documentation

g) Quality assurance

h) Quality control

i) Acceptance testing and handing over to the *Employer*

j) Documentation

k) Maintenance support

The *Contractor* is required to guarantee the complete prefabricated substation for Secondary clarifiers.

12.4.2. Other requirements

The Contractor is to design (oil skimmer), produce required drawings and select plant & material which satisfies the following:

- The overall plant performance and efficiency specification.
- The specified reliability; and keep maintenance costs to a minimum.
- Local and statutory authorities. Each system and sub-system components are to be evaluated for compliance with PER of OHSACT of 1993 and be categorised (where applicable) according to SANS 347.
- Space constraints and construction requirements.
- The specified and applicable standards confirmed in the specification including all the legal requirements in respect of safety and the prevention of environmental pollution.
- Facilitation of efficient manufacture, inspection, transportation, installation, maintenance, cleaning and repairs.
- Safe and satisfactory operation for a life expectancy of the chosen technology.
- Prevention of undue stresses being produced by expansion and contraction due to temperature change and other local natural and manmade conditions.
- All material from which the equipment is manufactured from is compatible with the intended duty and service conditions. All equipment is suitable treated and protected from corrosion; and
- All electrical equipment, forming part of the specified equipment shall be sealed against penetration by hose cleaning operations and be also accessible for repair and maintenance.
- The *Contractor* shall manage and execute the engineering, quality control, inspections, plant and material selection, preparation of installation drawings, testing, balancing, commissioning and preparation of operating and maintenance manuals. The *Contractor's* submissions include, but is limited to the following.
    - Detailed design
    - Plant and material selection.
    - Installation drawings
    - Codification and labelling of the plant
    - Testing, balancing and commissioning Documentation
    - Operating Instruction and Maintenance Manuals
    - Inspection Record Cards/Checklists
    - Quality assurance.
    - *Employer* interfacing information such as.
        - Electrical Load lists
        - Virtual Signal List & Alarm List
        - Mimics
    - Any applicable certification required by South African regulations.
- The *Contractor* shall also comply with the requirements of the scope document number 348-9950943 and any other requirements in this document.

Note: The scope of works, as detailed in these specifications' documents; comprise of the Engineering, Provision of all labour including materials and *Contractor's* equipment, Manufacturing, Supply, Delivery, Off-loading, Hoisting, Erection, Testing, Balancing and Commissioning to service, Guarantee and Maintenance after final completion of the prefabricated substation for Secondary clarifiers.

12.4.3. Power Supply interruptions

The *Contractor* ensures that the supplied equipment is capable of safely shutting down the plant without damage in the event of partial or total loss of electrical power and must be designed to accept a sudden restoration of electric power, without damage and without operator intervention.

12.4.4. Certificate of Compliance

The *Contractor* ensures that all permanent or temporary installations are subject to statutory requirements as explained in OHS Act and SANS 10142-1 for the wiring of premises which include the issuing of a Certificate

of Compliance (COC) before an installation is accepted by the *Project Manager*. A COC must be provided where it is required as well as the installation of all required cables and related equipment).

12.5. Use of *Contractor*'s design

Clause 22.1 is applicable on *Contractor's* design and deliverables as stated in the Works Information and scope document number 348-9950943
The *Contractor* submits the *Contractor's* Design Documents to the *Project Manager* for acceptance at the times and in the manner and format stated in the Works Information
Acceptance of *Contractor's* designs, to be applied as stated in Clause 21 of the Contract.

The *Contractor* grants to the *Employer*, with effect from the starting date, in the case of documents or other matters not yet in existence, with effect from the creation thereof (and notwithstanding the Completion or termination of this contract), an irrevocable royalty-free non-exclusive licence to use all of the documents provided to Provide the Works (including, but not limited to calculations, computer programmes and other software, drawings, manuals, models and other documents of a technical nature), for any purpose whatsoever, including for the purpose of operating, repairing, maintaining, dismantling, re-assembling and making adjustments to all parts of the Works. The *Contractor* ensures that each Subcontractor executes all and any further documents and takes all and any other actions as may be required in order to give effect to this licence.

12.6. Design of Equipment

The *Contractor* to provide Works as stated in Clause 23.1 of the Contract

12.7. Equipment required to be included in the *works*

a) The *Contractor* to provide equipment and the material required for execution of the works.
b) The *Employer* to provide specification documents such as drawings, data sheet etc. to assist the *Contractor* in the execution of the works. These documents remain the property of Medupi Power Station.
c) The *Contractor* to supply all required tools, equipment to their employees in order to perform their tasks.

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

The *Contractor* shall provide as-built drawing for completed *works (oil skimmer).* The *Contractor* provides General Arrangement (GA) diagrams to be accepted by the *Employer*. Piping system to be designed to meet the requirements of the scope of work 348-9988014 and the Eskom standards listed as Appendix B on the scope of work document number 348-9988014

13. Procurement

13.1 People

13.1.1. Minimum requirements of people employed on the Site

People employed to Medupi Power Station should undergo Safety Induction and other courses before they can access the project site (Medupi Power Station)
The *Contractor* does not alter previous decisions communicated to the *Employer* or Others without the *Employer*'s acceptance or agreement.
Any new foremen/*Supervisor*s appointed by the *Contractor* after Contract Date or during provision of the Works are fully conversant with respect to details of the methodology and communication process existing, prior to accessing the Site. The *Contractor* provides the CVs and all other relevant information of the replacement employees to the *Project Manager* as soon as possible after he is aware that a skilled employee will no longer be working on the Contract.
Permits for foreigners – The *Contractor* informs the *Employer* of any need to employ foreigners and on acceptance by the *Employer*, the *Contractor* arranges permits for such employees. The *Contractor* informs the *Employer* when the services of Specialists are required. The *Contractor* ensures interface with Others is managed before commitment is made to bring international specialist to Site.
The *Contractor* ensures that his workforce is trained and competent to perform their respective duties. The *Contractor* provides CVs and proof of qualifications of his key persons (listed in paragraph 2.7 of this Works

Information) as a returnable schedule. Labour from designated areas – Where local labour resources can be utilised, the *Contractor* ensures that in their recruitment processes, preference is given to such resources. The Medupi information centre can be utilised for recruitment of local labour.
Industrial Relations: The *Contractor* will remunerate employees in accordance with the acceptable market remuneration / minimum wage. The *Contractor* manages all industrial relations matters with his employees

13.1.2. BBBEE and preferencing scheme

The company shall maintain or improve upon their current B-BBEE Contribution level for the duration of the contract. The supplier will be required to submit a new B-BBEE certificate within 3 months, should ownership of the company change during the life of the contract.

The *Contractor* is expected to submit a valid B-BBEE Verification Certificate from a SANAS accredited Verification Agency each year. Failure to submit such a Certificate may be regarded as the breach of the contract by the *Employer.*

13.1.3. Accelerated Shared Growth Initiative – South Africa (ASGI-SA) /SDL&I

The *Contractor* complies with and fulfils the *Contractor's* obligations in respect of the Accelerated and Shared Growth Initiative - South Africa in accordance with and as provided for in the *Contractor's* SDL&I Compliance Schedule.

Local Content and Production

This tender concerns a service that has material and commodities that are part of the designated sector as per regulation 13 of the Preferential Procurement Regulations, 2017 and Local Production and Content. Therefore, only locally produced goods or services with a stipulated minimum threshold for Local Production and Content are accepted.

- Steel -100%
- Valves and Actuators -100%
- Pumps - 70%
- Cement - 100%
- PPE -100%

13.1.4. Skills Development

Supplier Development Localisation and Industries (SDL &I) Undertakings

Eskom intends to improve Skills Development by ensuring that technical support is directed towards enhancing supply capacity and capability within the industry or sector of operation. By doing this the capacity and competitiveness of the local supply base will be increased and the goals of shared growth, employment creation, poverty reduction and skills development will be achieved.

The tenderer will provide work integrated learning (WIL) to two (02) Lephalale TVET College students or those within vicinity of the station for the duration of the contract

Retention

The *Contractor* shall keep accurate records and provide the *Project Manager* with reports on the *Contractor*'s actual delivery against the above stated SDL&I criteria. [Elaborate on access to and format of records and frequency of submission etc.]

The *Contractor*'s failure to comply with his SDL&I obligations constitute substantial failure on the part of the *Contractor* to comply with his obligations under this contract.

Reporting

.

a. The tenderers shall on a monthly /quarterly basis submit a report to Eskom in accordance with Data Collection Template on their compliance with the SDL&I obligations described above.
b. Eskom shall review the quarterly reports submitted by the tenderers within 60 (sixty) days of receipt of the reports and notify the tenderers in writing if their SDL&I obligations have not been met.
c. Upon notification by Eskom that the tenderers have not met their SDL&I obligations, the tenderers shall be required to implement corrective measures to meet those SD&L obligations before the commencement of the following quarter, failing which retention clauses shall be invoked.
d. Every contract shall be accompanied by the SDL&I implementation schedule which must be completed by the tenderers and returned to SDL&I representative for acceptance before contract award. This will be used as a reference document for monitoring, measuring and reporting on the tenderer's progress in delivering on their stated SDL&I commitments.

Job Creation

Job creation proposals by tenderers will not form part of the tender evaluation criteria. It is however, part of Eskom's contribution towards the Government's job-creation initiative as contained in the New Growth Path (NGP) and the New Development Plan (NDP).

Eskom has made a number of empowerment commitments to the local communities surrounding the areas where it conducts its construction activities. Amongst these, are commitments to be considered for local empowerment possibilities in its procurement strategy. In doing this, *Employer* is seeking to ensure that the local communities benefit from its procurement spends through wealth generation and capacity development; and that this benefit is spread as widely as possible throughout the community.

All tenderers are therefore encouraged to propose to the *Employer* the number of semi-skilled and unskilled labourers that will be sourced from local to site in support of this empowerment commitment to the local communities.

13.2. Subcontracting

13.2.1. Preferred subcontractors

Undertaking to subcontract some of the following works to EME/QSE's with at least 51% BWO, and EME or QSE which is at least 51% owned by black people living in rural or underdeveloped areas or townships.

13.2.2. Subcontract documentation, and assessment of subcontract tenders

1. Subcontracting agreement (signed by both parties) with subcontractor company registration documents (CK, CSD, B-BBEE certificate or sworn affidavit).
2. Copies of sub-contracting contracts (agreements) or copies of letters from the tenderer to the sub-contractors, stating the intent to sub-contract. Both documents should be signed by the Tenderer and the Sub-contractor(s) earmarked.

13.2.3. Limitations on subcontracting

N/A

13.2.4. Attendance on subcontractors

The Subcontractor attends all meetings which the *Contractor* attends and all meetings as required by the *Employer* which requirement is not a compensation event.

13.3. Plant and Materials

13.3.1. Quality

All work should be done in accordance with the quality management system of Medupi Power Station as set out in the quality manual, in addition to the ISO 9001:2015 quality management system. High quality standards are also assured by conforming to the following:

a) The use of sound design and engineering principles,
b) The design process uses a good performance and functional specification,
c) It is ensured that the installation conforms to the User Requirement Specification and Works Information.
d) Design Review Procedure is followed
e) Engineering Change Procedure
f) Electrical Asset Creation Process
g) QA/QC on project (manufacturing, installation, commissioning)

Records Books or Data Books

The Contractor to develop, document via procedure for Project Manager's approval and thereafter implement a system for collation or quality verification records, including change management records into Manufacturing, Construction and Commissioning Record Books.

- Contractor to review data book progressively during 30%, 70% and 100% of the completed work and provide valid comments in the form of comment sheet per each stage of review to the Employer prior Employer's review.
- No data book shall be reviewed by the Employer without Contractor s reviewed evidence and comment sheet Indicating first review second review with addressed comments and final review.
- The Contractor to develop Data book Register and maintain for the duration of the project

Said Procedure shall define format, content and structure of Record books and process of compilation and handover and shall, as a minimum, conform to the following:
a. Record Books shall be provided by the Contractor for.

- Manufacturing - Prepared for each individual "Purchase Order refer to 240-109836134 clause 3, Scope of work and employer requirements". Only manufacturing records per discipline e.g., Civil, Structural steel, Mechanical, Electrical, C&I works etc.
- Construction/Erection - Prepared for Each Discipline as in bullet 1, each geographical area for civil works and for systems/sub- systems for mechanical and electrical systems including C&I separately: Commissioning - prepared for each commissioned system.

Note: Record books shall be not combined on Data Dossier. Manufacturing, Construction/Erection and Commissioning shall be separated.

- The Contractor need not include documents and drawings etc. that have been approved by the Project Manager which are included in SPO and shall instead provide and include an index of such documents in the Record Books on the basis that the originals are in SPO and traceable via the "Index".
- Record Book shall be written in English or provided with an English translation
- The index of all Record Books shall be submitted to the Project Manager for approval.
- As the work progresses, Contractor shall compile Record Books progressively with the original material certificates, installation, erection, testing, inspection and change management documents and shall verify continued and accurate updating via weekly review and spot checking against inspection performed that week.
- Contractor shall report the status of Record Book compilation progress at Weekly Progress / Quality Meetings together with the Data book Register.
- Record Books shall be endorsed by stamp, date and signature of the Contractor and the Employer signifying completion and accuracy when complete.
- Each Record Book shall have cover sheet (With a Sleeve pocket to insert a cover sheet) of A4 size paper and a spine label on which is printed the following:
- Title of Document, Contractor's company logo, Unique number/SPO, Name of Project

Contractors' Job Code, Contractor Document number, Eskom Document Number, System KKS number, System Description, Document type "Manufacturing or Construction or commissioning", Contractor's number, Name of Contractor, Volume Numbering (1 of …. or 1/10) xv. Address of Contractor, Column for signature by Contractor Representative and Employer's representative

• All Manufacturing Record books shall be Completed, Approved, and handed over to the Employer not later than (7) Seven days after Delivery Inspection on site Prior Installation/Construction Phase.
• All Construction Record books shall be Completed, Approved Safety Cleared and handed over to the Employer not later than (7) Seven days after Final inspection (AFI) Prior Commissioning Phase
• For other civil / Earthwork, All Construction Record books shall be Complete, Approved and handed over to the Employer prior taking over section of works.
• All Commissioning Record books, Operating, maintenance and training manuals shall be Completed, Approved and handed over to Eskom not later than (7) Seven days after the last test prior taking over of completed works (TOC)
• Construction Record Book shall be compiled in A4 size with 4-post binders in loose-leaf form with numbered pages such as, Page 1 of 10 or 1/10 whichever sequential counting method that clearly identifies page numbering.
• Summary table of each volume's contents shall appear in all volumes. Volumes are to be numbered e.g., 1 of 3, 2 of 3, 3 of 3 etc. both on spine and front cover.
• The binders are to be robust and not subject to distortion by impact during shipping. The binders shall not be over filled and contain only a suitable number of documents to enable convenient handling.
• Contents shall be sectionalized and separated by properly labelled dividers
• Contents shall be placed in the relevant sections and sections shall be separated by properly labelled section dividers/separator sheets easy referencing with going through the content.
• All section dividers/separator sheets shall be made of card and shall bear the Section Identifier - 1, 2...
b) The contents of each section, e.g., Section 1, Section 2, etc., of the Record Book shall be placed directly behind the relevant section dividers/separator sheets and each document shall be clearly marked with the following:
• Relevant section letter, Page number - every document shall receive a page number, In each section the page numbers shall run consecutively.
i) Record Books shall contain as a minimum:
• All material Reports and Certificates, All Inspection Reports, All Test Reports, All Release Notes, All Change Management Reports, All drawings or an index of drawings identifying drawing No. and revision status, All Defect Reports, All Procedures or an Index of Procedures, All Inspection and Test Plans if used as a Quality Verification Record or an Index of Inspection and Test Plans if used as an assurance and control document, All Drawings or an Index of Drawings.

Statutory Records

•
The Contractor shall submit a statutory compliance file containing minimum documents as follows:
a) Electrical Equipment
• Statutory register and COCs

b) Civil Structure
Statutory register, Professional Engineering Certificates, Glazing Certificates, Sewer Certificates (Subjected to exemption)

c) Pressurised Equipment
Statutory register, Certificate of Conformance for PER equipment, Inspection and Hydraulic Pressure Test Certificate for PER equipment and Pre commissioning Certificates.

d. Lifting Equipment
• Statutory register – lifting equipment, Statutory register – passenger conveyance lifts, Load test certificates for all lifting equipment's and Transformer Impact Recording, Functional safety clearances for all equipment, Operating procedures and Maintenance Procedures.
e. Permanent KKS certificates (no temporary labels to be allowed at take-over)
f. Software and applications to interrogate the equipment, i.e. power electronics, All the configuration files and settings implemented, FAT, SAT and SIT Reports, CEMS, Dust and gaseous emission correlation tests to be completed.
• Boiler Registration certificate

Handing over of Record books/Data Books by Contractor

QA Completeness review

After addressing all comments given to the Contractor during QC 100% review of data books by the Employer,
The Contractor shall request QA via Project Manager to perform completeness review of the record books
The Employer Quality Assurance team will also make reference to the data book checklist (200-616427) for compliance of format and lay out of the Record Book / Data Book.

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

To be dealt with "as and when" the need arises in terms of the conditions of the contract.

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

The *Contractor* supplies all Other Plant and Material. The *Contractor* provides a list of this in the *Contractor's* Works Information.
The transport section (functional unit) is suitable for handling and removal by providing mechanism for crane hooks. The transport section is suitable for handling and removal by providing mechanism to avoid damage to the functional unit.
Transportation of the equipment will be done as per the requirement of 240-56178825. During transportation the electrical components are packaged in such a way that damage is prevented. Components of the functional unit that are transported separately are marked accordingly and are easily identifiable.
The *Contractor* supplies the labelling for the Plant that forms part of the Works. The *Contractor* provides labels for the Quenching pipeline and equipment's according to the labelling specification.
The labels are affixed in such a way that they are easily legible and not obstructed by the wiring or by other components.
Clamping methods applied to the labels ensures that removal of the labels requires force. The *Project Manager* will approve the proposed method of clamping prior to use.
The *Contractor* supplies the *Project Manager*, for verification and acceptance purposes, with a label list showing the text only. The *Project Manager* will approve the positioning and designation of labels.

The KKS codes are used accordingly on documentation (e.g., drawings, manuals, equipment lists, cable schedules etc) as a unique identification means. References to plant are accompanied by the relevant KKS code for that item of plant.

Abbreviations to descriptions on the labels are generally not acceptable. Where abbreviations are unavoidable, due to the limited number of characters that can be engraved/etched on labels, the abbreviations are submitted to the *Project Manager* for acceptance. The *Contractor* makes use of the *Employer's* Standard Plant Related Abbreviations for Inter-System Use.
Where equipment requires prolonged storage due to the outage movement, the *Contractor* will store the equipment were requirement.
Warranty period for the plant materials will start during take-over.

13.3.4. Spares and consumables

Spares and consumables are to be as per scope of work from the *Employer* where applicable and the following noted. The *Contractor* supplies the *Employer* with a detailed complete list of all spares required in order to maintain the equipment for the first two years of operation. This list of spares is supplied three months before the delivery of the first Equipment.
At the same time, a second list containing recommended spares for the subsequent two years of operation is also supplied.
Included in the list is the description of the individual spares, type, part ordering number and supplier information.
Where so requested by the *Employer*, additional equipment is supplied at the same price as quoted in the [Activity schedule].
The *Employer* prefers that support from the Original Equipment Manufacturer (OEM) is available locally in South Africa. The *Contractor* is required to provide technical and product support for the design life.

13.4. Tests and inspections before delivery

Inspection activities during manufacturing shall be managed according and in line with the Manufacturing Inspection and Testing work 348-860842.
All inspections and testing to be performed in accordance with the Quality Control Plan (QCP) and Method statement developed by the *Contractor* in consultation with the *Employer*

Where a product nonconformity is identified by the Contractor to a system, product or process, a nonconformity shall be documented and reported to the employer as detailed on Control of nonconformity product (348-890104)

13.4.1. Test certificates

One copy of all test certificates must be submitted to the *Employer* for approval as a returnable schedule to substantiate the details stated in the *Contractor's* Works Information.
Two copies of all the required test certificates must be supplied to the *Employer* prior to take over of the Works.

13.5. Marking Plant and Materials outside the Working Areas

All Plant and Material paid for by the *Employer* must be clearly labelled as being the *Employer*'s property

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

The *Contractor* provides lifting facilities for installation of Quenching pipeline. The *Contractor* also considers areas that are strained. The supply of these facilities may not affect the delivery of the *Works*

13.7. Cataloguing requirements by the *Contractor*

Not applicable

14. Construction

14.1. Temporary works, Site services & construction constraints

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

The *Contractor* makes his own assessment of, and allowance in his Prices for any access problems as a result of the *Employer*'s security requirements, permits and/or Site regulations. No change to the Prices, Key Dates and/or Completion Date is allowed on account of difficulties of access to the works, or for the requirement of working adjacent to or in the same area as *others*.

Access to the Site is controlled and governed by the terms and conditions laid down by Medupi Power Station. The Site is shown to the *Contractor* during the site meeting or clarification meeting. Parameter of the proposed Site will be included in the Site Information.

The *Contractor* liaises with the Medupi Power Station security staff in order to obtain temporary permits for his staff and vehicles which will be working within the station.

The *Contractor* submits his application for vehicle permits to the *Project Manager*. The personnel and vehicles entering and leaving the site are subjected to routine searches and alcohol tests. The *Contractor* ensures that all its employees and sub-*Contractor*s carry their access cards at all times.

The *Contractor* obtains a "Gate Permit" from the *Employer* before materials and equipment can be removed from site. A "Gate permit" gives an itemised list of materials and equipment to be removed from site.

The *Employer* refuses access to Site for reasons such as security concerns, disorderly conduct, substance abuse, misconduct, criminal records. The *Contractor* is not entitled to a change in Prices, Key Dates and/or Completion Date as a result of this.

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

The *Contractor is* required to comply with all the Medupi Power Stations site rules and regulations. The *Contractor* complies with the Site a copy of which is available at the *Project Manager*'s offices.

Any subject within the authority of the *Project Manager* may be addressed by a Site regulation which does not constitute a compensation event.

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

The *Contractor* is issued with current Site regulations at the project kick-off meeting. The file remains the property of the *Project Manager* and the *Contractor* is responsible for its maintenance and updating to include new or revised regulations as issued by the *Project Manager* during the course of the works

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

People restrictions and constrains, the hours of work will be as per the project calendar, conduct and records as per the Terms and Condition of the contract. The *Contractor* would need to comply with Medupi Power Stations site rules and regulations. Restrictions and hours of work will apply at the Medupi Power Station. The *Contractor* keeps records of his employees on Site, including those of his *Subcontractor*s which the *Project Manager* or *Supervisor* has access to at any time. These records may be required by the *Employer* at any given time for the following but not limited to:

a) Emergency (evacuation/drill) and investigations
b) Labour unrest
c) Absenteeism
d) Sick leave
e) Assessments (labour hours timesheets)

14.1.4. Health and safety facilities on Site

The *Contractor* provides a First Aid service and SHE representative to his employees and Sub-*Contractor*s. In the case where these prove to be inadequate, like in the event of a serious injury, the *Employer*'s Medical Centre and facilities will be available. Outside the *Employer*'s office hours, the *Employer*'s First Aid Services are only available for serious injuries and life-threatening situations. The *Employer* recovers the costs incurred, in the use of the above *Employer*'s facilities, from the *Contractor*.

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

Refer to EMP and ROD referenced above and as per the latest revision of the Medupi Power Station Environmental Policy which is available from the *Project Manager*.

14.1.6. Title to materials from demolition and excavation

The *Contractor* has no title to materials from excavation, demolition, stripped and material removed from site or the plant (e. g. copper, steel etc). The *Contractor* notifies the *Project Manager* when such materials are found, and the *Project Manager* instructs the *Contractor* how to deal with such materials. In circumstances where certain equipment is required for spares, the *Project Manager* gives special instruction detailing a specific storage area and identifying which parts to be stripped and where different types of stripped material will be taken to.

14.1.7. Cooperating with and obtaining acceptance of Others

There will at times be Others working in the same area as the *Contractor*, it is the responsibility of the *Contractor* to co-ordinate his work with the *Employer* and *Other*s to maintain harmonious working conditions on Site.

During the progress of the works the *Contractor* provides access to Others who also execute work in the same area, as and when required and agreed with by the *Employer*.

The *Contractor* makes his own assessment of the challenges which may be encountered for providing access to and interfacing with Others (this includes access difficulties experienced during construction or commissioning phase). Where there are difficulties or unresolved interfacing or access issues the *Contractor* must ensure that they meet with Others to find solutions or resolve issues without impacting his/her execution of the works. The *Contractor* is not entitled to a change in Prices, Key Dates and/or Completion Date as a result of the interface obligations or the *Contractor's* assessment.

If the *Contractor* and Others are unable to resolve the problem, they will meet with the *Employer* in order to find a solution or resolve the issue. The *Employer* will issue an instruction to the *Contractor* and *Other*s on how to proceed. In areas where affected property or area is to be shared for work by different *Contractors,* affected *Contractor* s have to cooperate and manage their agreements and notify the *Project Manager* of such agreements.

14.1.8. Publicity and progress photographs

No photographs are allowed to be taken or distributed on site unless permitted to do so by the *Project Manager* and the following process adhered at all times. The taking of photographs at the Power Station including the Project *Works* is restricted and subject to the approval by the *Project Manager*.

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

All publications on site must not contradict Eskom regulations and publication legislation in general.

14.1.9. *Contractor*'s Equipment

Contractor is responsible to all equipment brought onto site. Refer to Clause 4.1 in SANS 1200 A

a) The *Contractor's* Equipment does not impair the operation or access to the plant.
b) The *Contractor* provides all or any temporary and expendable materials required for the storage of material.
c) The *Contractor* provides a list of all Equipment on Site whether it is owned or hired, for record purposes.
d) The *Contractor* ensures that all his equipment on site including scaffolding has unique identification

Note : For any removal of equipment from site, refer to section 14.1.1

14.1.10. Equipment provided by the *Employer*

The *Employer* will not provide any equipment to the *Contractor*. All necessary equipment needs to be provided by the *Contractor.*

Should a mobile crane be required for the execution of the Works, it will be supplied by the *Contractor*, The availability of the crane must be made at least seven days (7) prior to the required date. The *Contractor* will be responsible for operating the crane. The *Contractor* is required to provide its own certified riggers. The *Contractor* is not entitled to a change in Prices, Key Dates and/or Completion Date due to unavailability of mobile cranes.

The *Contractor* must ensure that the test certificates (e.g. load testing of cranes) for the equipment are available prior to use.

14.1.11. Site services and facilities

The *Employer* will provide power, water, waste disposal, sewer connection points If applicable. The *Contractor* will be responsible for the material and connection to the connection points or to the mains. The *Employer* will fill the water tanks with water and remove sewage from septic tanks.

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

A site will be made available to the *Contractor* for his yard within the Medupi Power Station security area. The proposed Site will be shown to the *Contractor* during site meeting or clarification meeting. The yard is a raw site and will be used by the *Contractor* for the establishment of offices, workshop and stores. The *Contractor's* yard is subject to periodic inspection and audited by the *Project Manager*/delegated person.

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

The *Contractor* conducts underground surveys before any excavation is performed as per Eskom, SHE specification and Occupational Health and Safety regulations.

Supply of Electricity

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

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

No connection is made to the permanent installation at the Medupi Power Station without the prior acceptance of the *Project Manager*.

The power supply is managed in accordance with the latest revision of the Eskom safety regulations i.e.:

a) 32-846, Operating Regulations for High-Voltage Systems

b) 240-150642762 Generation Plant Safety Regulations

c) CoC for the site installation is required prior to power being switched on

All electrical works to be carried out by a Master Installation Electrician (MIE). The *Contractor* also provides a Certificate of Compliance (CoC) to prove compliant to electrical work. The certificate to be included into data book for review.

Lighting

The *Contractor* at his own expense provides temporary local lighting in accordance with the requirements of the OHS Act as amended

Water

Water will be made available on request free of charge from water points on site. The *Contractor* supplies at his own cost all the necessary connections, fittings, piping work, temporary plumbing and pumps necessary to lead water from the *Employer*'s points of supply to the various points where it is required. The *Contractor*

is responsible for maintaining this equipment and for removing it at Completion of the whole of the Works. Any water leaks must be attended to immediately by the *Contractor*.

The *Project Manager* does not guarantee continuity of supply and the *Contractor* makes his own provision for standby supplies to maintain continuity of work. The *Contractor* is not entitled to a change in Prices, Key Dates and/or Completion Date for any discontinuation or interruption of water supply.

Roads

Main access roads are surfaced and complete and may be used by the *Contractor* with the necessary care. The *Employer* maintains the site roads, to a fair condition. Any costs incurred by the *Employer* from damage caused to underground services and structures. As a result of the *Contractor* not using the prescribed routes is recovered from the *Contractor*.

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

Setting-Out Beacons

The *Employer* provides permanent beacons marking the main setting out grid lines for the *works*, and permanent level benchmarks.

The *Contractor* takes reasonable steps to preserve beacons and benchmarks provided by the *Employer* who is not to be held responsible if any existing beacons are removed as long as other beacons exist.

14.1.12. Facilities provided by the *Contractor*

The *Contractor* is to provide all office and ablution facilities (structures or chemical toilets), including covered storage working areas, eating area, if applicable. The *Contractor* is to provide in the way of accommodation, Condensate Quenching pipeline services, storage, vehicles and office equipment. The *Contractor* to provide water tanks and septic tanks if there is no main water or sewer connection in the allocated *Contractor* s yard. All associated work and material will be for the contractor's account.

The *Contractor* includes in his establishment rates all further treatment of the yard areas that he considers necessary for his entire operation throughout his period of occupation and under all weather conditions. The *Contractor* also includes for all security fencing, security and access arrangements. The yard is kept clean and tidy at all times, this includes all workshops and storage areas under the control of the *Contractor*. Maintenance of the yard is the *Contractor*s responsibility. If the yard is not adequately maintained, the *Employer* instructs the *Contractor* to maintain the yard to the appropriate standards of which instruction does not constitute a compensation event.

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

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

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

14.1.13. Existing premises, inspection of adjoining properties and checking work of Others

Where the *Contractor* requires to work in the same area as *Other*s either at the same time or consequentially or there is interface with Others either at the same time or consequentially ("the Overlap"), the *Contractor* notifies the *Employer* and Others. The *Contractor* includes the Overlap in his programme and ensures *Others* also include it in their programmes. The *Contractor's* programme will be rejected in accordance with clause 31.3 of the NEC if he fails to do so.

The *Contractor* notifies the *Employer* and Others a minimum of [two] calendar weeks before the Overlap starts. The *Contractor* inspects the Overlap area on the day he is to start work, liaises with Others and completes a report on the Overlap area and the works in the Overlap area. He submits to the *Employer* within [48] hours of the date of starting work. The *Contractor* who requires access is responsible for compiling the report. His report includes the adequacy of the Overlap area, the works in the Overlap area; damage to the Works, a record of Others working in the Overlap area and any *other* constraints in the area. The Others working in the Overlap area also sign the report. The *Contractor* does the same when he completes the work in the Overlap area. The *Contractor* promptly notifies the *Employer* of any damage to his works or any other part of the Overlap area on both starting and completing his works and provides an explanation of how the damage occurred. The *Contractor* caters for the time for this activity in his revised programme for acceptance to ensure that there is no delay on his part.

The *Contractor* identifies all interfaces with *others* in his *Contractor's* Works Information and as required by paragraph 2.6 of this Works Information and does so for the execution of the Works. The *Contractor* inspects the works of Others whom he has identified as an interface point and where alignment and compatibility between the Works and Others' works is required. Similarly, the *Contractor* also allows Others to inspect his works as required by them.

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

The *Project Manager* designates the working area boundary limits and assigns for the *Contractor's* use access roads, parking areas, storage areas, existing facilities areas and construction areas. The *Contractor* does not trespass in or on areas not designated for his work.
The *Contractor* is responsible for keeping *Contractor's* personnel out of areas not designated for *Contractor's* use, except, in the case of isolated work located within such areas for which the *Contractor* is authorised to do so.

14.1.15. Excavations and associated water control

In addition to the requirements of paragraph 2.6 of this Works Information, the *Contractor* notifies the *Project Manager* a minimum of four (4) calendar weeks prior to commencing excavation. The *Contractor* identifies all services in the areas affected by the excavation works and notifies the *Employer* and Others of his findings a minimum of three (3) weeks prior to commencing excavation.

The *Contractor* conducts underground surveys before any excavation is performed as per Eskom, SHE specification and Occupational Health and Safety regulations. All services need to be verified by the *Contractor* prior to excavation.

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

The *Contractor's* method statement must include how he will deal with known services and any unknown services which become known to the *Contractor* during the execution of the Works. The *Contractor* accepts responsibility for the protection of all pipes, gauges, and the plant area. The *Contractor* immediately, and in any event no later than 1 hour, notifies the *Project Manager* if he damages any services.

The *Contractor* remedies any damage caused or procures the services of a third party to remedy such damage. The *Contractor* is liable for all damages, including damages suffered by Others and third parties, arising from or in connection with all services including the protection of all pipes, gauges and the plant area.

14.1.17. Control of noise, dust, water and waste

The *Contractor* complies with the more stringent of all Laws, Eskom standard and Medupi communicated documentation. This includes areas allocated for storage of materials, site offices and all Other working areas. If a particular standard is not specified, the *Contractor* complies with the *Employer*'s requirements of which requirement are not a compensation event. The *Contractor* keeps the Working Areas clean and free from accumulation of waste materials and refuses regardless of the source.

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

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

"waste" means any matter, whether liquid or solid or any combination thereof, which is a by-product, emission, residue or remainder of any process or activity carried out in connection with the Works and which is not reused promptly and, in any event, no later than three calendar days after production, in the carrying out the Works.

The *Contractor* provides a sufficient number of marked bins and/or containers as and where required for the temporary storage of waste. The types of bins and/or containers comply with the latest revision of the procedure Management of Waste at Medupi. The *Contractor* segregates waste in accordance with the Medupi Power Station requirements.

Bins and containers are emptied, and waste removed to the designated area at least once a week. The temporary and waste are removed to the designated area at least once a week. The temporary storage areas for bins and containers are maintained and not constitute a nuisance to Others. The *Contractor* ensures there is no spillage of waste alongside the bins and containers at any time

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

Hazardous waste is dealt with in accordance with the Laws, Eskom standards, Medupi Power Station requirements and the Contract. The *Contractor* is solely responsible for the proper disposal of hazardous waste.

14.1.18. Sequences of construction or installation

The *Contractor* is responsible for the construction and installation of the equipment according to the *Contractor*'s construction and installation plans.

The *Contractor* complies with the *Employer*'s Work Co-ordination Process.

Without derogating from the provisions of the Conditions of Contract, the Work Co-ordination Process is used by the *Project Manager* to monitor and manage activities on the Power Station and to facilitate the integration and co-ordination of the various works by Others.

If not included in the contract, the Project Manager will notify the *Contractor* of the requirements of the Work Co-ordination Process prior to the date of site establishment by the *Contractor*.

The *Contractor* is responsible for the construction and installation of the Plant and Materials according to the *Contractor's* method statement. The *Contractor* ensures that method statements as a minimum are conducted for the following:

a) Designing a new job or task.

b) Changing jobs or task.

c) Introducing new equipment or substances; and

d) Reviewing a procedure when problems have been identified, for example, from near miss incidents or an accident/incident investigation.

e) Simultaneous execution of the tasks as per the approved *Contractor* method statement.

The *Contractor* ensures that method statements and safe work procedures as a minimum contain the following:

a) The level of supervision required for the task

b) The training and qualifications required by the workers to perform the task

c) The Supervisor for the task or job and the employees who will undertake the task

d) The tasks that are to be undertaken that pose risks.

e) The equipment and substances that are used in these tasks.

f) The control measures that have been built into these tasks.

g) The personal protective equipment to be worn

h) Actions to be undertaken to address safety issues that may arise while undertaking the task.

All method statements must be submitted to the *Employer* for review and acceptance before any work commences. Method statements and safe work procedures must be submitted to the *Employer* a month before commencement of the works however during construction method statements and safe work procedures for any new activities are submitted to the *Employer* for review and acceptance three days prior to the activity taking place, all method statements and safe working procedures must be accompanied by a relevant risk assessment

Rejection of the method statement or safe work procedure due to non-conformance of the *Contractor* does not constitute a compensation event.

In addition to the requirements of paragraph 2.6 of this Works Information, the *Contractor* provides for access to *Other*s and allows for interface, alignment and compatibility between his sequence of construction or installation activities and *Other*s' sequence of construction or installation activities. Similarly, the *Contractor* accommodates *Other*'s requirements in relation to interface, alignment and compatibility of their sequence of construction or installation activities.

14.1.19. Giving notice of work to be covered up

The *Contractor* notifies the *Supervisor* a minimum of 5 working days prior to commencing work to be covered up. The *Contractor* notifies the *Project Manager* and *Supervisor* in writing of all planned activities for the week.

14.1.20. Hook ups to existing works

Plant and Material may not be modified without express written permission from the *Project Manager*.

The *Contractor*s may not hook up for lifting, supporting or for any other reason to any position or exiting works in the plant without a written position of the *Project Manager*. If the *Contractor* requires the use of existing infrastructure, it needs to be arranged with the Project Manager.

14.2. Completion, testing, commissioning and correction of Defects

14.2.1. Work to be done by the Completion Date

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

No alterations or adjustments will be made to the *Works* after final checks are done without the *Project Manager's* written permission.
At this stage the following must have been achieved:

a) Installation and pre-commissioning completed.

b) Testing report and the associated certificates received.

c) Signed erection and safety clearance certificates.

d) Final Draft of the Technical, Operating, Maintenance manuals delivered

e) All Quality Control Plan (QCP) documentation received.

f) All Data Books submitted and accepted by the *Employer*

The *Project Manager* cannot certify Completion until all the work including that listed above has been done and is also free of Defects which would have, in his opinion, prevented the *Employer* from using the works and *Other*s from doing their work.

Sectional completion of the work will be when the entire system/ equipment is connected to the system and commissioned or operational.

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

	Item of work	**To be completed by**
	As built drawings of the completed Works	Within 14 days after Completion
	Performance testing of the *works* in use as specified in paragraph 5.2.8 of this Works Information.	See performance testing requirements.
	All Works to be inspected and detailed report submitted to the *Employer*. (Works to be provided as stated in the Works Information)	As per the Accepted Programme

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

As per clause 35.2 of the Contract, the *Employer* uses the works, without taking over the works, before Completion for reasons relating to the operation of the Medupi Power Station, commissioning, and/or capability testing of the works and associated plant area.

14.2.3. Materials facilities and samples for tests and inspections

Refer core clause 40.2. Where applicable, The *Employer* does not provide any Materials, facilities and/or samples for tests and inspections. The *Contractor* provides all Materials, facilities and/or samples required for tests and inspections.

The *Contractor* provides a schedule of all the required tests and connections as well as areas where these will be performed to the *Project Manager* for acceptance.

a) Testing for all the electrical work

b) Equipment to use for doing the testing may need to be inspected.

c) Providing facility for testing to assure *Employer* of the quality of the works.

d) Earthing test equipment etc.

14.2.4. Commissioning

The *Contractor* shall perform Safety clearance and commission the tanks as per Eskom Commissioning procedure
Commissioning will not start until the following documents that are required for the commissioning of the plant is accepted by the *Project Manager*:

a) All relevant drawings (as built)

b) All type and routine test certificates

The *Contractor* provides the *Employer* with the following documents minimum of [four] calendar weeks before the date of commissioning:

a) erection completion certificate handed to the *Project Manager,*

b) the dates of the tests listed in paragraph a-k below.

The *Employer* elects as his sole discretion to attend the tests listed in paragraphs a-k below. The *Contractor* conducts, amongst others, the following tests and checks in order for the *Employer* to allow commissioning to occur:

a) Adjustment setting, operational checking and electrical injection testing of each relay, functional unit, circuit and accessory prior to installation of cables.

b) Check for any visual damage to the circuit breakers, current transformers, bushings/insulators, instruments, switches, auxiliary relays, and all other equipment.

c) Check tightness (torque where applicable) on all connections.

d) Power frequency voltage test where applicable.

e) Check the continuity of all current transformer and voltage transformer loops where applicable.

f) Check the fixing and locking devices on doors and covers.

g) Repetition of all functional tests (i.e., mechanical, electrical and automation functions) on some parts of the plant as done in the *Contractor*'s premises.

h) Check the operation of all mechanical/manual devices for racking, earthing and spring rewind.

i) Verify the operation of the interlocking system'

j) Any Other tests and checks required in terms of the *Contractor*'s interface, alignment and compatibility obligations and requirements.

k) any other tests and checks specified in the *Contractor*'s Works Information.

The *Employer* conducts his own erection and commissioning checks to ensure conformance with the Contract. These checks do not release the *Contractor* of his obligation to ensure compliance with the Contract.

The *Contractor's* failure to ensure compliance with all the pre-requisites for the *Employer* to allow commissioning to proceed will entitle the *Employer* to claim all damages arising from or in connection with this breach, including damages suffered by *Other*s.

a) The *Contractor* conducts the following tests as stipulated above in order for the *Employer* to certify that commissioning has occurred in accordance with the Contract requirements.

b) Any tests required in terms of the *Contractor*'s interface, alignment and compatibility obligations and requirements.

c) any tests specified in the *Contractor*'s Works Information.

d) any tests and required by Best Industry Practice

The *Contractor* includes the following tests and checks in order for the *Employer* to certify SAT once the erection of the Plant has been completed:

a) Any tests required in terms of the *Contractor*'s interface, alignment and compatibility obligations and requirements.

b) any tests specified in the *Contractor*'s Works Information.

c) any tests and required by Best Industry Practice

Once the *Contractor* has satisfactorily completed all his tests, the

Upon completion of commissioning, the *Contractor* provides drawings incorporating the changes arising from or in relation to commissioning within 14 calendar days.

The *Contractor* provides all necessary resources during the erection, installation, testing and commissioning of the Works.

Records are to be kept of each SAT in a logbook defining the tests to be undertaken, time and date of the commencement of the test, duration of the test, criteria that need to be met and results entered of the tests. These records are submitted to the *Project Manager*.

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

The *Contractor* gives the *Project Manager* written notice that the Works are ready for energization. The *Contractor* commences with energisation no more than 48 hours after commissioning and testing is completed. The *Contractor* provides the *Employer* with no less than 5 working days of the date on which energisation occurs.

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

At this stage the following must have been achieved:

a) Installation and pre-commissioning completed.

b) Testing report and the associated certificates received.

c) Signed erection and safety clearance certificates.

d) Final Draft of the Technical, Operating, Maintenance manuals delivered.

e) All Quality Control Plan (QCP) documentation received.

14.2.6. Take over procedures

Take-over is after or at the same time as Completion. The *Employer* takes over the Works on the date of safety clearance in accordance with the sectional completion dates of the Accepted Programme.

Once the section of the Works is complete as per Part Section 1 Option L and the Key Date Schedule, a Completion Certificate may be issued. (It is the *Contractor*s responsibility to apply for the Completion Certificate).

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

Refer to Clause 43.4 requires that the *Project Manager* arranges for the *Employer* to allow the *Contractor* access to and use of a part of the *works* which has been taken over if needed to correct a Defect. After the *works* have been put into operation, the *Employer* may require the *Contractor* to undertake certain procedures before such access can be granted

14.2.8. Performance tests after Completion

Test to be conducted:

- All Equipment to be tested as per the discipline design code

14.2.9. Training and technology transfer

The *Contractor* provides training, for each unit on the equipment and systems included as part of the *works* to the various categories of the *Employer's* technical staff (operators, maintenance and engineering personnel) for the duration of the works. Training will comprise both theoretical and practical training. Training provided by the *Contractor* is directly applicable to the actual equipment supplied for the works. Generalised training based on similar equipment is not acceptable. The facilities for training provided by the *Employer* are at the Site. It will be a suitably sized air-conditioned room, as well as trainee and trainer desks, a projector and flipchart or white board. The number of personnel to be trained to be determined and agreed with the *Project Manager*.

The *Contractor* submits to the *Project Manager* for approval a detailed training programme as well as a prospectus for each course. The *Contractor* provides electronic and hard copies of the training material to the attendees and the *Project Manager*.
The training schedule is incorporated in the Accepted Programme. The training schedule is separate. *Project Manager* to discuss and decide with the *Contractor* where it is required
Practical hands-on training for each individual employee forms an integral part of each of the following courses:
There are no restrictions on the *Employer* copying, developing and using the training material provided by the *Contractor*.

14.2.10. Operational maintenance after Completion

Refer to the Scope Document Number 348-9988014

15. Plant and Materials standards and workmanship

15.1. Investigation, survey and Site clearance

Refer to the Scope Document Number 348-9988014

15.2. Building works

Refer to the Scope Document Number 348-9988014

15.3. Civil engineering and structural works

Refer to the Scope Document Number 348-9988014

15.4. Electrical & mechanical engineering works

Refer to the Scope Document Number 348-9988014

15.5. Process control and IT works

Refer to the Scope Document Number 348-9988014

Other [as required]

A. List of Equipment

Refer to the Scope Document Number 348-9988014

B. List of Standards and Specifications

Refer to the Scope Document Number 348-9988014

16. List of drawings

16.1. Drawings issued by the *Employer*

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

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

Drawing number	Revision	Title

C3.2 *CONTRACTOR*'S WORKS INFORMATION

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

Typical sub headings could be

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

This section could also be compiled as a separate file.

PART 4: SITE INFORMATION

Document reference	Title	No of pages
	This cover page	1
C4	Site Information	3
	Total number of pages	4

PART 4: SITE INFORMATION

Core clause 11.2(16) states

“Site Information is information which

- describes the Site and its surroundings and
- is in the documents which the Contract Data states it is in.”

In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

General description

The Medupi Power Station Project in Lephalale is a green-fields coal-fired power plant comprising of six units providing a total of 4 800MW on full capacity. The Power station is situation approximately 20Kms from the town of Lephalale (Ellisras). It is situated along the Steenbokpan Road. The works takes place within the boundaries of Medupi Power station.

The *Contractor* makes his/her own assessment of and allows in his/her rates for those access problems that may be encountered. No extra payment or claim of any kind is allowed on account of difficulties of access to the *works*, or for the requirement of working adjacent to or in the same area as others.

Medupi Power Station is declared as National Key Point. Access to site shall be in line with the Medupi Power Station’s access procedure. The *Contractor* shall be required to make an application to enter site for the duration of the contract, including the warranty and defect period. A permit shall only be issued once the *Contractor* and his or her employees have attended the safety induction and has undergone medical checks.

The *Contractor* shall have no claim against the *Employer* in respect of delay at the security main gate.

Note that the speed limit on the site is 40 Km/h. The vehicle permits of any persons contravening any traffic act on site shall be cancelled.

The *Contractor* complies with the Medupi Power Site Regulations, a copy of which is available for perusal at the *Project Manager’s* offices.

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

Before work starts on site, an inaugural meeting is held with the *Contractor* and the *Project Manager* to explain all requirements of the Site Regulations.

The *Contractor* allocates staff to be trained and authorised as Authorised Supervisor or Responsible Persons according to *Employer's* Plant Safety Regulations. These Authorised Supervisor or Responsible Persons are available on site as and when required to take out permits to work.

At his own cost the *Contractor* provides his/her own accommodation and transport for all his/her employees engaged in the execution of the works. This includes the needs of his/her *sub-contractors*. No accommodation is available at Medupi Power Station.

The security screening clause to be inserted to reads as follows: "Acceptance of this tender is subject to the condition that both the contracting company's management and its employees will provide Eskom with a clear criminal record not older than thirty (30) days from a reputable screening company. If the principal contractor appoints a subcontractor, the same provisions and measures will apply to the subcontractor. Acceptance of the tender is also subject to the condition that the contractor will implement all such security measures for the safe performance of the work as required in the scope of the contract.

Contractors are required to submit the SAPS Clearance Certificate obtained by the employee along with a copy of his/her Identity Document or Passport to the site Security Manager. The Security Manager is required to verify the authenticity of the CRC Certificate with SAPS and to cross reference the employee seeking access against known HR databases and site databases to determine if the employee in question has in the past participated in disruptive labor actions and if the individual was dismissed from Eskom and the reason for such dismissal. Every employee applying for access must be evaluated as an individual and subsequent finding recorded. A risk analysis of the employee profile indicating whether the employee is a risk to the installation must be completed. Any risk rating allocated above a level III will be deemed unsuitable

The *Contractor* always provides security necessary for the protection of the works until the completion of the whole of the works.

No firearms, weapons, alcohol, illegal substances and cameras are permitted on site. Any person suspected of being under the influence of alcohol is tested and if proved positive, is refused entry to the security area.

The *Contractor* implements a health and safety plan and maintains the safety system until the completion of the whole of the works. The plan, will as a minimum, contain PPE information, written safe working procedures, job specific risk assessments, safety meetings, etc. The plan will be to the *Employer'*s satisfaction and will be accepted prior to the commencement of any work. Contractor is to provide additional lighting where lighting is not sufficient in working areas.

All equipment coming to site will be inspected by *the Employer's* Safety Department.

The *Contractor* will be subject to periodic audits by the *Employer* in order to ensure compliance with the plan. Any deviations will be corrected to the *Employer's* satisfaction.

The *Project Manager* has the right to stop the *Contractor*'s work activities which, in the opinion of *Project Manager*, is un-safe. The *Contractor* may only continue with work activities when all safety deficiencies have been corrected to the *Project Manager's* satisfaction. The *Contractor* shall have no claim against the *Employer* in respect of delay due to the above.

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

The works shall be executed in and/or around Unit 6-1 Boiler, Primary and Secondary Clarifier. All interfaces are as stated in the Specification document 348-9988014.

Any equipment, or appliances, used by the *Contractor* is to conform to the applicable OHS Act safety standards and is maintained in a safe and proper working condition. The *Project Manager* has the right to stop the Contractor's use of any equipment which, in the opinion of *Project Manager*, does not conform to the foregoing.

Loading and off-loading and material handling equipment is not available on site and if required, is to be provided by the Contractor.