



NEC3 Engineering & Construction Contract

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

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

for **Medupi Power Station Weighbridge Construction**

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CONTRACT No. TBC

Part C1: Agreements & Contract Data

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[to be inserted from Returnable Documents at award stage]	
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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 Weighbridge Construction**

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 [●]
	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) _____
_____ Mr Zweli Witbooi

Capacity _____
_____ General Manager Medupi Power
_____ Station

for the

Employer Eskom Holdings SOC Limited
Medupi Power Station
Steenbokpan Road
Lephalale
0555

Name & signature of Justice Mphahlele _____ Date _____

witness _____

○ **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		

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	_____	Zweli Witbooi
Capacity	_____	_____
On behalf of	(Insert name and address of organisation)	General Manager Medupi Power Station Eskom Holdings SOC Ltd Medupi Power Station Steenbokpan Road Lephalale, 0555
Name & signature	_____	_____
of witness	_____	_____
Date	_____	_____

C1.2 ECC3 Contract Data

Part one - Data provided by the *Employer*

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

- Please read the relevant clauses in the conditions of contract before you enter data. The number of the clause which requires the data is shown in the left hand column for each statement however other clauses may also use the same data.
- Some ECC3 options are always selected by Eskom Holdings SOC Ltd. The remaining ECC3 options are identified by shading in the left hand column. In the event that the option is not required select and delete the whole row. Where the following symbol is used "[●]" - data is required to be inserted relevant to the specific option selected.]

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

Clause	Statement	Data
1	General	
	The <i>conditions of contract</i> are the core clauses and the clauses for main Option	
	dispute resolution Option	A: Priced contract with activity schedule
	and secondary Options	W1: Dispute resolution procedure
		X1: Price adjustment for inflation
		X2: Changes in the law
		X7: Delay damages
		X13: Performance Bond
		X16: Retention
		X17: Low performance damages
		X18: Limitation of liability
		Z: Additional conditions of contract
	of the NEC3 Engineering and Construction Contract, April 2013 (ECC3)	
10.1	The <i>Employer</i> 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 <i>Project Manager</i> is: (Name)	TBC
	Address	

Tel

Fax

e-mail

10.1 The *Supervisor* is: (Name)

Address

Tel No.

Fax No.

e-mail

11.2(13) The *works* are

**Medupi Power Station Weigh Bridge
Construction**

11.2(14) The following matters will be included in the Risk Register

- **Adverse weather conditions (Rain, Wind, Heatwave and Hailstorm).**
- **Labour strike and community unrest.**
- **Earthworks planning need to take into consideration the rain.**
- **Normal Construction hazardous working with machinery.**
- **Procurement (lead time)**
- **Substantial Procurement of material when required.**
- **Security of equipment, material and resource.**
- **Access constraints and interfaces with others.**
- **Interface and integration of works with the running plant and other Contractors.**
- **Disease outbreak impact on labour force.**
- **Plant access from other Contractors.**
- **Working at Heights.**
- **Hazardous Gas.**
- **Electrocution.**
- **Power supply interruptions or failure.**
- **Interface and integration of the works with the running plant and other Contractors.**
- **Dehydration (hot weather conditions).**
- **Ash dust.**
- **Fire and Smoke**
- **Snakes**
- **Any other risk identified during the execution of the works will be updated on the risk register.**

11.2(15) The *boundaries of the site* are

**Medupi Power Station Weighbridge & Access
control building & infrastructure**

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 refers.	
12.2	The <i>law of the contract</i> is the law of	the Republic of South Africa	
13.1	The <i>language of this contract</i> is	English	
13.3	The <i>period for reply</i> is	One week and 24 hours for emergency.	
2	The Contractor's main responsibilities	Data required by this section of the core clauses is provided by the <i>Contractor</i> in Part 2 and terms in italics used in this section are identified elsewhere in this Contract Data.	
3	Time		
11.2(3)	The <i>completion date</i> for the whole of the works is	TBC	
11.2(9)	The <i>key dates</i> and the <i>conditions</i> to be met are:	Condition to be met	key date
		1 Key Resources and full site establishment	[•]
		2	[•]
		3 [•]	[•]
30.1	The <i>access dates</i> are:	Part of the Site	Date
		1 Medupi Power Station	July 2024
		2 Weighbridge Construction area	July 2024
31.1	The <i>Contractor</i> is to submit a first programme for acceptance within	One week after Contract Award Date	
31.2	The <i>starting date</i> is	TBC	
32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than	Two weeks	
35.1	The <i>Employer</i> is not willing to take over the works before the Completion Date.		
4	Testing and Defects		
42.2	The <i>defects date</i> is	52 weeks after Completion of the whole of the works.	
43.2	The <i>defect correction period</i> is	2 weeks	
	except that the <i>defect correction period</i> for	Emergency is 24 hours	
	and the <i>defect correction period</i> for	Load loss is 24 hours	
5	Payment		
50.1	The <i>assessment interval</i> is	The 25th day of each successive month.	

51.1 The *currency of this contract* is the **South African Rand (ZAR).**

51.2	The period within which payments are made is	Thirty (30) calendar days after the receipt of an invoice.
51.4	The <i>interest rate</i> is	<p>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</p> <p>(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 <i>mutatis mutandis</i> 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.</p>

6 Compensation events

60.1(13)	<p>The place where weather is to be recorded is:</p> <p>The <i>weather measurements</i> to be recorded for each calendar month are,</p> <p>The <i>weather measurements</i> are supplied by</p> <p>The <i>weather data</i> are the records of past <i>weather measurements</i> for each calendar month which were recorded at:</p> <p>and which are available from:</p>	<p>Medupi Power Station.</p> <p>the cumulative rainfall (mm)</p> <p>the number of days with rainfall more than 10 mm</p> <p>the number of days with minimum air temperature less than 0 degrees Celsius</p> <p>the number of days with snow lying at 09:00 hours South African Time</p> <p>and these measurements:</p> <p>South African Weather Service Bureau</p> <p>Lephalale</p> <p>The South African Weather Bureau</p>
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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
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this Contract Data.				
8	Risks and insurance			
80.1	These are additional <i>Employer's</i> risks	None		
9	Termination		There is no reference to Contract Data in this section of the core clauses and terms in italics used in this section are identified elsewhere in this Contract Data.	
10	Data for main Option clause			
A	Priced contract with activity schedule	There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.		
11	Data for Option W1			
W1.1	The <i>Adjudicator</i> 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).		
W1.2(3)	The <i>Adjudicator nominating body</i> 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 <i>tribunal</i> is:	arbitration.		
W1.4(5)	The <i>arbitration procedure</i> is	the latest edition of Rules for the Conduct of Arbitrations published by The Association of Arbitrators (Southern Africa) or its successor body.		
	The place where arbitration is to be held is	Johannesburg South Africa		
	The person or organisation who will choose an arbitrator	the Chairman for the time being or his nominee of the Association of Arbitrators (Southern Africa) or its successor body.		
	- if the Parties cannot agree a choice or - if the arbitration procedure does not state who selects an arbitrator, is			
12	Data for secondary Option clauses			
X1	Price adjustment for inflation			
X1.1(a)	The <i>base date</i> for indices is	[June 2024].		
X1.1(c)	The proportions used to calculate the Price Adjustment Factor are:	proportion	linked to index for	Index prepared by
		0.	[Labour]	[SEIFSA Table

		[35%]		C3A]
		0.	[Material]	[SEIFSA Table G]
		[50%]		
		[0.15%]	non-adjustable	
		Total 1.00		
X2	Changes in the law	There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.		
X2.1	The law of the project is the law of the Republic of South Africa.			
X7	Delay damages (but not if Option X5 is also used)			
X7.1	Delay damages for Completion of the whole of the <i>works</i> are	R 10 000 per day up to a limit of 10% of the Contract Value.		
X13	Performance bond			
X13.1	The amount of the performance bond is	10% of the total of the prices.		
X16	Retention (not used with Option F)			
X16.1	The <i>retention free amount</i> is	R0.00 (Zero Rand)		
	The <i>retention percentage</i> is	5% of the total Price for each invoice amount.		
X17	Low performance damages			
X17.1	The amounts for low performance damages are:	Amount	Performance level	
		R 10 000 per day up to a limit of 10% of the Total Prices.	for not meeting accepted schedule dates.	
X18	Limitation of liability			
X18.1	The <i>Contractor's</i> liability to the <i>Employer</i> for indirect or consequential loss is limited to:	R0.0 (zero Rand)		
X18.2	For any one event, the <i>Contractor's</i> liability to the <i>Employer</i> for loss of or damage to the <i>Employer's</i> property is limited to:	The amount of the deductibles relevant to the event described in the insurance policy format selected in the data for clause 84.1 above, which policy is available on request from Eskom Group Insurance.		
X18.3	The <i>Contractor's</i> liability for Defects due to his design which are not listed on the Defects Certificate is limited to	The greater of <ul style="list-style-type: none">the total of the Prices at the Contract Date andthe amounts excluded and unrecoverable from the <i>Employer's</i> 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 <i>Contractor's</i> total liability to the <i>Employer</i> for all matters arising under or in connection with this contract, other than excluded matters, is limited to:	<p>the total of the Prices other than for the additional excluded matters.</p> <p>The <i>Contractor's</i> total liability for the additional excluded matters is not limited.</p> <p>The additional excluded matters are amounts for which the <i>Contractor</i> is liable under this contract for</p> <ul style="list-style-type: none"> • 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 <i>works</i>, Plant and Materials), <ul style="list-style-type: none"> • death of or injury to a person and • infringement of an intellectual property right.
X18.5	The <i>end of liability date</i> is	<p>(i) Three (3) years after the <i>defects date</i> for latent Defects and</p> <p>(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.</p> <p>A latent Defect is a Defect which would not have been discovered on reasonable inspection by the <i>Employer</i> or the <i>Supervisor</i> before the <i>defects date</i>, without requiring any inspection not ordinarily carried out by the <i>Employer</i> or the <i>Supervisor</i> during that period. If the <i>Employer</i> or the <i>Supervisor</i> do undertake any inspection over and above the reasonable inspection, this does not place a greater responsibility on the <i>Employer</i> or the <i>Supervisor</i> to have discovered the Defect.</p>
Z	The Additional conditions of contract	
	are	Z1 to Z15 always apply.
Z1	Cession delegation and assignment	
	Z1.1 The <i>Contractor</i> does not cede, delegate or assign any of its rights or obligations to any person without the written consent of the <i>Employer</i> .	
	Z1.2 Notwithstanding the above, the <i>Employer</i> may on written notice to the <i>Contractor</i> cede and delegate its rights and obligations under this contract to any of its subsidiaries or any of its present divisions or operations which may be converted into separate legal entities as a result of the restructuring of the Electricity Supply Industry.	

Z2 Joint ventures

- Z2.1 If the *Contractor* constitutes a joint venture, consortium or other unincorporated grouping of two or more persons or organisations then these persons or organisations are deemed to be jointly and severally liable to the *Employer* for the performance of this contract.
- Z2.2 Unless already notified to the *Employer*, the persons or organisations notify the *Project Manager* within two weeks of the Contract Date of the key person who has the authority to bind the *Contractor* on their behalf.
- Z2.3 The *Contractor* does not alter the composition of the joint venture, consortium or other unincorporated grouping of two or more persons without the consent of the *Employer* having been given to the *Contractor* in writing.

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

- Z3.1 Where a change in the *Contractor's* legal status, ownership or any other change to his business composition or business dealings results in a change to the *Contractor's* B-BBEE status, the *Contractor* notifies the *Employer* within seven days of the change.
- Z3.2 The *Contractor* is required to submit an updated verification certificate and necessary supporting documentation confirming the change in his B-BBEE status to the *Project Manager* within thirty days of the notification or as otherwise instructed by the *Project Manager*.
- Z3.3 Where, as a result, the *Contractor's* B-BBEE status has decreased since the Contract Date the *Employer* may either re-negotiate this contract or alternatively, terminate the *Contractor's* obligation to Provide the Works.
- Z3.4 Failure by the *Contractor* to notify the *Employer* of a change in its B-BBEE status may constitute a reason for termination. If the *Employer* terminates in terms of this clause, the procedures on termination are P1, P2 and P3 as stated in clause 92, and the amount due is A1 and A3 as stated in clause 93.

Z4 Confidentiality

- Z4.1 The *Contractor* does not disclose or make any information arising from or in connection with this contract available to Others. This undertaking does not, however, apply to information which at the time of disclosure or thereafter, without default on the part of the *Contractor*, enters the public domain or to information which was already in the possession of the *Contractor* at the time of disclosure (evidenced by written records in existence at that time). Should the *Contractor* disclose information to Others in terms of clause 25.1, the *Contractor* ensures that the provisions of this clause are complied with by the recipient.
- Z4.2 If the *Contractor* is uncertain about whether any such information is confidential, it is to be regarded as such until notified otherwise by the *Project Manager*.
- Z4.3 In the event that the *Contractor* is, at any time, required by law to disclose any such information which is required to be kept confidential, the *Contractor*, to the extent permitted by law prior to disclosure, notifies the *Employer* so that an appropriate protection order and/or any other action can be taken if possible, prior to any disclosure. In the event that such protective order is not, or cannot, be obtained, then the *Contractor* may disclose that portion of the information which it is required to be disclosed by law and uses reasonable efforts to obtain assurances that confidential treatment will be afforded to the information so disclosed.
- Z4.4 The taking of images (whether photographs, video footage or otherwise) of the *works* or any portion thereof, in the course of Providing the Works and after Completion, requires the prior written consent of the *Project Manager*. All rights in and to all such images vests exclusively in the *Employer*.
- Z4.5 The *Contractor* ensures that all his subcontractors abide by the undertakings in this clause.

Z5 Waiver and estoppel: Add to core clause 12.3:

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

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

- Z6.1 The *Contractor* undertakes to take all reasonable precautions to maintain the health and safety of persons in and about the execution of the *works*. Without limitation the *Contractor*:
- accepts that the *Employer* may appoint him as the “Principal Contractor” (as defined and provided for under the Construction Regulations 2014 (promulgated under the Occupational Health & Safety Act 85 of 1993) (“the Construction Regulations”) for the Site;
 - warrants that the total of the Prices as at the Contract Date includes a sufficient amount for proper compliance with the Construction Regulations, all applicable health & safety laws and regulations and the health and safety rules, guidelines and procedures provided for in this contract and generally for the proper maintenance of health & safety in and about the execution of *works*; and
 - undertakes, in and about the execution of the *works*, to comply with the Construction Regulations and with all applicable health & safety laws and regulations and rules, guidelines and procedures otherwise provided for under this contract and ensures that his Subcontractors, employees and others under the *Contractor's* direction and control, likewise observe and comply with the foregoing.
- Z6.2 The *Contractor*, in and about the execution of the *works*, complies with all applicable environmental laws and regulations and rules, guidelines and procedures otherwise provided for under this contract and ensures that his Subcontractors, employees and others under the *Contractor's* direction and control, likewise observe and comply with the foregoing.

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

- Z7.1 Within one week of receiving a payment certificate from the *Project Manager* in terms of core clause 51.1, the *Contractor* provides the *Employer* with a tax invoice in accordance with the *Employer's* procedures stated in the Works Information, showing the amount due for payment equal to that stated in the payment certificate.
- Z7.2 If the *Contractor* does not provide a tax invoice in the form and by the time required by this contract, the time by when the *Employer* is to make a payment is extended by a period equal in time to the delayed submission of the correct tax invoice. Interest due by the *Employer* in terms of core clause 51.2 is then calculated from the delayed date by when payment is to be made.
- Z7.3 The *Contractor* (if registered in South Africa in terms of the companies Act) is required to comply with the requirements of the Value Added Tax Act, no 89 of 1991 (as amended) and to include the *Employer's* VAT number 4740101508 on each invoice he submits for payment.

Z8 Notifying compensation events

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

Z9 *Employer's* limitation of liability

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

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

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

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

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

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

Z12 Ethics

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

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

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

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

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

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

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

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

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

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

Z12.2 The *Employer* may terminate the *Contractor's* obligation to Provide the Services if a Committing Party has taken such Prohibited Action and the *Contractor* did not take timely and appropriate action to prevent or remedy the situation, without limiting any other rights or remedies the

Employer has. It is not required that the Committing Party had to have been found guilty, in court or in any other similar process, of such Prohibited Action before the *Employer* can terminate the *Contractor's* obligation to Provide the Services for this reason.

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

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

Z13 Insurance

Z 13.1 Replace core clause 84 with the following:

Insurance cover 84

- 84.1** When requested by a Party, the other Party provides certificates from his insurer or broker stating that the insurances required by this contract are in force.
- 84.2** The *Contractor* provides the insurances stated in the Insurance Table A.
- 84.3** The insurances provide cover for events which are at the *Contractor's* risk from the *starting date* until the earlier of Completion and the date of the termination certificate.

INSURANCE TABLE A

Insurance against	Minimum amount of cover or minimum limit of indemnity
Loss of or damage to the works, Plant and Materials	The replacement cost where not covered by the <i>Employer's</i> insurance The <i>Employer's</i> policy deductible, as Contract Date, where covered by the <i>Employer's</i> insurance
Loss of or damage to Equipment	The replacement cost
Liability for loss of or damage to property (except the works, Plant and Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i>) caused by activity in connection with this contract	<u>Loss of or damage to property</u> <u>Employer's property</u> The replacement cost where not covered by the <i>Employer's</i> insurance The <i>Employer's</i> policy deductible, as Contract Date, where covered by the <i>Employer's</i> insurance <u>Other property</u> The replacement cost <u>Bodily injury to or death of a person</u> The amount required by applicable law
Liability for death of or bodily injury to	The amount required by the applicable law

employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract	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 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 <i>Employer's</i> Asbestos Standard 32-303: Requirements for Safe Processing, Handling, Storing, Disposal and Phase-out of Asbestos and Asbestos Containing Material, Equipment and Articles.
SANAS	means the South African National Accreditation System.
TWA	means the average exposure, within a given workplace, to airborne asbestos fibres, normalised to the baseline of a 4 hour continuous period, also applicable to short term exposures, i.e. 10-minute TWA.

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

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

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

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

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

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

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

C1.2 Contract Data

• Part two - Data provided by the *Contractor*

Notes to a tendering contractor:

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

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

	○ Statement	○ Data
10.1	The <i>Contractor</i> is (Name): Address Tel No. Fax No.	
11.2(8)	The <i>direct fee percentage</i> is The <i>subcontracted fee percentage</i> is	% %
11.2(18)	The <i>working areas</i> are the Site and	
24.1	The <i>Contractor's</i> key persons are: 1 Name: Job: Responsibilities: Qualifications: Experience: 2 Name: Job: Responsibilities: Qualifications:	

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

PART C1: AGREEMENTS AND CONTRACT DATA PAGE 19 C1.2B ECC3 CONTRACT DATA PART 2

	<ul style="list-style-type: none"> ○ Data for Schedules of Cost Components 	<p><i>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).</i></p>
A	Priced contract with activity schedule	Data for the Shorter Schedule of Cost Components (N/A)

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 (not used with Option F)

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

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

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

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

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

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

Eskom Holdings SOC Ltd
Megawatt Park
Maxwell Drive
Sandton
Johannesburg

Date:

Dear Sirs

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

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

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

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

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

“Bank’s Address” - means [●]; [Drafting Note: Bank’s physical address to be inserted]

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

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

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

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

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

“Project” - means [insert if applicable].

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

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

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

state the amount claimed (“the Demand Amount”);

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

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

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

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

The Bank's obligations in terms of this Guarantee:

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

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

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

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

This Guarantee:

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

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

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

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

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

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

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

Signed at _____

Date _____

For and behalf of the Bank

Bank Signatory: _____

Bank Signatory: _____

Witness: _____

Witness: _____

Bank's seal or stamp

Pro forma Advanced Payment Bond (for use with Option X14)

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

Eskom Holdings Limited
Megawatt Park
Maxwell Drive
Sandton
Johannesburg

Date: _____

Dear Sirs,

Advanced Payment Bond for Contract No.

With reference to the above numbered contract made or to be made between

Eskom Holdings SOC Limited

(the *Employer*) and

{Insert registered name and address of the Contractor}

(the *Contractor*), for

{Insert details of the works from the Contract Data}

(the *works*).

I/We the undersigned

on behalf of the Surety

of physical address

and duly authorised thereto do hereby bind ourselves as Surety and co-principal debtors in solidum for the due and proper repayment by the *Contractor* to the *Employer* of the advanced payment made by the *Employer* to the *Contractor* under the Contract, and for all losses and expenses that may be suffered or incurred by the *Employer* as a result of non-payment by the *Contractor*, subject to the following conditions

1. The terms *Employer*, *Contractor*, and the *works* have the meaning as assigned to them by the *conditions of contract* listed in the Contract Data for the aforesaid Contract.
2. We renounce all benefits from the legal exceptions "Benefit of Excussion and Division", "No value received" "Revision of Accounts", "Cession of Action" and any other exceptions which might or could be pleaded against the validity of this bond, with the meaning and effect of which exceptions we declare ourselves to be fully acquainted.
3. The *Employer* has the absolute right to arrange his affairs with the *Contractor* in any manner which the *Employer* deems fit and without being advised thereof the Surety shall not have the right to claim his release on account of any conduct alleged to be prejudicial to the Surety. Without derogating from the foregoing compromise, extension of the construction period, indulgence, release or variation of the *Contractor's* obligation shall not affect the validity of this Advance Payment bond.
4. This bond expires on the date when the Surety receives a notice from the *Project Manager* stating that the advanced payment has been repaid to the *Employer* in terms of the Contract, or liquidated by deductions from other payments due to the *Contractor*.
5. The amount of the bond shall be payable to the *Employer* upon the *Employer's* demand and no later than 7 days following the submission to the Surety of a certificate signed by the *Project Manager* stating the amount of the *Employer's* losses, damages and expenses incurred as a result of the non-

performance aforesaid. The signed certificate shall be deemed to be conclusive proof of the extent of the *Employer's* loss, damage and expense.

6. Our total liability hereunder shall not exceed the sum of (R.....) which is equal to the advance payment.
7. This Advanced Payment Bond is neither negotiable nor transferable and is governed by the laws of the Republic of South Africa.

Signed at _____ on this _____ day of _____ 200_

Signature(s)

Name(s) (printed)

Position in Surety company

Signature of Witness(s)

Name(s) (printed)

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]

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 Limited, 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); [Drafting Note: Insert amount of Retention Money Guarantee.].
 - 1.8 “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 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 director of Eskom or his authorised delegate.

- 3.2 state the amount claimed ("the Demand Amount");
- 3.3 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.
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 0 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 _____ Bank's seal or stamp

For and behalf of the Bank

Bank Signatory: _____ Bank Signatory: _____

Witness: _____ Witness: _____

Pro forma ASGI-SA Guarantee

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

Eskom Holdings Limited
Megawatt Park
Maxwell Drive
Sandton
Johannesburg

Date:

Dear Sirs

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

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

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

1. In this Guarantee the following words and expressions shall have the following meanings:-
 - 1.1 "Bank" - means [●], [●] Branch, (Registration No. [●]); [Drafting Note: Name of Bank to be inserted]
 - 1.2 "Bank's Address" - means [●]; [Drafting Note: Bank's physical address to be inserted]
 - 1.3 "Contract" – means the written agreement relating to the Project, entered into between the *Employer* and the *Contractor*, on or about the [●] day of [●] 200[●] (Contract Reference No. [●] as amended, varied, restated, novated or substituted from time to time; [Drafting Note: Signature Date and Contract reference number to be inserted])
 - 1.4 "*Contractor*" – means [●] a company registered in accordance with the laws of [●] under Registration Number [●]. [Drafting Note: Name and details of Contractor to be inserted]
 - 1.5 "*Contractor's* ASGI-SA Obligations" - means the *Contractor's* ASGI-SA Obligations under and as defined in the Contract.
 - 1.6 "*Employer*" - means Eskom Holdings Limited, a company registered in accordance with the laws of the Republic of South Africa under Registration Number 2002/015527/06.
 - 1.7 "Expiry Date" - means the [●] day of [●] 200[●]; [Drafting Note: anticipated date of issue of ASGI-SA Performance Certificate to be inserted.]
 - 1.8 "Guaranteed Sum" - means the sum of R [●] ([●] Rand);
 - 1.9 "Project" – means the
2. At the instance of the *Contractor*, we the undersigned _____ and _____, in our respective capacities as _____ and _____ of the Bank, and duly authorized thereto, confirm that we hold the Guaranteed Sum at the disposal of the *Employer*, as security for the proper performance by the *Contractor* of the *Contractor's* ASGI-SA Obligations and hereby undertake to pay to the *Employer*, on written demand from the *Employer* received prior to the Expiry Date, any sum or sums not exceeding in total the Guaranteed Sum.
3. A demand for payment under this guarantee shall be made in writing at the Bank's address and shall:
 - 3.1 state the amount claimed ("the Demand Amount");
 - 3.2 state that the Demand Amount is payable to the *Employer* in the circumstances contemplated in

the Contract.

4. Notwithstanding the reference herein to the Contract the liability of the Bank in terms hereof is as principal and not as surety and the Bank's obligation/s to make payment:
 - 4.1 is and shall be absolute provided demand is made in terms of this bond in all circumstances; and
 - 4.2 is not, and shall not be construed to be, accessory or collateral on any basis whatsoever.
5. The Bank's obligations in terms of this Guarantee:
 - 5.1 shall be restricted to the payment of money only and shall be limited to the maximum of the Guaranteed Sum; and
 - 5.2 shall not be discharged and compliance with any demand for payment received by the Bank in terms hereof shall not be delayed, by the fact that a dispute may exist between the *Employer* and the *Contractor*.
6. The *Employer* shall be entitled to arrange its affairs with the *Contractor* in any manner which it sees fit, without advising us and without affecting our liability under this Guarantee. This includes, without limitation, any extensions, indulgences, release or compromise granted to the *Contractor* or any variation under or to the Contract.
7. Should the *Employer* cede its rights against the *Contractor* to a third party where such cession is permitted under the Contract, then the *Employer* shall be entitled to cede to such third party the rights of the *Employer* under this Guarantee on written notification to the Bank of such cession.
8. This Guarantee:
 - 8.1 shall expire on the Expiry Date until which time it is irrevocable;
 - 8.2 is, save as provided for in **0** above, personal to the *Employer* and is neither negotiable nor transferable;
 - 8.3 shall be returned to the Bank upon the earlier of payment of the full Guaranteed Sum or expiry hereof;
 - 8.4 shall be regarded as a liquid document for the purpose of obtaining a court order; and
 - 8.5 shall be governed by and construed in accordance with the law of the Republic of South Africa and shall be subject to the jurisdiction of the courts of the Republic of South Africa.
 - 8.6 Any claim which arises or demand for payment received after expiry date will be invalid and unenforceable.
9. The Bank chooses domicilium citandi et executandi for all purposes in connection with this Guarantee at the Bank's Address.

Signed at _____

Date _____

For and behalf of the Bank

Bank Signatory: _____

Bank Signatory: _____

Witness: _____

Witness: _____

Bank's seal or stamp

- **PART 2: PRICING DATA**
ECC3 Option A

Document reference	Title	No of pages
C2.1	Pricing assumptions: Option A	3
C2.2	The <i>activity schedule</i>	

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 <i>activity schedule</i> 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:

See Revised BOQ

i

[illegible]

C2.2 the *activity schedule*

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

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

C3.1: EMPLOYER'S WORKS INFORMATION

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4.2.2	Subcontract documentation, and assessment of subcontract tenders	Error! Bookmark not defined.
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4.5	Marking Plant and Materials outside the Working Areas	Error! Bookmark not defined.
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5	Construction	Error! Bookmark not defined.
5.1	Temporary works, Site services & construction constraints	Error! Bookmark not defined.
5.1.1	<i>Employer's</i> Site entry and security control, permits, and Site regulations	Error! Bookmark not defined.
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5.1.3	People restrictions on Site; hours of work, conduct and records	Error! Bookmark not defined.
5.1.4	Health and safety facilities on Site	Error! Bookmark not defined.
5.1.5	Environmental controls, fauna & flora, dealing with objects of historical interest	Error! Bookmark not defined.
5.1.6	Title to materials from demolition and excavation	Error! Bookmark not defined.
5.1.7	Cooperating with and obtaining acceptance of Others	Error! Bookmark not defined.
5.1.8	Publicity and progress photographs	Error! Bookmark not defined.
5.1.9	<i>Contractor's</i> Equipment	Error! Bookmark not defined.
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5.1.16	Underground services, other existing services, cable and pipe trenches and covers	Error! Bookmark not defined.
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Part 3: Scope of Work

1 Description of the works

1.1 Executive overview

Medupi Power Station is situated approximately 15km North-West from the Town of Lephalale in Waterberg District, Limpopo Province. The expected life of the plant is 50 years from the dates of Commercial Operation. The Power Station is currently operating without a permanent weighbridge on-site, currently using an external weighbridge for weighing of delivery trucks carrying loads to be hauled to site for various purposes. This weighing method has incurred costs to the business and gives a risk of inaccurate delivery loads onto site with resultant excessive cost and time impacts.

The bi-directional Weighbridge system and Access Control Building is to be designed and constructed at Gate 4. Additionally, the weighing of delivery trucks system shall include the weighbridge control room, access control building and other works such as the HVAC systems, Low pressure services, drainage systems, access roads and all works described in this scope to have a operating and maintainable security delivery system at gate 4. The area is required to comply to the relevant National Key Point (NKP) security requirements during delivery activities.

The Weighbridge project is to allow for the weighing of delivery trucks carrying the following loads onto site:

1. Fuel Oil;
2. Coal (reject or supply);
3. Limestone (for future FGD plant);
4. Gypsum (for future FGD plant); and
5. Any other loads which required to be verified over the life of the power station.

1.2 Employer's objectives and purpose of the works

This scope of works provides information to the *Contractor* for the complete works required for the design, supply, construct, installation and commissioning of the Weighbridge inclusive of the weighbridge control room system & equipment. The design and construction of Access Control Building with ablution facilities and the Weighbridge control room at Gate 4 at Medupi Power Station. This project includes associated infrastructure such as the access road & modification of existing roads, fencing, building services including but not limited to CBMS; HVAC, C&I works such as surveillance, weighing ticketing system, inventory and monitoring systems; plumbing and incidental works, Electrical components and Low-pressure services for a holistic system.

The Contractor shall verify and optimise the Employer's conceptual Design and takes full accountability for the Design.

The purpose of this document is to provide the scope of work to appoint a suitable contractor for the design, construction, supply, installation, commissioning and handover of the Medupi Power Station the Weighbridge inclusive of the weighbridge control room system & equipment and the design and construction of Access Control Building and the Weighbridge control room and associated infrastructure at Gate 4 at Medupi Power Station.

1.3 Interpretation and terminology

The following abbreviations are used in this Works Information:

Abbreviation & Acronym	Description
AFC	Approved for construction
AIA	Approved Inspection Authority
CBMS	Consolidate Building Management System
C&I	Control & Instrumentation
CM	Configuration Management
CRA	Concept Release Approval
DRA	Definition Release Approval
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ERA	Execution Release Approval
EDWL	Engineering Design Work Lead
FAT	Factory Acceptance Test
FTE	Full Time Employee
GTE	Group Technology Engineering
HAZOP	Hazard and Operability Study
ITP	Inspection And Test Plan
WULA	Integrated Water Use Licence Application
KKS	Kraftwerk Kennzeichen System
LDE	Lead Discipline Engineer
LPS	Low Pressure Services
MDL	Master Document List
OBL	Outside Battery Limits
OEM	Original Equipment Manufacturer
OHS	Occupational Health and Safety
PCM	Project Control Manual
PDD	Project Development Department
PDM	Project Design Manual
PEM	Project Engineering Manager
PM	Plant Maintenance
PPPFA	Preferential Procurement Policy Framework Act
RACI	Responsibility, Accountability, Consult and Inform
ROC	Requirements of capability
ROD	Record of Decision

SAT	Site acceptance test
SIT	Site integration test
SHE	Safety, Health & Environmental
SHEQ	Safety, Health, Environment, Quality
SPO	Smart Plant Enterprise for Owner Operators
SRD	Stakeholders Requirements Definition
URS	User Requirements Specifications
QCP	Quality Control Plan
WML	Waste Management Licence

The following definitions are used in the Works Information

Definition	Description
Availability	Indicates the percentage probability that a component or system is in the required operational state at a given time.
Calibration	A set of operations that establish the relationship between values of quantities indicated by a measuring instrument, and the corresponding values realized by standards.
Detail Design	Process to develop and issue Approved for Construction documents and drawings in accordance with the Design Base, including Quality Control, Quality Assurance, and Change Management.
Electronic load-cell scale	A mass meter of which the load transmitting device comprises or includes one or more load cells which measure the mass of a load and transmit the value thereof in the form of an electrical signal to a manually operated or self-indicating electronic measuring device which provides analogue or digital indication of the mass of the load.
Gross weight	Total weight without deductions.
Maintainability	The relative ease and economy of time with which a failed component or system can be restored to a specific condition when maintenance is performed.
Platform scale	A mass meter consisting of a load receptor in the form of a platform, a load transmitting device, and a load measuring and indicating device.
Pipework	Pipes and fittings used for the conveyance of fuel, water, gases or other fluids.
Reliability	The percentage probability that a component, system or process will function without failure as required, under stated conditions, for a stated period of time.
Stakeholder	Anyone that has an interest or is affected by the outcome of the project.
Supplier	A party whose business is to supply a particular service or commodity.
System	An integrated set of constituent pieces that are combined in an operational or support environment to accomplish a defined objective. These pieces include people, hardware, software, firmware, information, procedures, facilities, services and other support facets.
Tarpaulin	A waterproof fabric sheet used to cover the tip bin mounted on a truck's trailer.
Tare weight	The weight of an empty vehicle or container.
Truck(s)	Tandem Axle Side Tip Interlink Combination Truck.
Valve	A device for shutting-off or controlling the flow of a fluid through a pipe or duct.
Vehicle scale	A mass meter for the determination of the mass of road vehicles, with a load receptor in the form of a platform on which road vehicles may be moved for

	the measurement of their mass.
Verification	Means to certify the accuracy of any measuring instrument on the basis of any relevant measuring standard.
Weighbridge	A roadway mounted platform scale for weighing vehicles.

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

Normative

- [1] Occupational Health and Safety Act (Act 85 of 1993) with associated regulations
- [2] ISO 9001: Quality Management System Requirements
- [3] Occupational Health and Safety Management Systems Requirements (OHSAS 18001)
- [4] Standard Building Regulations, Preambles and SABS 1200 requirements.
- [5] UK chartered Institution of Building services Engineers Guidebook, CIBSE
- [6] BS 5720 British Standard: Code of practice for mechanical ventilation and air conditioning in buildings
- [7] BS 8233 British Standard: Code of practice for sound insulation and noise reduction in buildings
- [8] ASHRAE 15-2010 Safety Codes for mechanical refrigeration
- [9] ASHRAE 34-2010 Designation and safety classification of refrigerants
- [10] ASHRAE 62 Ventilation for acceptable indoor air quality
- [11] ASHRAE 55 Thermal environmental condition for human occupancy
- [12] ASHRAE 52/76 Standard test method
- [13] ASHRAE G1 Guideline for commissioning air conditioning systems
- [14] VGB-R 171e First Edition Guidelines for the supply of technical documentation for fossil-fired and regenerative power stations
- [15] 200-11303 - Medupi Occupational Health, Safety and Management Policy [16] The National Water Act (Act No. 36 of 1998).
- [17] The Environmental Conservation Act (Act No 73 of 1989).
- [18] Government Notice 704, National Water Act 1998.
- [19] PAM/244/001 Management of Maintenance Waste to Minimise Environmental Impact
- [20] 32-245 - Eskom Waste Management Standard
- [21] 32-421 - Eskom Life Saving Rules
- [22] 36-681 - Eskom Plant Safety Regulations
- [23] 240-60490979 - OHS Operational Plan
- [24] 200-1679 - Project Quality Plan
- [25] 200-1689 - Medupi Quality Specifications
- [26] 200-45965 - Manufacturing Inspection and Testing

- [27] 200-46362 - Site Inspections Procedure
- [28] 200-129834 Storage and Preservation
- [29] 200-1680 - Document and Record Management Procedure
- [30] 200-53810 - Documentation Handover List
- [31] 240-86973501 - Engineering Drawing Standards
- [32] 240-61227631 - Piping and Instrumentation Diagram (P&ID) Standard
- [33] 200-42385 MDL Management Procedure [34] 200-5667 Control of Drawings Procedure
- [35] 200-64539 Documentation Format and Layout Specification
- [36] ISO 10007 Guidelines for Configuration Management
- [37] KKS Key Part - Fossil power station (NPSZ 45-45) - 200-18202
- [38] The application of KKS plant coding (NMP 45-7) - 200-4190
- [39] 36-776 Rev 0 Environmental Conditions For Process Control Electronic Equipment Used At Power Stations (GGS 1426 Rev 0)
- [40] 240-102547991 General Technical Specifications for HVAC Systems Standard.
- [41] Medupi Weigh Bridge Control Room And Gate House HVAC Installation Specification And BOQ Rev200-3340, Medupi Label Specification
- [42] 200-5343, Medupi Power Station Project Standard Abbreviation
- [43] 36-817 Eskom Ups Standard
- [44] 240-54179170, Technology Documentation Classification And Designation Standard
- [45] 200-5664, Medupi Change Management Procedure
- [46] 200-71827, (EED_GTD_C&I_006), Alarm Management System Guideline
- [47] 240-56737448, Fire Detection And Life Safety Design Standard
- [48] 240-54937450, Fire Protection & Life Safety Design Standard
- [49] 200200-26680, Medupi Power Station Architectural Technical Specifications For Structures And Other Buildings
- [50] 200-24289 (Ssz_45-17), Medupi Power Station Corrosion Protection Specification
- [51] 200-3583, The Identification Of The Contents Of Pipelines and Vessels
- [52] 200-64539, Documentation Format and Layout Specification
- [53] 200-94660 - Issuing of KKS certificate
- [54] 200-3340 - Medupi Label specification
- [55] 200-5343 - Employer's abbreviation standard
- [56] 200-5664 - Medupi ECM Procedure
- [57] 200-11757, Earthing and Lightning Protection Standard
- [58] 200-11768, Medupi Power Station Cable and Racking Standard
- [59] 200-71827 EED_GTD_C&I_006 Rev 0 Alarm Management System Guideline
- [60] GGS 0456 Rev 4. Specification for LV Switchgear And Control Gear Assemblies and Associated Equipment For Voltages Up To And Including 1000 V Ac And 1500 V DC

- [61] ESKSCAAC6 Rev 0. Specification for the Identification of the Contents of Pipelines and Vessels.
- [62] 240-56227443, Requirements for Control and Power Cables For Power Stations
- [63] 240-56355754, Field Instrument Installation Standard
- [64] 240-56355815, Junction Boxes And Cable Termination Standard
- [65] 240-56355789, Flow Measurement Systems Installation Standard
- [66] 240-56355843, Pressure Measurement Systems Installation Standard
- [67] 240-56355888, Temperature Measurement Systems Installation Standard
- [68] GGS1427, Impulse Piping
- [69] PPZ 200 -16714, Commissioning and Completion Of Medupi Power Station
- [70] 240-531136850 - Eskom Design Review procedure
- [71] 200-16817 - Excavation Permit Application Procedure
- [72] 200 16714 - Medupi Commissioning procedure
- [73] 200-15406 - Issue Takeover Certificate
- [74] SANS 10108 - The Classification of Hazardous Locations and Selection of Equipment for Use in Such Locations
- [75] 240-56536505 - Hazardous Location Standard
- [76] 240-106628253 - Standard for Welding Requirement on Eskom plant
- [77] 240-54937450 - Fire Protection & Life Safety Design Standard
- [78] 240-56356376 - Site commissioning for low pressure services
- [79] 200-11757 - Medupi Power Station Earthing and Lightning Protection Standard
- [80] 240-55714363 - Coal-Fired Power Stations Lighting and Small Power Installation Standard
- [81] 200-11768 - Medupi power Station cabling and racking standard
- [82] 200-38425 - Procedure for Hazard Identification and Risk Assessment
- [83] 240 54937439 - Fire Protection/Detection Assessment Standard
- [84] 240-49230030 - Reliability Engineering Analysis Guideline
- [85] 240-49230046 - Failure Mode and Effect Analysis (FMEA) Guideline
- [86] 240-49230067 - Life Data Analysis Guideline
- [87] 240-49230100 - Safety Engineering Analysis Guideline
- [88] 240-49230111 - Hazard and Operability Analysis (HAZOP) Guideline
- [89] 240-49910508 - Environmental Analysis Guideline
- [90] 240-50056004 - Constructability Analysis Guideline
- [91] 240-56364545 - Structural Design and Engineering Standard
- [92] 240-84418186 - Road Specification Manual
- [93] 240-57127955 - Standard for Design of Drainage and Sewerage Infrastructure
- [94] 240-57127955 - Geotechnical and Foundation Engineering Standard
- [95] SANS 10144 - Detailing of reinforcement for concrete
- [96] SANS 10102 - 1 The selection of pipes for buried pipelines Part 1: General provisions

- [97] SANS 10102 - 2 The selection of pipes for buried pipelines Part 2: Rigid pipes
- [98] SANS 1024 - Welded steel fabric for reinforcement of concrete
- [99] SANS 10400 - All Parts National Building regulations
- [100] SANS 10400 - The application of the National Building Regulations
- [101] SANS 1115 - Cast iron gratings for gullies and storm water drains
- [102] SANS 1123 - Pipe flanges
- [103] SANS 1200 A - Standardized specification for civil engineering construction Section A: General
- [104] SANS 1200 DA - Standardized specification for civil engineering construction Section DA: Earthworks (small works)
- [105] SANS 1200 DE - Standardized specification for civil engineering construction Section DE: Small earth dams
- [106] SANS 1200 DB - Standardized specification for civil engineering construction Section DB: Earthworks (pipe trenches)
- [107] SANS 1200 DK - Standardized specification for civil engineering construction Section DK: Gabions and pitching
- [108] SANS 1200 LB - Standardized specification for civil engineering construction Section LB: Bedding (pipes)
- [109] SANS 1601 - Structured wall pipes and fittings of unplasticized poly(vinyl chloride) (PVC-U) for buried drainage and sewerage systems
- [110] SANS 1200 LE - Standardized specification for civil engineering construction Section LE: Storm water drainage
- [111] SANS 2001-CC1 - Construction works Part CC1: Concrete works (structural)
- [112] SANS 2001-CM1 - Construction works Part CM1: Masonry walling
- [113] SANS 2001-CM2 - Construction works Part CM2: Strip footings, pad footings and slab-on-the-ground foundations for masonry walling
- [114] SANS 285 - Calcium silicate masonry units
- [115] SANS 2001-DP1 - Construction works Part DP1: Earthworks for buried pipelines and prefabricated culverts
- [116] SANS 2001-DP4 - Construction works Part DP5: Sewers
- [117] SANS 2001-DP5 - Construction works Part DP5: Storm water drainage
- [118] SANS 2001-CS1 Construction works
- [119] SANS 207 - The design & construction of reinforced soils & fills
- [120] SANS 282 - Bending dimensions and scheduling of steel reinforcement for concrete
- [121] SANS 5863 - Concrete tests - Compressive strength of hardened concrete
- [122] SANS 227 - Burnt clay masonry units
- [123] SANS 10021 - The waterproofing of buildings (including damp-proofing and vapour barrier installation)
- [124] SANS 62 - Steel pipes Part 1 &2
- [125] SANS 8870 - Drainage Pipework
- [126] SANS 8872 - Drainage Pipework

- [127] SANS 920 - Steel bars for concrete reinforcement
- [128] SANS 10162-1-The structural use of steel Part 1: Limit-states design of hot-rolled steelwork
- [129] SANS 10162-2 - The structural use of steel Part 2: Cold-formed steel structures
- [130] SANS 1700-16-2 - Fasteners Part 16: Washers Section 2
- [131] SANS 1700-16-3 - Fasteners Part 16: Washers Section 3: Plain washers chamfered
- [132] SANS 121 - Hot dip galvanized coatings on fabricated iron and steel articles
- [133] SANS 10102-1 The selection of pipes for buried pipelines Part 1: General provisions
- [134] SANS 10102-2 Selection of pipes for buried pipelines Part 2: Rigid pipes
- [135] SANS 986 Precast reinforced concrete culverts
- [136] SANS 927 Precast concrete kerbs, edgings and channels
- [137] SANS 824 Lime for soil stabilization
- [138] SANS 50197-1 Cement Part 1: Composition, specifications and conformity criteria for common cements
- [139] SANS 1058 Concrete paving blocks
- [140] SANS 1350 Guardrails for roads (W-section)
- [141] SANS 457 Wooden poles, droppers, guardrail posts and spacer blocks
- [142] SANS 10005 The preservative treatment of timber
- [143] SANS 538 High temperature wood-preserving creosote
- [144] SANS 539 Wood-preserving creosote
- [145] SANS 1519 Road signs
- [146] SANS 731-1 Road markings
- [147] SANS 2001-BE1 Construction works Part BE1: Earthworks (general)
- [148] SANS 1200 M Standardized specification for civil engineering construction Section M
- [149] SANS 60079-part 15 Electrical apparatus for explosive gas atmosphere
- [150] SANS 1507 Electrical Cables
- [151] SANS 60439 Low-voltage switchgear and control gear assemblies
- [152] SANS 0142-1 Standard Regulations for Wiring of Premises
- [153] SANS 101003 - 2004 Noise level
- [154] SABS 1424 Filters used in air conditioning and general ventilation
- [155] SABS 1238 1979 "Standard Specification for Air Conditioning Ductwork
- [156] SABS 0173 1980 "Code of Practice for the Installation, Testing and Balancing of Air Conditioning Ductwork".
- [157] SANS 60079-part 15 Electrical apparatus for explosive gas atmosphere
- [158] SANS 0108-1974 Classification of hazardous locations
- [159] SANS 10160-4 - Basis of structural design and actions for buildings and industrial structures Part 4: Seismic actions and general requirements for buildings
- [160] EN 1998-1 : Eurocode 8: Design of structures for earthquake resistance – Part 1:General rules, seismic actions and rules for buildings

- [161] 200-3583 Specification for the Identification of the Contents of Pipelines and Vessels
- [162] 200-6166 Eskom backfill specification
- [163] SSZ_45-17 - Medupi Power Station Corrosion Protection Specification
- [164] 84CIVL053 - Medupi Power Station Specification for Structural Concrete [164] 200-466984 - CIVL031 General Fence Specification
- [165] IEC 61511: Functional Safety - Safety Instrumented Systems for the Process Industry Sector
- [166] IEC 61508: Functional Safety of Electrical/Electronic/Programmable Electronic Safety Related Systems
- [167] IEC IEC 62381 Automation systems in the process industry - Factory acceptance test (FAT), site acceptance test (SAT), and site integration test (SIT)
- [168] 240-56356396 Earthing Standard
- [169] 240-56227443 Requirements For Control And Power Cables For Power Stations
- [170] 200-11768 Station Cabling and Racking standard
- [171] SANS 60794-1-1 Optical fibre cables - Part 1-1: Generic specification - Genera
- [172] SANS 61312 Protection against lightning electromagnetic impulse
- [173] ANSI/TIA-942-A: Telecommunication infrastructure standard for data centres
- [174] ANSI/TIA 568: Telecommunication cabling generic standard and component (fibre optic and twisted pair cabling) specific standards
- [175] ANSI/TIA 569: Communication pathways and spaces (racking, trunking) standard
- [176] ANSI/TIA 607: Grounding and bonding of communication cabling standard
- [177] SANS, relevant and applicable
- [178] Regulatory and legislative requirements (relevant and applicable)
- [179] National Building Regulations
- [180] SANS 10400

The following roles and responsibilities apply:

Appendix A Person	Appendix B Responsibility
Appendix CApproved Appendix DInspection Appendix EAuthority (AIA)	Appendix FThe AIA is an external agent representing the Department of Labour (Pressure Equipment and Regulations), responsible for reviewing designs of all critical plant areas and ensuring compliance to government construction code.
Appendix GContractor	Appendix HThe <i>Contractor</i> shall design , execute and complete the Works in accordance with the Contract and with the Designers' instructions, and shall remedy any defects in the Works.
Appendix IEngineering Appendix JDesign Work Appendix KLead (EDWL)	Appendix LHe/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.

Appendix MLead Appendix NDiscipline Appendix OEngineer (LDE)	Appendix PThe 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
Appendix QSite Appendix RConstruction Appendix SEngineering Appendix TPractitioner	Appendix UThe Site Construction Engineering role is part of the project engineering team and participates in conjunction with other team members of all disciplines in order to assure the technical integrity of a fully functional and operational plant that meets the user requirement and Eskom Engineering expectations and requirements. Appendix VThe role provides an assurance function. Appendix WQuality inspections, Final acceptance, sign-off and approval
Appendix XQuality Appendix YManagement	Appendix ZQuality ensures Contractor s build plant according to contractual specifications, and user requirements and codes. Quality is the custodian of the Quality Management System and quality records, and facilitates the work of the Approved Inspection Appendix AAAuthority (AIA). The Quality Function's responsibility is to ensure Contractor s have a sound quality system in place. Quality checks these systems on behalf of the Employer.

2 Management and start up.

2.1 Management meetings

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

Title and purpose	Approximate time & interval	Location	Attendance by:
Site and Technical Meeting	Weekly	Venue determined by the <i>Project Manager</i>	<i>Employer, Contractor, Supervisor, and Others as determined by the Project Manager</i>
Progress Meetings	Weekly	Venue determined by the <i>Project Manager</i>	<i>Employer, Contractor, Supervisor, and Others as determined by the Project Manager</i>
Planning Meetings (including integration meetings with Others)	Ad-hoc	Venue determined by the <i>Project Manager</i>	<i>Employer, Contractor, Supervisor, Planners and Others as determined by the Project Manager</i>
Safety Meetings	Monthly	Venue determined by the <i>Project Manager</i>	<i>Employer, Contractor, Supervisor, Safety Officers and Others as determined by the Project Manager</i>
Payment Assessment Meeting	Monthly - 20th of every month	Venue determined by the <i>Project Manager</i>	<i>Employer, Contractor, Supervisor, Quantity Supervisors and Others as determined by the Project Manager</i>

Title and purpose	Approximate time & interval	Location	Attendance by:
Quality and Engineering Meeting	Monthly or as determined by <i>Project Manager</i>	Venue determined by the <i>Project Manager</i>	<i>Employer, Contractor, Supervisor Safety Officers and Others as determined by the Project Manager</i>

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

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

2.2 Documentation control

2.2.1 Documentation to be Provided by the Employer

The Contractor will be provided with one signed copy of the Contract, which includes contract agreement with the documents which would make up the Contract as identified in the form of agreement.

2.2.2 Document Identification

All documents issued shall be numbered, dated and registered on the project document management system, maintained by the Contractor and conforming to the Contractor's Quality Management Plan. The documents shall be available at the recorded locations as noted in the document management system.

All documents supplied by the Contractor are subject to the Employer's acceptance. The Contractor includes the Employer's drawing number in the drawing title block. This requirement only applies to design drawings developed by the Contractor and his Subcontractors. Drawing numbers are assigned by the Employer as drawings are developed. The Contractor shall establish a document tracking system to record the dates for the supply and receipt of all design drawings, calculations and requests for information. The Contractor will be issued with a series of project drawing numbers which shall apply to all drawings including those from Subcontractors. These numbers will then be used for reference throughout the project.

2.2.3 Document Submission

Within three (3) weeks of the starting date, the Contractor complies with the Vendor Document Submittal Schedule regarding documentation submission.

All project documents must (electronic and hard copies) be submitted to the Project Manager using a Transmittal Note and shall comply with the Project / Plant Specific Technical Documents and Records Management Work Instruction (240-76992014).

2.2.4 Email Subject

The email subject shall as a minimum have the following:
(Project Name_Discipline_Subject)

The *Contractor* shall submit documentation to the Eskom Representative as well as the Project's Documentation Centre in the following media:

1. Electronic copies shall be submitted to Eskom Documentation Centre through generic email address as specified in Controlled of Drawings Procedure. Electronic copies too large for email shall be delivered on CD/DVD, large file transfer protocol and/or hard drives to the Project Documentation Centre. A notification email, with the transmittal note attached, shall be sent to the project generic email address. The Representative shall be copied on the email as well.
2. Hard copies shall be submitted to the Eskom Representative accompanied by the Transmittal Note.
3. The format of the final documentation handover shall be specified in the Vendor Document Submittal Schedule.

2.2.5 Electronic Data Control

The Contractor shall carry out a daily backup of all electronic information contained on his computer system. Electronic backup information shall be kept in an appropriate format, suitably labelled, segregated and stored in an environment that will not adversely affect its condition.

2.2.6 Incoming and Outgoing Correspondence

The Contractor shall number and date all incoming and outgoing correspondence as per agreed communication matrix.

2.2.7 Daily Records

The Contractor must keep daily records of daily diaries for work performed and submit them to the Supervisor on a daily basis.

2.2.8 Drawings Format and Layout

The creation, issuing and control of all Engineering Drawings shall comply with the Engineering drawing Standard, 240-86973501. As a minimum, the Contractor shall submit to the Project Manager one hardcopy and an electronic copy and drawings may not be "Right Protected" or encrypted.

The Contractor submits the Master Document List to the Employer on a monthly basis for tracking purposes irrespective of whether there are updates or not. The MDL includes list of drawings and documents and contains the following minimum information for each document:

- Date of submission
- Transmittal number
- Transmittal title
- Document description
- Document number
- Document Type
- Revision number
- Document Approval Status
- Document Authorisation Status (i.e. Accepted With Comments, Not Accepted with Comments, Accepted)

2.2.8.1 Documentation Review and Turn-around

The *Employer* has a minimum 14 calendar days to review and consolidate review comments for documentation submitted by the *Contractor*. The *Contractor* also has a minimum 14 calendar days to respond and / rectify as per the comments by the Employer.

2.2.9 Drawings Format and Layout

The creation, issuing and control of all Engineering Drawings will be in accordance to the latest revision of 36-943 (Engineering Drawing Office and Engineering Documentation Standard) and 36-945 and 36-946 (associated Work Instructions) to be supplied as part of the enquiry documents. Drawings issued to the *Employer* will be a minimum of one hardcopy and an electronic copy. All *Contractors* are required to submit electronic drawings in Micro Station (DGN) format, and scanned drawings in pdf format. No drawings in TIFF, AUTOCAD or any other electronic format will be accepted. Drawings issued to Eskom may not be "Right Protected" or encrypted. (240-86973501) The Employer reserves the right to use these drawings to meet its other contractual obligations

2.2.10 Plant Identification

2.2.10.1 Plant Coding Allocation

Coding of the design will be based on the KKS coding system and the *Employer* will undertake the coding in line with its standards. The KKS coding shall be applied during the design review stage(s) and cross referenced to all arrangement drawings, schematics, wiring diagrams, instructions and manuals and where practical to spare parts list/manuals. The *Contractor* will be required to include allocated coding to the electronic design drawings. Latest Eskom KKS coding standard to be included.

2.2.10.2 Plant Labelling

The *Contractor* will also manufacture and install KKS labels to identified plant items as per list supplied by the *Employer*. Labels will be manufactured and installed according to the *Employer's* KKS Plant Labelling and Equipment Descriptions Standard. The labeling standard will be supplied as part of the enquiry documents.

2.2.11 Configuration change control

Any changes to the design baselines will be formally managed according to the Eskom Project Engineering Change Procedure (240-53114026). All design reviews will be conducted according to the Design Review Procedure (240-53113685).

2.3 Health and safety risk management

2.3.1 General

In carrying out its obligations to the *Employer* in terms of this contract, which obligations include, amongst others, providing the *works*; using Plant, Materials and Equipment; and whilst at the site for any reason, the *Contractor* is the “*Employer*” in terms of the Occupational Health and Safety Act, No. 85 of 1993, in respect of its activities and in relation to its employees, agents, Subcontractor/s and mandatories.

The *Contractor* does not consider itself under the supervision or management of the *Employer* with regard to compliance with the Safety Health and Environmental requirements.

Furthermore, the *Contractor* does not consider himself to be a subordinate or under the supervision of the *Project Manager* in respect of these matters. The *Contractor* is responsible for the supervision of its employees, agents, Subcontractors and mandatories and takes full responsibility and accountability for ensuring that they are competent, aware of the Safety Health and Environmental requirements, whilst executing the *works* in accordance with the Safety Health and Environmental requirements.

The *Contractor* ensures compliance with, amongst others:

- a) The provisions of the Occupational Health and Safety Act, No. 85 of 1993 and all applicable regulations (as amended), binding in terms thereof;
- b) The latest versions of standards, procedures, specifications, rules, systems of work and requirements of the *Employer*, copies of which will be provided to the *Contractor* on request. Refer to Section 6.
- c) The Health and Safety Plan prepared by the Contractor in accordance with the Employer’s Safety Health and Environmental Specification – 240-127760320 and requirements.
- d) The provisions of the National Environmental Management Act (as amended) and all regulations in force from time to time in terms of that Act, including Record of Decisions, Medupi Environmental Programme for the Emergency Coal Handling at Silo 10 & 30, Construction of access Roads and Conveyor Systems, Medupi Waste Management Procedure – 240-101861550, Medupi Environmental Non-conformances, corrective and preventive measures and all applicable environmental legislations.
- e) Conduct OHS work stoppages to address poor safety performance and not claim for standing time but carry the cost from their site.

(The documentation referred to in paragraphs 2.3.1 (a) (b) (c) and (d) are collectively referred to as the Safety Health and Environmental requirements and forms a part of the contract Works Information.)

The *Contractor* ensures that its employees, agents, Subcontractors and mandatories comply with the provisions of the Occupational Health and Safety Act, No. 85 of 1993, and all applicable regulations binding in terms thereof as well as the *Employer’s* Safety Health and Environmental Specification whilst making use of plant, materials and equipment and whilst at the Site for any reason whatsoever.

The *Contractor* implements a comprehensive health and safety management system, based on the ISO 45001:2018 requirements for utilisation at the project.

The *Contractor* appoints a person, qualified and competent in accordance with the safety health and environmental requirements, as the liaison with the *Employer's* Project Safety, Health and Environment Manager/Officer or delegated person for all such matters as pertaining related to safety, health and the environment. The *Contractor* shall ensure that such a person is contactable 24 hours a day, and is registered with a registered professional council approved by the Principal Director of the Department of Labour, as per the requirements of the latest Construction Regulations, inclusive of all exemptions and amendments pertaining thereto.

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 mandatories to comply with their obligations, and/or the failure of the *Employer* to procure the compliance by the *Contractor*, its employees, agents, Subcontractors and/or mandatories with their responsibilities and/or obligations in terms of or arising from the Occupational Health and Safety Act, No. 85 of 1993.

2.3.2 Mandatory Agreements

The *Contractor* confirms that:

- a. In terms of sections 37(1) and 37(2) of the OHSA, the *Employer* is relieved of any and all of its responsibilities and liabilities pertaining to the activities performed by the *Contractor* (and its employees, agents, Subcontractors and mandatories) relating to the *works*; the use of plant, materials and equipment; and whilst at the Site for whatsoever reason.
- b. The *Contractor* confirms that, in terms of the Construction Regulations, regulation 6, it is hereby mandated as the designer and must perform all duties required of a designer. (This will be applicable only where the *Contractor* is required to do design work as part of their Scope).

The *Contractor* confirms that he has been provided with sufficient information regarding the health and safety arrangements applicable to the *works*; the use of Plant, Materials and Equipment, as well as at the Site.

In addition, the *Contractor* shall ensure that:

- c. Prior to the *Contractor* commencing with any operations/ activities relating to the *works* and/or prior to gaining access to the Site, the *Contractor* concludes a written mandatory agreement with the *Employer* in terms of section 37(2) of the OHSA and 5(1)(k) under the construction regulations. The aforementioned agreement constitutes a record of the written arrangements and procedures between the *Contractor* and *Employer* regarding health and safety.
- d. As far as is reasonably practicable, the safety and absence of risks to health in connection with the production, processing, use, handling, storage or transport of articles or substances is maintained;

- e. As far as is reasonably practicable, all hazards pertaining to the health and safety of persons and harm to the environment that are attached to any work which is performed, any article or substance which is produced, processed, used, handled, stored or transported and any plant or machinery which is used in its business, is clearly identified and, as far as is reasonably practicable, further establishes what precautionary measures should be taken with respect to such work, article, substance, plant or machinery in order to protect the health and safety of persons and or harm to the environment, and provides the necessary means to apply such precautionary measures;
- f. Such information, instructions, training and supervision as may be necessary to ensure, as far as is reasonably practicable, the health and safety at work of its employees, agents, Subcontractors and mandatories is provided;
- g. As far as is reasonably practicable, no employee, agent, Subcontractor and mandatory performs any work or produces, processes, uses, handles, stores or transports any article or substance or operates any plant or machinery, unless the precautionary measures contemplated in paragraph 2.3.3, or any other precautionary measures which may be prescribed have been taken;
- h. Such measures as may be necessary in the interest of health and safety and the environment are enforced;
- i. Work is performed and that plant, materials or equipment is used under the direct supervision of a person trained to understand the hazards associated with it and who has the authority to ensure that precautionary measures required by the *Employer* are implemented; and
- j. All employees are informed of the scope of their authority as contemplated in OHSA.

2.3.3 Health and Safety Obligations

The contractor shall at all times comply with the Eskom's Medupi Power station Occupational Health and Safety (OHS), legal and other requirements as amended for the duration of the contract. In addition, the contractor shall comply with the requirements contained in the OHS Specification/requirements. Medupi power station reserves the right to terminate the contract, if the contractor/supplier has built up a history of poor performance or non-conformance in relation to matters of occupational health and safety and legal compliance. **No work may begin until the Health and Safety file has been approved by the individual Business Unit's OHS personnel. For the length of the contract, the contractor shall adhere to the respective Business Unit's OHS, legal, and other requirements, as amended.**

In addition to the mandatory agreements, the *Contractor*:

- a. Ensures that all statutory appointments (as required in terms of the Occupational Health and Safety Act, No. 85 of 1993 and all applicable regulations binding in terms thereof, as amended) and other appointments required in terms of the *Employer's* Safety Health and Environmental Specification – 240-127760320 and Contracts and Contractor Management Standard (32-726)

are in place and that all appointees are cognisant of their duties and responsibilities in terms of such appointments;

- b. Ensures that such appointees execute their duties and responsibilities as required by such an appointment.
- c. Ensures that all personnel brought by itself onto site (including employees of *Contractors* and Subcontractors) are suitably qualified and trained for the performance of the task, duties and functions, which will be allocated to them;
- d. Immediately reports any occupational or other injuries, near miss events, property damage, environmental related incidents as well as any potential threat to the health and safety of individuals at the *works* or on the site, as soon as he becomes aware thereof, to the *Project Manager*;
- e. Complies with the *Employer's* Environmental, Occupational Health & Safety Incident Management Procedure - 32-95, relating to the reporting and investigation of incidents. The classification of incidents contained in such document are considered final and must be applied by the *Contractor* relating to any incidents/ injuries relating to its employees, agents, *Contractors*, Subcontractors and mandatories whilst on Site;
- f. Conducts a risk assessment regarding the utilisation of PPE and thereafter ensure that PPE of good quality is issued (at its own cost) to its employees, agents, *Contractors*, Subcontractors and mandatories prior to such individuals accessing the site, alternatively performing activities related to the *works* at the site, as specified in the Eskom PPE Specification - 240-44175132.
- g. **Contractors are required to conduct the following as part of the continuous improvement initiatives:**
 - Visible Felt Leadership by top management
 - Identify critical tasks and monitor those tasks through Planned Job Observations
 - Behavioural based safety, if the contractor does not have its own procedure, Eskom procedure can be used as a guide
 - Contractor 16.1 shall present the lost time injury (LTI) incidents at Medupi Power station General Managers meeting within 7 days of the incident.
- h. **Contractor management key performance indicators**
 - Maintain Health and Safety file and compliance to the health and safety plan
 - Always maintain good housekeeping
 - Implement and monitor near miss programme.
 - Comply to BSO, Visible Felt Leadership and Planned Job Observation programmes
 - Zero Fatalities
 - At any given point, the OHS performance must be within the lost time injury (LTI) tolerance level as amended.

- All incident investigations shall be completed within 30 days of the occurrence of an incident.
 - Close audit findings as per the recommended time frames
 - Close Non-conformance as per the recommended time frames
- i. On completion of the project, Eskom team (led by the Contract custodian/ Project Manager) involved in the project together with the contractor shall conduct the final audit/inspections to identify the gaps prior to the contractor leaving site or completing the project. Before the final invoice is paid/processed, the Contract custodian/Project Manager shall ensure that the below requirements are met:
- Close all incidents and audit findings.
 - Clean the respective yard and ensure good housekeeping where the contractor was working.
 - Contractor shall submit safety statistics and a safety file to Eskom BU Safety department for closeout and filling.
 - Completion of a closeout report (Annexure D form as per 32-726) to close the contractual work

2.3.4 Radiographic Examinations

If radiographic tests are carried out in the plant, the danger area must be evacuated with the exception only of authorised radiographic workers, and thereafter barricaded. Compliance is according to Regulatory, Eskom's Safety Health and Environmental Specification – 240-127760320 and Medupi Power Station, Site regulations number 16 for use, conveyance and storage of Radioactive sources; document identifier – Site Regulations 16 No persons will be allowed gate access if the Medupi Power Station Procedure is not followed. The transportation of density tests should be fully complied with before access will be granted into Medupi Power Station.

In advance arrangements needs to be made with GCD, SHE Practitioner for the RPO of Medupi Power Station to be available for testing and authorizing entrance into Medupi Power Station.

The relevant warning signs should be visible on all the vehicles that is transporting radio-active source even density tests on and off site. The relevant warning signs at the lockout gates are bolt secured and not by wire or any other means, which could be removed while radiographic tests are in progress. The area is barricaded and access is restricted until the radiographic process is complete. The radiographic technicians ensure that all the lockout gates are opened on completion of the tests.

2.3.5 Fire Protection

The *Contractor* ensures that adequate fire fighting apparatus is provided at all his work sites, and that his staff and sub-contractors are trained in the use of this apparatus.

Precautions are taken to prevent any occurrence of fires or explosions while carrying out any work near flammable gas and liquid systems.

Any tampering with the *Employer's* Fire Equipment is strictly forbidden. All exit doors, fire escape routes, walkways, stairways and stair landings are kept free of obstruction, and not be used for work or storage at any time. Firefighting equipment remains accessible at all times.

2.4 Environmental constraints and management

The *Contractor* provides an Environmental Management Plan applicable during installation and maintenance of *works*. The plan provides a guideline on the environmental management of the handling of the *works*. All waste will be handled in an environmentally friendly manner. The *Contractor* conforms to the “polluter pays principle”, duty of care and other NEMA principles.

The *Contractor* conforms to all requirements dictated in the document “Environmental Management Programme for the Emergency Coal Handling at Silo 10 & 30; Construction of Access Roads and Conveyor Systems”. Medupi Waste Management Procedure – 240-101861550, Medupi Environmental Non-conformances, corrective and preventive measures as well as the National Environmental Management Act (NEMA, Act No. 107 of 1998) and the National Environmental Management Waste Act (NEMWA, Act No. 59 of 2008).. This is achieved by undertaking inspections, audits, monitoring and reviews, conducted internally by the *Contractor* and externally by the *Project Manager*.

The *Contractor* ensures that all environmental authorization obligations, applicable legislative requirements and *Employer's* specific requirements are fulfilled. This includes all national, provincial and local environmental legislation and requirements.

The *Contractor* issues on a weekly and monthly basis, Environmental Management Performance and Expenditure Reports to the *Project Manager*.

The *Contractor* conducts their environmental management based on the ISO 14001:2004 requirements and implement their environmental management practices accordingly.

The *Contractor* develops and implements as a minimum the following requirements:

1. ENVIRONMENTAL MANAGEMENT SYSTEM (ISO 14001: 2015)

- Environmental Policy
- Objectives and Targets

- Roles and Responsibilities
- Communication
- Internal Audits
- Emergency Preparedness (Environmental related emergencies)
- Monitoring, measurement, and evaluation of compliance
- Non-Conformance, Corrective action, and preventive action
- Management Review
- Aspects and Impacts Register

2. ENVIRONMENTAL MANAGEMENT PLAN

- Handling of Hazardous Chemical Substances
- Site Establishment
- Water Management
- Access Control
- Environmental Human Resources
- Environmental Training
- Environmental Incident Reporting
- Compliance to Other Legal Requirements

3. WASTE MANAGEMENT PLAN

- Procedure/method statement submitted
- Register of possible waste to be generated by the project
- Waste segregation
- Waste minimization
- Records of waste quantities disposed (Template)
- Legislation requirements

All environmental procedures, as listed above, shall be site-specific and submitted to the *Employer* for acceptance by the *Project Manager* before the commencement of construction activities.

The *Employer* will provide a copy of the environmental authorisation and Environmental Management Plan to the contractor for the drafting of the above procedures.

2.4.1 Waste Management

All waste management activities, which includes procurement of control measures, handling and disposal or processing of all waste forms generated on the *Contractor's* site, are conducted according to Gx Medupi PS Waste Management Plan – 240-101861550, and all requirements of the Employer as per the Environmental Management Programme for the Emergency Coal Handling at Silo 10 & 30, Construction of Access roads and Conveyor Systems. All costs associated with waste management are the responsibility of the *Contractor*.

All demolished concrete is treated as Hazardous waste and disposal to be disposed of at a licensed Hazardous Waste Site, and safety disposal certificates are kept for record purposes.

2.4.2 Spill Management

The *Contractor*, at his cost, has available spill control measures (spill kits, drip trays, etc.), to the satisfaction of the *Employer*. All hazardous wastes generated from a spill are disposed of at a licensed disposal facility, at the cost of the *Contractor*, and safety disposal certificates are kept for record purposes.

2.4.3 Dust and Storm-water Management

The *Contractor* implements dust control measures for the project. The *Contractor* ensures that no ponding of storm water occurs on the site and shall establish good storm-water. The *Contractor* is responsible for ensuring that no dust emanates from construction activities by conducting dust suppression daily.

2.4.4 Signage

The *Contractor* supplies and installs all Safety, Environmental, Fire and Waste Management signage at the Ash Dump Facility and the surrounding areas. Signage shall be manufactured and installed in accordance with the applicable Eskom standard. Signage shall be appropriately located to prevent unauthorised access and to indicate safety precautions.

2.4.5 Environmental Rehabilitation

The *Contractor* rehabilitates both its lay-down and construction site at the end of the project. The rehabilitation is done in accordance with the Gx Coal Area 1 Environmental Rehabilitation Plan - 240- 100259162, as provided by the *Employer*. The *Contractor* submits to the *Project Manager* a rehabilitation plan and schedule at least 2 weeks before finalisation of the *works* for approval by the *Project Manager*. All rehabilitation costs are the responsibility of the *Contractor*.

2.5 Quality assurance requirements

2.5.1 General

The *Contractor* complies with the *Employer's* Quality Requirements Standards.

- a) The *Contractor* and all Subcontractors comply with the *Employer's* quality requirements including those listed in the *Employers* specification document, (240-105658000)
- b) The contractor and sub-contractor shall develop, implement and maintain a formal quality management system that conforms to the latest ISO 9001 standard this includes but is not limited to providing an ISO 9001:2015 certificate which is a mandatory requirement for this contract. The

Contractor uses the QMS for all phases of the Project. The Contractor provides evidence of a fully implemented QMS within its own organisation. The Employer may, at his sole discretion, carry out an audit on the Contractor or Subcontractor's QMS for acceptance.

- c) On-site assessment for the contractor can be performed by the Employer's Quality department if required, to establish whether the submitted documentation/ requirements are the true reflection of the QMS on site.

2.5.2 Quality Management Documents Requirements

The *Contractor* shall be certified and demonstrate compliance to the latest version of the ISO 9001 Quality Management Systems standard.

The *Contractor* shall implement the requirements of the latest revision of the Medupi Quality Specification and have the following documented information as a minimum:

- Quality Policy
- Project Quality Plan
- Operational procedures
- Inspection and test plans, method statements, work instructions, control of nonconformity, corrective action, risk management, etc.)

DATA BOOKS

The *Contractor* shall develop and implement a system for collation or quality verification records, including change management records, design review management records, Manufacturing, Construction and Commissioning Record Books (Data Books) as specified in the Medupi Quality Specification.

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:

1. Quality Management documentation as specified in the Medupi Quality Specification
2. Safety clearances (to be granted prior commissioning)
3. Construction, layout and component approvals
4. Routine test certificates
5. Construction and as-built drawings and approvals
6. Statutory certification
7. Data Books (Record Books)

The data books shall be reviewed by the employer for 10%, 30%, 50%, 70% and 100%.

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, designs, construction and commissioning data books shall be completed and approved and handed over to the *Employer*.

2.5.3 Quality Control Plan or Inspection and Test Plan

As defined in the approved CQP the *Contractor* drafts and submits to the *Project Manager* for acceptance, prior to the commencement of any works, the requisite Inspection and Test Plan (ITP) or Quality Control Plan (QCP). The ITP/QCP shows each activity from the Works Information. The *Project Manager* inserts intervention points based on the risk profile of the equipment.

- a) The interventions points include all witness, hold, verification, surveillances and review points required by the *Project Manager*. The *Contractor's* failure to allow the intervention points will constitute a non-conformance.
- b) The intervention requirements take into consideration the criticality of the Plant and Materials.
- c) Where intervention points have been bypassed without prior written waiver from the *Project Manager*, result in the repeat performance of the activity in question and a Non-conformance (NC) is issued.

2.5.4 STORAGE AND PRESERVATION

The *Contractor* shall implement storage and preservation requirements in accordance with the Storage and Preservation Procedure.

2.5.5 Inspections and Tests

The *Contractor* shall be required to maintain inspection databases where all records of inspection are maintained as required in the Medupi Quality Specification.

1. Inspection activities during manufacturing shall be managed according to the Medupi Manufacturing Inspection and Testing Procedure.
2. Inspection activities during construction shall be managed according to the Medupi Site Quality Assurance Control and Verification Procedure.

2.5.6 Quality Responsibility

The *Contractor* responsibilities include but are not limited to the following:

- a) The *Contractor* is accountable for the quality of the output and liable for any failures.
- b) Implementation of their QMS on site
- c) Administration of their QA/QC systems on site

- d) Verification of approval status of Subcontractor's Quality programmes, that is, CQP's, QCPs, NC's, Defects and all their operational procedures and works instructions
- e) On-and-offsite inspections
- f) Weekly and monthly progress reporting on quality performance
- g) The *Contractor* is responsible for defining the level of intervention of QA/QC or inspections in line with the *Employers* requirements.
- h) The *Contractor* is responsible for defining the level of intervention of QA/QC or inspections to be imposed on his Subcontractor, suppliers and sub-suppliers and must ensure that these are in line with the *Employer's* requirements.

The *Supervisor* will be responsible for the following:

- a) Reviews of the quality submissions
- b) Verification of the *Contractor's* intervention points
- c) Reviews the *Contractor's* ITP/QCP documents (procedures, test results)
- d) Reviews the data book
- e) Issue of Defects Certificate
- f) Checks and marks off materials off site

2.5.7 Non Conformances and Defects

Where Non-Conformance (NC) notifications are issued, the *Contractor* acknowledges receipt within the period of reply and proposes corrective and preventive actions to the *Supervisor*. The corrective and preventive actions will include the implementation and completion dates. Progress on all NCs notifications issued to the *Contractor* must be reported to the *Supervisor* on weekly basis.

- a) The *Contractor's* Quality Manager keeps a register of all NC notifications issued
- b) Records of NCs notifications are kept and form part of the data book records.
- c) Deviations from the Contract are treated as a non-conformance.

To ensure reduction of non-conformances, the *Employer* will implement a penalty to the value of R20 000.00 for every NCR issued during the contract period and not closed within 14 working days.

During the contract execution phase, the *Contractor* will be monitored by the *Supervisor* for performance on quality related aspects. The monitoring will be in the form of audits and assessments.

2.5.8 Quality Reporting

The *Contractor* submits a monthly quality report, on the last working day of the month. The report includes but not limited to the following:

- a) A register of NCRs and defects
- b) Updated QCP / ITP register
- c) QA monthly report summary
- d) Planned and completed local and foreign inspection dates
- e) Completed and outstanding Inspections
- f) Audit findings report
- g) Risks with Mitigation plan

2.5.9 Preservation, shipping and transportation

The *Contractor* ensures that all Plant and Materials are preserved in an appropriate manner as described in the product specifications or in the *Employer* preservation, shipping and transportation procedures as applicable. The *Contractor* submits the preservation, shipping and transportation procedures to the *Supervisor* for review and acceptance. The *Supervisor* may choose to witness the packaging, loading and offloading of the products depending on the equipment criticality, this will be indicated in the intervention points on the ITP/QCP.

The *Contractor* also ensures that all storage requirements for Plant and Materials are properly implemented to preserve the products against adverse conditions, deterioration, damages, etc. Storage and preservation procedures for the different equipment must be submitted to the *Project Manager* for review and acceptance. The *Project Manager* may request to inspect the stored Plant and Materials at any given point during the storage period of the product.

The *Contractor* shall comply with the quality criteria and constraints stated in this Works Information.

Plant and Materials for this contract is not shipped by the *Contractor* until all the documents stated in the Particular Specification have been submitted to the *Supervisor*

2.5.10 TESTING, COMPLETION, COMMISSIONING

1 Testing

- 1 The *Contractor* shall refer to the relevant drawings, standards and specifications for the sampling and testing of materials.
- 2 The *Contractor* shall, when submitting any work to the Employer for examination, satisfy himself by testing, measurement and otherwise as may be necessary that the work does in fact meet with the requirements of the specifications.
- 3 This information shall be submitted with the *Contractor's* request for examination and the Employer shall be authorised to decide on the number and type of tests, measurements, etc. required to enable him to judge the quality of the work. The submission of this information shall in no way diminish the authority of the Employer to conduct such tests as he may consider necessary in order to determine the quality of the work performed by the *Contractor*, nor shall he be bound to take account of the *Contractor's* tests, measurements, etc. should he consider these to be either incorrect or not representative.

- 4 For reinforced concrete works all testing shall conform to the Medupi specification for structural concrete. Any deviation from the specified testing shall be motivated by the Contractor and shall be submitted to the Employer through Project Manager for acceptance.
- 5 The act of passing any completed Works or accepting materials or goods for payment by the Employer shall not be construed as signifying approval or acceptance thereof. Failure on the part of the Employer to reject any defective work or material or goods shall not in any way relieve the Contractor of his obligations under the Contract, nor prevent later rejection when such work or material is discovered.
- 6 The contractor shall provide FAT (Factory Acceptance Test) certificates for any approved testing used in the duration of the contract
- 7 The *Contractor* shall allow for FAT, SAT and SIT for approval by the Employer. All documentation shall be approved and up to date prior to FAT, SAT and SIT inspections being witnessed by the Employer.
- 8 The *Contractor* shall prepare ITPs and QCPs for the manufacturing and installation of plant, which shall be submitted to the Employer for review and approval.
- 9 The Employer shall use such accepted ITPs to indicate intervention points (referred to as hold points) at which he is required to be present, during the manufacturing and installation of the plant at the manufacturer's facility and at the installation site(s).
- 10 The *Contractor* shall formally invite the Employer to all such hold point inspections, the inspections shall be scheduled by the *Contractor* giving not less than 28 days' notification for the FAT, SAT and SIT and not less than 24 hours' notice for construction hold points.
- 11 The *Contractor* shall only dispatch such plant to site once the Employer has approved all manufacturing holding points. Plant shall be delivered to site with all completed and appropriately signed quality Databook(s), which shall be submitted to the Employer for his review, approval.

2 Completion And Commissioning

- 1 The Contractor shall refer to the Employers Policies and Procedures Programme, Progress Reporting and Meeting Requirements, Commissioning Plan as well as procedure PPZ 200 -16714 Commissioning and Completion of Medupi Power Station for detailed requirements for pre-commissioning and commissioning procedures.
- 2 In line with sub-clause 4.1 of the General Conditions and as amended and amplified in the Particular Conditions, the *Contractor* shall submit to the employer the "as-built" documents and operation and maintenance manuals in accordance with this Specification and sufficient detail for the Employer to operate, maintain, dismantle, reassemble, adjust and repair the Works. Until these documents and manuals have been submitted by the contractor, such part of Works shall not consider completed for the purposes of taking-over.
- 3 The *Contractor* shall electronically submit the performance and guarantee tests procedures to the Employer for review and comment, at a date to be agreed, but not less than 112 days prior to start of commissioning. Unless otherwise stated the *Contractor* shall provide three sets of the manuals to enable the Employer to review, comment and request changes as necessary. Copies of all Manuals shall also be provided electronically.

3 Manuals

All manuals shall be divided by systems or sections and cross indexed as necessary.

a) Certification Manual

This manual shall contain the approved works certification documentation for all Plant and services as specified in the relevant codes and standards and in this specification and the

Contractor's Quality Manual. This manual shall also include all material test certificates. Certificates and test procedures shall be specific to the Plant supplied.

b) Design Manual

This manual shall contain all the design calculations and all Plant and system data sheets and design criteria required under the Contract

c) Construction Manual

This shall include a comprehensive record of as-built Site construction tests and records. The manual(s) shall be compiled in separate parts to reflect the Plant and services supplied.

d) Commissioning Manual

This manual shall include all the records, certificates and test results arising from the agreed pre-commissioning and commissioning procedures carried out on Site. The performance tests and guarantee test results shall also be included. There is a particular requirement that all commissioned plant/ equipment values be recorded in this manual and subsequently incorporated into the final version of Operating and Maintenance manuals.

e) Operating and Maintenance Manuals

The *Contractor* shall provide three hardcopies and an electronic copy of the preliminary version of all the O&M manuals, including spare parts, properly bound, to enable the Employer's staff to become fully acquainted with the operation, adjustment and maintenance of the entire works. The manuals shall contain full and explicit instructions in respect of the operation of the works under all operating conditions and the maintenance routines and requirements to be established to maintain the works for optimum performance. The instructions may be divided as appropriate into individual sections and sub-sections as necessary. All section and sub-sections shall be clearly indexed and cross-referenced as required for clarity.

The instructions for the related parts shall be accurate and easy to understand and shall contain the necessary sequence of individual activities. The diagram and drawings associated with the instruction shall be clear and unambiguous.

All sections must contain an introductory description of the item/system including its function and operating criteria and any special features.

The operating instructions shall include at least the following specific procedures/practices:

1. Starting-up
2. Shutting down
3. Operation during fault conditions
4. Surveillance and monitoring of plant
5. Check lists
6. Standard readings
7. Operational parameters (especially limiting values in critical areas)
8. Isolating procedures
9. Switching
10. Troubleshooting
11. Fault reporting
12. Normal operational reporting
13. Compliance with requirements for interfacing with grid

14. Safety/security/firefighting first aid
15. General plant standards and guidelines
16. Test procedures
17. Drawings, schematics, logic and wiring diagrams, function
18. Diagrams, P&IDs, with full implementation of the KKS numbering system
19. Control and protection

The maintenance instructions shall provide for the three maintenance functional groups - Mechanical, electrical, control and instrumentation and shall include at least the following:

1. A complete and accurate description of the main plant items and systems of the works specific to each function.
2. Detailed maintenance procedures and intervals for all plant items.
3. Assembly and disassembly procedures
4. Spare parts lists and drawings including storage constraints
5. Use of special tools and equipment
6. Lifting procedures
7. Drawings, detailing tolerances
8. Schematics, logics and wiring diagrams, function diagrams, P&IDs, with full implementation of KKS.
9. Isolating procedures, safety and codes of safe practice
10. Firefighting / first aid
11. Set-up and calibrating procedures
12. Optimisation of control loops
13. Diagnostics and trouble shooting
14. Specialist maintenance / repair procedures including welding
15. Materials
16. Test procedures
17. Design clearances and settings with allowable clearances, and Settings for maintenance purposes

It is an essential requirement that all information and Plant data contained in the manual shall be works specific and derived from the design, manufacturers/supplier and commissioning data of the as-built works. Where the *Contractor* includes standard brochures the installed item of Plant shall be clearly identified.

Handover documentation delivered by the *Contractor* shall consist of all documents relating to the accepted and constructed or delivered and accepted Plant, systems, components, equipment, and items, as identified by the VDSS and agreed to the *Contractor* and Employer.

The *Contractor* shall ensure that all Plant within his scope of work as delivered and accepted and is consistent with the related handover documentation. The delivery of handover documentation by the *Contractor* may be in successive instalments but shall be completed prior tests on completion. The delivery shall be performed on a per system basis as systems are commissioned and taken over.

2.6 Programming constraints

2.6.1 General

The *Contractor* submits a single integrated Level 4 programme that incorporates all the work to be performed including that of his Subcontractors. The interfaces between Subcontractors as well as the interfaces between Subcontractors and the *Contractor* are clearly identified. Project key dates are incorporated into the programme. The *Contractor* shall manage the interfaces between his Subcontractors and Others working on the same Site.

2.6.2 Computerised Planning and Reporting

Primavera is the only planning tool Eskom accepts for this project; therefore the *Contractor* is required to obtain this planning tool for the use of producing their programmes. The *Project Manager* does not intend duplicating the *Contractor's* planning and scheduling, however, the Accepted Programme will be used in the *Employer's* internal integrated and Master project programmes for project control purposes, updating and monitoring. The accepted programme will be in Primavera XER file. The *Project Manager* requires one project programme to be used and updated during the installation process, which will remain with Eskom. This insures that any changes, deviations to the Programme can be carried out on the agreed programme and monitored. The initial programme supplied to Eskom after Contract award must be fully resource loaded.

Any changes that are required to be made to the Project/Programme i.e. scope changes, delays and the such, will be recorded through the Eskom change process and documentation, where all parties agree to the changes and sign.

The *Contractor* and *Project Manager* shall agree on the format of how the updates will be done i.e. PDF, XER, and the frequency of the updates i.e. such as on a weekly basis, or at any other time as required by the *Contractor*, or as instructed by the *Project Manager*.

The latest version of Primavera has been adopted by the *Employer* for all planning, progress monitoring and reporting on the Contract. The *Contractor* obtains this software and applies it for the planning and control of the work in line with the Work Breakdown Structure (WBS) which will be agreed upon contract award.

2.6.3 Additional Programme Requirements

The *Contractor* shall use the Critical Path Method (CPM) technique for programme and planning and shall submit the programme basis document to the *Project Manager*. The programme basis document describes the programme and planning methodology, format, project execution philosophy, resource assumptions, qualifications and any other items that may have a substantive impact on the schedule. The programme layout takes into account the Key Dates provided above and the Work Breakdown Structure (WBS). The following levels of programme are to be used for this project for dynamic integrated project control:

- Management level programme (Level 1)
- Project level programme (Level 2)
- Control level programme (Level 3)
- Discipline specialty programme (Level 4)

The *Contractor* submits a Resource Loaded Level 4 Detailed Programme with the tender documentation. The Level 4 Detailed Programme is to be submitted within one month of contract award for review and acceptance by the *Project Manager*.

2.6.3.1 Management Level Programme (Level 1)

The management level programme is used to establish work goals and overall time frames for the works. It is a statement of project objectives recorded in graphic form. The management level programme defines and establishes goals or major milestones key dates. The duration of major operations and their relationship to one another. Identified Long Lead material items and responsibility assignments for accomplishing project objectives.

2.6.3.2 Project Level Programme (Level 2)

The project level programme is prepared representing the significant work activities and deliverables associated with the works. The end product is a time scaled bar chart schedule developed through use of a logic network. This programme is separated by work areas, by Phase and by WBS. A "rolled up" programme from the control level programme is produced. It is separated by each work activity and by Phase (for example: Engineering, Procurement, Construction and Commissioning).

2.6.3.3 Control Level Programme (Level 3)

The work within each work area is broken down by Engineering Discipline, Procurement of Tagged equipment and Bulks, Construction, and Commissioning & Start-up. The control level programme is resource-loaded. It forms the basis for progress measurement, progress curves and histograms for each discipline within a work area.

2.6.3.4 Discipline Programme (Level 4)

This level typically represents day-to-day tasks, which are work activity based and become summarised in the Level 3 activities. Resource information for manpower, Plant, Material and Equipment and reflected in the resource histograms is to be provided by the *Contractor*. Staffing Histograms are to be submitted based on "equivalent personnel". Available work hours take into account 4 and 5 week months and statutory holidays that may occur. Staffing histograms is updated with actual data for each reporting period and re- forecasted as required should significant deviations occur.

2.6.4 Submission of Revised Programmes and Progress Reporting

The Contractor submits one electronic copy in Primavera P6 (XER) of each revised programme and progress report to the Project Manager for acceptance. The Contractor submits revised programme on monthly basis or as instructed by the Project Manager. The monthly reports shall comply with the progress reporting requirements as stated below

2.6.5 Weekly Status Reports

A weekly status report is submitted by the Contractor to the Project Manager. This report is less formal than the monthly report and is used as a tool for the day-to-day management of the project. Contents of a weekly report will include the following items:

- The updated Primavera programme
- Programme summary narrative
- Progress and performance summaries
- Sectional Completion and Key Milestone status

2.6.6 Monthly Progress Report

The contents of the report may vary from month to month depending upon the phase of the project and/or the items of management focus. However, the basic framework of the report consists of the following:

- Executive summary (narrative identifying major movement within the reporting period).
- Revised Programme indicating, actual progress of work against last Accepted Programme.
- A one-month look ahead work window.
- Activities completed, activities in progress during current reporting period and Critical Path activities report
- Key issues and risks of concern and mitigation actions.
- Cost and Cash flow and Cost curve 'S-curve'.
- Early warning and Compensation Event Register
- Report selecting all of the activities of the Employer and Others and Resource Schedule Histogram.
- Forecast Rate of payment schedule updated with actual progress.
- Statement and report on works ahead and behind progress.
- Procurement plan for all Resources (labour, equipment, plant and material) in Excel Format. The plan shows mobilisation per month, equipment, people, plant and materials for the duration of the contract.

2.6.7 Planning Programmes

The *Contractor* develops a contract programme which will include a bar chart conforming to the project master programme dates included and sufficient detail to indicate the *Contractor's* intention for executing the works. This programme covers major items relating to design, procurement, manufacture, delivery, erection, start-up and commissioning. The critical path is clearly shown.

Key milestones, access dates, interface dates and commissioning key dates are clearly identified in the contract programme, including access dates and release of terminal points that involve the *Employer* or Others.

The programme makes provision for site related preparation such as site establishment, safety induction and medical clearance of the entire *Contractor's* staff that will be working on site.

2.6.7.1 Design Programme

The design programme contains a full list of documents and drawings, their submission dates and duration for review as specified by the *Contractor* in the VDSS. The programme also illustrates the sequence of work for the project and the submission of drawings, studies and reports.

The design programme meets the requirements of the *Contractor* and Others engaged on the project. The *Contractor* is required to submit the programme for review by the *Project Manager*.

The programme should include all the design reviews to be conducted as per the *Employer's* Design Review Procedure. The *Contractor* is responsible for conducting the following design reviews:

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

2.6.7.2 Procurement and Manufacturing Programme

The *Contractor* is required to submit a procurement and manufacturing programme for review by the *Project Manager*, which identifies as a minimum:

- a) Details of orders and target dates for placing subcontracts
- b) Any detailed design required within the manufacturing period
- c) Long-lead delivery items
- d) Hold-points and witness-points for inspection and tests for acceptance and release.
- e) CSI roll out plan to be incorporated.

This programme is in sufficient detail to enable the work to be adequately tracked and progressed.

2.6.7.3 Construction Programme

The *Contractor* is required to submit a construction programme that is resource loaded for review by the *Project Manager*. This programme includes the following criteria:

- a) Full details of all civil/mechanical/electrical/C&I/Low Pressure Services terminal point release requirements
- b) Identify any erection or commissioning activities that may affect other construction activities
- c) Identify when services are required for commissioning purposes

This programme meets the requirements of the *Contractor* and Others engaged on the project.

The programme shall be based on the following working hours: Where applicable

- a) Twenty four (24) hours per day
- b) Seven (7) days per week
- c) Holidays included as working days
- d) Pay weekends to be negotiated (if working 7 day work week)

2.6.7.4 Commissioning Programme

During the progress of the *works*, the *Contractor* develops a detailed commissioning programme with sufficient detail to enable the work to be adequately progressed and tracked to meet the commissioning key dates.

Training programme to be incorporated into the commissioning programme.

The commissioning programme is detailed to sub-system level and is fully integrated with the Construction Programme.

2.6.7.5 Reporting and Data Requirements for *Contractors* Document number 240-83561037

This specification is included as an Annexure to the Works Information. This specification lists all the data and reporting that must be submitted by the *Contractor* on a weekly / monthly basis to the *Project Manager*. The purpose of this information is to implement proper project controls on this project.

2.6.7.6 Project Work Breakdown Structure

Activity durations should not be longer than 10 days, activities longer than 10 days should be split into sub tasks.

WORK BREAKDOWN STRUCTURE (WBS)		
1	PLANNING PROGRAMME	
2	CIVIL AND STRUCTURAL	
		<i>Design Activities</i>
		<i>Procurement Activities</i>
		<i>Manufacturing Activities</i>
		<i>Delivery Activities</i>
		<i>Construction Activities</i>
		<i>Commissioning Activities</i>
7	OTHER	
8	HAND-OVER	

2.7 Contractor's management, supervision and key people

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

The *Contractor* will provide the *Employer* and the *Project Manager* with an operational plan, including organogram showing the key people and the roles and responsibilities.

The organogram provided must show clear reporting lines between individuals, including individuals from subcontractors or joint ventures.

The *Contractor* provides the following key personnel as a minimum:

- a) Dedicated *Project Manager*
- b) Dedicated Project Planner
- c) Dedicated *Site Manager*
- d) Dedicated *Quality Manager*
- e) Dedicated *Site Safety Manager*
- f) Dedicated Environmental Manager

2.8 Invoicing and payment

At each *assessment interval*, the *Contractor* submits to the *Project Manager* a forecast rate of invoicing that includes all the expected payments by the *Employer* to the *Contractor* on a month-by-month basis.

The invoices from the *Contractor* contain the following information:

- a) The registered name of the *Contractor*
- b) The VAT registration number of the *Contractor*
- c) The address of the *Contractor*
- d) The *Employer's* contract number
- e) The VAT registration number of the *Employer*
- f) The amount paid to date
- g) The value of the invoice split into payments as per the *activity schedule* as indicated in the Price Lists.
- h) Any retention monies to be deducted from the invoice
- i) Any interest payable
- j) Escalation formula used where applicable
- k) Settlement discount
- l) Proof of ownership of materials supplied

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

All invoices in PDF format shall be emailed straight from your system to an Eskom email address (see email addresses below):

- Email addresses for invoice submission:
 - All invoices: invoiceseskomlocal@eskom.co.za

- The *Project Manager* shall be copied when submitting invoices.
- All queries and follow up on invoice payments should be made by contacting the FSS Contact Centre:
 - Tel: 011 800 5060 or e-mail: fss@eskom.co.za
- For Foreign invoices, the *Contractor* is required to physically deliver hard copies of original documents to the *Project Manager* even though the *Contractor* has e-mailed those invoices.
- The *Contractor* ensures compliance with the tax Requirement for submitting invoices electronically.
- If there is Cost Price Adjustment (CPA) on your invoice, the *Employer* recommends that the *Contractor* issue a separate invoice for CPA so that if there are any issues on the CPA the rest of the invoice can be paid while resolving CPA issues.
- The base invoice number needs to be mentioned on the CPA invoice.
- Electronic invoicing does not guarantee payment but ensures visibility of all invoices and ensures that no invoices get lost. If the Goods Receipt (GR) is not done the invoice will be parked and the system will automatically send an e-mail to the *Project Manager* to do the goods receipt. This is also tracked by the *Employer* through the parked invoice report.
- The *Contractor* can request a parked invoice report from the Finance Shared Services (FSS) Contact Centre, which can then be followed up and corrected. You are welcome to forward the details of invoices corrected to the FSS Contact Centre.

2.9 Insurance provided by the *Employer*

As stated 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.

2.10 Contract change management

There are no additional requirements to the compensation event clauses in Section 6 of the core clauses.

2.11 Provision of bonds and guarantees.

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

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

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

There are no additional requirements to the compensation event clauses in Section 6 of the core clauses.

2.13 Training workshops and technology transfer

The Contractor provides training on the Plant regarding operating, maintenance and engineering aspects. The Contractor provides training material and a separate training course for operating, maintenance and engineering personnel.

1. Training for the use of the Weighbridge and Gate 4 Access Control Building shall be provided to relevant departments within the station for the effective and efficient operation.
2. Training with associated training manuals (including special tools) for the operation of the weighbridge system shall be provided to the client for effective and efficient operation. The *Contractor* shall provide a training schedule for classroom training, practical and exams.
3. Training will be required for HVAC maintenance team on the operations of the installed HVAC system by the contractor.
4. Training will be required for C&I Maintenance team to do the weighbridge scale Calibrations and verification tests.

3 Engineering and the *Contractor's* design

3.1 *Employer's* design

3.1.1 SYSTEM OVERVIEW

The proposed solution shall entail design, construction, procure, supply, installation and commissioning of the Weighbridge inclusive of the Access Control Building and Weighbridge Control room with all associated facilities at Medupi power station as in the scope of works included but not limited to the following:

3.1.1.1 Access Control Building Architectural and Structural

The Contractor shall design and construct an Access Control building approximately 160 m2 comprising of concrete walls, brick walls on reinforced concrete foundations, structural steel columns and a sheet cladded roof. The building shall mainly be constructed on natural ground level.

3.1.1.2 Weighbridge

The *Contractor* shall supply and install two bi-directional weighbridges with a minimum rated capacity of 60 metric tons (60,000 kg), and the scale platform's footprint shall measure 24m x 3m (minimum). The *Contractor* shall be responsible for the structural and mechanical design, construction, fabrication, installation, testing and certification of the weighbridges and all accessories.

3.1.1.3 Weighbridge Control Room Building Architectural and Structural

The *Contractor* shall design and construct a control room building comprising of concrete walls, brick walls on reinforced concrete foundations and roof structure

3.1.1.4 Small Power and Lighting

The *Contractor* shall provide and install all small power and lighting for all buildings and high mast lighting.

3.1.1.5 Weighbridge Control System

A Workstation shall be provided in the control room and integrated to the weighbridge controller system to perform local control and monitoring, and for automatic comprehensive data logging and archiving with detailed analysis and reporting for maintenance management and accounting purposes. There will be overview screens with detailed mimics one or 2 levels deep.

Operational Areas of control shall be managed by a security and password protection system, implemented at the operator station level when the operator logs on. This allows operators to have access to control weighbridge system. All operator actions shall be logged and may be interrogated during run-time or historically, by area, operator and console. Supervisors and engineers shall also have higher levels of access to additional functions that are not available to a console operator.

For system time synchronization, NTP (Network time protocol via Ethernet), to Medupi time servers is possible but will completely be in Contractor's scope to connect to nearest available connecting point. Contractor is at liberty to also provide own GPS time input and antenna.

Local indication and alarm indications shall also be provided for by Contractor.

Local control stations for the Weighbridge at the local point of operations will be provided by the contractor which will be integrated to the computer and workstation in the control room.

As a minimum, the weighbridge control and accounting system should be able to:

- i. Identify or distinguish the different types of payloads or material being weighed

- ii. Automatically identify and log the vehicle being weighed
- iii. Log accurately time of measurement or time stamp the measurement
- iv. Log operator operating the system at the time of measurements
- v. Alarm and log any discrepancies or faults as they arise and even log the fault during the measuring process.
- vi. Provide detailed reports and trends per vehicle, per type of material weighed - the structure of these reports will be as agreed with Employer during detail design of project.
- vii. Store all logged data, events, video footage and reports for a period of at least five years.
- viii. All archived or stored data should be able to be exported to a .csv file without requiring reprogramming of the control system - it should be exportable through few simple steps.
- ix. The archived or stored data should be filterable using any criteria possible
- x. The system should also be able to backup and restore all data onto a removable storage media without in a few simple steps without having to reprogramme the control system.

The weighbridge control system shall also be able to be interfaced to existing plant information system and future information system through as a minimum an OPC connection.

3.1.1.6 Fire Protection.

The Contractor is responsible for the detailed design, supply, installation, testing and commissioning and sign off (PEC) of the fire detection system that includes the provision and installation of fire panels, Smoke detectors, Optical smoke detectors, Heat detectors, Manual call points, Monitoring Controllers, Isolator for short circuit protection, CO sensors, Contact Coupler, Strobe lights, and any other requirements as detailed in the Employers Requirements Specification and drawings.

3.1.1.7 Access Control

The Contractor is responsible for the detailed design, supply, installation, testing and commissioning of the Access Control System that includes the provision and installation of LCD monitors, Operator Workstation for CCTV access control, Photo ID Workstation, Photo ID Printer, Keyboards, Mouse / joystick for controlling PTZ cameras and any other requirements as detailed in the Employers Requirements Specification and drawings.

3.1.1.8 Closed Circuit Television System

The Contractor is responsible for the detailed design, supply, installation, testing and commissioning of the CCTV that includes the provision and installation of CCTV cameras, PTZ CCTV cameras, CCTV camera lens, CCTV camera housings, CCTV camera housing mountings, CCTV camera brackets, Poles for fitting CCTV cameras, Digital Video Recorders (DVR's) including CD / DVD writer, Mouse / joy stick, Power supplies and any other requirements as detailed in the Employers Requirements Specification and drawings.

3.1.1.9 HVAC Works

The Contractor is responsible for detailed design, supply, installation, testing and commissioning of the HVAC works for the Gate 4 Access Control building and Weighbridge Control room and any other requirements as detailed in the scope of work. These works to be fully integrated with CBMS and Fire protection systems.

3.1.1.10 Road Works

The contractor is responsible for the detailed design and construct of new road works and modification of the existing road to fit the works of the weighbridge. The work will include ripping of existing road surface, additional fill and layer work as well as surfacing of the road, storm water and road markings. Designated parking areas. Due to widening of the existing road, extension of the existing culvert has to be constructed. In order to incorporate the new road layout, an existing precast culvert at the entrance to the site will be extended and any other requirements as detailed in this document.

3.1.1.11 Landscaping

Landscaping of a small area at the access Control building as well as erosion protection of slopes is included, and any other requirements as detailed in the scope of work.

3.1.1.12 Services

Services to the buildings include fire water, potable water as well as sewer. These services will be connected to existing services at positions provided and any other requirements as detailed in the scope of work.

3.1.1.13 Access Control Fencing at Gate 4

The detailed design, procure, supply, installation, testing and commissioning of the three-layer perimeter fence system including the electric gate and manual gates for the Gate 4 Access Control building as per the NPK requirements and any other requirements as detailed in the scope of work.

3.1.2 SCOPE OF WORK

The scope of work for the project entails design, construction, procure, supply, installation, and commissioning, testing and handover of the Weighbridge inclusive of the Access Control Building and Weighbridge Control room with all associated facilities and infrastructure. These include but not limited to:

1. Site inspection and topographical survey of the areas (as deemed necessary by the Contractor).
2. Geotechnical investigation and earth works for road works, buildings, weighbridge platform, high mast lights, pipelines, cables sleeves and any other requirements for underground services.
3. Design & Construction with commissioning of a new roads The work will but not limited to include ripping of existing road surface, additional fill and layer-work as well as surfacing of the road, storm water, road markings and any other requirements as detailed in the scope of work.
4. Design, Construction and commissioning of the landscaping designs in the small area at the access Control building as well as erosion protection of slopes as detailed in the scope of work
5. The detailed design, procure, supply, installation, testing and commissioning of the HVAC system for the Gate 4 Access Control building and weighbridge control room and any other requirements as detailed in the scope of work.
6. The detailed design, supply, installation, testing and commissioning of the fire protection system that includes the provision and installation of fire extinguishers and hose reels, and any other requirements as detailed in the scope of work.
7. The design, procurement, supply, installation, testing and commissioning of all small power and lightings for all buildings.

8. The detailed design, procure, supply, installation, testing and commissioning of the two bi-directional weighbridges with a minimum rated capacity of 60 metric tons (60,000 kg), and the scale platform's footprint shall measure 24m x 3m (minimum). In addition, the structural and mechanical detailed design, fabrication, installation, testing and certification of the weighbridges and all accessories.
9. The detailed design, construction and commissioning of the Access Control Building and Weighbridge Control Room Building comprising of concrete walls, brickwork walls on reinforced concrete foundations with structural steel columns and roof structure and a sheet cladded roof and any other requirements as detailed in the scope of works.
10. Design, supply and Installation and construction and commissioning of Services to the buildings include fire water, potable water as well as sewer and any .
11. Design, Construction and commissioning of the storm water drainage system and connection to existing storm water drainage system and any other requirements as detailed in the scope of work.
12. The detailed design, procure, supply, installation, testing and commissioning of the three-layer perimeter fence system including the electric gate and manual gates for the Gate 4 Access Control building as per the NPK requirements and any other requirements as detailed in the scope of work
13. The design, construction, and commissioning of all incidental works.
14. Hazardous Zone classification based on design.
15. Consumable spare parts, including the specialist tools, first fill and consumables, lubricants and chemicals required for erection and commissioning up to the issuing of the Completion Certificate for the works by the Employer.
16. Earthing and lightning protection of the steelworks, buildings, weighbridges, fencing and any other requirements as detailed in the Employers Requirements Specification.
17. All electrical works for a fully functional system.
18. All control and instrumentation works to make a fully functional system.

The *Contractor* shall submit the design to the Project Manager for acceptance in a design pack. Employer engineering to do design review and comments given accordingly.

The *Contractor* and the OEM shall identify any discrepancies that could lead to shortcomings in the design and makes the Employer aware of such discrepancies and provides recommendations, where applicable.

The *Contractor shall* takes action on such discrepancies.

Any discrepancies found in the design after approval of the first submission shall be the responsibility of the *Contractor*.

The design pack shall be eligible for approval once it consists of the following but not limited to:-

1. Design report & calculations of the access control building.
2. Design report & calculations of mechanical equipment.
3. Detailed design of the road works.

4. Structural supports calculations and drawings for weighbridges and platform.
5. Heat load calculations for the sizing of the HVAC System.
6. Issue for construction drawings.
7. As built (Isometric, P&ID's and General Arrangement Drawings);
8. Pressure test procedures;
9. Methodology statements.
10. Quality Control Plans (QCP);
11. Acceptance test procedures;
12. HAZOP Reports;
13. HAZLOC;
14. FMECA and RAM studies;
15. Fire Rational;
16. Load Schedules;
17. Wiring Diagrams;

All submitted design calculations and drawings shall be signed by a Professional Engineer with ECSA registration number stated on drawing. The *Contractor* shall supply the copy of ECSA registration for the Professional Engineer.

The drawings forming part of this document are issued for Information only to the *Contractor* to indicate the *Employer's* proposed Conceptual Design for the Works.

The *Contractor* shall verify and optimise the *Employer's* Design and takes full accountability and liability for the all the Designs in this scope.

3.1.2.1 MECHANICAL WORKS

3.1.2.1.1 HVAC WORKS

The *Contractor* shall provide for the Weighbridge Control Room and Gate House buildings ventilation and air-conditioning through detail design, supply and installation of louvers, ventilation equipment and associated ducting, and air conditioning by means of direct expansion inverter units for the substation capable to control the ambient conditions. The performance standards and technical requirements for the HVAC Works are set out in the following specifications:

- **240-102547991** General Technical Specification for HAV Systems Standard
- **240-701646423** Eskom HVAC Design guideline

The *Contractor* shall study these standards and procedures to understand the requirements and constraints pertaining execution of the HVAC Works. Where applicability of these standards and procedures is not clear the *Contractor* shall query such with Employer before undertaking Works that are the subject of these documents.

Size and space constraints are stipulated by the tender HVAC drawings provided by the Employer, where the *Contractor's* equipment and works may have an effect on the space and arrangement the *Contractor* shall give adequate advance notice in writing including details of such items to allow the Employer to similarly modify the drawings.

The *Contractor* shall submit the following documentation for approval by the Employer

1. Control drawings showing zoning, fire interface and connection and smoke extract functionality;
2. Detailed equipment list; (template supplied by the Employer).
3. Inspection Test Plans;
4. General Arrangement drawings;
5. Alarm list; (template supplied by the Employer) and
6. Air, chilled water and Cooling water P&IDs including control loops. Electrical single line diagrams for the MCC (summary of loads on the MCC)
7. Electrical schematic diagrams for the MCC

The *Contractor* shall further:

1. Make use of 'EED_GTD_C&I_006 (200-71827)' to ensure sufficient alarm management, where alarms shall be prioritised and rationalised to achieve the following:
 - a) Minimal false and nuisance alarms.
 - b) Distinguish between operational and maintenance alarms.
 - c) Allow for easy operator navigation and understanding of alarms.
2. Provide electrical works as indicated in the Works HVAC specification.
3. Provide Operation & Maintenance Manuals and Training Manuals
4. Complete Aux power schedule for all permanent power requirements.
5. Complete the following documentation and submit for approval:
 - a) Virtual Signals List (template supplied by the Employer).
 - b) Alarm Schedule - including alarm priority, recommended operator response and response times (template supplied by the Employer).
 - c) Drive and Actuator Schedule (template supplied by the Employer);
 - d) Instrument Schedule (template supplied by the Employer);
 - e) Cable Schedule (template supplied by the Employer);
 - f) General Arrangements of cubicles;
 - g) Hook Up Diagrams;
 - h) Panel Interface List;
 - i) Termination Diagrams;
 - j) Equipment List (of which drive and actuator and instrument schedules will be a subset); k) Inspection Test Plans.

3.1.2.1.2 FIRE PROTECTION

The *Contractor* is responsible for the detailed design, supply, installation, testing and commissioning of the fire protection system that includes the provision and installation of fire extinguishers and hose reels, and any other requirements as detailed in the Employers Requirements Specification and drawings.

The *Contractor* shall refer to the Employers Fire Protection & Life Safety Design Standard, 24054937450 this standard includes requirements and constraints pertaining execution of the fire protection Works. Where applicability of this standards is not clear the Contractor shall query such with Employer before undertaking Works that are the subject of this standard.

3.1.2.1.2.1 Design Approach

The Eskom Fire Protection/Detection Assessment Standard gives the possible design approaches that can be taken during a fire system design. This scope has been evaluated and is clearly defined in the Eskom Fire Protection standard. The scope will follow the legislative route of “Deem to Satisfy” (DTS) by complying with the requirements of SANS 10089-3.

The *Contractor* shall design, procure, supplies, install and commission the fire protection for the complete works.

The *Contractor* shall include as a minimum the following:

1. Hazardous Zone Classification as per HAZLOC.
2. Portable fire extinguishers covering all fire risk areas, positioned at strategic fire points.
3. Passive fire protection measures such as separation of flammables/ combustibles from ignition sources, enclosure and/or compartment of fire risks, fire-sealing of service penetrations, and coating of cables in potentially fire exposed areas.
4. Provision of an emergency lighting system, emergency escape routes and exits.
5. Safety signage as per SANS 10089-3.

Fire protection design shall conform to the national building regulations and fire protection design standards and to be certified by a Professionally register and competent Engineer.

3.1.2.1.2.2 Fire Risk Evaluation

A fire risk evaluation shall be initiated early in the design process, to ensure that the fire prevention and fire protection recommendations as described in SANS have been evaluated in view of the plant-specific considerations regarding design layout and anticipated operating requirements.

The evaluation shall result in a list of recommended fire prevention features to be provided based on an acceptable means for separation or control of common and special hazards, the control or elimination of ignition sources, and the suppression of fires. The fire water piping has to be installed, connected to the potable water lined and commissioned as detailed in the Employers Requirements Specification and drawings.

3.1.2.1.2.3 Hoses

New hoses shall be marked to indicate compliance with SANS standards. Hoses shall not exceed a length that would cause a hazard. Hose reach is typically between 3 and 4 m from the dispenser housing. The use of hoses with reach in excess of this shall be subject to a risk assessment. Manufacturers shall provide guidance on how such longer hoses can be protected from damage.

3.1.2.1.2.4. Water supplies

The contractor shall connect to existing water supplies in the area.

3.1.2.3 POTABLE WATER

The *Contractor shall* supply, procure, manufacture, install and commission a potable water piping and fittings to supply potable water to the buildings. Potable water system shall comply with SANS 62/ SANS 719. The *Contractor* shall pressure test potable water piping from potable water tie inn point to the buildings.

The on-site commissioning of the potable water distribution system shall be conducted as per Employer's on-site commissioning for low pressure services 240-56356376

3.1.2.3.1 Pressure Test Requirements

It is required for the piping to be pressure tested to determine if there are any leaks. When pressure tests are done the following shall apply:

1. All pressure tests to be done with water i.e. hydraulic pressure tests.
2. Pressure test procedure must be submitted to and approved by Employer before pressure test can commence. Pressure test procedure must also be included in the data book.
3. Two pressure gauges shall be used for the pressure test.
4. All Pressure gauges must have valid calibration certificates done by a SANAS accredited pressure laboratory for all locally manufactured items. The maximum validity of the calibration certificates is 6 months.
5. It must be ensured that proper venting takes place and that all air pockets have been vented. Method statement shall be provided.

The pressure inside the equipment under test shall be increased to a value of the specified test pressure as defined by the code. Thereafter, the pressure shall be increased in steps of approximately 10 % per minute of the specified test pressure until the full test pressure is reached. The piping system shall be held at the test pressure for a period of at least 30 min.

6. After the test has been completed a pressure test certificate must be issued which is included in the data book.

3.1.2.4 WEIGHBRIDGE SCALE TESTING AND CALIBRATION

The tests specified below shall be performed upon completion of the scale installation. This testing and the associated costs shall form part of the scope of work to be performed. Any additional recommended tests may be proposed for consideration. The initial set of tests forms part of installation cost. In addition, the supplier will be responsible for all costs associated with correcting deficiencies and retesting in the event of a test failure.

Tests to be performed as part of the scale calibration shall include, but not be limited to:

1. Zero Load Error test,
2. End-Middle-End test,
3. Eccentric Loading test, and
4. Accuracy Test.

Table 1: Weighbridge Scale Tests

Test to be performed	According to Requirement	Performed By
Calibration of the weighbridge scale.	Trade Metrology Act, 1973 (Act No. 77 of 1973)	Supplier or alternative accredited organization.
Control room scale controllers and PLC functionality and emergency recovery tests.	-	Supplier demonstration
Data management system functionality and emergency recovery tests.	-	Supplier demonstration
Global scale system electronics & electrical systems functionality.	-	Supplier demonstration
Load-cell performance evaluation reports shall be produced by the Supplier.	SANS 1838-1	NRCS

An experienced, competent, and authorized Supplier's representative shall calibrate each weighbridge scale as part of the scale and weighbridge control system supply.

This shall include the provision of all certified test weights and shall provide the required scale certification for capacity and accuracy as required in terms of the Trade Metrology Act, 1973 (Act No. 77 of 1973), the calibration certificate must SANAS Accredited institution, as included in the initial contracted cost.

3.1.2.5 MARKING, LABELLING AND PACKAGING

3.1.2.5.1 Weighbridge Scale Capacity Marking

The maximum permissible safe load for which the scale is constructed shall be conspicuously and indelibly marked on an essential part of the instrument or on a metal plate permanently secured to it.

Where the maximum safe load on the load receptor of a vehicle scale is less than the capacity of the instrument, such maximum safe load shall be marked on the scale in the same manner as the capacity, adjacent to the capacity marking.

3.1.3 Control and Instrumentation Works

- The weighbridge scale shall be of the fully electronic type, utilizing precision load cells, be furnished with all the associated hardware and software, and all other accessories required for a complete fully functional weighbridge scale and weighbridge control system.
- Additionally, the weighbridge scale shall be furnished with:
 - Automatic weight recording controls,
 - Local (inside the weighbridge control room) and remote (adjacent to the weigh-out weighbridge scale) ticket printer,
 - Local inventory tracking and invoice printing system and software,
- There shall be one weighbridge control room for the weighbridge control system. The weighbridge control room shall be situated such that the operator has full view of the entire weighbridge operation but clear of truck traffic.
- The weighbridge control system shall operate off a dedicated PLC which shall operate the entire weighbridge system and provide all the HMI requirements. The PLC shall be

provided with the relevant software and network interface to allow for remote access and local data transfer by the operator.

5. The PLC shall have a local data historian with 2 month data retention capability. The data stored by the historian will include the weight measurements and corresponding date, time and licence number plate of the truck and all CCTV footage.

HMI requirements:

1. The operator will see on a dedicated screen, as mimics, all the weighbridges and for each weighbridge the licence number plate of the truck being automatically weighed, and the weight measurement.
2. Weight display at each end of the bi-directional weighbridge scale platform such that it can be seen by the truck drivers.
3. The operator shall also have the ability to view all the CCTV footage at once, and redundant links for bi-directional weighbridge scale platform can be activated once required,
4. The operator will see on a dedicated screen, all the CCTV footage of the weigh-in trucks licence plate,
5. The operator will see on a dedicated screen, all the CCTV footage of the weigh-out trucks licence plate,
6. The operator will see on a dedicated screen, all the CCTV footage of the weigh-out trucks load box,
7. The operator will on a dedicated screen be able to view a selected single CCTV footage as described in bullet points 3, 4 & 5 above.
8. Indication to the truck driver by red and green traffic signals, which shall be controlled and operated from the weighbridge control system. The traffic lights shall be located near both ends of the bi-directional weighbridge scale so they can be seen by the truck driver.
9. Where a truck licence number plate does not read automatically, an ERROR indication shall be made to the operator due to no licence number plate being found, while a measurement is being taken, the operator shall have the ability to manually enter the licence plate number, and receive indication that the weight measurement and licence plate number are linked, then the operator manually by "push button" allows the truck to depart from the weighbridge.
10. Then, when that truck returns for weigh-out, an ERROR is shown because no licence number plate was found while a measurement is being taken then the operator shall have the ability to capture the licence plate number manually for that weighbridge, and receive an indication that the weight measurement and number plate are linked, then the operator manually by "push button" allows the truck driver to receive the ticket and proceed to depart from the weighbridge. The weighbridge control system will not allow a truck to exit a weighbridge until the operator has captured the license plate number.
11. In the case of a weighbridge scale utilized for weigh-out purposes, the weighbridge scale shall include a ticket printing tower mounted adjacent to the scale platform, accessible from the both sides of each weighbridge scale. Upon weigh-out, the truck driver will receive indication that the weight is successfully captured, and the ticket may be taken. The truck driver will then manually by "push button" have the ticket printed. Once the ticket is printed the truck driver will receive indication to proceed to exit the weighbridge scale.
12. The trucks may or may not necessarily enter and exit the plant (and thus the scale) in any specific order, so the scale controls and associated components shall be able to

automatically associate each individual weighing activity with a specific truck designation and shall further designate the weight as a gross or tare weight.

13. The weighbridge shall employ strain gauge load cells along with lateral positioning elements to minimize loads or forces other than vertical gravitational forces. The load cells: shall be of heavy-duty corrosion resistant construction, shall be hermetically sealed to ensure protection if submersed in liquid, shall be provided with surge voltage protection (including lightning protection), shall have waterproof connector elements included for connection to field wiring, and shall have a quick release mounting design for ease of maintenance.

14. The output signal from the electronic load cells shall be measured and amplified by solid-state circuitry and converted to a weight value.

15. One scale controller unit shall be provided for the weighbridge scale. It shall be enabled with a power-on indication, scale-in-use indication, test-in-progress indication, and initiation switches for the required modes. When the scale controller is powered up, it shall automatically go through a test mode. In the test mode, all parameters shall be checked, and an error code displayed if a problem is found. A complete list of error codes and suggested solutions shall be included in the scale documentation. If no problem is found, the controller shall function as required. The controller unit shall have a built in display screen capable of displaying a six-digit digital readout (minimum), in kilograms, and shall interface fully with a local (in the weighbridge control room) weighbridge control system PLC.

16. The weighbridge scale shall have built-in predictive diagnostics, capable of identifying load cell problems or failures. It shall enable some degree of pre-failure warning notification in order to minimize unplanned downtime. In the event of a load cell problem or failure, the diagnostics system shall identify the problem load cell, and shall alert the weighbridge control room based operator via the load cell controller display. The weighbridge control system shall have capabilities allowing for remote monitoring and troubleshooting by the scale system OEM.

17. In the weigh-out direction of the weighbridge a vertically oriented safety trip system shall be provided in such a manner that if an approaching truck has its load box(s) in the unloading position, warning horns and lights will be activated alerting the truck driver.

18. The electronic and electrical equipment employed for use with the weighbridge scale shall be suitably IP rated in accordance with the local environmental rating.

3.1.3.1 INVOICE SYSTEM

Important transaction information that shall be captured both automatically via the software with input from the weighing controller and the RFID system, or manually via operator input into the local PLC, shall include, but not be limited to:

1. Vehicle registration
2. Vehicle license expiry
3. Driver ID
4. Driver name
5. Driver tag
6. Driver license expiry
7. Driver Eskom license
8. SAP contract reference
9. SAP purchase order reference
10. Stockpile or product storage site number

11. Transaction date and time (automatic)
12. Route for delivery (trip info)
13. Hauled product sourced
14. Hauled product destination
15. Weight measured at source/load point scale
16. Weight measured on scale (automatic)
17. Weighbridge site name (automatic)
18. Scale operator ID (automatic - operator manual updatable)

All data shall also be automatically backed up via the network to a remote PC. Inventory control software shall also be provided for the remote PC to enable remote printing of inventory reports in a customizable fashion. The supplied weighbridge scale inventory software shall have Microsoft Excel TM export capability to enable remote viewing, format editing, and back-up storage of data.

An automated ticket printing system shall be furnished and installed. The ticket printing system shall be capable of printing an invoice or ticket that details the critical information pertaining to the weighing operation being performed on the scale, as detailed in the list above. The printer shall be capable of printing multiple copies and shall be programmed to print the desired number of copies, and to include the ability add additional information which may be required in the future.

3.1.3.5 CLOSED CIRCUIT TELEVISION SYSTEM

- (1) The Closed-Circuit Television (CCTV) System shall be provided by the Contractor and shall interface with the CBMS. The Contractor shall provide all hardware, software and cabling required for the CCTV system as part of the Works.
- (2) The CCTV system shall be fully integrated into the CBMS, as well as being able to operate as an independent system.
- (3) All indoor cameras shall be ceiling mounted where possible. If not possible they shall be wall mounted. Outdoor cameras can be wall mounted where applicable with the necessary cooling system (preferably natural cooling). All CCTV cameras shall require low maintenance.
- (4) Where cameras are required to be pole mounted in outdoor locations, the Contractor shall design, supply and install all necessary equipment in order to satisfy the requirement. This includes the pole and its fittings as well a cooling system.
- (5) If the pole mounted outdoor cameras require external power, the Contractor's scope shall include furnishing and installing an armoured power cable, suitable for direct burying, from the camera to a substation distribution board, furnished by others.
- (6) The Contractor shall also design and install the cabling system from the camera location to the applicable access point, which shall include direct-buried cable.
- (7) Any devices required between the Contractor's CCTV system and the CBMS shall be provided and installed by the Contractor. The Contractor shall provide trenching if necessary
- (8) Contractor to provide Video Management System which will include archiving or storing of all recordings for a period of at least 5 years. The storing and retrieving of each recording should be such that it is simple to retrieve any recording stored.

3.1.3.6 FIRE DETECTION SYSTEM

The Contractor designs, supplies, installs and commissions addressable Fire detection systems required for the weighbridge.

The fire detection system shall consist of control panels connected to field devices such as fire detection devices and monitoring devices located throughout all areas as defined in the buildings. Analogue field devices shall be capable of self-testing.

The Contractor shall verify the findings of the document "Fire Detection Requirements for Medupi Power Station" (document number 200-63065) by means of a fire risk assessment, to be submitted to the Engineer for approval.

The Contractor shall, as a minimum, examine, quantify/qualify and document the following aspects as part of the fire risk assessment:

- (1) The risk incurred by the exclusion of fire detection from the weighbridge.
- (2) Motivation for any additional fire detection not scoped in "Fire Detection Requirements for Medupi Power Station" (document number 200-63065), subject to the Engineer's approval.
- (3) The verification of the Employer's documentation (200-78980) describing the need for an intrinsically safe design and installation of any BMS equipment, as defined in SANS 10108, for all building/plant areas of the power station.
- (4) The classification in terms of category (i.e. L1, P1 etc.) of all fire zones where fire detection is installed, as per SANS 10139.
- (5) Verification of the fire zoning according to fire protection and HVAC designs.
- (6) The Contractor shall supply and install the fire detection system in all building areas as identified in the fire risk assessment document.
- (7) The fire detection system shall be designed to mitigate against the risks identified by the Employer and the Contractor's fire risk assessment.
- (8) The fire detection system shall be designed for each panel to operate independently from the BMS and CBMS system.
- (9) The fire detection systems shall be modular in design and have facilities for operating as stand-alone units, or as part of a network. The FDCP shall be completely modular and expandable.
- (10) Expanding or adding options shall be by means of plug-in modules that are automatically configured by the FDS.
- (11) The design of the FDS shall allow add-ons of field devices to be carried out on site.
- (12) The occurrence of a fire or fault alarm shall be recorded and reported without operator intervention.
- (13) The receipt of new alarms shall not be inhibited by existing alarms or operator actions.
- (14) A fault signal, or a keyboard operation carried out by an operator, shall not inhibit or delay the receipt of additional alarms.
- (15) The FDS shall employ methods to actively limit the number of false alarms generated such as (but not limited to) voting system by devices.

(16). The FDS shall be self-configuring with the ability to automatically detect cable connections to all field devices along the loop.

(17). The FDS shall be able to log all changes made to its configuration and the associated user.

3.1.3.4 ACCESS CONTROL SYSTEM

- (1) The access control system (ACS) and associated software forms part of the fully integrated system and should be fully compatible with the CBMS. The Contractor is required to design, install and commission access control systems as defined by the Employer's requirements.
- (2) The ACS shall interface closely with the subsystems of the BMS, namely the CCTV system and the Fire Detection System. Typical examples of this interface include ACS and motion triggered video recording and Fire Detection System triggered door releases.
- (3) The ACS shall support time periods, scheduling, embedded zoning and access levels. The Contractor shall submit the zoning philosophy to the Engineer for approval. The Contractor shall coordinate the zoning for access control with zoning philosophies for fire detection, HVAC and CCTV.
- (4) The access control system design for server rooms and data centres shall comply with the recommendations, specifications and requirements set out in Eskom document 32-894 "Eskom Server Room and Data Centre Standard" as found in Appendix A.
- (5) Where any conflict arises between the above-mentioned standard and these works, the Contractor shall identify the conflict and recommend a solution to the design Engineer and project manager.

3.1.3.5 STANDARDIZATION REQUIREMENTS

- 1 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.
- 2 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.

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

3.1.3.6 PHYSICAL CHARACTERISTICS OF CONTROL AND MONITORING SYSTEM

3.1.3.6.1 Operator Stations

The primary function shall be to monitor and will not be used in protection.

The Operator desk shall consist of two Operator station as a minimum – one for weighbridge operation and the other for CCTV and BMS functions.

3.1.3.6.2 Operating Screens

The minimum size of the operating screens is 24".

3.1.3.6.3 Operating Workstations

The operating workstation shall have the following characteristics:

- 19" rack mounted workstation
- Uses dedicated workstation hardware

- Rated for continuous use (24/7)
- Redundant network ports (with redundant connections to the network)
- Hard-drives are redundantly configured via a suitable RAID configuration
- Redundant power supplies
- Remote diagnostics, monitoring & alarming
- Engineering Stations

Portable engineering station shall be provided. The operator work station should also have engineering functionalities but only accessible with engineering or admin login details.

3.1.3.6.4 Servers

Redundant server(s) to provide the following functionalities will be provided by Contractor :

- Engineering servers - for the storage of the plant area's engineering database. The control system logic is created and modified via the engineering server and then downloaded to the relevant controllers
- Historian/PIS servers - for the long term storage of the plant area's information
- Update server - for the centralised management and distribution of antivirus software and security patches updates on all workstations and servers on the network
- Webserver – for view of the Weighbridge operations compliant to Eskom IT and Cyber security Requirements

Each of the above servers can share functionality and do not have to be separate individual servers. Typically multiple servers (as described above) may be hosted in one redundant set of hardware. However regardless of how many redundant sets of server hardware are used by the Contractor to realise the above server functions, each server machine must have the following physical characteristics:

- 4 Redundant connections to each applicable network
- 5 Redundant power supplies
- 6 Use dedicated server hardware
- 7 Hot swappable redundant hard drives via a suitable RAID configuration
- 8 19" Rack mounted in network cabinets

3.1.3.6.5 Network Switches

The housing and functionality requirements for all network switches shall be securely mounted in either the network cabinets or control system cubicle. All network switches shall be managed network switches with the following characteristics:

- Monitoring of the port connections and health of the device remotely
- Remote management, configuration
- All network switches support the backup and restoring of all configuration settings
- Remote network traffic monitoring
- Redundant power input ports
- All network switches are SNMPv3 compatible
- All network switches are IPv6 compatible

- Any network switch not housed in a network cabinet is of industrial Ethernet type and suitable for uncontrolled environmental and harsh conditions.

3.1.3.6.6 Network Cabinets

All servers and operator workstations will be housed in 19" network cabinets. Redundant servers should be mounted in separate network cabinets. Patch panels and network switches may be mounted in the same network cabinets (as opposed to dedicated network switch cabinets). As far as possible, all connectors on rack-mounted components must be rear facing in the network cabinet for easier cable management. Top entry shall be used for network cables and bottom entry for power cables.

The network cabinets must have the following characteristics:

- Fully perforated front and rear server cabinet doors to maximise air flow
- Top panel with grommet holes for cable entry
- Removable solid side panels
- Any cable cut-outs beneath the network cabinet must be sealed to prevent air leakage using raised floor grommets
- There must be no open spaces between the rails and sides of rack enclosure. This ensures the network cabinet air flow is managed correctly
- Comprehensive internal cable management system (for both horizontal and vertical cable management)
- Blanking panels on all unused slots to manage air flow efficiency and reduce hot spot temperature in the network cabinet
- Redundant Intelligent rack mounted power distribution units for remote management and diagnostics
- Rack mounted environmental monitoring devices for remote monitoring of the network cabinet environment
- Rack mounted LCD & keyboard
- Flexible brushes or shields must be used to prevent air leakage via cable entries

Network cabinets must have sufficient depth to allow free air around cables in rear.

3.1.4 ELECTRICAL WORKS

The *Contractor* shall design, procure, supply, install and commission all electrical work, cabling, cable terminations, earthing lighting and small power for a complete functional system.

The Contractor shall tie in on the indicated power distribution board for Access Control Building and Weighbridge system, C&I equipment, lighting etc. The Contractor shall comply with Eskom HAZLOC standard.

3.1.4.1 WEIGHBRIDGE SYSTEM

Electrical supply requirements for the weighbridge scale system shall be defined as follows.

- 1) A main power panel shall be provided as part of the weighbridge control room infrastructure and shall include circuit breakers for the weighbridge system's powered equipment.

- 2) All required junction boxes, terminal strips, power conditioners, UPS units, and lightening/surge protection devices, shall be provided.
- 3) All electrical requirements shall comply with Eskom's electrical equipment specifications.
- 4) Power supply redundancy shall be provided temporarily by means of one or more UPS units capable of meeting the electrical power requirements of full weighing operations for two hours plus system shutdown time.

3.1.4.2 SMALL POWER AND LIGHTING – All Buildings

The *Contractor* shall provide and install all small power and lighting for all building(s) in accordance with the small power and lighting drawings Coal Fired Power Stations Lighting and Small Power Installations standard 240-55714363.

1. The following lighting and small power requirements are to be utilised for every building as a minimum. Any building specific requirements will be given under each building section:
 - a. Temporary construction lighting and small power shall be provided by the *Contractor*.
 - b. The *Contractor* shall design, manufacture, install and commission lighting and small power for the buildings that will include:
 - i. least one single phase 16A 230V plug outlet per room, the plug outlet will be provided every 10m on every wall and 1m above the floor.
 - ii. Internal lighting designed to integrate with the installation arrangement of the equipment.
 - iii. At External/peripheral lighting that illuminate at least the walkway and landings of the building.
 - iv. Emergency lighting in the buildings.
 - c. All electrical equipment selected for the classified areas must comply with the area classification requirements and applicable standards. The design must cater for minimising the electrical equipment in hazardous zones by locating this equipment in less hazardous zones.
 - d. Lux levels survey shall be conducted upon completion of lighting installation to ensure or guarantee that the illuminance meets the requirements of South African National Standards as well as minimum values stipulated by occupational health and safety act.
 - e. The equipment of the same rating should be fully interchangeable to allow for low inventory and reduced down-times.
 - f. No cables or wires are allowed to run on the floor surface.
 - g. The *Contractor* shall submit both manufacturing and construction ITPs for lighting and power distribution board for acceptance by the *Project Manager* prior to starting with actual works.
 - h. Factory acceptance testing/inspection is mandatory for small power and lighting distribution board as well as light fittings.
 - i. All lighting and small power designs and installations shall comply with the following standards:
 - i. 240-55714363 Eskom generation Lighting and Small Power Installation Standard
 - ii. OHS Act: Occupational health and Safety

- iii. SANS 204: Energy Efficiency in Buildings
- iv. SANS 10142-1: The wiring of premises Part 1: Low-voltage installations

3.1.4.3 EARTH MAT AND LIGHTNING PROTECTION -All buildings

- (1) The *Contractor* shall be required to install the earth mat for the building(s) and equipment, including connecting all foundations and structural steel, as defined within the Specification as such shall be provided as part of the contractor works.
- (2) The *Contractor* shall provide the lightning protection system in accordance with the Employer's drawings and the Earthing and Lightning Protection Standard, 200 11757.
- (3) The *Contractor* shall refer to the above standards, these standards include requirements and constraints pertaining execution of the Works. Where applicability of this standards is not clear the *Contractor* shall query such with Engineer before undertaking Works that are the subject of this standard.
- (4) The *Contractor* will be responsible to design, installation, and commissioning of the earth mat and lightning protection for the buildings where required.
- (5) The *Contractor* shall design earthing and lightning protection systems in accordance with 240- 56356396 Earthing and Lightning Protection Standard and 0.84/3482 Medupi Power Station Earthing Standards.
- (6) The *Contractor* shall earth all installed equipment in accordance with 240-56356396 Earthing and Lightning Protection Standard.
- (7) The *Contractor* shall perform earthing continuity tests as part of the quality control process and provide an earthing certificate for all tested equipment. The tested earthing points must be marked and recorded for reference purposes (plant earthing maintenance purposes). All installation plans must be submitted to the *Project Manager* for testing witnessing purposes.
- (8) The *Contractor* shall ensure that all outdoor electrical equipment is weatherproof with at least an IP 65 rating
- (9) The earthing and lightning protection will be interconnected to the existing power island earth mat.
- (10) The *Contractor* is responsible to test the integrity of this mat in the area that was worked and repair it if required.
- (11) The *Contractor* shall clearly define the design, philosophy and implementation (installation) plan with drawings, calculation, software applied and all supporting documentations for:
 - 1. Lightning protection
 - 2. Earthing design

3.1.4.4 CABLING AND RACKING

Cabling and racking shall comply to Medupi Power station Cabling and racking standard, 200 11768.

3.1.4.4.1 Cabling – all buildings

- 1. Eskom engineering will allocate a point of power supply from which the *Contractor* will terminate and pull the permanent power supply cable to the distribution board. Cabling shall comply with Eskom specification (240-56227443).

2. The *Contractor* shall determine the cable route from the allocated power point.
3. All electrical equipment selected for the classified areas must comply with the area classification requirements and applicable standards. The design must cater for minimising the electrical equipment in hazardous zones by locating this equipment in less hazardous zones.

3.1.4.4.2 Cable servitudes, racking and supports – all buildings.

1. *Contractor* shall comply with the requirements for Control and Power Cables for Power Stations Standard (240-56227443).
2. The *Contractor* shall determine the cable route from the allocated power point.
3. The *Contractor* is to procure and install the correct size power cable to feed the main DBs of each building from the allocated power source.
4. Equipment foundations or supporting structures shall be designed to allow for cable access to equipment. Servitudes for all cable routes shall be allocated and are to be shown on plant layout drawings. Separate servitudes shall be allocated for control cables and power cables have permissible spacing between control cable routes and power cable routes.

3.1.4.5 LV SWITCHGEAR – ALL BUILDINGS

1. The electrical power supply allocation will be done by the *Employer*.
2. The *Contractor* is to supply and install the correct size bucket for the switchgear that will supply the power to the motors. The *Contractor* is to update all labels on the switchgear where applicable following the KKS standard. The *Employer* shall provide all relevant switchgear documentation once the allocation has been done as per the size of the motors.
3. The *Contractor* shall reseal any fire sealing that had to be damaged by installation of the cables.

3.1.4.5.1 Testing and Proof of Compliance – all buildings

1. The relevant certificates and test reports shall be provided by the *Contractor* to prove compliance to the relevant specifications. If the equipment supplied has been type tested, type test certificates for that make will be acceptable and do not have to be re-tested. E.i electrical CoC
2. The equipment offered shall be identical to the type of equipment tested. In the event that components differ from the once described in the type test certificates/reports, the components shall be subjected to retesting before acceptance by the *Project Manager*.

3.1.4.5.2 Factory inspection and testing – all buildings

1. The Project Manager shall inspect the Plant in the manufacturer's premises before dispatch and Contractor shall advise on a period required for the inspection and testing activities. Allowance shall be made in the delivery time to cater for this requirement
2. The Contractor shall supply a detailed procedure that will be used for Factory Acceptance Tests (FAT's) to be accepted by the Project Manager, 30 calendar days prior to starting date of the first FAT. The *Contractor* shall also give the *Project Manager* at least 14 calendar days' notice of the date on which the equipment is ready for inspection and testing.
3. If the factory inspection and testing is not to be done within the Republic of South Africa, at least 10 weeks' notice is required.
4. The light fittings that will be used will comply with the testing procedure set out by the

small power and lighting Eskom generation Lighting and Small Power Installation
Standard (240-55714363)

3.1.4.5.3 Component's acceptance – all buildings

1. All active components of the Plant that do not form part of the OEM's original design shall be subjected to Acceptance by the *Project Manager*. The component shall comply with the relevant requirements of this Specification as a minimum.
2. Where required, the *Contractor* shall provide calculations to prove the component application, design and compliance to the requirements. The relevant schematic drawings shall be used for the acceptance of components application. Should the requirements not meet the component application design requirement, the additional cost is borne by the *Contractor*.
3. Original copies of the technical documentation of each component shall be provided in a file complete with contents list with all calculations per component. A copy of filed labelled ComponentsAcceptance File shall be submitted in the regard.

3.1.4.5.4 Factory Inspection and Clearance for Dispatch – all buildings

1. The *Project Manager* shall be provided with the access to the *Contractor's* requirements on inspections, surveillance and audits.
2. The *Contractor* shall obtain clearance from the *Project Manager* before despatching of the equipment. This factory release inspection shall not release the *Contractor* of any of his obligations under the contract.
3. No plant shall be released for dispatch without the AS MANUFACTURED documentation and drawings accompanying them.

3.1.4.5.5 Site testing and commissioning – all buildings

1. The Contractor shall conduct the following tests and checks once the erection of the Plant on site has been completed (as a minimum requirement):
 - a. Settings adjustment, operational checking of each functional unit.
 - b. Checking for any visual damage to the functional units and all other equipment.
 - c. Check tightness (torque where applicable) on all connections.
 - d. Check the fixing and locking devices on doors and covers.
 - e. Repetition of all electrical functional tests where possible.
 - f. Lighting lux level tests.
2. The *Project Manager* shall witness the tests and checks.
3. Once the Contractor has satisfactorily completed all his tests, the *Project Manager* shall ensure conformance to the relevant specifications. These checks by no means release the Contractor of his obligations to perform all site inspection, testing and commissioning.
4. Upon completion of commissioning, the *Contractor* shall provide as built drawings within a period of 14 Calendar days.
5. The *Contractor* shall provide supervision during the erection, installation, site testing and commissioning of the Works. The supervision shall also be available during functional checks.
6. Commissioning checks for the complete system will be led by the *Contractor* in conjunction with the *Employer's* commissioning team

3.1.5 CIVIL & STRUCTURAL WORKS

The Civil & Structural scope of works includes but not limited to concrete works, steel works, brickwork, earthworks, roadworks, storm water drainage as well as any supporting infrastructure for the Mechanical, C&I and electrical scope indicated above for the Weighbridge and Gate 4 Access Control Building.

The *Contractor* shall be responsible for the design and construction of the Works.

3.1.5.1 REQUIREMENTS

1. The *Contractor* shall take full professional accountability and liability for all the Works in the scope and shall provide the following for review and acceptance:

a) Consolidated detailed design report signed by a Professional Civil Engineer which includes:

I. Two bi-directional weighbridges with a minimum rated capacity of 60 metric tons (60,000 kg), and the scale platform's footprint shall measure 24m x 3m (minimum).

II. The structural and mechanical detailed design, fabrication, installation, testing and certification of the weighbridges and all accessories

III. Survey results, outcomes of Geotechnical investigation, design criteria/parameters, specifications and standards used, loadings, assumptions, calculations results including detailed design calculations, design models, sources of information and any record of other information associated with the completed Works.

b) Detailed drawings for construction. Drawings shall be submitted in CAD formats.

2. The *Contractor shall* submit as-built data and drawings of the completed works upon handover. As-built drawings shall be submitted in PDF and native CAD formats.

3. Any discrepancy or ambiguity between the Employer's Specifications or requirements shall immediately be brought to the attention of the Project Manager for clarification.

3.1.5.2 STRUCTURAL WORKS

The structural works includes reinforced concrete, structural steelwork and brickwork.

3.1.5.2.1 Initial Assessment

The initial assessment for the structural designs shall include the following:

1. Geotechnical investigation of the ground to confirm if the location is suitable for foundations and location for the works
2. The topographical survey of the proposed area(s)
3. Underground surveys in the proposed areas to locate any underground services

3.1.5.2.2 Structural Design Criteria

The *Contractor* shall consider all the below mentioned design criteria for the Works and the Works shall comply with 240-56364545 Structural Design and Engineering Standard and the normative references within:

3.1.5.2.2.1 Reinforcement

The contractor shall comply with 84CIVL053 - Medupi Power Station Specification for Structural Concrete

1. Steel reinforcing shall comply with Steel bars for concrete reinforcement standard.
2. Welded mesh reinforcement shall comply with Welded steel fabric for reinforcement of concrete.
3. Bending schedule shall be in accordance with bending dimensions and scheduling of steel reinforcement for concrete.
4. Reinforcement chairs and spacing of spacers shall comply with detailing of reinforcement for concrete.
5. All concrete cover shall be 60 mm in contact with soil/sewage/water, 40 mm when exposed or above ground.

3.1.5.2.2.2 Concrete

The contractor shall comply with 84CIVL053 - Medupi Power Station Specification for Structural Concrete

3.1.5.2.2.3 Brickwork

All brick works shall comply to 200200-26680, Medupi Power Station Architectural Technical Specifications For Structures And Other Buildings and shall comply with SANS 227 requirements.

1. Brick walls shall be built in two stretcher bonds.
2. Mortar shall be Class II as per SANS 2001-CM1
3. All brick force shall comply with SANS 2001-CM1
4. Selected wall ties shall comply with the requirements of SANS 2001-CM1

3.1.5.2.4 Structural Steel

The contractor to comply in accordance to the 240-56364545 - Structural Design and Engineering Standard and all relevant and applicable SANS

1. Allowable deflections for differential structures are governed by the structural use of steel Part standard and the Southern African Steel Construction Handbook - Red Book.
2. Fixing of purlins to roof beams and trusses by means of angle cleats.
3. Washers shall be used for all bolted connections, and the washers shall comply with SANS 170016-2 Part 16 and SANS 1700-16-3 Part 16.
4. Bolts, nuts and threads shall comply with requirements of SANS 1700.
5. All metal grating, stair treads and fasteners shall be hot dipped galvanized to SANS 121.
6. Hand railing, floors, platforms and walkways shall be provided with kick plates.
7. Anchor bolts shall not be less than 16mm in diameter and shall be Grade 4.8 or Grade 8.8.

3.1.5.3 Construction Criteria

The *Contractor shall* construct the Works in accordance to the contractors' design based on the scope of work for, Medupi power station weighbridge and access control building and the

Construction works and other relevant and applicable SANS regulatory and legislative requirements.

3.1.5.3.1 Concrete Works

South African Standard Construction Works Part CC1: Concrete works (structural) shall be used for all concrete works. Requirements pertaining to concrete batching, construction and testing are stated in the 84CIVL053 Medupi Power Station Specification for Structural Concrete.

The SANs 2001-CC1 will be read in conjunction with the 84CIVL053 Medupi Power station concrete specification.

The *Contractor* shall:

1. Pay special consideration to the construction of concrete classified as “massive”. Some provisions to be considered for the casting of “massive” concrete elements have to include the use of fly ash, the cooling down of reinforcement and concrete mixing material (reducing the temperature of the concrete at the time of placing) and protection of the placed concrete.
2. Provide the Engineer with concrete temperature readings indicating that the temperature gradient between the hydration peak
3. Submit to the Engineer concrete mix designs, concrete-mix 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.

Also submit to the Engineer for review, detailed construction method statements and a quality and test plan prior to the casting of concrete. Construction joints and reinforcement shall be indicated as hold points for the approval by the Engineer.

- 4.
5. Include all specified tests and interventions as a minimum in the inspection and test plans.
6. Consider provisions to minimise early thermal cracking of the concrete.
7. Refer to specialist literature if required.
8. Familiarise himself with the local environmental conditions.

3.1.5.3.2 Structural Steelwork

1. All work shall be in accordance with the latest edition of SANS 2001-CS1.
2. The *Contractor* shall be responsible for the stability of the entire structure and all structural elements during all the erection stages.
3. All dimensions shall be verified on site by the *Contractor* before any fabrication of steelwork commences.
4. All welding shall be conducted by coded welders. Supporting documentation shall be submitted to the Engineer for acceptance. All welding shall comply with 240-106628253 - Standard for Welding Requirement on Eskom plant.
5. All welding works, testing and inspections shall be performed in accordance with AWS. D1.1 and designers' requirements.
6. The *Contractor shall* supply all bolts, washers, nuts etc. for the structural steelwork.

South African Standard Construction Works Part CS1: Structural Steelwork shall be used for all structural steel works and must be read in conjunction in SANS 2001-CM1.

The *Contractor* shall

1. Refer to the contractors' designer drawings for material grades to be used, fabrication and erection tolerances, testing and corrosion protection of the steel structures and elements. Specific reference shall be made to SANS 10162-1, The Structural Use of Steel- Part 1: Limit-state Design of Hot-rolled Steelwork, AWS D 1.1: Structural Welding Code – Steel, SANS 2001:CS1, Construction Works – Part CS1: Structural Steelwork and other standards listed in the above-mentioned standards.
2. Structural Steel Notes and the Steel Paint Specification given on the contractors' designer drawing shall also to be referred to.
3. Submit, to the employer, steel grade certificates, fabrication drawings, welder's certificates and quality and test plans for review prior to fabrication.
4. Submit a construction method statement for steel works as detailed in the VDSS, inclusive of risk assessments per area of construction, to the Employer for review and approval within 28 days prior to commencement of respective activities for review and approval by the Employer.

3.1.5.4 STORMWATER DRAINAGE AND TERRACING

The *Contractor* shall provide adequate storm water drainage for the Weighbridge system and Gate 4 Access Control Building Infrastructure.

The design shall ideally tie into the existing storm water network at Medupi Power Station to reduce the requirements for any additional drainage infrastructure.

3.1.5.4.1 Initial Assessment

The initial assessment for the storm water drainage design shall include the following:

1. Location of all existing drainage infrastructure within the area contributing to the storm water network and/or independent drainage infrastructure.
2. Topographical survey of surrounding areas to determine contributing catchment areas to the storm water network and the and the Fuel Weighbridge and Gate 4 Access Control Building Infrastructure.
3. Survey of all existing drainage infrastructure.
4. Calculation of pre-development storm water flows and any other additional process flows which currently contribute to the existing storm water network.
5. Calculation of post-development flows to determine the additional flow that will be entering the existing storm water network.
6. Assessment of the capacity of the storm water network to accommodate the additional flow entering the system.
7. Assessment of any treatment and storage facilities integrated within the storm water network to accommodate the additional flow requirements.

3.1.5.4.2 Design Criteria

3.1.5.4.2.1 Alternative Studies

Should the existing storm water network be insufficient in accommodating the additional flow, the *Contractor* shall investigate alternative options to cater for the additional flows resulting from the scope.

These may include any combination of providing new drainage infrastructure, upgrading the relevant sections of the existing storm water network or attenuating this flow prior to its release into a system.

The alternative options considered shall be discussed in the design report. This shall also be supplemented by a high-level cost analysis to support the final design solution to be implemented.

3.1.5.4.2.2 Design Considerations

The storm water design 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.

3.1.5.4.2.3 Return Period

1. All new drainage structures and/or systems shall be designed for a 1 in 50 year return period.
2. If it is the *Contractor's* intention to connect any new drainage infrastructure into the existing system, then this system shall also be verified to accommodate a 1 in 50 year return period.

3.1.5.4.2.4 Flood Calculations

The method used to determine design flood peaks shall be referenced in the design calculations. All design calculations should be submitted in detail in the design report. Outputs from any software used shall be submitted in the appendices of the design report.

3.1.5.4.2.5 Rainfall Data

Rainfall data used in the design calculations shall be obtained from an approved source and shall be referenced in the design report.

3.1.5.4.2.6 Design of Storm water Pipes

1. A minimum pipe diameter of 450mm shall be used for any new designs.
2. Calculations for the loads on the pipelines and selection of the appropriate pipe class shall be done in accordance with SANS 10102-1 and SANS 10102-2. A minimum of Class 100D is required for all concrete storm water pipes.
3. All storm water pipes shall be designed with a minimum slope of 0.5%. Changes in slope, especially a reduction in slope, shall be avoided as far is possible.
4. Design flow velocities shall be between 0.5m/s and 3.0m/s with a desirable minimum range of between 0.9 and 1.5m/s. The absolute minimum of the half-full velocity shall not be less than 0.6m/s.
5. The design flow in pipes shall not exceed a ratio of 80% of the capacity of the pipe.

3.1.5.4.2.7 Manholes

Manholes shall be positioned at distances not greater than 50m apart and at a minimum shall be located at the following points:

1. Where two or more storm drains converge.
2. Where pipe sizes change.
3. Where a change in horizontal alignment occurs.
4. Where a change in grade occurs.

3.1.5.4.2.8 Design of Storm water Channels

240-57127955 - Standard for Design of Drainage and Sewerage Infrastructure

It shall be *Contractor's* responsibility to ensure that channels shall be designed with a desirable velocity to ensure that no deposition of sediment or erosion occurs for channels which have soil or grass cover. The *Contractor* may introduce direct protection (linings) or indirect protection (obstructions) to reduce flow velocities or erosive capacity of channels. The choice of lining shall be based on its ability to accommodate the design velocity.

For concrete lined channels, design of the concrete section and joints shall take into consideration the expected design velocity and prevention of any concrete pieces breaking away due to pulsating pressure changes at joints.

3.1.5.4.2.9 Erosion Protection

It shall be the contractor's responsibility to put in place erosion protection measures for the dissipation of energy in channels, the discharge from pipes or weirs shall be considered where downstream erosion or scouring is possible.

3.1.5.4.2.10 Legislation

The following legislative documents shall be adhered to during the designs of all water related infrastructure:

1. The National Water Act (Act No. 36 of 1998)
2. The Environmental Conservation Act (Act No 73 of 1989)
3. Government Notice 704, National Water Act 1998
4. Relevant and applicable regulatory and legislative requirement

3.1.5.5 EARTHWORKS AND ROADWORKS

The *Contractor* shall provide an access road to the Weighbridge and Gate 4 Access Control Building Infrastructure. The design should tie into the existing road network at Medupi Power Station. The Works includes but not limited to material filling, layer works, concrete block paving, guardrails and road markings.

3.1.5.5.1 Initial Assessment

The initial assessment for the Road designs includes the following:

1. Geotechnical investigation of the ground to confirm if the location is suitable for roadworks.
2. The topographical survey of the proposed area(s).
3. Underground surveys in the proposed areas to locate any underground services.

4. Location of existing road(s) infrastructures within the area to tie in the proposed access.
5. Survey of all existing road infrastructures.

3.1.5.5.2 Earthworks and Road Design Criteria

The *Contractor* shall consider all the below mentioned design criteria for the Works and the Works shall comply 240-84418186 - Road Specification Manual and Standardized specification for civil engineering construction Section M and the normative references within:

3.1.5.5.2.1 Layer ways and Concrete Block Paving

1. Precast concrete kerns, edgings and channels shall comply with SANS 927.
2. Road lime chemical stabilizing agents shall comply with SANS 824.
3. Chemical stabilizing cement shall comply with SANS 50197-1.
4. Concrete paving blocks shall comply with the requirements of SANS 1058.
5. Guardrails shall comply with the requirements of SANS 1350.
6. Guardrails shall be galvanized with a hot-dip (galvanized) zinc coating.
7. Timber posts shall comply with the requirements of SANS 457.
8. Posts shall have a top diameter of not less than 150 mm. Posts with a top diameter up to 230 mm will be acceptable, provided that posts with widely varying diameters shall not be used together in the same length of guardrail typical lap length is required to be 45 × smaller bar diameter.
9. Timber posts and spacer blocks shall be treated in accordance with SANS 10005 using creosote that complies with SANS 538 or SANS 539

3.1.5.5.2.2 Guardrails

1. Guardrails shall comply with the requirements of SANS 1350.
2. Guardrails shall be galvanized with a hot-dip (galvanized) zinc coating.
3. Timber posts shall comply with the requirements of SANS 457.
4. Posts shall have a top diameter of not less than 150 mm. Posts with a top diameter up to 230 mm will be acceptable, provided that posts with widely varying diameters shall not be used together in the same length of guardrail typical lap length is required to be 45 × smaller bar diameter.
5. Timber posts and spacer blocks shall be treated in accordance with SANS 10005 using creosote that complies with SANS 538 or SANS 539.
6. The retro-reflective material for the reflector plates shall comply with SANS 1519.

3.1.5.5.2.3 Road Markings

Road marking paint shall comply with the requirements of SANS 731-1 and CKS 192.and Eskom 240-84418186 - Road Specification Manual

The no pick-up time of road marking paint shall comply with Class 1 requirement in SANS731-1.

3.1.5.5.2.4 Construction Criteria

The *Contractor* shall construct the Works in accordance with the contractors' design based on the scope of works and the SANS 1200 Standards and other relevant SANS specifications referenced herein.

3.1.5.6 GEOTECHNICAL WORKS

The *Contractor* shall carry out a geotechnical investigation on the proposed areas. In situ DCP testing shall be carried out to determine soil density. Samples shall be taken for laboratory testing. The following tests shall be carried out as a minimum:

1. Field work
2. Laboratory testing & reporting
3. Foundation Indicator Tests
4. CBR
5. Road Indicator Tests

The *Contractor* shall conduct the necessary tests to confirm the allowable bearing capacity for the associated structures

3.1.5.6.1 Fill Placement

All fills shall be prepared in accordance with the Eskom backfill specification revision 11 and relevant construction drawings. Where the drawings differ from the above specification, the specification shall take precedence.

The *Contractor* shall submit a construction method statement for preparation of engineered fill, inclusive of risk assessments per area of construction, to the Engineer for review and approval within 28 days prior to the commencement of back filling activities for review and approval by the Engineer.

The *Contractor* shall include the following activities and interventions as a minimum on inspection and test plans:

1. Approval of testing equipment including verification of manufacturing specifications and calibration certificates - hold point for *Contractor* and Engineer
2. Approval of construction materials. The *Contractor* shall submit following test results at appropriate intervals to Engineer for review and acceptance – grading, Atterberg Limits, Mod AASHTO and CBR - hold point for *Contractor* and Engineer
3. Rip (if applicable), adjust moisture content and compact subgrade to in situ density specified by relevant drawings and specifications - hold point for *Contractor* and witness point for Engineer
4. Verify subgrade compaction density and stiffness through specified testing - hold point for *Contractor* and Engineer.
5. Import construction material from approved source - hold point for *Contractor* and Engineer.
6. Compact in approved layer thicknesses to specified in situ compaction densities - hold point for *Contractor* and Engineer.
7. Verify layer compaction density and stiffness through specified testing - hold point for *Contractor* and Engineer.
8. Conduct plate load tests on final layer as per Eskom specification latest revision - hold point for *Contractor and Engineer*.
9. As-built survey of final layer - hold point for *Contractor* and Engineer.

3.1.5.7 PAINTING AND CORROSION PROTECTION

The corrosion requirements are stipulated in the Medupi Power Station Corrosion Protection Specification, SSZ_45-17. The painting requirements are stipulated in the Specification for the Identification of the Contents of Pipelines and Vessels,

3.1.5.8 SITE CONSTRAINTS

- a) Weather conditions
- b) Existing infrastructure
- c) Logistics and supply constraints
- d) Site access constraints

3.1.6 VERIFICATION

3.1.6.1 DESIGN REVIEWS

Design reviews shall be conducted in accordance with Eskom Design Review Procedure.

3.1.6.2 FACTORY AND SITE ACCEPTANCE TESTING REQUIREMENTS

All factory and site acceptance tests shall be conducted as per the requirements in the scope of work to be developed for execution phase.

3.1.6.3 COMMISSIONING AND HAND-OVER REQUIREMENTS

The Medupi Weighbridge and Gate 4 Access Control Building shall be commissioned in line with Medupi Commissioning Procedure and handed over as fully functional system that conforms to applicable standards. The handover documentation shall be in line with Documentation Handover List as agreed between the *Employer* and *Contractor*.

3.1.7 MAINTENANCE

The design shall include the following for the plant maintenance requirements:

- 1 Plant maintainability characteristics sufficient to achieve the required availability;
- 2 Number and skill of maintenance personnel;
- 3 Packaging, handling, storage and transportation;
- 4 Preferred access routes;
- 5 Preferred equipment for ease of maintenance;
- 6 Period between major shut-downs;
- 7 Standardisation requirements;
- 8 Maintenance information management;
- 9 Spares;
- 10 Special tools & software;
- 11 Training;
- 12 Technical documentation:
 - a. Manuals;

- b. Procedures; and
- c. Parts catalogue.

13 Pumping system to be designed with sufficient space for easy maintenance (lifting equipment)

3.1.8 SPARE PARTS

The supply of all spare parts and consumables required for commissioning, performance and reliability testing of the complete plant up to the issuing of the *Completion* Certificate for the *Works*, shall be the responsibility of the *Contractor*. It is the *Contractor*'s responsibility to ensure that an adequate supply of spares is available on site to fulfil his contractual obligations during the commissioning, performance and reliability testing up to take-over of the plant.

The quantities of spares for two years operation based on the *Contractor*'s recommended list shall be ordered at the discretion of the *Project Manager*.

3.1.9 PROGRAMMING CONSTRAINTS

The *Contractor* shall

1. be responsible for the compilation of a high-level programme (which includes key dates, milestone dates, etc.) for the *Works*, and shall submit to the *Project Manager* for acceptance.
2. Revise the programme every month to track the progress of the *Works*.

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
C4	This cover page Site Information	1
	Total number of pages	

• 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

Medupi Power Station is a coal fired power plant comprising of six units providing a total of 4 800MW on full capacity. The Power Station is situated approximately 20 Km from the town of Lephalale (Elliras), it is situated along the Steenbokpan Road. The weighbridge project is 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 a 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 criminal and medical checks.

The *Contractor* shall have no claim against the *Employer* in respect of any delay at the security main gate.

Note that the speed limit on the site ranges from 20 – 40Km/h. The vehicle permit of any persons contravening any traffic act on site shall be cancelled.

No firearms, weapons, alcohol and illegal substances are permitted on site. Alcohol tests are conducted on site, if alcohol testing is proved positive, entry to site will be refused and the Contractor will follow his/her disciplinary action against such acts.

The Contractor implements a safety plan and maintains the safety system until the completion of the whole works. The plan as minimum, contain PPE information, written safe working procedures, job specific risks assessments, safety meeting, etc. the plan will be to the Employers satisfaction and will be accepted prior to the commencement of any work.

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

In the Project Manager has the right to stop the Contractor's work activities which in the opinion of the 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 Gate 4 premises. All interfaces are as stated in the Specification document 348-942854

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 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.