



## NEC3 Engineering & Construction Contract

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

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

for **Water Balance and Flow Meter Upgrade**

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

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## Part C1: Agreements & Contract Data

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[to be inserted from Returnable Documents at award stage]	

## C1.1 Form of Offer & Acceptance

### Offer

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

### Matimba Power Station Water Balance and Flow Meter Upgrade

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

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

Options A B, C or D	The offered total of the Prices exclusive of VAT is	R [•]
	Sub total	R [•]
	Value Added Tax @ 15% is	R [•]
	The offered total of the amount due inclusive of VAT is <sup>1</sup>	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)

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

## Acceptance

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

The terms of the contract, are contained in:

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

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

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

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

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

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

Signature(s)

Name(s)

Capacity

**for the  
Employer**

\_\_\_\_\_  
(Insert name and address of organisation)

Name &  
signature of  
witness

Date

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

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

Note:

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

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

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

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

### For the tenderer:

### For the Employer

Signature	_____	_____
Name	_____	_____
Capacity	_____	_____
On behalf of	(Insert name and address of organisation)	(Insert name and address of organisation)
Name & signature of witness	_____	_____
Date	_____	_____

# 1. C1.2 ECC3 Contract Data

## Part one - Data provided by the *Employer*

Clause	Statement	Data
1	<b>General</b>	
	The <i>conditions of contract</i> are the core clauses and the clauses for main Option	
		<b>A: Priced contract with activity schedule</b>
	dispute resolution Option	<b>W1: Dispute resolution procedure</b>
	and secondary Options	
		<b>X2 Changes in the law</b>
		<b>X7: Delay damages</b>
		<b>X15: Limitation of <i>Contractor's</i> liability for design to reasonable skill and care</b>
		<b>X16: Retention</b>
		<b>X18: Limitation of liability</b>
		<b>Z: <i>Additional conditions of contract</i></b>
	of the NEC3 Engineering and Construction Contract, April 2013 (ECC3)	
10.1	The <i>Employer</i> is (Name):	<b>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</b>
	Address	<b>Registered office at Megawatt Park, Maxwell Drive, Sandton, Johannesburg</b>
10.1	The <i>Project Manager</i> is: (Name)	<b>Johan Botha</b>
	Address	<b>Matimba Power Station</b>
	Tel	<b>+27 14 763 8225</b>
	e-mail	<b>BothaJH@eskom.co.za</b>
11.2(3)	The <i>completion date</i> for the whole of the works is	<b>31 March 2023</b>
11.2(13)	The <i>works</i> are	<b>Installation and commissioning of water balance and flow meter upgrade</b>

11.2(14)	The following matters will be included in the Risk Register	The Risks will be recorded in the Risk Register as notified by the Contractor or the Employer during the execution of the Works
11.2(15)	The <i>boundaries of the site</i> are	Matimba Power Station Water Systems and the Contractor's yard
11.2(16)	The Site Information is in	Part 4: Site Information
11.2(19)	The Works Information is in	Part 3: Scope of Work and all documents and drawings to which it makes reference.
12.2	The <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	2 days
16.1	Early Warning	<p>The <b>Contractor</b> and the <b>Project Manager</b> give an early warning by notifying the other as soon as either becomes aware of any matter which could</p> <ul style="list-style-type: none"> <li>• increase the total of the Prices</li> <li>• delay Completion</li> <li>• delay meeting a Key Date or</li> <li>• impair the performance of the <i>works</i> in use.</li> </ul>

## 2 The Contractor's main responsibilities

20.1	Providing the Works	The <b>Contractor</b> Provides the Works in accordance with the Works Information.
26.1	Subcontracting	No subcontracting allowed.

## 3 Time

30.1	The <i>access dates</i> are:	Part of the Site	Date
		1 Matimba Power Station	Start Date of the Contract
31.1	The <b>Contractor</b> is to submit a first programme for acceptance within	1 week of the Contract Date.	
31.2	The <i>starting date</i> is	2022-09-01	
32.2	The <b>Contractor</b> submits revised programmes at intervals no longer than	1 week.	

## 4 Testing and Defects

40	Tests and Inspections	All NEC ECC3 Sub-Clauses 40.1 to 40.6 will apply
42.2	The <i>defects date</i> is	52 weeks after Completion of the whole of the <i>works</i> .
43.2	The <i>defect correction period</i> is	3 days
45	Uncorrected Defects	NEC ECC3 Sub-Clauses 45.1 and 45.2 will apply

<b>5</b>	<b>Assessing the amount due</b>	
50.1	The <i>assessment interval</i> is	<b>Between the 25<sup>th</sup> day of each successive month.</b>
51.1	The <i>currency of this contract</i> is the	<b>South African Rand.</b>
51.4	The <i>interest rate</i> is	<b>Not applicable for this contract</b>
<b>6</b>	<b>Compensation events</b>	
60.1(19)	An event which	<b>stops the Contractor completing the works or delays the contractor to execute the works</b>
<b>8</b>	<b>Risks and insurance</b>	
84.1	The <i>Contractor</i> provides for insurances	<b>as stated in the Insurance Table</b>
<b>INSURANCE TABLE</b>		
	<b>Insurance Against</b>	<b>Minimum amount of cover or minimum limit of indemnity</b>
	Loss of or damage to the works, Plant and Materials	The replacement cost for the replacement of any Plant and Materials provided by the <i>Employer</i>
	Loss of or damage to equipment	The replacement cost
85.1	Insurance policies	<b>the <i>Contractor</i> submit to the <i>Project Manager</i> certificates which state that the insurance required by this contract is in force.</b>
86.1	If the <i>Contractor</i> does not insure	<b>The <i>Employer</i> may insure a risk. The cost of insurance to the <i>Employer</i> is paid by the <i>Contractor</i></b>
<b>9</b>	<b>Termination</b>	<b>Applicable NEC ECC3 Clause: 90 Termination and relevant sub-clauses 90.1 to 90.5 91 Reasons for Termination and relevant sub-clauses 91.1 to 91.7 92 Procedures on termination and relevant sub-clauses 92.1 to 92.2 92 Payment on termination and relevant sub-clauses 93.1 to 93.2</b>
<b>MAIN OPTION CLAUSE</b>		
<b>A</b>	<b>Priced contract with activity schedule</b>	<b>Contained in Section 2</b>
<b>W1</b>	<b>DISPUTE RESOLUTION</b>	
W1.2	The <i>Adjudicator</i> is	<b>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 <a href="http://www.ice-sa.org.za">www.ice-sa.org.za</a>). If the Parties do not agree on an Adjudicator the Adjudicator will be appointed by the Arbitration Foundation of Southern Africa (AFSA).</b>
W1.4(2)	The <i>tribunal</i> is:	<b>Arbitration.</b>



## SECONDARY OPTION CLAUSES

<b>X2</b>	<b>Changes in the law</b>	<b>A change in the law of South Africa</b>
<b>X7</b>	<b>Delay damages</b>	
X7.1	Delay damages for Completion of the whole of the <i>works</i> are	<b>R10 000.00 per day up to a limit of 10% of total contract value</b>
<b>X15.1</b>	<b>Limitation of the <i>Contractor's</i> liability for his design to reasonable skill &amp; care</b>	<b>The <i>Contractor</i> is not liable for Defects in the <i>works</i> due to his design so far as he proves that he used reasonable skill and care to ensure that his design complied with the <i>Works Information</i>.</b>
<b>X16</b>	<b>Retention</b>	
X16.1	The <i>retention percentage</i> is	<b>5%</b>
<b>X18</b>	<b>Limitation of liability</b>	
X18.1	The <i>Contractor's</i> liability to the <i>Employer</i> for indirect or consequential loss is limited to:	<b>R1,000,000.00 (One Million Rand)</b>
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:	<b>the amount of the deductibles relevant to the event described in the <i>Employer's</i> insurance policy.</b>
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	<b>The total cost of design and loss to employer on cost incurred based on defective design.</b>
X18.5	The <i>end of liability date</i> is	<b>1 year after the completion date. Inclusive of latent Defects.</b>  <b>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>.</b>
<b>Z</b>	<b>The <i>Additional conditions of contract</i> are</b>	<b>Z1 to Z12 always apply.</b>
<b>Z1</b>	<b>Cession delegation and assignment</b>	
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.	
<b>Z2</b>	<b>Joint ventures</b>	
Z2.1	If the <i>Contractor</i> 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 <i>Employer</i> 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.

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

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- 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.

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

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- 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.

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**Z8 Notifying compensation events**

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- 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".

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**Z9 Employer's limitation of liability**

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- 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 <i>Contractor</i> 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 <i>Contractor</i> , or any member thereof in the case of a joint venture, or its employees, agents, or Subcontractors 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.

Z 12.1 A Committing Party may not take any Prohibited Action during the course of the procurement of this contract or in execution thereof.

Z 12.2 The *Employer* may terminate the *Contractor's* obligation to Provide the Works 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 Works for this reason.

Z 12.3 If the *Employer* terminates the *Contractor's* obligation to Provide the Works for this reason, the procedures and amounts due on termination are respectively P1, P2 and P3, and A1 and A3.

Z 12.4 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.

## Annexure B: Insurance provided by the Employer

*These notes are provided as guidance to tendering contractors and the Contractor about the insurance provided by the Employer. The Contractor must obtain its own advice. Details of the insurance itself are available from the internet web link given below.*

- For the purpose of works contracts, insurance provided by Eskom (the *Employer*) has been arranged on the basis of “project” or “contract” value, where the value is the total of the Prices at Completion of the whole of the works including VAT.

A “project” is a collection of contracts or work packages to be undertaken as part of a single identified capital expansion or refurbishment of a particular asset or facility.

A “contract” is a single contract not linked to or being part of a “project”.

- For ECC3 there are three main “formats” of cover and deductible structure: Format A, Format B and Format Dx.

**Format A** is for a project or contract value less than or equal to R350M (three hundred and fifty million Rand) inclusive of VAT.

**Format B** is for a project or contract value greater than R350M. (three hundred and fifty million Rand) inclusive of VAT.

In the case of contracts / packages within a project:

- For a contract / package of R50M which is part of a R400M project, Format B will apply
- For a contract / package of R250M which is part of a R6 billion project, Format B will apply.
- For a contract / package of R120M which is part of a R350M project Format A will apply.

For a contract which is not part of a project the same limits apply:

- For a contract of R50M, Format A will apply
- For a contract of R355M, Format B will apply.

**Format Dx** applies only to Distribution Division projects and contracts. If a Distribution Division project or contract exceeds the Format A limit, the Eskom Insurance Management Services [EIMS] need to be contacted for advice on how to formulate the insurance cover. Cover and deductibles for Distribution Division are per the relevant policy available on the internet web link given below.

**Format A generally applies to Transmission Division** projects and contracts. If a Transmission Division project or contract exceeds the Format A limit, the Eskom Insurance Management Services [EIMS] need to be contacted for advice on how to formulate the insurance cover.

- Tendering contractors should note that cover provided by the *Employer* is only per the policies available on the internet web link listed below and may not be the cover required by the tendering contractor or as intended by each of the listed insurances in the left-hand column of the Insurance Table in clause 84.2. In terms of clause 84.1 “the *Contractor* provides the insurances stated in the Insurance Table except any insurance which the *Employer* is to provide”. Hence the *Contractor* provides insurance which the *Employer* does not provide and in cases where the *Employer* does provide insurance the *Contractor* insures for the difference between what the Insurance Table requires and what the *Employer* provides.
- When the Marine Insurance is required, the *Contractor* needs to obtain a copy of the latest edition of Eskom’s Marine Policies Procedures found at internet website given below.

Further information and full details of all Eskom provided policies and procedures may be obtained from:  
[http://www.eskom.co.za/live/content.php?Item\\_ID=9248](http://www.eskom.co.za/live/content.php?Item_ID=9248)

## C1.2 Contract Data

### Part two - Data provided by the *Contractor*

**[Instructions to the contract compiler: (delete this note before issue to tenderers with an enquiry)**

Whenever a cell is shaded in the left-hand column it denotes this data is optional. If not required select and delete the whole row, otherwise insert the required Data.]

**Notes to a tendering contractor:**

1. Please read both the NEC3 Engineering and Construction Contract (April 2013) and the relevant parts of its Guidance Notes (ECC3-GN)<sup>2</sup> 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

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

Clause	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	<b>10%</b> <b>0%</b>
11.2(18)	The <i>working areas</i> are the Site and	<b>Water plants</b>
24.1	The <i>Contractor's</i> key persons are: 1 Name: Job: Responsibilities: Qualifications: Experience: 2 Name: Job Responsibilities: Qualifications: Experience:	

<sup>2</sup> Available from Engineering Contract Strategies Tel 011 803 3008, Fax 011 803 3009 or see [www.ecs.co.za](http://www.ecs.co.za)

		<b>CV's (and further key persons data including CVs) are appended to Tender Schedule entitled</b>
11.2(3)	The <i>completion date</i> for the whole of the <i>works</i> is	
11.2(14)	The following matters will be included in the Risk Register	
11.2(19)	The Works Information for the <i>Contractor's</i> design is in:	
31.1	The programme identified in the Contract Data is	
<b>A</b>	<b>Priced contract with activity schedule</b>	
11.2(20)	The <i>activity schedule</i> is in	<b>(in figures) (in words), excluding VAT</b>
11.2(30)	The tendered total of the Prices is	



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

<b>Document reference</b>	<b>Title</b>	<b>No of pages</b>
C2.1	Pricing assumptions: Option A	2
C2.2	The Price List	4

## 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:

<b>Identified and defined terms</b>	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 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 because of a compensation event.

## The Price List

Item no.	Description	UoM	Qty	Rate	Total Price
<b>1.</b>	<b>Design</b>				
1.1	Cantilever steel structures to support level meters	Sum	1		
1.2	Reinforced concrete foundation plinth for steel structures & telemetry stations	Sum	1		
1.3	Modification of wier at sewage plant	Sum	1		
1.4	Detailed Operating and Control Philosophy	Sum	1		
1.5	Design of flow meters to ensure accurate water accounting	Sum	1		
<b>2.</b>	<b>Civil Works</b>				
2.1	Underground survey DPSH Testing / DCP test	Sum	1		
2.2	Digging of cable trenches	Sum	2		
2.3	Cantilever steel structures to support level meters at dams:				
2.3.1	Stormwater dam South	Sum	1		
2.3.2	Stormwater dam North	Sum	1		
2.3.3	Evaporation Pond East - trench	Sum	1		
2.3.4	Evaporation Pond West - trench	Sum	1		
2.3.5	Metsimaholo Dam	Sum	1		
2.4	Reinforced concrete foundation plinths for the cantilever steel structures and telemetry stations	Sum	11		
2.5	Modification of wier at sewage plant	Sum	1		
2.6	Modification of trench at evaporator dams	Sum	1		
2.7	Replacement of wier with flume at recovery dams	Sum	1		
<b>3.</b>	<b>Electrical Works</b>				
3.1	Conduits	Each			
3.2	Supply & installation of AC/DC converters	Each			
3.3	Station drains to sprinklers Power from irrigation Dam DB - 1A 2.5mm cable & lockable	Sum	1		
3.4	Recovery water from Storm north to dust suppression Power from irrigation Dam DB - 1A 2.5mm cable(400m) & lockable	Sum	1		
3.5	Treated sewage to maturation pond Power from Sewage plant DB - 1A 2.5mm cable	Sum	1		
3.6	Potable to head tank Lockable circuit breakers	Sum	1		

3.7	Raw water reservoir Re-do DB& Wiring	Sum	1		
3.8	Raw water received 1A CB	Sum	1		
3.9	South Storm Water dam DB, EL, 1A Cabling (1000m)	Sum	1		
3.10	Metsemaholo dam DB, EL, 1A Cabling (1000m)	Sum	1		
3.11	Evaporation ponds East DB, EL, 1A Cabling (1000m)	Sum	1		
3.12	Evaporation ponds West DB, EL, 1A Cabling (1000m)	Sum	1		
3.13	Evaporation ponds Inlet DB, EL, 1A Cabling (300m)	Sum	1		
3.14	Potable to Medupi Construction Village DB, EL, 1A Cabling (1000m)	Sum	1		
3.15	Commissioning of flow meters from device to DB boards	Sum	1		
<b>4.</b>	<b>Mechanical Works</b>				
4.1	Sewage Plant				
4.1.1	V-notch Wier installation at maturation dam	Sum	1		
4.1.2	Untrasonic transmitter installation to monitor treated sewage leaving the dam	Sum	1		
4.2	Medupi Construction Village				
4.2.1	Electromagnetic flowmeter installed at outlet of potable head tank	Sum	1		
4.2.2	Replace mechanical meter	Sum	1		
4.2.3	Modification of pipework	Sum	1		
4.3	Evaporation dams				
4.3.1	Interface to be provided to flowmeter	Sum	1		
4.3.2	New flow meter installation between east & west dams	Sum	1		
4.3.3	Electromagnetic flowmeter installed at west/east inlet	Sum	1		
4.3.4	Modification of pipework	Sum	1		
4.4	Water Treatment Plant (WTP)				
4.4.1	1x flowmeter below demin clarifiers to account for demin sludge discharge	Sum	1		
4.4.2	Replace existing flowmeter with DP transmitter at demin filter outlet to account for demin water to sand filter backwash	Sum	1		
4.4.3	Modification of pipework	Sum	1		
4.5	Demin to Aux cooling				
4.5.1	Flowmeters in cable tunnel below U4	Sum	1		
4.5.2	Replace existing vortex flowmeter monitoring flow to Aux cooling south	Sum	1		
4.6	Recovery Dams				

4.6.1	Replace wier with flume.	Sum	1		
4.7	R110/R112				
4.7.1	Replace R110 ultrasonic flow meter with electromagnetic flowmeter	Sum	1		
4.7.2	Modification of pipework	Sum	1		
4.8	Ash Dump				
4.8.1	Electromagnetic flow meter from station drains to sprinklers	Sum	1		
4.8.2	Electromagnetic flow meter from station drains to station	Sum	1		
4.9	Replacement of Hartmann & Braun Transmitters				
4.9.1	Potable to head tank	Sum	1		
4.9.2	Potable to station	Sum	1		
4.9.3	Potable to fire range	Sum	1		
4.9.4	Potable to sandfilter backwash	Sum	1		
4.9.5	Demin to CPP Regen	Sum	1		
4.9.6	Demin to WTP Regen	Sum	1		
4.10	Supply & Installation of Ultrasonic lever transmitters				
4.10.1	Stormwater dam South	Sum	1		
4.10.2	Stormwater dam North	Sum	1		
4.10.3	Evaporation Pond East	Sum	1		
4.10.4	Evaporation Pond West	Sum	1		
4.10.5	Metsimaholo Dam	Sum	1		
<b>5.</b>	<b>Control &amp; Instrumentation</b>				
5.1	Control/termination boxes	Sum	1		
5.2	Cabling from field instrument to new PLC via splitter box	Sum	1		
5.3	Replacement of telemetry systems	Sum	1		
5.4	Communications between remote field instruments and PLC	Sum	1		
5.5	Creation of ABB 800xA HMI graphic to display water balance flowmeter signals	Sum	1		
5.6	ABB 800xA Graphic Integration of new PLC I/O Modules Integration of all WPT system interfaces to plant historian (SAM VA System) Commissioning	Sum	1		
5.7	Commissioning of remote telemetry sites & exiting base station	Sum	1		
5.8	KKS Labelling for all equipment and cabling	Sum	1		
<b>6.</b>	<b>P&amp;G's</b>				
6.1	Site Establishment	Sum	1		
6.2	Site De-establishment	Sum	1		

6.3	Medicals & Induction	Sum	1		
6.4	Safety File	Sum	1		
6.5	PPE	Sum	1		
6.6	Project Management	Sum	1		
6.7	Engineering	Sum	1		
6.8	Installation Manpower	Sum	1		
6.9	Transport	Sum	1		
6.10	Accommodation	Sum	1		
6.11	Documentation	Sum	1		
6.12	Training	Sum	1		
<b>TOTAL OF PRICES (Excluding VAT)</b>					

<b>Resource</b>	<b>Rate</b>
Site Manager	
Engineer	
Responsible Person (RP)	
Authorised Supervisor (AS)	
SHE Officer	
Safety Officer	
Quality Officer	
Planner	
Artisan	
Labourer	

## PART 3: SCOPE OF WORK

Document reference	Title	No of pages
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## C3.1: EMPLOYER'S WORKS INFORMATION

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# 1 Description of the works

## 1.1 Executive overview

The water balance at a power station gives an indication of the various users of the water received by the power station. In order to perform this accurately, field equipment (flow and level measurement) is required for the station to be able to account for the water received and utilised.

Currently, the water management reports are drawn up “manually” on a daily, weekly and monthly basis to check how much water was utilised by the power station. In other words, an employee from Chemical Services Department drives around the power station property everyday recording values on paper and then inputs into an MS Excel sheet at the end of the day. Where no flow meters exist assumptions are made.

The expectations of a new water balance system will consist of flow meters and transmission of signals which can be used to calculate inputs and outputs of each sub process/system and determine the balance (deviations or amounts unaccounted for).

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

The objective of the new system is the capability to ensure water is accounted for at all times and that the dam levels are always monitored. The control philosophy of the system will remain unchanged whilst the operation of the water balance will change.

The purpose of the *works* is to provide Matimba Power Station with a functional Water Balance system that complies with the Water Accounting and Management Framework Standard. Flowmeters, level transmitters, telemetry stations need to be installed to achieve this purpose.

## 1.3 Interpretation and terminology

The following abbreviations are used in this Works Information:

Abbreviation	Meaning given to the abbreviation
%	Percentage
°	Degree
µS/cm	Micro Siemens per centimetre
AP	Automation Processor
C&I	Control and Instrumentation
CP	Common Plant
CS	Control System
DB	Distribution Board
DCS	Distributed Control System
Demin	Demineralised Water
DP	Differential Pressure
GTE	Group Technology Engineering
HMI	Human Machine Interface
HMI	Human Machine Interface
I/O	Input / Output
IP	Ingress Protection

Abbreviation	Meaning given to the abbreviation
JB	Junction Box
Kg	Kilogram/s
kW	KiloWatt
kPa	Kilopascal
L	Litre
LDPE	Low-density Polyethylene
LP	Low Pressure
LV	Low Voltage
m <sup>3</sup> /hr	Cubic meter per hour
mA	Milliamps
MCB	Miniature Circuit Breaker
MPa	Mega Pascal
mV	Millivolts
MW	Megawatt
N/A	Not Applicable
NB	Nominal bore
NH <sub>3</sub>	Ammonia
NTU	Nephelometric Turbidity Units
OEM	Original Equipment Manufacturer
OPCR	Outside Plant Control Room
ORP	Oxidation-Reduction Potential
PCM	Process Control Manual
PID	Piping and Instrumentation Diagram
PLC	Programmable Logic Controller
PMS	Plant Maintenance Strategy
Ppm	Parts per million
PS	Power Station
RAM	Reliability, Availability and Maintainability
RP	Responsible Person
SABS	South African Bureau of Standards
SANS	South African National Standards
SCH	Schedule
SS	Stainless Steel
V	Voltage
VSD	Variable Speed Drive
WAF	Water Accounting Framework
WTP	Water Treatment Plant

The following terminology is used in this Works Information:

Definitions	Description
Common Plant	Non-Unit Plant areas other than the Water Treatment Plant
Contractor	Refers to the single Contractor who is responsible for all aspects of the project – C&I, Mechanical, Civil Electrical, etc. either by executing or sub-contracting the work.
Flow Conditioner	Device which reduces irregularities in the flow profile, varying turbulence levels within the velocity or turbulence intensity profile, swirl and any other fluid flow characteristics which will cause a flow meter to register flow differently than what is expected.
Ultrasonic Flowmeter	In this document this will refer specifically to transit time ultrasonic flowmeters, except when explicitly stated otherwise.
Magflow meter	In this document this will refer to any electromagnetic flow meter
Local	Control is transferred to the Local Control Station and the Control Room Operator will have no control over the devices from the HMI.
Remote Manual	Control Room Operator at the control room initiates control of the individual devices.
Remote Auto	Operator will have the facility to start a sequence in automatic mode in this mode.
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.
The works	This includes all plant and material that forms part of the water balance accounting system.
New PLC	This PLC is the PLC on which all of the Water Balance signals (both the current signals and the new signals) need to be routed to.
New HMI Graphic	This is a new dynamic 800xA HMI graphic will display all of the Water Balance signals coming from the new PLC. This HMI graphic will form part of the current 800xA Outside Plant and Water Treatment Plant HMI in the Outside Plant Control Room.

## 2 Management and start up.

### Management meetings

Meetings are held monthly between the Project Manager and the Contractor (and any other co-opted members). The Contractor is represented, at each meeting, by the appropriate members of the staff.

The venue for these meetings is as determined by the Project Manager. The Project Manager writes the minutes of meetings.

Any action of the Project Manager or Contractor implied in the minutes of meetings with contractual implications is confirmed by means of a separate communication given in accordance with this Works Information and NEC.

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

- Contractor's current activity progress and planned finish dates;
- Contractor's programme agenda compared for delays and milestone targets
- Health, safety and quality Management;
- The progress of any other relevant activities;
- To discuss any technical or commercial issues;
- Problem areas or concerns.

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:
Project Kick-Off Meeting	Once, before contract start	Matimba Power Station	<b>Contractor's</b> Project Manager, Project Supervisor and other attendees at the discretion of the contractor.  <b>Employer's</b> Project Team
Progress Meeting	Once a week.	Matimba Power Station	<b>Contractor's</b> Project Manager, Project Supervisor and other attendees at the discretion of the contractor.  <b>Employer's</b> Project Team
Progress Report and Assessment Meeting	Monthly	Matimba Power Station	<b>Contractor's</b> Project Manager, Project Supervisor and other attendees at the discretion of the contractor.  <b>Employer's</b> Project Team

Title and purpose	Approximate time & interval	Location	Attendance by:
Risk Management Review	Monthly	Matimba Power Station	<b>Contractor's</b> Project Manager, Project Supervisor and other attendees at the discretion of the contractor.  <b>Employer's</b> Project Team

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*. Such meetings should not prejudice the Employer in terms of cost, quality and schedule. 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.

## Documentation / Documentation Control / Configuration Management

### Document Management

#### Document identification

The documentation requirements cover the various engineering stages, from the design stage through fabrication, installation, testing and commissioning and most importantly for the operating, maintenance and training stage of the project.

The Contractor is responsible for the compilation and the supply of the documentation during the various project stages and to provide the documentation programme to link with the milestone dates. Documentation and drawings are programmed for delivery to meet the milestone dates and in accordance with the agreed VDSS supplied Employer.

#### Documents Submission

All documents and records are submitted according to Technical Document and Record Management Work Instruction (240-76992014) and Gx Projects Documentation Deliverable Requirements Specification (240-65459834) and the Employer ensures that the Contractor is provided with latest revisions of all these documents. In order to portray a consistent image it is important that all documents used within the project follow the same standards of layout, style and formatting as described in the documents above. The Contractor is required to submit documents as electronic in .pdf format in a CD and hard copies and are delivered to the Project Manager with a transmittal note.

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)

### **Documentation Review and Turn-around**

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

### **Drawings Format and Layout**

The creation, issuing and control of all Engineering Drawings are in accordance to the latest revision of 240-86973501 (Engineering Drawing Office and Engineering Documentation Standard) and 36-945 and 36-946 (associated Work Instructions). Drawings issued to the Employer are 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 are accepted. Drawings issued to the Employer may not be "Right Protected" or encrypted. (240-86973501) The Employer reserves the right to use these drawings to meet its other contractual obligations.

### **Plant Identification**

#### **Plant Coding**

Coding of the design is based on the KKS coding system and the Employer undertakes the coding in line with its standards. The KKS coding is 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 is required to include allocated coding to the electronic design drawings.

The Contractor to use the KKS system for classifying and designating both plant and their associated documents. All technical documentation as per "Technical documentation classification and designation standard – 240-54179170" contain a KKS code as part of the documentation identification relevant to the plant equipment. All plant (Process, Mechanical, Electrical, C&I and Civil) to be coded to KKS breakdown level 3. The KKS code contains break down level 1, break down level 2 and breakdown level 3. Omission of any break down level is not permitted. The system is applied from the concept stage until project closeout.

Detailed nameplate or label list with the service legends and including the KKS Code to be prepared by the Contractor and submitted to the Project Manager for review and comment before commencing manufacture of the labels. All maintainable plant equipment and components to be labelled including pipework. The rules for applying the KKS and the KKS codes are contained in the Employer's Standard 240-93576498 and in the publication KKS power plant classification (B105e) 5th Edition 2003 published by Verlag VGB PowerTech Service GmbH (Essen), and the KKS Applications: Guideline and explanations A, B1-4 (B106e).

The Contractor to code all plant within scope of supply according to the KKS Classification System to Breakdown Level 3 where possible. The relevant KKS codes thus allocated appear on all plant related documentation, drawings, lists and correspondence.

The Contractor is responsible for ensuring the accuracy, completeness and consistency of the designations in all documents. This applies both to designations within documents (plant designations) and of Documents (documents designations). The Contractor to submit these for the Project Manager's acceptance.

A list of the KKS designations allocated is drawn up by the Contractor for each scope of delivery. Methods of KKS designation, list formulation and submission format to be proposed by the Contractor and agreed by the Project Manager.

#### **Plant Labelling**

- New labels are provided for all plant, material and equipment provided as part of the works. It is the responsibility of the Contractor to manufacture and install labels according to station based labelling standard. Employer to provide the labelling standard.

- All labels are made from anodised aluminium and are pop riveted in place.
- Coding and labelling of components inside electrical and C&I panels are completed by the Contractor.
- The Coding practitioner to facilitate base-lining of all equipment lists from the Contractor, and only baseline equipment lists to be used as a basis for the production of labels.
- The abbreviations are in accordance with the Employer's abbreviation standard, 240-71432150 Plant Labelling Standard provided in Section 6.1.

## **Health and safety risk management**

### **General**

In carrying out its obligations to the Employer in terms of this contract, which obligations include, amongst others, to Provide 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:

- The provisions of the Occupational Health and Safety Act, No. 85 of 1993 and all applicable regulations (as amended), binding in terms thereof;
- The latest versions of standards, procedures, specifications, rules, systems of work and requirements of the Employer, copies of which are provided to the Contractor on request.
- The Health and Safety Plan prepared by the Contractor in accordance with the Employer's Safety Health and Environmental Specification – 240-149136837 and requirements.
- The provisions of the National Environmental Management Act (as amended) and all regulations in force from time to time in terms of that Act,

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 - 240-149136837 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 OHSAS 18001 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 ensures 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.

The *Contractor* acknowledges that he is fully aware of the requirements of all requirements and undertakes to employ only people who have been duly authorised in terms thereof and who have received sufficient safety training to ensure that they can comply therewith.

The *Contractor* undertakes not to do, or not to allow anything to be done which will contravene any of the provisions of the Act, Regulations or Safety and Operating Procedures.

The *Contractor* shall appoint a person who will liaise with the *Employer* Safety Officer responsible for the premises relevant to this contract. The person so appointed shall on request:

- Supply the Employer Safety Officer with copies of minutes of all Health and Safety Committee meetings, whenever he is required to do so.
- Supply the Employer Safety Officer with copies of all appointments in respect of Employees employed on this contract, in terms of the Act and Regulations and shall advise the Employer Safety Officer of any changes thereto.

*Employer* may, at any stage during the currency of this agreement be entitled to:

- Do safety audits at the Contractor's premises, its work places and on its Employees.
- Refuse any Employees, sub-Contractor or agent of the Contractor access to its premises if such person are found to commit any unlawful act or any unsafe working practice or is found to be not authorised or qualified in terms of the Act.
- Issue the Contractor with a work stop order or a compliance order should Employer become aware of any unsafe working procedures or conditions or any non-compliance with the Act, Regulations and Procedures by the Contractor or any of its Employees, sub-Contractors or agents. Stoppages of this nature will not constitute a compensation event.

### **Mandatory Agreements**

The Contractor confirms that:

- 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 ensures that:

- 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.
- 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;
- 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;
- 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;

- As far as is reasonably practicable, no employee, agent, Subcontractor and 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;
- Such measures as may be necessary in the interest of health and safety and the environment are enforced;
- 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
- All employees are informed of the scope of their authority as contemplated in OHSA.

### **Health and Safety Obligations**

In addition to the mandatory agreements, the Contractor:

- 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 – 240-149136837 and SHE Requirements Procedure (32-726) are in place and that all appointees are cognisant of their duties and responsibilities in terms of such appointments;
- Ensures that such appointees execute their duties and responsibilities as required by such an appointment.
- 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 are allocated to them;
- 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; Complies with the Employer's Occupational Health and Safety Incident Management Procedure – 32-95 and Environmental Incident Management Procedure – 240-133087117 relating to the reporting and investigation of incidents. The classification of incidents contained in such document are considered final and are applied by the Contractor relating to any incidents/ injuries relating to its employees, agents, Contractors, Subcontractors and mandatories whilst on Site;
- 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.

### **Eskom Life Saving Rules**

#### **RULE 1: OPEN, ISOLATE, TEST, EARTH, BOND, AND/OR INSULATE BEFORE TOUCH**

With the aim to ensure a safe electrical work environment, no person may work/operate on, around or near any electrical network, line or apparatus, electrically connected to the power system and/or electrically charged and/or not electrically charged unless:

- a) He/she is trained and authorised as competent for the task to be done;
- b) There is a valid permit to work, where required;
- c) A pre-task risk assessment to identify all risks and hazards has been conducted prior to any work commencing;
- d) He/she follows the requirements on OPEN, ISOLATE, TEST, EARTH, BOND and/or INSULATE BEFORE TOUCH, correctly based on applicable/related standards, procedures and outcome of risk assessment fit for the type of work or task to be performed;
- e) The authorised person (team leader) has certified and physically shown all team members that the apparatus is safe to work on;
- f) He/she makes the specific electrical environment safe prior to performing the work; and
- g) All the appropriate PPE (including face shield and insulated gloves for low voltage work) are worn.

#### **RULE 2: HOOK UP AT HEIGHTS**

Working at height is a significant part of work in Eskom Holdings and is regarded as a high-risk activity, and as a result all precautions must be taken to prevent incidents while working at height. Wherever reasonably

practicable, preference must be given to the performance of work at ground level as opposed to work in an elevated position. Where work in an elevated position is necessary, the requirements in this document shall apply.

No person may work at height where there is a risk of falling unless:

- a) He/she is medically fit to work at height;
- b) A pre-task risk assessment to identify all risks and hazards has been conducted prior to commencing any work of this nature;
- c) He/she is appropriately trained as determined by the risk assessment;
- d) He/she is appropriately secured during ascending and descending; and
- e) He/she is using an Eskom approved fall arrest system where applicable.

### **RULE 3: BUCKLE UP**

Where required, the proper wearing of seat belts for any driver, operator and passenger is mandatory in all vehicles/equipment when driving and/or travelling for Eskom business purposes. The driver is obligated to ensure that he/she as well as all passengers are properly seated and wearing their seatbelts at all times while being transported in the vehicle, as per Eskom specifications.

Note: This rule is applicable on any road or parking lot, irrespective of the speed, and when the vehicle moves in a forward or backward direction.

### **RULE 4: BE SOBER**

No person who is under the influence or who appears to be under the influence of intoxicating liquor or drugs will be permitted to enter, or remain on an Eskom site or conduct Eskom business or drive/operate a vehicle/equipment for Eskom business purposes.

This includes any level of alcohol or the presence of any drugs, controlled substances, and/or illegal substances in the body that impairs or could impair mental and physical functioning, irrespective of when the substance was used.

### **RULE 5: ENSURE THAT YOU HAVE A PERMIT TO WORK**

Where an authorisation limitation exists, no person shall work without the required Permit to Work (PTW), which is governed by for example the:

- a) Plant Safety Regulations; or
- b) Operating Regulations for High Voltage Systems (ORHVS); or
- c) Any other activity where a permit is required.

No plant is to be returned to service without the cancellation of all permits on that plant in accordance with procedure, unless permission is granted for a particular plant to be returned to service with permits still open, like in the case of redundant systems.

NOTE: In the case of live work, a "live work declaration form" is to be completed by the authorised person, who is the person responsible for the safe execution of work according to relevant standards and procedures. Outline the key principles or rules to support the implementation of the standard statement.

### **Matimba Permit to Work System**

The *Contractor* will ensure that he/she is informed of all the requirements of Eskom's Plant Safety Regulations and ORHVS and that he/she at all times comply to the requirements of these Regulations.

The *Contractor* will ensure that all his supervisors who are directly involved with Eskom's Permit to Work System, are trained and on successful completion of Matimba's authorization / evaluation process will be authorized as "Responsible Persons".

The Responsible Person shall ensure that:

- The conditions of permits and cautionary notices are strictly adhered to
- The lockout procedures, mechanical as well as electrical, are strictly adhered to and any deviations shall be corrected immediately
- The safe work procedures as laid down by Matimba Power Station and as determined by the Risk Assessment, shall be followed
- The workers register and cautionary notices are discussed daily with workers

### **Health and Safety Plan (Construction Regulations)**

The following will be required after contract award:

The Contractor shall compile a Health and Safety Plan, filed in a Health and Safety File, comprising of the following:

- Proof of the contracting company's own Health and Safety Policy
- Proof of appointments, assignments and designations as required in terms of the Occupational Health and Safety Act, No 85 of 1993
- Proof of Risk Assessments regarding Hazards identified and proof of training of own employees regarding controls derived from the risk assessment
- Proof of Safe Work Procedures that derived out of the Risk Assessments
- Proof of the contracting company's own Emergency Plan that will deal with their own emergencies on site
- Proof of a Fall Protection Plan, if required to perform work at elevated levels developed by a competent person appointed by the contracting company
- Proof of "Notification to perform Construction Work" – a copy of the notification addressed to the Department of Labour as required Regulation 3 of the Construction Regulations
- Proof of an Induction Program (it is advised that the Matimba SHE Rules as a Guide) and an attendance register signed by its employees prior the commencement of any construction work on site
- Proof of the contracting company's employees Medical Fitness Certificate. (Must still be valid – one year. May only have been issued by an occupational health practitioner)
- Proof of contractors weekly Health and Safety Rep Inspections regarding its own site and where detached work is performed
- Proof of Personal Protective Equipment (PPE) issued to Contractor's employees
- Proof of contracting company's Accident/Incident Reporting and Investigation System
- Proof of checklists and where applicable test certificates, regarding contractor's tools, equipment, machinery, mobile equipment, vessels under pressure and any other applicable checks required by the Act
- A "Section 37(2) Agreement with Mandatory" needs to be drawn up by the Employer and co-signed by the Contractor before work can commence
- The Contractor shall ensure that his Subcontractors do also have a Health and Safety File and that it must be accepted by the Contractor.
- The Safety Officer employed by Matimba Power Station will audit these Health and Safety Plans to ensure compliance with the provisions of the Act.
- In terms of Clause 4 (b) of the Construction Regulations, the Employer points out the hazards or risks that is associated with the works, as indicated in Appendix B, to the Contractor. The hazards or risks it are however not limited to this list.

### **Housekeeping**

Working areas are cleaned daily. All electrical cables and hoses are routed so as not to cross over floors and walkways. All equipment is packed neatly without interference to access. All excess scaffolding material is removed from working areas after the scaffolding has been erected. Scrap bins are available on the zero meter level and emptied daily by the *Employer*.

### **Barricading**

Access to danger zones is done using handrail type guards of at least 1,2 meters high, able to block access to the danger zone. Symbolic safety signs depicting "Danger" and "No entry" are attached to the guards.

## **Radiographic examinations**

When radiographic tests are performed in the plant, the danger area is barricaded. Workers are made aware of this fact and the Radiographic technicians ensure that no person is within or enter the danger area prior to commencing of or during the tests by public announcement according to the procedure. See relevant procedure PA/272/001.

## **Scaffolding**

All scaffolding erected complies with procedure PS/031/001. At least one person in the *Contractor's* service shall be competent to inspect scaffolding in the case where the *Contractor* himself needs scaffolding. Certificates must be handed in at the *Project Manager* after contract award. The Employer is responsible for the supply, erection and dismantling of scaffolding

## **Fire Protection**

The Contractor ensures that adequate firefighting 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. Fire fighting equipment remains accessible at all times.

## **Environmental constraints and management**

The Contractor provides an Environmental Management Plan applicable during the execution of the Works. The plan provides a guideline on the environmental management of the handling of the works. All waste is 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 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 monthly basis, Environmental Management Performance and Expenditure Reports to the Project Manager.

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

The Contractor develops and implements as a minimum the following procedures:

- Environmental Management Plan,
- Waste Management Work Instruction,
- Spill Management Procedure,
- Hazardous Chemical Substances Management and Storage Procedure,
- Stockpile and Erosion Management Procedure,
- Clear-and-Grub Procedure,
- Environmental Rehabilitation Procedure.

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

provides a copy of the environmental authorisation and Environmental Management Plan to the contractor for the drafting of the above procedures.

### **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 Matimba Power Station Waste Management Procedure – PS/244/001, and all requirements of the Employer as per the Environmental Management Programme All costs associated with waste management are the responsibility of the Contractor.

### **Rehabilitation**

The Contractor rehabilitates both its lay-down and construction site including all disturbed areas under their jurisdiction and or as directed by Supervisor at the end of the project. The Contractor submits to the Project Manager a rehabilitation plan and schedule at least 2 weeks before finalisation of the works for acceptance by the Project Manager. All rehabilitation costs are the responsibility of the Contractor.

### **Hazardous Waste**

All waste introduced to and/or produced on *Employer's* Premises by the *Contractor* for this order, must be handled in accordance with the minimum requirements for the Handling and Disposal of hazardous waste in terms of Government Legislation as proclaimed by the Department of Water Affairs and Forestry 1994 Ref.: BN0621-16296-5. (A copy of this document is available at the Power Station for reference purposes).

### **Environmental Management**

Matimba has an Environmental Policy, PP/240/001, to which the *Contractor* and his employees must adhere. It is the responsibility of the *Contractor* to ensure that he obtains copies of the Matimba Environmental Policy, the legal register applicable to his area of responsibility, the aspect register and the Matimba procedures (applicable to the *Contractor's* area of responsibility) and to familiarize themselves on such procedures, within 30 days from the date of commencement of work at Matimba, to assist the *Contractor* and his/her employees to prevent pollution and to comply with legislative requirements. Copies of the above-mentioned documents shall be obtained from the *Project Manager* or Environmental Officer on the first day prior to commencement of work at Matimba. The *Contractor* shall submit proof to the Environmental Officer of Matimba that he and his employees has done all the necessary training on procedures and Policies supplied to them and that they do understand the contents of the procedures, registers and policies and will adhere to them at all times.

The *Contractor* adheres to the following rules:

- Provide sufficient storage containers, labelled depicting general or hazardous waste and store in a designated storage area
- No hazardous waste may be stored for a period of more than 90 days on the Matimba premises
- Ensure that all hazardous waste is disposed of at a licensed Class H disposal site. A copy of the hazardous waste disposal certificate is submitted to the Project Manager.
- Ensure that all other general waste is disposed of at the local municipal waste dump
- Ensure that the Contractor's site does comply with the general good housekeeping practices. Redundant materials are moved to allocated sites. No scrap shall be stored in the Contractor's yard. Scrap is to be cleared from Site daily.

The non-adherence to the Matimba Environmental policy and rules could result in the termination of this contract.



## Quality Assurance Requirements

### Quality Management System

The *Contractor* shall implement and maintain a quality management system that as a minimum meets the requirements of 240-105658000 - Supplier Quality Management: Specification. If the *Contractor* is registered, the appropriate ISO 9001:2000 Registration certificate of compliance must be supplied with the tender.

The *Contractor* further ensures that the subcontractor's programmes comply with the requirements of the Works Information.

The *Contractor* notifies the *Project Manager* of any changes to the Quality System and obtains agreement prior to implementation on existing orders and contracts, or sub orders and sub contracts.

### Quality Documents Submitted with the Tender

The Contractor submits a copy of his quality policy and quality system procedures relevant to the Works.

The Contractor also submits a typical quality control plan.

The Project Manager evaluates the Contractor's capabilities with regards to quality assurance and quality control based on these submissions and the performance history of the Contractor. The Project Manager performs pre-award assessments where necessary, giving further information to aid the selection process.

### Quality Documents Submitted after the Contract Date

Contractor submits a fully detailed Quality Assurance Programme (QAP) for acceptance by the Project Manager within four weeks of the Contract Date.

The documents submitted by the Contractor shall include the following:

- Copy of the Quality Manual
- Copy of the Quality System Procedure
- Copy of the Contract Quality Management Plan
- Copy of Quality Control Plans
- Copy of the proposed index of the QA/QC, inspection and test records

The Contractor will further submit the following documents during the course of the contract:

- Non-conformance reports (NCR's) raised by the Contractor
- Notification of any planned changes to the Contractor's quality manual, quality system procedures, contract quality management plan or quality plan for acceptance by the Project Manager prior to implementation
- Concession/production permit applications and supporting documentation
- Data books and/or data packages

### Contract Quality Management Plan Requirement

The Contractor prepares a contract quality management plan that, where appropriate, indicates the following:

- Indicates the interface with the Contractors quality system and applicable documents such as procedures and work instructions
- Establishes communication channels between the Contractor and the Project Manager in respect of quality and the integration of such with prescribed contract communication channels
- Indicates how specific subcontractors will be monitored
- Identifies items or activities for which quality control plans will be prepared

- Identifies the specifications, drawings and acceptance criteria for material for which quality control plans are not required
- Identifies the areas or processes requiring special controls
- Identifies the Contractor's Management Representative and personnel responsible for the control of quality activities and their relationship to the Contractor's management structure
- Identifies the documents which are to be submitted to the Project Manager
- Identifies the Contractor's quality monitoring programme

The Contractor periodically updates the contract quality management plan to reflect changes in any of the above details. The frequency of such updates is determined by the Project Manager but will not be greater than one year.

### **Quality Control Plan**

The Contractor quality control plans cover inspection and test proposals for items or activities to be supplied as part of the works.

The quality control plan indicates the following as appropriate:

- The identification of the item
- The material
- A list of the sequence of operations including inspections and tests
- The identification of the specification, drawings or procedures for each operation
- The acceptance criteria with reference to the appropriate technical specification, in-house, national or international standard and relevant clause number
- The inspections and tests the Contractor has nominated for hold and witness points
- Provision for inspections and tests nominated by the Project Manager
- Provision for inspection status indication
- Inspection and test records that are generated by the Contractor

The quality control plans are reviewed by the Project Manager to allow for insertion of his specific requirements, including hold and witness points, prior to commencement of work. The Contractor does not commence work until the Project Manager accepts.

### **Inspection and Testing**

All Plant and Materials are comprehensively tested in accordance with the agreed QCPs prior to commencement of work. The Employer reserves the right to appoint others to inspect all parts during manufacturing, erection and commissioning to be present at any of the tests specified. The witnessing of tests by the Supervisor or Others, and if the Supervisor chooses to waive the witnessing of any tests, it does not relieve the Contractor of his responsibilities to Provide the Works.

All tests which the Employer requires are carried out by the Contractor during manufacturing, erection and commissioning to prove compliance with the specification independently of any tests which may have been carried out at the Contractor's premises.

The Supervisor inspects parts of the Plant at his discretion during manufacturing stages and before shipment as per the agreed QCP;

- The Contractor is responsible for the inspection of all the works performed and the Supervisor only verifies that such work is conducted as per the Works Information.
- The Contractor conducts all inspections in accordance with the accepted QCP.
- The Contractor provides suitably qualified personnel to conduct on-and-off site inspections.
- The Contractor ensures that all parts of the works are inspected and accepted before the Supervisor is invited for verification.
- The Contractor allows for a minimum of five (5) working days' notice for local off-site inspections, 24 hours for local on-site inspection, and 21 working days' notice for foreign inspections. The notice strictly contains copies of the Contractor's inspection reports and particulars of work which the inspection notice/request entail.

## **Quality Records**

The Contractor prepares and submits to the Project Manager an Index of QA/QC and inspection and test records prior to the commencement of work.

The Project Manager determines which documents are to be submitted during the performance of work and reviews the index and request changes if required. The Contractor conforms to the Index approved by the Project Manager

The Contractor ensures all records identify the items, equipment and/or activities to which they pertain and collates indexes and securely stores the records in such a manner that they are readily retrievable.

The Contractor implements appropriate administrative controls to limit access to prevent inadvertent loss of or damage to records.

The Contractor stores all quality records. The Contractor only destroys or discards quality records with the approval of the Project Manager.

The Contractor presents on completion of the works all quality records in the form of a data package. The package is indexed and shows the entire contents.

## **Quality Reporting**

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

- A register of NCRs and defects
- Updated QCP / ITP register
- QA monthly report summary
- Planned and completed local and foreign inspection dates
- Completed and outstanding Inspections
- Audit findings report
- Risks with Mitigation plan

## **Preservation, shipping and transportation**

The Contractor develops and implements a comprehensive preservation, shipping and transportation programme consisting of plans, processes, procedures, and actions undertaken for the purpose of planning for, and maintenance of, material deliverables quality. The Contractor and Subcontractor complies with the Employer's Quality Requirements: Specifications 240-105658000.

## **Programming constraints**

### **General**

The Contractor submits a single integrated Level 3 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.

### **Computerised Planning**

MSPProjects is the only planning tool which the Employer accepts for this project; therefore the plan submitted to the Employer must be converted or submitted in this format. The Project Manager does not intend duplicating the Contractor's planning and scheduling, however, the Accepted Programme is used in the Employer's internal integrated and Master project programmes for project control purposes, updating and monitoring. The Project Manager requires one project programme to be used and updated during the execution of the Works. This insures that any changes, deviations to the Programme can be carried out on the agreed programme and monitored. The initial programme supplied to the Employer after Contract award is fully resource loaded.

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

The Contractor and Project Manager agree on the format of how the updates are done, 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.

### **Planning and Scheduling Levels**

All planning and scheduling is done based on the Critical Path Method (CPM). The Contractor uses activity codes to define interfaces to be agreed upon between Project Manager and Contractor. The Contractor's programme shows the actual critical path clearly.

The schedule layout takes into account the accepted WBS, reflecting the manner the works are to be performed as per the Contractor's Method Statement and how activities are to be summarised, reported and monitored.

The programme includes:

- a) Major milestones, interface dates, access dates and key dates (for the new plant, existing plant and between Subcontractors)
- b) The duration of major activities and their relationship to one another.
- c) Identified long-lead material items.
- d) Responsibility assignments for accomplishing project objectives end product is a time scaled bar-chart programme developed using logic network.

This programme is separated by unit, by plant area, by phase, by WBS. The work within each plant area is broken down by engineering discipline, procurement, delivery, construction by the Contractor, start-up and commissioning. The programme is resource-loaded and it forms the basis for progress measurement, progress curves and histograms for each discipline within a plant area. This is used for Evaluations and for the accepted programme after contract award. This is saved and used as the original.

The Contractor's Forecasted Rate of Invoicing (FRI) also aligns with the resource loading on the programme.

### **Planning Programmes**

The Contractor develops a contract programme which includes 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.

The programme is based on the following working hours: Where applicable

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

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

The Contractor provides the Project Manager with an organogram showing key people distinguished by their roles and responsibilities.

The organogram shows clear reporting lines between individuals, including individuals from Subcontractors or joint ventures.

The Contractor provides the following key personnel as a minimum:

- Project Manager/ Supervisor
- Site Health and Safety Officer

The Contractor ensures that a well-balanced structure is provided and maintained for all key personnel, all subject to the Contractor's work plan, legislative requirements and regulations. The Contractor's management, supervision and key personnel are such that they enable the Contractor to Provide the Works.

## **Invoicing and payment**

There are no additional requirements to the invoicing and payment clauses in Section 5 of the core clauses.

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

- The registered name of the Contractor
- The VAT registration number of the Contractor
- The address of the Contractor
- The Employer's contract number
- The VAT registration number of the Employer
- The value of the invoice split into payments as per the activity schedule as indicated in the Price Lists.
- Any retention monies to be deducted from the invoice
- Any interest payable
- Escalation formula used where applicable

All invoices in PDF format are emailed straight from your system to an Eskom email address.

- Email addresses for invoice submission: [Invoiceseskomlocal@eskom.co.za](mailto:Invoiceseskomlocal@eskom.co.za). The Project Manager is copied when submitting invoices.
- All queries and follow up on invoice payments are made by contacting the FSS Contact Centre: Tel: 011 800 5060 or e-mail: [fss@eskom.co.za](mailto: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 is parked and the system automatically sends 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. The Contractor is allowed to forward the details of invoices corrected to the FSS Contact Centre.

## 2.9 Insurance Provided by the Employer

There are no additional requirements to the risk and insurance clause in Section 8 of the core clauses.

## Contract change management

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

## Training workshops and technology transfer

The *Contractor* shall provide training on the equipment and system included as part of the *works* to the various categories of the Employer's technical staff after the implementation and completion of the works.

Training provided by the Contractor is directly applicable to the actual equipment supplied for the Works. The training should include both classroom and practical training. Generalised training based on similar equipment is not acceptable. The training is to be structured such that competency tests are done at the end of training sessions on all participating trainees.

The training group will compromise of the following:

- Operating
- C&I maintenance
- Electrical maintenance
- Mechanical maintenance
- Electrical Engineering
- Auxiliary Engineering
- C&I Engineering

During commissioning, all the above-mentioned trainees will be present for commissioning training as well as on-job training. The local facility for training provided by the Employer is suitably sized air-conditioned room that accommodates about ten trainees as well as trainer, overhead projector and white board. The training should be sufficient that once completed the learner would be able to operate and maintain the metal detector for the life span of the metal detector.

## Training Manuals

The course material is in English and includes all third party documentation. A copy of the training documentation is supplied for each trainee with an additional three (3) master sets for the Employer's library and training department.

The training dates are included and shown in the Accepted Programme. The supply of drafts, pre-print proofs and printed copies of training documentation is planned by the Contractor in such a way that the required training is complete before commissioning of the Plant.

Training manuals are continuously updated by the Contractor up to the date of issue of the Defects Certificate for the whole of the works.

### 3 Engineering and the *Contractor's* design

#### ***Employer's* design**

##### **3.1.1 Description of the works**

The *works* entails the design, manufacturing, supply, relocation and installation, verification and commissioning of the field instruments (primary flow measurement devices), power cabling and associated racking as indicated in Limit of Supply and Services (LOSS)

##### **3.1.2 Battery Limits**

The battery limits for the *works* are as follows:

###### **3.1.2.1 Civil Battery Limits**

The *Contractor* is responsible for the detail design and construction of the following:

- Cantilever steel structures to support the level meters
- Reinforced concrete foundation plinths for the cantilever steel structures and Telemetry stations.
- Modification of the weir at the sewage plant.
- Modification of the trench at Evaporation dams.
- Replacement of weir with a flume at Recovery dams.

The *Contractor* is responsible for carrying out all construction according to the detailed design and supplying the necessities to ensure the *works* are in accordance with the requirements as stipulated in the Technical Specification.

The *Contractor* shall comply with the Eskom Standards and the relevant SANS standards.

###### **3.1.2.2 C&I Battery Limits**

Instrumentation will be installed by the *Contractor* and cabling from field (instrumentation) to the new PLC via a splitter box will be the responsibility of the *Contractor*. That is, all field work will be the responsibility of the *Contractor* up to and including wiring to the new PLC. This field work includes the installation of new and the replacement of old telemetry stations required for the communication between remotely located flow meters and the new PLC. The *Contractor* is also responsible for the creation of a dynamic ABB 800xA HMI graphic which will display all of the Water Balance flowmeter signals.

The *Contractor* is responsible for replacing the six obsolete Hartmann & Braun transmitters in the Potable and Demin plants with new, standardised flow meters. The list of these flow meters is shown in Appendix C – Instrumentation Schedule.

The *Contractor* is responsible for all software and logic changes within the boundary of the project to ensure full functional requirements for the project are completed. The *Contractor* ensures all work performed on the control system is by an authorised service provider associated with the control system, namely the control system OEM.

###### **3.1.2.3 Electrical Battery Limits**

Power supply cables terminations and connections from the field to the switch gear will be the responsibility of the *Contractor*. The *Contractor* is responsible for the control/termination box commissioning. The *Contractor* will be responsible for cable trench digging where it's required and the use of previous trench is not possible. The *Contractor* is responsible for commissioning of flow meters from the device to distribution board. The *Contractor* is responsible for routing of cabling in specified cable trench.

#### 3.1.2.4 Mechanical Battery Limits

The *Contractor* will be responsible for the detail design, supply, installation, commissioning and verification of the flowmeters at Matimba Power Station to ensure accurate water accounting. This includes modification of any pipework necessary for installation and relocation of flowmeters.

#### 3.1.3 Control and Instrumentation Design

The control and instrumentation system design includes the following key components:

- Field instrumentation and interface
- Local indication
- Replacement and new Telemetry system

The C&I scope of work design provides control and monitoring of the process plant at the existing C&I control system. The Employer's process control and operating philosophy describes the control and monitoring requirements.

A basic overview of the C&I required interface is provided below. The following interfaces should be noted:

- Instrumentation is interfaced via a junction box either to a telemetry station.
- The splitter interfaces the signal from the instrumentation/telemetry station to the remote I/O.
- The remote I/O interfaces directly with the old PLC.
- The old PLC interfaces with the ABB HMI to display the Water Balance graphic.

Figure 1 shows the proposed new flow meter component description

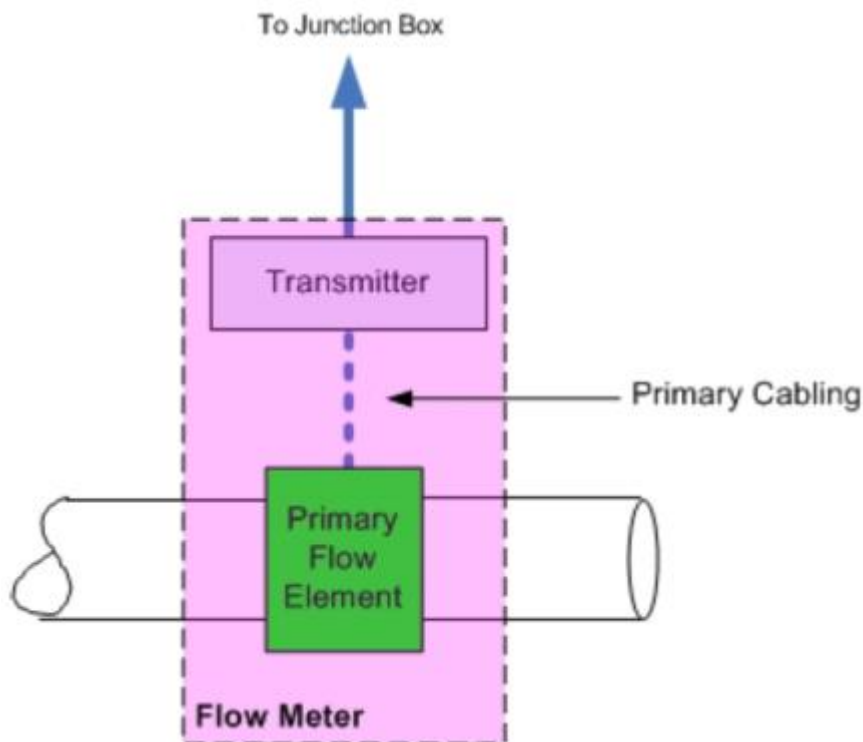


Figure 1: Flowmeter Description



### 3.1.3.1 Flowmeters

All flow meter supplied is required to be suited to fulfil the following functional requirements:

- Built-in local digital indication that can be programmed to indicate the range and the engineering units of the process.
- Indication for both instantaneous and totalised flow rates.
- A high turn down ratio so that the minimum possible different types of transmitters can be used for all the applications.
- A minimum accuracy of 0.5% for payment meters and 2% for the other water balance flowmeters. The payment meters that are being installed are 00GAC10CF001 and 00GKB91CF001.
- Be able to interface to the PLC via a 4-20mA I/O single channel.
- A minimum drift-free-period guarantee of 10 years.
- All supplied flowmeters are required to have a built-in diagnostics that constantly monitor and alarm any faults on the flow meters.

In order to comply with WAS, sixteen flowmeters (6 electromagnetic flowmeters, 1 ultrasonic clamp-on flowmeter, 2 ultrasonic transmitters and 7 differential pressure transmitter) are required in and around site to monitor the water flow in streams previously unaccounted for or to replace transmitters which are no longer working.

Figure 1 shows an illustration of the typical components of a flowmeter.

These sixteen flowmeters are to be installed in the following locations:

- Sewage Plant – A V-notch Weir needs to be installed at the maturation dam. The civil infrastructure is in place. A minor modification is required to support the ultrasonic transmitter required to monitor the treated sewage water leaving the dam.
- Medupi Construction Village – An electromagnetic flowmeter needs to be installed at the outlet of the Potable Head Tank in the Construction Village. This is currently a mechanical meter, but in order to comply with the specifications for payment meters, this needs to be changed to an electromagnetic flowmeter.
- Evaporation Dams – a flowmeter was installed at the inlet to the west dam from the channel. this flowmeter must be interfaced into the water balance system installed by the Contractor. The flowmeter between the west and east dam must be installed by the Contractor as per specification. An electromagnetic flowmeter which must be installed at the inlet to the West Evaporation dam. A trench needs to be dug to reach the pipeline.
- Water Treatment Plant – There are two flowmeters that are required in this area. The first is an electromagnetic flowmeter that must be installed below the Demin Clarifiers to account for the Demin sludge discharge. There is an old electromagnetic flowmeter currently installed in this location which must be replaced. The second flowmeter is a DP transmitter that is required at the Demin Filter outlet to account for the Demin Water to sand-filter backwash.
- Demin to Auxiliary Cooling – There is one ultrasonic clamp-on flowmeter that needs to be installed in the cable tunnel below Unit 4. This flowmeter will replace the currently installed Vortex flowmeter that is used to monitor the flow to Auxiliary Cooling South.
- Recovery Dams – The Clean Drains to Recovery Dams currently has a Rectangular Plate Weir installed in the concrete trench leading up to the Clean Recovery Dam. The transmitter is working, but it is not accurate due to the amount of dirt that accumulates in it over time. The lack of maintenance since its initial installation has made the cleaning of this weir very maintenance intensive. The weir should be replaced with a flume due to the flume's self-cleaning capabilities. The instrumentation at this location can remain as is; it is merely the civil infrastructure which needs to be changed.
- R110/R112 – According to the Water Accounting and Management Framework Standard, all payment meters need to be electromagnetic flowmeters. The R110 and R112 flowmeters which are currently installed are ultrasonic clamp-on flowmeters. While it is acceptable for the back-up flowmeter (R112) to remain an ultrasonic flowmeter, R110 will need to be replaced with an electromagnetic flowmeter.
- Ash Dump - Two electromagnetic flowmeters must be installed at the ash dump to record the water flow from the Station drains to sprinklers and the station drains to the station. These flowmeters will be located very close to the North Storm Water Dam.

- Obsolete Transmitters – There are six obsolete Hartmann & Braun differential pressure transmitters installed across the Water Treatment plant, these are to be replaced with the new types of Transmitters:
  - 00GKB30CF001 – Potable to Head Tank
  - 04GKB30CF001 – Potable to Station
  - 00GKB11CF001 – Potable to Fire Range
  - 00GKA10CF002 – Potable to Sand-Filter Backwash
  - 00LDN50CF001 – Demin to CPP Regen
  - 00GCK30CF004 – Demin to WTP Regen

Ultrasonic Level transmitters are required at five of the dams located in and around the station site. Each of the Ultrasonic Level transmitters must be suspended from a structure as described in the Civil Infrastructure and Building Design requirements. The level transmitters must be installed at the following locations:

- North Stormwater Dam
- South Stormwater Dam
- Metsimaholo Dam
- Evaporation Pond (East)
- Evaporation Pond (West)

### 3.1.3.2 Telemetry Stations

Eleven (11) remote telemetry sites are required in remote areas and the existing base station will be replaced. All of the telemetry stations are linked to a base telemetry station at the Water Treatment Plant. The sites for the Telemetry stations are described below:

- Base Telemetry Station
- Marapong Village Telemetry Station
- Sewage Plant Telemetry Station
- Irrigation Dam Telemetry Station
- Raw Water Reservoir Telemetry Station
- Recovery Dam Telemetry Station
- R110/R112 Telemetry Station
- North Stormwater Dam Telemetry Station – Requires base foundation
- South Stormwater Dam Telemetry Station – Requires base foundation
- Metsimaholo Dam Telemetry Station – Requires base foundation
- Evaporation Ponds Telemetry Station – Requires base foundation
- Potable to Construction Village Telemetry – Requires base foundation

### 3.1.3.3 ABB 800xA HMI Graphic

An ABB 800xA HMI graphic displaying of all of the flowmeters needs to be designed by the *Employer* and integrated with the new PLC I/O modules by the *Contractor* to display all of the current and new signals of the Water Balance.

The existing WTP system interfaces to the plant historian (SAM VA System). All of the new signals must be interfaced to the VA system and it is the *Contractor's* responsibility to ensure that the signals are interfaced correctly.

### 3.1.4 Works Operating and Control Philosophy

#### 3.1.4.1 Modes of Operation

The Matimba Water Balance is used purely for monitoring purposes and, as a result, there are no control and operating requirements for these flowmeters and level transmitters. The Water Balance calculations are done in accordance with the PG/201/001 – Water Received Calculation Method document.

The Water Accounting Framework Standard states that “accurate water use monitoring, accounting and reporting is considered to be an integral and fundamental water management tool available to power

stations" .As result Matimba is required to ensure that all the major streams are measured for water accounting purpose. The installed flow meters on the streams shall be monitored on a monthly basis. All local display shall depict flow rate in cubic meters per hour (m<sup>3</sup>/h) and total volume in cubic meter (m<sup>3</sup>). The PLC shall display the flow meter flow rate and total volume per meter per month. On the first day of every month the total volume per meter per month shall reset to zero but the main counter for the flow meter should never reset and should reside on the VA View.

The *Contractor* is responsible for the provision of a detailed Operating and Control philosophy if needs be as per the *Contractors* detailed design and submits this to the Project Manager for acceptance prior to commencing with the construction activities. The Operating and Control philosophy conforms to the Employer's format for such a document.

#### **3.1.4.2 Indications to Operator**

All instruments will have local indications on the instrument itself as well as on the centralised control system plant mimic on the new ABB HMI graphic.

The current signals to the WTP HMI for the existing flow meters are to be retained.

### **3.1.5 Electrical Design**

The *Employer's* electrical design includes the following:

#### **3.1.5.1 General**

Water balance meters and level indicators will use existing power supply network to obtain power. All existing power supply points should be in usable state and complying with Eskom standards and where there are not compliant there should be fixed under this water balance project cost. New flow meters and level indicators which are located in areas without power supply should have power supply design such that power can be obtained from nearest feasibly distribution board.

**Table 1** has a list of power supply requirements per flowmeter/level indicator. The exact lengths for cables and cable specification will be finalised in detailed design provided by the contractor. Power supply designs should be as per SANS10142 and latest revision of applicable Eskom standards provided in this Works Information.

The *Contractor* will be provided with 220VAC power supply at 50Hz. The supplier will have to supply AC to DC converters where 24VDC power supply is required. All installation to be done as per latest revision of SANS 10142.

**Table 1: Power supply requirements as per flowmeter/level indicator**

Stream no. as per directive	Stream number	Flowmeter KKS	Power Supply requirements	Recommended design	Additional comments
	Demin to Sand filter Backwash	New	None, will be loop supplied from the PLC		
A.4.6.3	Recovered water from station drains to sprinklers	00GMG36CF501	Power to be taken from Irrigation Dam DB	1A circuit breaker, 2.5 square mm cable and existing DB requires lockable circuit breakers	DB existing but not compliant, i.e. Must have lockable circuit breakers.
A.3.7.1	Demin to CPP regens	00LDN50CF001	N/A	Replacement is done with Yokogawa transmitter with similar electrical requirements	
A.3.7.2	Demin to WTP regen	00GCK30CF004	N/A	Replacement is done with Yokogawa transmitter with similar electrical requirements	
A.4.6.4	Recovered water from North Storm Dam to Dust Suppression	00GMG36CF001	Power to be taken from Irrigation Dam DB (200m away)	1A circuit breaker, 400m of 2.5 square mm cable.	Power supplied from same DB as A.4.6.3
A.6.3.2	Treated Sewage to Maturation Dam	New	Power taken from Sewage Plant DB	1A circuit breaker, 2.5 square mm cable	
A2.1	Potable to head tank	00GKB30CF001	The replacement will done with Yokogawa transmitter with similar electrical requirements	Lockable circuit breakers	
	Raw Water Reservoir	00GAC10BB001KB 02	The DB needs to be redone and the wiring is in a bad state. Also need to have lockable circuit breakers.	New DB with lockable circuit breakers	

Stream no. as per directive	Stream number	Flowmeter KKS	Power Supply requirements	Recommended design	Additional comments
A1.1	Raw water received	00GAC10CF001	There is a DB (KKS 00BJX) at this location. A spare breaker is required. Another KKS at location is 10-00AYH08FE001 (Raw Water Telemetry)	1A circuit breaker	
	North Stormwater Dam		Power supply available at KKS 00BHG06BA001CCT18		
	South Stormwater Dam		The dam has two parts and there is no power supply on either side. The idea will be to consider the nearest pole transformer and tap from there.	DB, earth leakage, 1A circuit breaker and cable	Cable is estimated to 1000 m.
	Metsemaholo Dam		There is no power supply. The idea will be to consider the nearest pole transformer and tap from there.	DB, earth leakage, 1A circuit breaker and cable	The cable is estimated to 1000m
	Evaporation Ponds East		Power Supply will be made available through one of the nearby transformers.	DB, earth leakage, 1A circuit breaker and cable	Cable is estimated to 1000 m
	Evaporation Ponds West		Power Supply will be made available through one of the nearby transformers. (same as above)	DB, earth leakage, 1A circuit breaker and cable	Cable is estimated to 1000 m
A.4.5.2	Clean Drains to Recovery Dam		N/A	N/A	
	Evaporation pond inlet	New	Power supply to be obtained from construction transformer	DB, earth leakage, 1A circuit breaker and cable	Cable length is 300 m
	Potable to Medupi Construction Village	00GKB91CF001	Power Supply from DB Board under Head Tank in Construction Village	DB, earth leakage, 1A circuit breaker and cable	Cable length is 1000m.

- The *Contractor* will be required to complete a plant walk on site to determine the suitability of the allocated supply. During the plant walk, the *Contractor* may also identify a suitable cable route to the process plant should new plant imposed limitations.
- The *Contractor* will ensure that the identified spare panels are equipped with new switchgear circuits. The *Contractor* must take into account the designed process plant loads and the allocated circuit ratings during the design.
- The *Contractor* will be required to complete the cable installations from the switchgear to the field equipment. All equipment must be earth to the existing earthing points and verification according to Eskom standards must be adhered to.
- The *Contractor* will update cable schedules according to the templates provided and create drawings if they do not exist. The *Contractor* will execute work according to Eskom and applicable SANS standards for all installation

### 3.1.5.2 Cabling

The *Contractor* shall provide the design, supply, installation, termination, labelling, testing and commissioning of all cabling.

- Existing cable routes, racking, trunking, conduits and cabling shall be used where possible, without compromising the integrity of the installation.
- Cable routes are of a consistent and integrated design.

- New cable routes shall be designed such that equipment can be removed for maintenance without causing damage to the cables.
- Cable conduits shall be provided, if not existing.
- Durable cable numbering/labelling shall be such that cable maintenance is easily achieved.
- Cable numbering per access way is restricted.
- All cables, as a minimum, shall be insulated with flame-retardant, halogen-free PVC outer sheath. Internal cores of all multi-core cables shall be colour coded.
- The management, design expertise, supply and the Contractor shall provide installation for all cables, cabling and routing.
- All installed cables are tested and certificates of compliance are issued prior to commissioning of any instrument.
- All cables provided are secured with suitable cable glands, straps or clamps on racks, in cubicles, switchgear rooms, control rooms, equipment room etc.
- All cables termination in cubicles shall be such that maintenance is easily achieved.
- Underground scans are required for all electrical installation which needs cable trench or will use from existing trench.

### 3.1.5.3 Earthing, Lighting and Electrical Protection

All metal instrument casing shall be earthed and earthing should comply with the latest revision of Eskom earthing standards.

### 3.1.6 Civil and Structural Design

The *Employer* performed a basic design for the cantilever steel structure to support the ultrasonic level meters as well as the reinforced concrete plinth for the aforementioned structure. The *Employer's* basic design will form the basis of the *Contractor's* detail design of the above mentioned structures.

The *Contractor* is responsible for the detail design of the following:

- Cantilever steel structures to support the level meters at the following dams:
  - Metsimaholo dam.
  - North Storm water dam.
  - South Storm water dam.
  - Evaporation pond (East).
  - Evaporation pond (West).
- Reinforced concrete foundation plinths for the cantilever steel structures and Telemetry stations.
- Modification of the weir at the sewage plant.
- Replacement of weir with a flume at Recovery dams.

### 3.1.7 Works Function and Performance Requirements

- The Water Balance system is required to monitor all of the inlet and outlet water streams to and from Matimba Power Station as per the WAF directive – 240-105200800.
- The system is required to perform simple calculations as per PG/201/001 – Water Received Calculation Method.
- The Water Balance system is required to be accessible from the Matimba Outside Plant Control Room for Chemical Services and Operating personnel to draw up reports and for monitoring purposes.
- The Water Balance system is required for monitoring purposes only. There are no automation requirements.

### 3.1.8 Works Life-expectancy

The *works* is comprised of different subsystems which have varying life-expectancies. The functional Water Balance system that the *works* will provide must last for the life of the station, until approximately 2050. Minor upgrades to the different subsystems will need to be done to maintain the overall function of the system as each of the subsystem's reach their end of life. The life expectancy of the PLC subsystem is approximately 10 years after commissioning of the *works*.

## 3.2 Parts of the works which the *Contractor* is to design

The *Contractor* shall be responsible for the design, manufacture, procurement, delivery to site, off-loading, erection, installation, site testing and commissioning of all Plant and Material required ensuring a fully functional system.

### 3.2.1 Scope of the work

The scope of *work* describes the major activities and plant and material that falls within the scope of the *Contractor*. It is the responsibility of the *Contractor* to ensure that all the activities are carried out and all equipment, plant and material is supplied to complete the *works* in every respect.

- The works comprises the following:
  - Detail Design
  - Manufacture and procurement
  - Delivery to and offloading at site
  - Installation
  - KKS labelling for cables, junction boxes and new instruments as per 240-93576498 KKS Coding Standard
  - Corrosion protection
  - Interfacing with existing plant
  - Commissioning, testing and optimisation
  - Initial training of Employer's personnel in the operation and maintenance of the system
  - Documentation as specified in works
  - Quality management for all activities
  - Safety and plant signage
  - Storage on site
- All plant, material and equipment is required to be designed for operation in a power plant environment with a minimum requirement for maintenance and operator intervention.
- It is not the intention of this scope of work to describe in detail all the activities the *Contractor* is required to carry out, nor to describe in detail everything to be supplied by the *Contractor*.
- The *Contractor* provides the whole of the works as defined in section 3.2 of the works information except where explicitly stated as otherwise.
- The *Contractor* incorporates all the requirements of the Employer's design stated on section 0 of the works information.
- The *Contractor's* design is required to be accepted before any procurement and construction begins.

### 3.2.2 *Contractor's* scope for the operating, control and maintenance philosophy

The *Contractor* is responsible for the provision of a detailed operating and control philosophy as per the *Contractor's* detailed design of the *works* and submits this to the *Project Manager* for review prior to commencing with the construction activities.

The *Contractor* shall provide a detailed maintenance philosophy for the installed equipment. The *Contractor* shall also provide the necessary periodic maintenance inspections required for the plant together with the maintenance philosophy. The *Contractor* shall provide a critical spares list for the *works*.

### 3.2.3 General Design and Manufacturing Process Constraints

In providing the *works*, the *Contractor* is fully responsible for the delivery to, offloading and storage of all plant, equipment and materials required for the *works* on site. The *Project Manager* reserves the right to carry out any checks of his/her own on any plant, equipment and materials that have been delivered to site for the *works*.

The *Contractor* is fully responsible for the installation of all mechanical, civil, electrical, process control and instrumentation components, equipment and material as well as the interfacing and tie-ins with existing plant and equipment as required for the *works*.

The *Contractor* is responsible for the complete optimisation of the *works* in order to meet or exceed the guaranteed performance levels.

The *Contractor* is required to indicate the full extent of the guarantees they are prepared to offer with respect to water quality, volumetric flow, efficiency and availability of the *works*.

### 3.2.4 Engineering Design Phase

The design of the Plant and Materials that forms part of the design for the *works* shall conform to the following requirements:

#### 3.2.4.1 Control and Instrumentation Design Requirements

##### 3.2.4.1.1 General C&I Requirements

The following general design requirements are applicable to all aspects of the C&I design:

- All field equipment is installed in a suitable location.
- The *Contractor* shall ensure field equipment operates in an environment within the parameters stipulated by the manufacturer.
- Where harsh environmental conditions are unavoidable, the field equipment shall be designed for operation in that environment.
- All IP ratings are as per SANS 60529
- All supplied field equipment, excluding Junction Boxes (JBs) and their electrical connections are rated IP 65 or better.
- Field equipment situated outdoors, or in adverse environments, must be provided with additional protection hoods and enclosures.
- All supplied field equipment operates over an ambient temperature range of: -10°C to 70°C.
- The equipment layout shall be such that when mechanical work is performed, no C&I equipment shall be damaged.
- The supplied field equipment provided shall be standardised to the maximum extent possible
- The *Contractor* as part of the scope of work provides a detailed design report prior to execution of the works during the detail design scope freeze as stipulated on the VDSS as per Appendix B.
- All the documents required to be submitted by the *Contractor* during the design freeze shall be supplied as part of design data pack.
- The detail design report shall be in line with Eskom detail design report template (240-49910707) attached in Appendix F.
- All field equipment installations are required to comply with Field Instrument Installation Standard, 240-56355754.

##### 3.2.4.1.2 Instrumentation

- The Contractor shall execute the work presented in the Instrument Schedule supplied in Appendix B – Instrument Schedule in the excel spreadsheet format.
- The Contractor shall identify the location of the new instruments based on the requirement of the Employer.
- The chosen location shall ensure optimal performance of the new instruments.
- The Contractor provides an interface from the instrumentation to C&I control system.
- The Contractor requests C&I control system existing interface connection details from the Employer.
- The Contractor provides instrumentation suitably accurate for measurement of all major and minor streams applicable to the Matimba Water Balance.
- The Contractor submits detailed instrumentation information to the Project Manager for acceptance before procurement or installation.
- Instruments are installed according to 240-56355754: Field instrument installation Standard
- The Contractor designs, supplies, installs, commissions and verifies sixteen (16) flowmeters, five (5) ultrasonic level transmitters, eleven (11) remote telemetry sites, replacement of the existing base station and a new additional PLC modules need to be installed to perform the Water Balance calculations which will interface with the existing HMI at Matimba Power Station to ensure accurate water accounting as per Appendix A and Appendix B.



- The *Contractor* is responsible for linking all the telemetry systems to a base telemetry station at the WTP.
- The contractor verifies the two (2) inlet channel flowmeters at the Recovery Dams after the civil Contractor has finished constructing the new channels (Primary Measuring Device –(PMD)). Data of the constructed channels shall be used by the Contractor to calibrate the ultrasonic channel flow meters.
- The Contractor is responsible for the de-commissioning of all the existing meters that need to be replaced as indicated in Appendix A (LOSS) and Appendix B (instrument Schedule) provided.
- The installation of each flow meter and level transmitter is required to allow for:
  - Safe and easy access during maintenance and calibration
  - Protection of the flow meter against environmental factors (rain, sunlight and mechanical damage)
  - An instrument and its installation position are required to be labelled such that if the instrument is removed the label shall still be visible on the plant.
- All supplied instruments shall have a built-in diagnostics that constantly monitor and alarm any faults.
- All installed instruments shall be wired to the appropriate junction box.
- All provided instruments shall be suited to fulfil the following functional requirements.
  - Built-in local digital indication that can be programmed to indicate the range and the engineering units of the process.
  - Indication for both instantaneous and totalised flow rates.
  - A high turn down ratio so that the minimum possible different types of transmitters can be used for all the applications.
  - A minimum accuracy of 0.5% for payment meters and 2% for the other water balance flowmeters. The payment meters that are being installed are 00GAC10CF001 and 00GKB91CF001.
  - A 4-20mA output
  - A minimum drift-free-period guarantee of 10 years.
  - All supplied analogue field equipment must be HART devices.
- The Contractor implements the applicable type of flow meters for all the pipelines listed in Appendix C of the works information document, by taking the pipe size available pipe length up – and downstream into account.
- The Contractor confirms the stated available pipe lengths as indicated in Appendix C of the Technical Specification document.
- In the cases where the flow meter is explicitly stated the Contractor supplies only the stated flow meters types adhering to the stated accuracy and repeatability.
- The Contractor is required to install Magflow meters with soft rubber lining on the ash line (number in Appendix C) except where the Contractor can prove that a different type of flow meter will be more beneficial.
- The Contractor ensures that the selected flow meters are applicable to the water qualities stated in Appendix C
- The contractor confirms and supplies the correct power cable lengths
- The contractor performs all the alterations to the pipework in order to install the selected flow meters.
- The Contractor is responsible for taking the process conditions into consideration and doing the relevant calculations for any pipe cutting, welding and NDT in line with PER requirements and piping standards on the affected systems.
- The Contractor supplies the in situ verification certification, in situ electronic verification of all the components and the calibration certificate for each flow meter installed as per the ISO/IEC 17025 standard.
- All in-line flow meters replacement is required to be of same size flange as the existing meters to avoid replacement of pipe work.
- Where the Contractor cannot adhere to same size flow meter as the existing flange the Contractor is responsible for cutting, welding and NDT testing.
- The Contractor identifies the exact location of the new flow meters in the indicated pipe lines. The chosen location shall ensure optimal performance of the flow meters.
- All flowmeters located outside the station terrace shall have a monitoring frequency of  $\leq 5$  minutes.
- All flowmeters located within the station terrace shall have a monitoring frequency of  $\leq 10$  seconds.
- All flowmeter readings shall be captured on a system which allows for trending of the data as well as archiving of the data. This system shall have a back-up to ensure that the data is not lost.

- All local displays shall depict flow rate in cubic meters per hour (m<sup>3</sup>/h) and total volume in cubic meters.

#### **3.2.4.1.3 Flowmeters and Level Transmitters**

##### **a. Transmitter Racks**

- The Contractor is responsible to make sure that the supply, installation, termination, labelling, testing and commissioning is required to comply with Eskom Standard document: 240:56227443 – Requirements control and Power cables for the power stations standard.
- The instrumentation transmitter, where applicable, shall be mounted on suitable racks.
- Racks will provide adequate covering for protection against environment.
- The Contractor shall use existing racks where possible and supply racks where needed.
- All rack provided shall be durable, sturdy, suitable for the environment in which they are installed and easily.
- If angle iron is used for local indication racks, a minimum wall thickness of 3 mm is required.
- Where local indication cannot be mounted on a rack, the Contractor shall obtain clearance from the Employer regarding alternative installation.

##### **b. Power Supply**

- The Contractor shall supply 24 VDC power supplies.
- The Contractor shall supply a single power supply for all field equipment terminated at a specific junction box.
- The 24 VDC power supply will make use of the 220 VAC power supply available at each junction box.
- Where required, the Contractor shall make use of the available 220 VAC supply, available at the specified junction box.
- The Contractor shall earth the newly installed 24 VDC power supplies and provide surge and lightning protection where applicable (applicable flowmeters will be indicated by Eskom.)

#### **3.2.4.1.4 Human Machine Interface Graphic Requirements**

- The Contractor is responsible for the configuration /updating of the current existing Common Plant HMI graphics. The HMI graphics are to display indications for both instantaneous and totalised flow rates with the following units of measurement;
  - Instantaneous flow - cubic meters per hour (m<sup>3</sup> /h)
  - Totaliser - cubic Meter (m<sup>3</sup> )
- The Contractor standardises the HMI to display the same units of measurement as above on all the streams measured. This is a requirement for Water Accounting Framework.
- The Contractor ensures that the following alarms are configured on the PLC:
  - Communication Signal loss alarm
  - Zero flow alarm
- All alarms shall be configured on the HMI in accordance to Eskom Standards below:
  - 240-57859210 - Alarm System performance of Control Systems Applied in Fossil Plant Standard
  - 240-56355466 - Alarm Management System Guideline.

#### **3.2.4.1.5 Telemetry**

- The Contractor shall provide 15 remote telemetry sites and replace the existing base station.
- Table 2 presents the locations, the Limit of Scope and Supply (LOSS) diagrams and the Function IO block diagram associated with each of the remote telemetry stations.

**Table 2: Telemetry station location, LOSS diagram and IO Block**

Location	LOSS	IO Block
Station R110/R112	LOSS_TEL 002	IO_TEL 001
Recovery dams	LOSS_TEL 002	IO_TEL 002
Raw water reservoir	LOSS_TEL 002	IO_TEL 003
Marapong hospital	LOSS_TEL 002	IO_TEL 004
Sewage irrigation pond	LOSS_TEL 002	IO_TEL 005
Evaporation pond	LOSS_TEL 001	IO_TEL 006
Metsemaholo dam	LOSS_TEL 001	IO_TEL 007
Stormwater dam (North)	LOSS_TEL 001	IO_TEL 009
Stormwater dam (South)	LOSS_TEL 001	IO_TEL 007
Sewage plant	LOSS_TEL 002	IO_TEL 008
Potable to Medupi Construction Village	LOSS_TEL 001	IO_TEL 010

### 3.2.4.1.6 Control System

- The *Contractor* ensures all work performed to the control system is done by an OEM authorised service provider.
- The *Contractor* provides all PLC and I/O modules required for interfacing C&I plant, specified in the Technical Specification, to the C&I control system.
- The *Contractor* provides all C&I control system logic, HMI and alarm changes and additions for the Matimba Water Balance system.

### 3.2.4.2 Mechanical Design Requirements

The Mechanical scope of work for this package entails the following:

- The Contractor as part of the scope of work provides a detailed design report prior to execution of the works during the detail design scope freeze as stipulated. All the documents required to be submitted by the Contractor during the design freeze shall be supplied as part of design data pack.
- The Contractor design, supplies, installs, commissions and verifies the flowmeters at Matimba Power Station to ensure accurate water accounting.
- The materials of construction of the pipework shall be appropriately selected for the chemical it will be handling. The line shall not contain different materials of construction at connection points in order to prevent galvanic corrosion.
- The Contractor is responsible for the de-commissioning of all the existing meters that need to be replaced Appendix E of the Technical specification document.
- The Contractor implements the applicable type of flow meters for all the pipe lines listed in Appendix E of the Technical Specification document by taking the pipe size and available pipe length up - and downstream into account.
- The Contractor confirms the stated available pipe lengths as indicated in Appendix E of the Technical specification.
- In the cases where the flow meter is explicitly stated the Contractor supplies only the stated flow meters type adhering to the stated accuracy and repeatability.
- The Contractor is required to install Magflow meters for all the streams on the potable water system except where the Contractor can prove that a different type of flow meter will be more beneficial with regards to meeting the technical specifications.
- The Contractor ensures that the selected flow meters are applicable to the water qualities stated in Appendix E
- The Contractor confirms and supplies the correct power cable lengths and provides a detailed costing as part of the tender returnable.
- The Contractor performs all the alterations to the pipework in order to install the selected flow meters.
- The Contractor is responsible for taking the process conditions into consideration and doing the relevant calculations for any pipe cutting, welding and NDT in line with PER requirements and piping standards on the affected systems.
- The Contractor supplies the in situ verification certification, in situ electronic verification of all the components and the calibration certificate for each flow meter installed as per the ISO/IEC 17025 standard. General Requirements.
- All in-line flow meters replacement is required to be of same size flange as the existing meters to avoid replacement of pipe work.

- Where the Contractor cannot adhere to the same size flow meter as the existing flange, the Contractor is responsible for cutting, welding and NDT testing.
- The Contractor identifies the exact location of the new flow meters in the indicated pipelines. The chosen location shall ensure optimal performance of the flow meters.
- Pipe Supports
- All pipe work, valves and pipe hangers, brackets and supports are arranged in such a manner that they do not obscure the view of any instrumentation or obstruct safe and normal access to panels, switches, etc.

#### **3.2.4.2.1 Welding**

- Welding is in accordance with 240-56241933, "Control of welding during construction, repair and maintenance activities standard"
- Welding is in accordance with 240-83539994, "Eskom NDT personnel approval for quality related special processes on Eskom plant standard"
- Welding is in accordance with 240-56246601, "Qualification, certification and accreditation requirements for personnel and entities performing welding related work on Eskom plant standard"
- Welding is in accordance with 240-83540088, "Requirements for non-destructive testing on Eskom plant standard"
- Welding is in accordance with 240-56355225, "Welding of high pressure temperature tube and pipework standard"
- Welding is in accordance with 240-106628253, "Standard for Welding Requirements on Eskom Plant"

#### **3.2.4.2.2 General Mechanical requirements**

- The Contractor shall provide specifications/material certificates for all components of the design, for example valves, gaskets, welding material, pipeline, paintwork, tanks, etc. The Contractor shall further guarantee that all materials used are appropriate quality.
- The Contractor shall provide a pressure surge analysis to indicate that the pipes have been designed to withstand any pressure transients, which may result as a cause of abnormal system pressure surges.

#### **3.2.4.3 Civil and structural Design Requirements**

The *Contractor* is responsible for the detailed design of the following:

- Cantilever steel structures for the level meters installation at the following dams:
  - Metsimaholo dam.
  - North Storm water dam.
  - South Storm water dam.
  - Evaporation pond (East).
  - Evaporation pond (West).
- Reinforced concrete foundation plinths for the cantilever steel structures and Telemetry stations.
- Modification of the weir at the sewage plant.
- Modification of the trench at Evaporation dams.
- Replacement of weir with a flume at Recovery dams.

The design and calculations of the aforementioned structures to be based on Eskom standard 240 – 56364545: Structural design and Engineering standard.

The *Contractor* is required to submit the designs and method statement for the execution of the *works* to the *Employer* in advance of construction commencement for review by the *Employer's* engineering team, taking into consideration the *Employer's* Review Procedure as set out in 240-53113685: Design Review Procedure.

The *Contractor* is responsible for all sub surface investigations and include in his price, all the cost associated with the sub surface investigation and appropriate laboratory and field tests necessary to determine the geotechnical properties of the subsoil to withstand all the loading conditions to be imposed.

The *Contractor* is responsible and accountable for all temporary works and designs thereof.  
The *Contractor* is required to account for all of the above requirements in the development of the construction programme.

#### **3.2.4.3.1 Geotechnical Information**

The *Contractor* is required to carry out a geotechnical investigation. Test pits to be excavated to a depth of at least 2m or until refusal. In-situ DCP testing to be carried out to determine soil density. Samples to be taken for laboratory testing and the following tests conducted:

- Foundation Indicator Tests
- CBR
- Road Indicator Tests

An allowable bearing capacity of 150 kPa is required for the in-situ material at a depth of 0.25m below surface. The *Contractor* conducts the necessary tests to confirm the allowable bearing capacity. If the allowable bearing capacity is below 1%0 kPa, the *Contractor* over-excavates and replaces the in situ material with imported G5 material. Backfill to be compacted to 95% MOD AASHTO at optimum moisture content in layers of 150 mm.

#### **3.2.4.3.2 Concrete**

- All concrete work to be in accordance with SANS 2001 CC1 unless otherwise stated.
- All blinding concrete is required to be 15/19MPa i.e. 19 mm aggregate to be used in combination with other aggregates, cement and water and is required to attain minimum 28 day cube strength of 15 MPa.
- All structural concrete used for the base is required to be 35/19MPa i.e. 19 mm aggregate and to attain minimum 28 day cube strength of 35 MPa.
- Mix designs for the above mentioned to be submitted to the Employer for review and acceptance.
- The Contractor to submit the details of the chosen products for the protective coating to be used, including product data sheets to the Employer for acceptance prior to its procurement and use.
- Tolerances for all concrete work is to be in accordance with SANS 2001 CC with a level II degree of accuracy and is to be carefully maintained throughout the construction.
- All cast-in items are required to be inspected and accepted by the Employer in writing before casting of concrete may commence.
- The Contractor is required to obtain written acceptance from the Employer for the use of any add-mixture or the use off ready mixed concrete, to pump concrete, or to use cement or cement blends other than ordinary Portland cement (OPC)
- Compaction of concrete to be done by means of mechanical vibrators only.
- The Contractor is required to demonstrate, by means of a report from an approved laboratory, that the aggregates do not exhibit excessive shrinking properties in accordance with SANS 1083 and is also required to demonstrate that the aggregates do not have a potential alkali silica reaction.
- All concrete to have a maximum water/cement ratio of 0.45 with a minimum cement content of 420 kg/m<sup>3</sup>.
- The Contractor is required to perform a slump test on the same batch of concrete every time a sample is taken and the result recorded.
- The Contractor is required to produce 6 No. 150 mm cubes per batch of concrete with 3 cubes tested at 7 days and 3 cubes tested at 28 days. 7 day strength is required to be two-thirds of 28 day strength. The Contractor submits all test results to the Employer for acceptance.

#### **3.2.4.3.3 Steel**

- All structural steel used to be grade S355JR in accordance with SANS 50025.
- All works to be in accordance with the latest edition of SANS 2001 CS1.
- The Contractor is responsible for the stability of the entire structure and all structural elements during all the erection stages.
- All dimensions to be verified on site by the Contractor before any fabrication of steelwork commences.

- Workshop drawings to be submitted to the Employer in duplicate, for his written acceptance of its design compliance before fabrication of any structural steel may commence. Dimensional checks are not done by the Employer.
- On-site welding not permitted without prior acceptance in writing by the Employer.
- Welded connections are required to be welded all around with a 5 mm fillet weld except where shown otherwise. Butt welds are required to be full penetration welds.
- All welding required to be conducted by coded welders. Supporting documentation is also required to be submitted to the Employer for acceptance. All welding to comply with AWS D1.1.
- Electrodes for electric welding to be E7018.
- All welds to be inspected using visual aids.
- All butt welds to undergo ultrasonic non-destructive testing (100 %).
- Fillet welds undergo magnetic particle inspection (20 %).
- Certificates from the manufacturer verifying the steel grade submitted to the Employer.
- The Contractor is required to supply all bolts, washers, nuts etc. for the structural steelwork.

#### **3.2.4.4 Electrical Design Requirements**

##### **3.2.4.4.1 General**

- The Contractor develops the detailed design for all electrical works as per employers design in section 2.1. The scope of work includes detail design, manufacture or procure, factory acceptance testing (FAT), supply, delivery, off-loading, installation, site acceptance testing (SAT), commissioning and handover.
- The Contractor adheres to 36-681: Generation Plant Safety Regulations and 32-846: Operating Regulations for High Voltage Systems for all Electrical works.
- The Contractor will be required to complete a plant walk on site to determine the suitability of the allocated supply. During the plant walk, the Contractor may also identify a suitable cable route to the process plant should new plant imposed limitations. The exact lengths for cables and cable specification will be finalised in detailed design. Power supply designs should be as per SANS10142 and latest revision of applicable Eskom standards.
- The Contractor will be provided with 220VAC power supply at 50Hz. The supplier will have to supply AC to DC converters where 24VDC power supply is required. All installation to be done as per latest revision of SANS 10142.
- The Contractor will ensure that the identified spare panels are equipped with new switchgear circuits. The Contractor must take into account the designed process plant loads and the allocated circuit ratings during the design.
- The Contractor will be required to complete the cable installations from the switchgear to the field equipment. All equipment must be earth to the existing earthing points and verification according to Eskom standards must be adhered to.
- The Contractor will update cable schedules according to the templates provided and create drawings if they do not exist. The Contractor will execute work according to Eskom and applicable SANS standards for all installations.

#### **3.2.5 General Detailed Design Requirements**

- In designing the works, the Contractor takes due cognisance of existing plant and equipment as well as safety and housekeeping constraints. It is the responsibility of the Contractor to overcome any issues that may arise due to space constraints with prior consent from project management and no extra payment or claim of any kind will be allowed on account of difficulties of access to the works or for the requirements of working adjacent to or in the same area as others. Adequate working space is to be provided by the Contractor for all new plant and existing plant for inspection, testing, operating and maintenance purposes.
- The Contractor is fully responsible for integrating his design with the existing installed plant and equipment. The works is to comply with professional engineering practice and standards for fossil fuel power plants. The works is to be designed for the environmental conditions prevailing at Matimba Power Station Site.
- The Contractor lists all the consumable components that forms part of the works, specifies each components life and includes it as part of the design package.

- All Plant and Materials used for process control are constructed of suitable material so that no corrosion or erosion by chemicals can occur, by virtue of its installation in the process.
- The Contractor provides all relevant welding procedures for acceptance by the Project Manager.

### **3.3 Procedure for submission and acceptance of *Contractor's* design**

#### **3.3.1 Detailed Design Review**

- The design documentation shall be submitted to the *Project Manager* four weeks after the Contract Date. The *Project Manager* approves or rejects six weeks after the design is submitted.
- All design work is signed and approved by the applicable Professional Engineer (mechanical, electronic, electrical, chemical, civil etc.) responsible for their preparation before being submitted to the *Project Manager*.
- The *Contractor* submits detailed Technical Data Sheets of all mechanical equipment used for the works to the *Project Manager* as part of the design.
- Approval of the design by the *Project Manager* does not relieve the *Contractor* of his liability for his design and drawings.

#### **3.3.2 Submission and Acceptance Criteria**

The *Contractor* establishes a document tracking system to record the dates for the supply and receipt of all design drawings, calculations, requests for information and design documentation.

The *Contractor* is to supply the following documentation as the minimum requirements of this specification in the design package before any manufacturing, construction or commissioning commences:

- Document submittal schedule indicating when all documents will be submitted
- Drawing Register indicating when drawings will be submitted
- Complete detailed design file
- Functional Specifications
- Line Sizing Calculations and Material Selection
- Final isometric and general arrangements illustrating pipe dimensions, pipeline layouts and showing pipe supports
- General Arrangement Drawing of System and boundaries
- Equipment datasheets
- Quality Control Plan and Inspection and Test Plan
- Commissioning procedures
- Assembly procedures
- Technical, Operation and Maintenance Manuals of all plant equipment
- Operating and Control Philosophies
- Maintenance Philosophy
- HMI Graphics
- Loop Diagrams
- Field termination drawings
- Pipeline Schedule
- Instrument schedule
- Mechanical Hook-up diagrams
- Electrical Hook-up diagrams
- I/O block diagrams
- LOSS diagrams
- Cubicle Internal Equipment Schedule
- Functional Distribution (Allocation of field devices to I/O)
- Detailed I/O List and Channel Assignments
- Electrical cable schedules
- C&I cable schedules
- Electrical termination schedules
- C&I termination schedules
- Instrument datasheets
- Instrument calibration certificates

- Schematics for the electrical design
- Critical Spares List
- Welding Procedure Specifications
- Welding Procedure Qualification Record
- Operating, Maintenance and Engineering Training Manuals

### 3.4 Commissioning

This is defined as bringing into service all items of the *works* as specified, meeting the requirements of the functional Works Information, as well as the control system and plant performance including all necessary testing and verification of the stated performance. The equipment covered by the Works Information is installed and complete in all respects by the dates stated in the Accepted Programme. The *Contractor* provides sufficient personnel for the satisfactory and timely commissioning of the equipment. Before equipment is placed in service, the *Contractor* certifies that it is in a suitable and safe condition. Prior to the time when cold commissioning commences, the *Project Manager* nominates a representative to co-ordinate the commissioning of all equipment forming an integral part of the plant being commissioned. The *Contractor* co-operates fully with the *Project Manager's* Representative/s in the work of commissioning the whole of the plant for which the *Employer* supplies the portion of equipment specified. The *Employer* uses the *works*, without taking over the *works*, before Completion for the commissioning, optimisation and capability testing of the *works* and associated plants.

The commissioning stage consists of cold and hot commissioning.

- **Cold commissioning**

During cold commissioning, functional tests are done and they form part of the cold commissioning. Those tests include checking of all interlocks and controls. The *Supervisor* forms part of the people conducting these tests. Special care is taken to safety aspects, special function limits, and position indication.

At tender stage, the *Contractor* shall provide a sample of the type of functional test forming part of the cold commissioning and their duration.

- **Hot commissioning**

Hot commissioning is where the plant processes are placed into operation in conjunction with the control system. The commissioning activities are carried out in conjunction with the *Supervisor*. The *Contractor* is responsible for the hot commissioning of all the equipment forming part of the *works* to satisfy the requirements of the Works Information. The *Contractor* notifies the *Project Manager* that cold commissioning is complete and requests the commencement of hot commissioning.

The *Employer* is responsible for plant preparation for hot commissioning. However, for that portion of the equipment, which cannot be commissioned separately from other plant, the commissioning is at the discretion of the *Project Manager* for the particular stage of commissioning. In cases where various components (existing or new) are connected to form an integrated system, the *Contractor*, at the time of commissioning, carries the responsibility for the correct functioning of the whole of the system. If a defect is identified in the equipment interfacing or external to the *Contractor's* scope the *Contractor* directs the *Project Manager's* Representative/s to rectify the defects. The *Contractor* provides a sample of the type of functional test forming part of the hot commissioning with typical test durations.

Each metal detector has to be hot commissioned individually per unit until all the units are fully implemented and completed. The run or test period should not exceed a week for each metal detector installed. During this time, all functional tests will be done as normal operation. A list of tests should be provided at tender stage.

The *Contractor* shall undertake all the activities of engineering and design from systems engineering through technical clarification, design freeze, production engineering to installation, commissioning and completion.

The *Contractor* shall provide a project organogram specific for this project indicating lines of communication and responsibilities covering the *Contractor's* resources as well as all outsourced sub-contracting organisations with their interaction with the *Employer*. The *Contractor* shall further provide detail of each



position in the organogram clearly detailing the responsibility and accountability by means of job descriptions reporting structure within the project.

The *Contractor* shall provide a detailed description of the engineering and design process for this project clearly indicating the time frames and concurrency of activities of engineering work. The *Contractor* shall also provide a clear explanation of the *Employers* involvement regarding time frames of the various activities, specific disciplines required at that time, as well as specific information requirements.

## **As-built drawings, operating manuals and maintenance schedules**

- Language: All documentation, including reports, manuals, etc. shall be in the English language.
- Manuals: The technical, training, operating and maintenance manuals are provided for each type of a functional unit. Technical manuals include all technical data as well as the technical data and leaflets of each individual component provided. Where generic manuals are provided, an addendum is provided indicating the applicable project specific components.

Manuals are of a good quality and cover the following as a minimum:

- Technical descriptions of the equipment and component parts
- General arrangement drawings
- Installation instructions with drawings or pictures
- Operating and maintenance instructions for all components
- Detailed parts lists (accompanied by exploded view type drawings clearly detailing the part and uniquely identifying it)
- Spare part ordering instructions

Any special instructions pertaining to storage of spare parts or their shelf life is included in the maintenance manual. All drawings requested for component location, dismantling and reassembly for maintenance are included in the maintenance manual. All special tools required for operating and maintenance of the equipment are presented in a form of a schedule in the operating and maintenance manual, respectively. The content of the training manual is based on the content of the technical, operating and maintenance manuals.

The documents are reviewed by the Project Manager for correctness and conformance to the accepted design.

“As Built” documentation is deemed as a part of the works, hence Completion is not certified until such documentation is accepted by the Project Manager.

## **Drawing Requirements**

### **• Drawing Numbering System**

The Employer supplies the proposed Project Manager drawing numbering system. The Contractor may assign his own drawing number as required to meet his document control system requirements.

### **• As-Built Drawings**

The Contractor's Staff maintains a master set of red-lined as-built drawings. The Contractor provides drawing mark-ups as work is completed. The Project Manager and the Contractor ensure that all appropriate information is transferred to the field record copy of drawings. The Project Manager and the Contractor check the "as-builds" for completeness and accuracy.

The following types of drawings are updated to as-built status:

- GAs
- Underground utilities drawings
- Electrical single-line diagrams
- Electrical schematic drawings
- Wiring diagrams (including panel layouts and loop diagrams)

- Plant arrangements
- Piping layouts
- Valve and Equipment lists

### **Operating and Maintenance Manual**

The Contractor provides operating and maintenance manuals, as well as an Operating Technical Specification for the new Plant. The Contractor provides four (4) hard copies and an electronic copy.

The procedures are provided by the original equipment manufacturer detailing descriptions of operating and the maintenance work. The procedure covers the requirements for maintenance of the equipment over the design life.

### **Maintenance Schedule**

The Contractor provides a maintenance strategy for the life expectancy of the new Plant with a summary schedule. The Contractor provides the life expectancy of the equipment. The Contractor lists maintenance spares (with detailed specifications) for the life expectancy of the equipment.

## 4 Procurement

### 4.1 Minimum requirements of people employed on the Site

- All people employed to Provide the Works shall have South African Citizenship or a valid workers permit if not South African nationals.
- All people employed to Provide the Works shall be trained on health and safety
- All people employed to Provide the Works shall be trained on doing risk assessment
- All people employed should have at least a year of experience in Bulk Material Handling
- Superiors should have experience in the magnitude of the work.
- Professionally registered (Technologist/Engineer) personnel with at least 5 years of experience on Water Balance and Water Measurement must be in the team to provide guidance.

### 4.2. BBBEE and preferencing scheme

The company shall maintain or improve upon their current B-BBEE Contribution level for the duration of the contract. The supplier will be required to submit a new B-BBEE certificate within 3 months, should ownership of the company change during the life of the contract.

Enflotech (Pty) Ltd is LME level 3 Contributor to B-BBEE, contractor submitted sanas accredited B-BBEE certificate

#### 4.2.1 Accelerated Shared Growth Initiative – South Africa (ASGI-SA) /SDL & I

The Contractor complies with and fulfils the Contractor's obligations in respect of the Accelerated and Shared Growth Initiative - South Africa in accordance with and as provided for in the Contractor's SD&L Compliance Schedule.

#### 4.2.2 Local Content and Production

This works/service is a non-designated sector and therefore no local production threshold is applicable to qualify for further evaluation. Tenderers will also be encouraged to utilise local and local to site resources.

#### 4.2.3 Skills Development (not weighted criteria)

Eskom intends to improve Skills Development by ensuring that technical support is directed towards enhancing supply capacity and capability within the industry or sector of operation. By doing this the capacity and competitiveness of the local supply base will be increased and the goals of shared growth, employment creation, poverty reduction and skills development will be achieved.

Tenderers are required to comply with Construction Skills Development Goals percentage of 0.25% of the contract value in accordance with CIDB regulations. The below skills are a guidance.

Skills Type	No of learners	Intake	Outcome	Target
<b>Method 1:</b> Graduates in Electrical Engineering	2	S4	National Diploma Electrical	
<b>Method 2:</b> Artisans (Electrical)	2	N3/NCV Level 4 Electrical/Control and Instrumentation TVET College Graduates	SETA Trade Test Certificate	

The Contractor shall keep accurate records and provide the Service Manager with reports on the Contractor's actual delivery against the above stated SD&L criteria. [Elaborate on access to and format of records and frequency of submission etc.]

The Contractor's failure to comply with his SD&L obligations constitutes substantial failure on the part of the Contractor to comply with his obligations under this contract

#### **4.2.4 Retention**

- a. Eskom shall be permitted to retain 2.5% (two and half percent) of the invoices (excluding VAT) as security for the fulfilment by the tenderers of their SD&L obligations.
- b. Once Eskom has verified that tenderers have fulfilled their SD & L obligations, the 2.5% retained shall be approved for reimbursement by Eskom to suppliers within 90 (ninety) days of verification by Eskom.

#### **4.2.5 Reporting**

- a. The tenderers shall on a monthly /quarterly basis submit a report to Eskom in accordance with Data Collection Template on their compliance with the SD& L obligations described above.
- b. Eskom shall review the quarterly reports submitted by the tenderers within 60 (sixty) days of receipt of the reports and notify the tenderers in writing if their SD&L obligations have not been met.
- c. Upon notification by Eskom that the tenderers have not met their SD&L obligations, the tenderers shall be required to implement corrective measures to meet those SD&L obligations before the commencement of the following quarter, failing which retention clauses shall be invoked.
- d. Every contract shall be accompanied by the SD&L implementation schedule which must be completed by the tenderers and returned to SD&L representative for acceptance **before** contract award. This will be used as a reference document for monitoring, measuring and reporting on the tenderer's progress in delivering on their stated SD&L commitments.

### **4.3 Subcontracting**

#### **4.3.4 Preferred subcontractors**

Subcontracting will be applicable once agreed upon

#### **4.3.5 Limitations on subcontracting**

No more than 30% of the total contract value may be subcontracted.

#### **4.3.6 List of Proposed Sub-Contractors**

The *Contractor* indicates on a list as shown below, the names of any sub-contractors whose services may be used to provide the *works*. The *Contractor* provides a short description of the work it is proposed to sub-contract to each, together with an approximate value of the work to be executed by each.

Where the sub-contractor will be required to do physical work on site the *Contractor* provides details on the experiences of the mentioned sub-contractor as well as a list of references involving work of a similar nature.

Notwithstanding the inclusion of a sub-contractor's name below, the *Contractor* obtains the written acceptance of the *Project Manager* prior to the employment of such sub-*Contractor* on the Site.

The *Contractor* will provide details of previous works and references of work done by the intended

<b>Sub-Contractor</b>	<b>Description of work</b>	<b>Approximate value</b>	<b>Accepted by <i>Project Manager</i></b>

## **4.4 Plant and Materials**

### **4.4.4 Quality**

All Plant and Materials are either new. All New Plant and Materials are free from defects. No Reconditioned Plant and/or Materials are regarded as new under any circumstances.

It is the responsibility of the Contractor to ascertain the condition of any used equipment or materials, transport to site, corrosion protection, as well as any spares compatibility issues that may present itself in the future.

The Contractor does not use Plant or Materials which are generally recognised as being unsuitable or otherwise to be avoided for the purpose for which they are intended.

Only components of high reliability are utilised, with a proven operating history, to enable the Plant to achieve required reliability and availability. Plant and Material design, engineering and manufacture accord with the best modern practice applicable to high-grade products of the type to be furnished, so as to ensure the efficiency and reliability of the works and the strength and suitability of the various parts for the works.

Plant and Materials withstand ambient conditions and the variations of temperature arising under working conditions without distortion, deterioration or undue strains in any part.

All parts are made accurately, and where practicable, to standard gauges so as to facilitate replacement and repairs. Like parts are interchangeable.

No repair of defective Plant and/or Materials is permitted without the Project Manager's acceptance and any such repair, if accepted, is carried out in accordance with the Employer's requirements.

The Contractor ensures that co-ordinated and formally documented management system is in place for the assurance of quality as specified in ISO 9001, Quality management Systems – Requirements.

The Project Manager is free to specify hold and witness points during the installation and on site testing stages of the project. The Contractor issues preliminary notification of such hold and witness points by four days advance notice to the Project Manager, and confirms such hold and witness points at least four days prior to the activity.

Documentation regarding quality procedures is submitted within thirty days of Contract Award. The Project Manager reviews and comments on the acceptability of these documents within the period for reply. If controlled copies of these documents have been submitted to the Employer, then the controlled copy numbers may be quoted in the submission.

The Employer places emphasis on the provision of a comprehensive Quality Management System (QMS) for all phases of the project. The QMS shall comply with the requirements of ISO 9001. The Contractor and all of the Contractors' suppliers shall hold a valid certificate of compliance for their QMS to the requirements of ISO 9001:2008. The Employer may at his sole discretion carry out an audit any supplier or sub-supplier QMS for compliance.

Documents submitted for review and acceptance by the Project Manager after the Contract Date and prior to the commencement of work. The Contractor submits a fully detailed Quality Control Plan for acceptance within four weeks of the Contract Date.

No work is allowed on Site unless the Employer accepts the Quality Control Plan. The Contractor utilises the Employer's quality documentation forms for requesting access, erection checks etc. These request forms are to be submitted to the Supervisor at least one week prior to the requested activity, or as agreed to by the Project Manager. Apart from any statutory data packages required, the Contractor also compiles a data package of the relevant drawings, test certificates etc. for each section of work which is to be reviewed and signed off by the Supervisor at erection check stage prior to the commencement of the commissioning phase.

#### **4.4.5 Plant & Materials provided "free issue" by the *Employer***

None

#### **4.4.6 *Contractor's* procurement of Plant and Materials**

The *Contractor* procures all Plant and Materials required for constructing, installing and commissioning the works.

The *Contractor*:

- Advises the *Project Manager* in advance of all major shipments of Plant and Material and co-ordinates with the *Employer* the arrival, off-loading and release of such. The *Contractor* promptly unloads its shipments and promptly releases carrier equipment.
- Notifies the *Project Manager* of being unable to promptly unload any shipment not less than 5 (five) days prior to arrival. The *Project Manager*, at her option, off-loads or makes arrangements for others to off-load such shipments for the account and risk of the *Contractor*. Costs incurred in respect of off-loading will be for the *Contractor's* account.
- Ensures that all the Plant and Materials are inspected. The Contractor notifies the Project Manager who instructs designated Employer's representatives to inspect the Plant and Materials at the factory, or the *Contractor's* premises, before it is transported to the Site. Supplies and uses suitable and sufficient construction plant, tools and equipment and materials as may be required to carry out the works efficiently.
- At all times provides protection for all plant and materials from damage or loss due to weather, fire, theft, unexplained disappearance or similar. At all times protects from damage, due to the Contractor's service to Provide the Works, all plant and materials and equipment and all items on the site that are the property of the Employer or Others.
- Provides or manages, as part of works everything necessary for the receiving, inspection, safe keeping and storage, issuing, handling, management and administration of all plant and materials purchased by the Contractor.
- Provides through the Project Manager and relevant Construction Management personnel the documentation for the warranties from suppliers of all any relevant plant and material used in the execution of the works.
- Ensures to provide all guarantees and warranties of the plant & materials used in the works to the Project Manager and Employer when construction is completed.
- Supplies the labelling for the Plant that forms part of the works. The Contractor provides labels for the Plant according to the Matimba label specification. The Contractor makes use of the KKS codes and descriptions provided by the Employer.
- The labels are affixed in such a way that they are easily legible and not obstructed by the wiring or by other components.
- Clamping methods applied to the labels shall ensure that removal of the labels requires force. The Project Manager's acceptance should be sought for the proposed method of clamping prior to use.
- Supplies to the Project Manager, for verification and acceptance purposes, with a label list showing the text only. The Project Manager's acceptance should be sought for the positioning and designation of labels.

- The KKS codes are used accordingly on documentation (e.g. drawings, manuals, equipment lists, cable schedules etc.) as a unique identification means. References to plant are accompanied by the relevant KKS code for that item of plant.
- Abbreviations to descriptions on the labels are generally not acceptable. Where abbreviations are unavoidable, due to the limited number of characters that can be engraved/etched on labels, the abbreviations are submitted to the Project Manager for acceptance. The Contractor makes use of the Employer's "Eskom Plant Labelling Abbreviation Standard; 240-109607332.
- Arranges all shipments of Plant and Materials and consigns all such shipments to himself as consignee at the project shipping address, freight fully prepaid. The Contractor makes demurrage agreements and settlements with carriers for his shipments.
- Where materials are required to comply with a standard specification, the Contractor shall provide the Project Manager with certificates showing compliance to the standard.
- Samples ordered or specified shall be delivered to the Project Manager's office on site for check before acceptance.
- Unless otherwise specified, all proprietary materials shall be used and placed in strict accordance with the published instructions of the relevant manufacturer.

#### **4.4.7 Spares and consumables**

The Contractor submits, on completion of the design, a detailed listing of the recommended spares and prices for the Project Manager's acceptance to comply with the aforementioned requirement. The prices quoted shall include for packing, delivery to and off-loading at site, inspection and testing and adequate protection against corrosion, damage and weathering during transit and storage.

### **4.5 Tests and inspections before delivery**

The Employer carries out quality inspections at his discretion without wavering the Employers right to conduct inspections at the Contractor's site prior to delivery.

All inspections and testing to be performed in accordance with the Quality Control Procedure (QCP) developed by the Contractor.

The Employer will be provided access to the Contractor's premises for the purpose of:

- Establishing compliance with the contractual requirements by means of inspections, surveillance and audits.
- Witnessing the performance of any tests.

The Employer will inspect equipment forming part of the Plant before they are released from the Contractor's premises at his discretion. This inspection entails a thorough check to ensure complete compliance with this specification including schedules, design drawings and other applicable standards.

The Contractor obtains clearance from the Employer or the Employer's agent before despatching of the equipment. This factory release inspection does not release the Contractor of any of his obligations under the contract.

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

The Contractor is liable for all plant & equipment in the designated area under his control. The Employer will not take any responsibility for any loss or damage to the equipment.

### **4.7 Cataloguing requirements by the Contractor**

The Contractor needs to satisfy the following requirements as stated in Procurement Instruction Number 1 of 2018 – Incorporating Cataloguing into the Procurement Environment, Unique Identifier 240-1289988974:

- Cataloguing requirements as stated in Appendix 3.1 – Part A2

- Specification for labelling as shown in Appendix 3.4
- Cataloguing templates examples as shown in Appendix 3.5



## 5 Construction

### Temporary works, Site services & construction constraints

#### Employer's Site entry and security control, permits, and Site regulations

The *Contractor* complies with the following:

- Matimba Power Station Health and Safety Standards as per Matimba Power Station Health & Safety Specifications for Contractors (PA/270/003).
- Compliance with Eskom & Matimba No Smoking Policy
- Adhere to the OHS Act 85 of 1993
- All staff will undergo Safety Induction, presented by Matimba Risk Management Department
- Adhere to Eskom Life saving Rules at all times
- The Contractor must conform to the access control requirements as set out in the document called "Health and Safety Practices for Contractors at Matimba Power Station".
- The Contractor must conform to the requirements set out in the document called "Eskom Environmental Practices and Standards".
- Names and Identity numbers are required seven working days before the contract starts. Photo copies of Identity documents are also required. This must be arranged with the Employer's Representative.
- Lost permits will be paid for by the Contractor to Protective Services at a cost of R30-00 per lost permit.
- Only work vehicles with an approved permit will be allowed on site. No private vehicles will be allowed on site.
- Arrangements must be made with the Employer's Representative well in advance to allow sub-contractors on site.
- The transport of any equipment onto site must be declared and documented at Protective Services in order to facilitate the future removal thereof.
- Eskom may at its discretion provide any spare parts, materials or equipment as may be required for the execution of the contract works.
- At least one supervisor shall be authorized as a Responsible Person in terms of the Eskom Plant Safety Regulations to take out Permits to Work on plant.

#### Access to Site

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

The Contractor liaises with the Matimba SHE Practitioner/Officers for Safety Induction prior work to commence.

After Induction the Contractor will be issued with a copy of the attendance register for the induction attended. This proof of induction will be used by the Employer to verify attendance prior to signing the Personal Site Access document.

The Contractor's employees take the signed site access documents to security reception official in order to finalize their site access.

The Contractor ensures that all its employees carry their site access forms with them all the time.  
The Contractor is subjected to alcohol testing on a daily basis.

The Contractor submits his application for vehicle permit to the Project Manager. The personnel and vehicles entering and leaving the site are subjected to routine searches.

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

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

This message is handed over to any Subcontractor working on Matimba Power Station.

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

Restrictions and hours of work may apply at Matimba Power Station. The Contractor keeps records of his people on Site, including those of his Subcontractors which the Project Manager or Supervisor have access to at any time. These records may be required in the event of a compensation event for assessment purpose or other cause.

### **Health and safety facilities on Site**

- The Medical Station is available on site during normal working hours. The after hours emergency telephone number is 014-763-8311 or from a Matimba phone the extension is 5000 that can be phoned for assistance.
- Fire protection and rescue services are available on site 24 hours per day.

### **Title to materials from demolition and excavation**

As per Clause 73.2 the Contractor has no title to materials from excavation and demolition (e. g. copper).

### **Publicity and progress photographs**

Cameras and taking or publishing photographs is prohibited

### ***Contractor's Equipment***

- The Contractor provides all Equipment that is required to complete the works.
- The Contractor ensures that all his construction labour and equipment remains within the fenced off allocated construction area.
- The Contractor ensures that any staff, labour, or equipment moving outside his allocated construction site does not obstruct the normal operation of the power station.
- Any additional access routes required are coordinated with the Project Manager.
- The Contractor keeps daily records of his equipment used on Site and the Working Areas (distinguishing between owned and hired Equipment) with access to such daily records available for inspection by the Project Manager at all reasonable times.
- All Equipment used by the Contractor in Providing the Works comply with the General Machinery Regulation 4 of the Occupational Health and Safety Act (Act 85 of 1993).
- The contractor shall register all their equipment and declare all their belongings at the security gate upon arrival. Unregistered belongings upon arrival will not be allowed to be removed offsite.

### **Equipment provided by the *Employer***

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

### **Site services and facilities**

#### **Site Yard**

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

A site is made available to the Contractor for his yard within the Power Station security area. The proposed site is shown to the Contractor during site meeting or clarification meeting. The yard is a raw site and will be used by the Contractor for the establishment of his offices, workshop and stores.

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

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

### **Supply of Electricity**

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

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

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

The power supply is managed in accordance with the latest revision of the Eskom safety regulations i.e.:

- a) 32-846, Operating Regulations for High-Voltage Systems
- b) 36-681, Generation Plant Safety Regulations
- c) COC for the site installation is required prior to power being switched on.

### **Lighting**

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

### **Water**

Water is made available on request free of charge from water points on site. The Contractor supplies at his own cost all the necessary connections, fittings, piping work, temporary plumbing and pumps necessary to lead water from the Employer's points of supply to the various points where it is required. The Contractor is responsible for maintaining this equipment and for removing it at Completion of the whole of the works.

The Project Manager does not guarantee continuity of supply and the Contractor makes his own provision for standby supplies to maintain continuity of work. Claims of any nature relating to discontinuity of water supply shall not be considered and entertained.

### **Roads**

Main access roads are surfaced, complete and may be used by the Contractor with the necessary care. The Employer maintains the Site roads, described above, to a fair condition. Any costs incurred by the Project Manager from damage caused to underground services, structures, etc. as a result of the Contractor not using the identified routes is recovered from the Contractor.

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

### **Facilities provided by the *Contractor***

- All transport i.e. Tractors, Trucks, L.D.V.'s
- Accommodation is for the Contractor's own account.
- All tools must be provided by the Contractor for the works.
- All workshop machinery must be provided by the Contractor for the works.
- All office equipment must be provided by the Contractor for the works.
- Telephone bills will be paid by the Contractor.
- The Contractor must provide working procedures for each activity to the Employer's Representative at least 2 weeks before work may proceed. This procedure will include "Safe working procedures".
- The Contractor must provide all the material needed for the works. The safeguarding, care and security of all equipment and materials while the Contractor is performing the works is the responsibility of the Contractor.
- If the Contractor uses portable two-way radios, the Employer's Representative must approve the type and make.
- At least one person in the service of the Contractor shall be certified competent to inspect scaffolding needed by the Contractor for the works. Certificates as proof of this will be handed to the Employer's Representative after contract award before the starting date.
- All redundant Contractor's material must be moved to allocated sites. No scrap shall be stored in the Contractor's yard. Scrap must be cleared of site daily.

### **Sequences of construction or installation**

The Contractor is responsible for the construction and installation of the equipment according to the Contractor's construction and installation plans.

The Contractor complies with the Employer's Work Co-ordination Process.

Without derogating from the provisions of the Conditions of Contract, the Work Co-ordination Process is used by the Project Manager to monitor and manage activities on the Power Station and to facilitate the integration and co-ordination of the various works by Others.

If not included in the contract, the Project Manager will notify the Contractor of the requirements of the Work Co-ordination Process prior to the date of site establishment by the Contractor.

### **Hook ups to existing works**

The adjacent plant and equipment may not be modified without written permission from the Project Manager. The Contractor complies with Eskom Life Saving Rules and will report any non-conformance.

## **Completion, testing, commissioning and correction of Defects**

### **Commissioning**

Commissioning to be done according to the requirements in section 3.4

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

The *Contractor* will be required to do plant checks to ensure that the material used and workmanship complies with the specified requirements. The *Engineer* will be attending whilst doing this. The results of those checks shall, if so ordered, be made available to the *Engineer*.

The plant will only be put in operation after relevant safety clearances for all plant and material has been issued by the Contractor and Signed by the Employer.

The contractor will be required to provide the Employer with the relevant start-up procedures.

### **Work to be done by the Completion Date**

On or before the Completion Date the *Contractor* shall have done everything required to Provide the Works.

The *Project Manager* cannot certify Completion until all the work been done and is also free of Defects which would have, in his opinion, prevented the *Employer* from using the *works* and Others from doing their work.

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

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

Acceptance tests shall be carried out to prove all the plant guarantee figures provided by the Contractor in the technical schedules.

Where the results of the performance tests performed don't correlate with expected results (concentration values, flow rates, pressures etc.) and/or the control functions as per the operating philosophy do not meet the specifications guaranteed, the Contractor, at his own expense, carries out all necessary adjustments and modifications to the works required to obtain the stated tolerances. Fully detailed proposals are submitted in writing to the Project Manager for approval before any adjustments and modifications are made and work in this respect is carried out when convenient to the Project Manager. All adjustments and modifications are subject to inspection and approval by the Project Manager.

When adjustments and modifications are completed, the Contractor advises the Project Manager in writing to this effect and applies for a further acceptance test. From the results obtained, and provided that the Employer is satisfied that it will be lasting, the works will be finally accepted by the Employer.

### **Operational maintenance after Completion**

Operational maintenance by the contractor will not be required. The training provided by the contractor must be sufficient to allow maintenance by the Employer's staff.

List of drawings

Drawings issued by the *Employer*

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

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

Drawing number	Revision	Title

6 APPENDIX A: LIMITS OF SUPPLY AND SERVICES (LOSS)

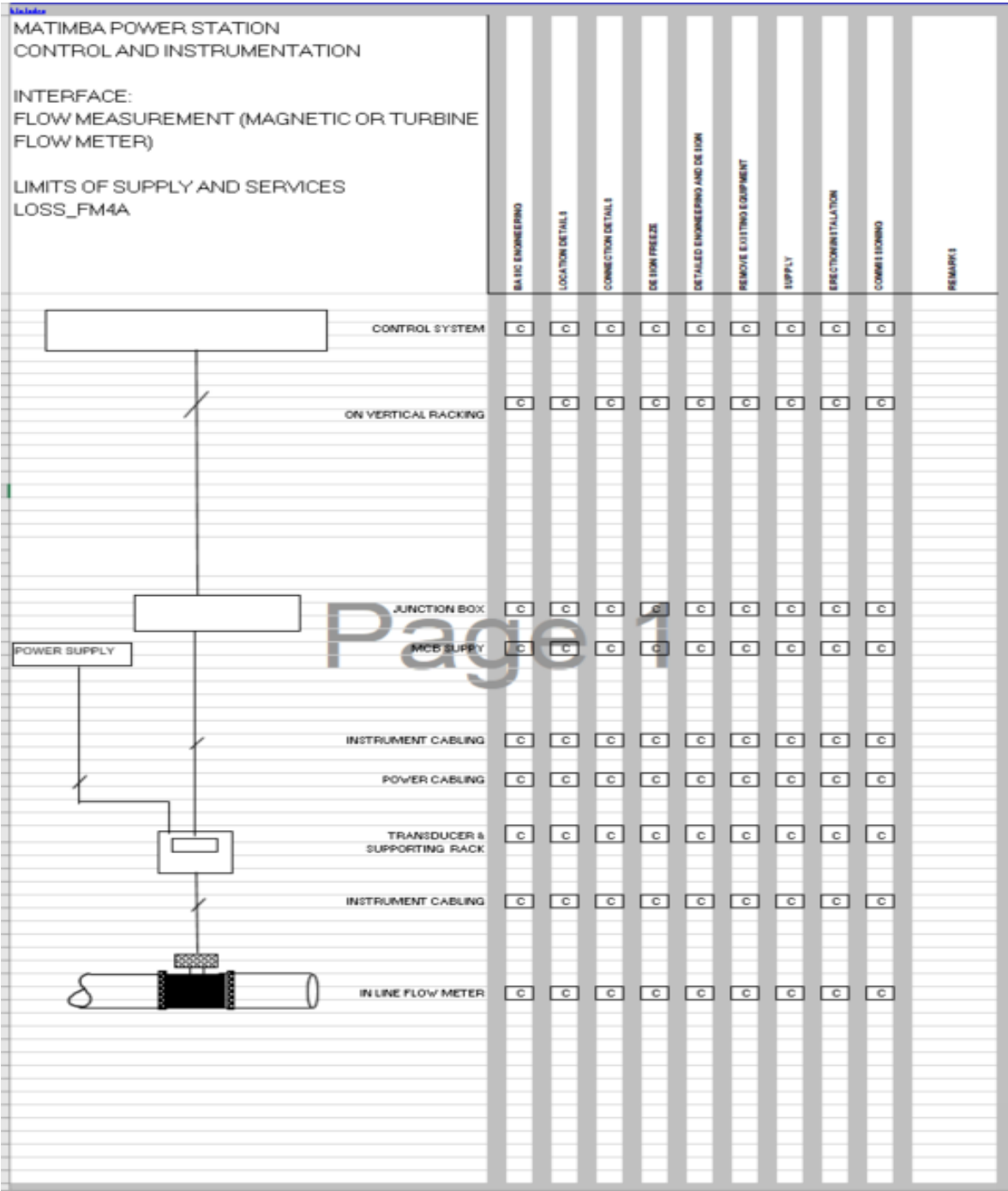


Figure 2: LOSS diagram of the Magnetic or Turbine Flow meter

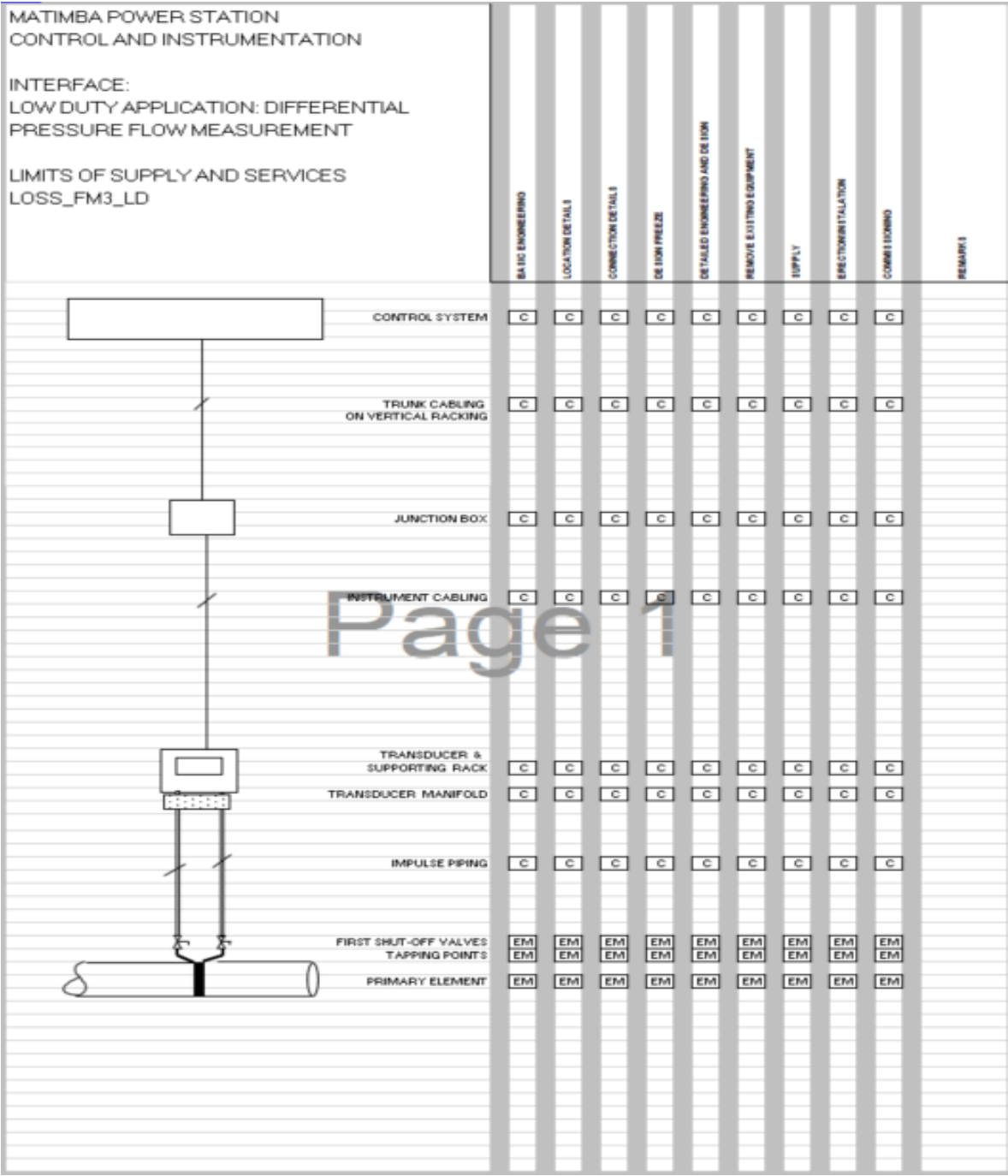


Figure 3: LOSS diagram of the differential pressure transmitter



## 7 APPENDIX C: REQUIRED FLOWMETERS AND AVAILABLE PIPE LENGTHS

### C.1 PIPE SPECIFICATIONS

#### Ultrasonic Transit Time Flowmeters

Stream	Flowmeter KKS	OEM	Pipe Material	Nominal Diameter (mm)	Diameters Upstream	Diameters Downstream	Adequate straight length
A1.4.1	00GAC50CF002	Khrone	Galvanised Steel	250	11	13	Yes
A1.4.2	00GAC50CF003	Khrone	Galvanised Steel	250	>10	>5	Yes
A.1.6.1	00GCK10CF001	Khrone	Mild Steel	324	15*	25	Yes*
A.1.6.2	00GHA10CF001	Khrone	Mild Steel	324	15*	18	Yes*
A1.7	00GAC50CF001	Khrone	Galvanised Steel	500	5	1	No
A.3.1	00GCK20CF001	Khrone	Mild Steel	600	5*	13	No
A.3.2	00GCK30CF006	Khrone	Mild Steel	300	7*	10	No
A.3.3	01GCK60CF001	Khrone	Stainless Steel	350	13*	3	No
A.3.5.1	00GCK68CF001	Khrone	Stainless Steel	60	10	15	Yes
A6.3.1	00UGN20CF001	Khrone	PVC	200	>10	>5	Yes
A6.5	00UGN40CF002	Khrone	PVC	150	1	13	No
*This is based on the assumption that the inline orifice plate has been removed							

#### Differential Pressure Flowmeters

Stream	Flowmeter KKS	OEM	Pipe Material	Nominal Diameter (mm)	Diameters Upstream	Diameters Downstream	
A.2.2.1	04GKB30CF001	Siemens	GS	200	15	50	
A.2.4	00GKB11CF001	Siemens	GS	500	>10	2	
A.2.7.1	00GKA10CF002	-	Mild Steel	250	25	7,5	
A.3.7.1	00LDN50CF001	Hartmann and Braun	Mild Steel	200	10	5	
A.3.7.2	00GCK30CF004	Hartmann and Braun	Mild Steel	150	13	67	

### Electromagnetic Flowmeters

Stream	Flowmeter KKS	OEM	Pipe Material	Nominal Diameter (mm)	Diameters Upstream	Diameters Downstream	Adequate straight length
A.1.8	00GAC30CF001	Khrone	Mild Steel	500	2	5	No
A.2.2.2	05GKB16CF501	Khrone Waterflux 3000	Mild Steel	200	0	0	Yes
A.2.3.1	00GKB90CF001	Khrone	Mild Steel	200	10	3	Yes
A.2.3.2	00GKB93CF001	Siemens Mag 5000	Galvanised Steel	250	8	8	Yes
A.2.3.4	No KKS	Yokogawa	Galvanised Steel	200	6	4	Yes
A.2.6.1	00GKB90CF001	Khrone	Galvanised Steel	250	9	10	Yes
A.2.6.2	00GKB10CF003	Khrone	Galvanised Steel	250	9	7	Yes
A.2.7.2	04GKB39CF501	Khrone		200	10	25	Yes
A.3.7.3	00GCR10CF001	EH Flowtec	Galvanised Steel	50	10	75	Yes
A.4.6.1	00GMG30CF001	Khrone	Mild Steel	250	12	12	Yes
A.4.6.2	00GMG40CF001	Khrone	Mild Steel	350	7	3	Yes
A.6.1.1	00GQA40CF002	Khrone	HDPE	400	5	5	Yes
A.6.1.2	00GQA40CF001	Khrone	PVC	200	9	5	Yes

### Other types of flow meters

Stream	Flowmeter KKS	OEM	Pipe Material	Nominal Diameter (mm)	Diameters Upstream	Diameters Downstream	Adequate straight length
A2.3.3	No KKS	Turbine	Mild Steel	50	0	2	No
A.2.3.5	05KGB48CF501	Turbine	Mild Steel	300	0	2	No
A.3.5.2	00GCK67CF001	Khrone Vortex	Stainless Steel	300	5	16	No

## C.2 WATER QUALITY

Category / System	Stream no. as per Directive	Stream description	Volumetric flow rate, m <sup>3</sup> /day	Specific conductivity, µS/cm	LI	Alkalinity	pH	Suspended solids, mg/L	Turbidity, NTU
Raw water	A.1.1	Raw water Supply	13887	89.7	0.26	28.6	8.9	present	8.76
	A.1.1.1	Evaporation from reservoirs (calculated)	-	89.7	0.26	28.6	8.9	-	8.76
	A.1.2	Reservoir level adjustment	-	-	-	-	-	-	-
	A.1.4.1	Raw water to Aux Cooling (N)	12.5	89.7	0.26	28.6	8.9	Present	8.76
	A.1.4.2	Raw water to Aux Cooling (S)	0	89.7	0.26	28.6	8.9	Present-	8.76
	A.1.6.1	Raw water to WTP (Demineralisation)	3166	89.7	0.26	28.6	8.9	Present-	8.76
	A.1.6.2	Raw water to WTP (Potable)	12201	89.7	0.26	28.6	8.9	Present-	8.76
	A.1.7	Raw water to Fire range	380	89.7	0.26	28.6	8.9	Present-	8.76
	A.1.8	Raw water to Ash conditioning	606	89.7	0.26	28.6	8.9	Present-	8.76

Category / System	Stream no. as per Directive	Stream description	Volumetric flow rate, m <sup>3</sup> /day	Specific conductivity, µS/cm	LI	Alkalinity	pH	Suspended solids, mg/L	Turbidity, NTU
Potable water	A.2.1	Potable to head tank	8114	87.3	-0.41	27.5	8.6	-	2.60
	A.2.2.1	Potable to station	1273	87.3	-0.41	27.5	8.6 1	-	2.60
	A.2.2.2	Potable to ring main	383	87.3	-0.41	27.5	8.6 1	-	2.60
	A.2.3.1	Potable to Marapong	3843	87.3	-0.41	27.5	8.6 1	-	2.60
	A.2.3.2	Potable to Medupi	1396	87.3	-0.41	27.5	8.6 1	-	2.60
	A.2.3.3	Potable to Mine	10.4	87.3	-0.41	27.5	8.6 1	-	2.60
	A.2.4	Potable to Fire range	713.6	87.3	-0.41	27.5	8.6 1	-	2.60
	A.2.6.1	Potable to Aux Cooling North	1213	87.3	-0.41	27.5	8.6 1	-	2.60
	A.2.6.2	Potable to Aux Cooling South	725						
	A.2.7	Potable to Sand-filter back wash	1796	87.3	-0.41	27.5	8.6 1	-	2.60

Category / System	Stream no. as per Directive	Stream description	Volumetric flow rate, m <sup>3</sup> /day	Specific conductivity, µS/cm	LI	Alkalinity	pH	Suspended solids, mg/L	Turbidity, NTU
Demineralised water	A.3.1	Filtered Water to Demineralised water production	2888	78.7	1.3	25.4	7.27	-	0.164
	A.3.2	Demineralised water to storage tank	2930	0.0056	-	-	-	-	0.077
	A.3.3	Demineralised water to Units (LP & HP range)	1930	0.0056	-	-	-	-	0.077
	A.3.5.1	Demineralised water to Aux Cooling North	17.2	0.0056	-	-	-	-	0.077
	A.3.5.2	Demineralised water to Aux Cooling South	47.9	0.0056					0.077
	A.3.6	Demineralised water to Condensate polishing		0.0056	-	-	-	-	0.077
	A.3.7.1	Demineralised water to CPP regens	67.2	0.0056	-	-	-	-	0.077
	A.3.7.2	Demineralised water, WTP regen	3.3	0.0056	-	-	-	-	0.077

Category / System	Stream no. as per Directive	Stream description	Volumetric flow rate, m <sup>3</sup> /day	Specific conductivity, µS/cm	LI	Alkalinity	pH	Suspended solids, mg/L	Turbidity, NTU
Recovery dams/ Recovered water/ Supplementary water	A.4.5.2	Clean Drains to Recovery Dam	630					Present-	
	A.4.5.3	Dirty Drains to Recovery Dam	3987					Present-	
	A.4.5.1	Storm water harvested (calculated)	-					Present-	
	A.4.6.1	Recovered water from station drains to Ash Dump	1839	75	-8.86	8.2	6.48	Present-	3.36
	A.4.6.2	Recovered water from station drains to Station	3384	75	-8.86	8.2	6.48	Present--	3.36
	A.4.8	Evaporative losses (calculated)	-					-	-

Category / System	Stream no. as per Directive	Stream description	Volumetric flow rate, m <sup>3</sup> /day	Specific conductivity, µS/cm	LI	Alkalinity	pH	Suspended solids, mg/L	Turbidity, NTU
Sewage	A.6.1	Raw sewage to sewage plant	1175				6.4	Present-	304
	A.6.3	Treated sewage to irrigation	887				7.4	Present-	4
	A.6.5	Treated sewage to recovery dams	255				7.4	Present-	7

PART 4: SITE INFORMATION

Document reference	Title	No of pages
C4	This cover page	1
	Site Information	3
	Total number of pages	4

## PART 4: SITE INFORMATION

Core clause 11.2(16) states

“Site Information is information which

describes the Site and its surroundings and  
is in the documents which the Contract Data states it is in.”

In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

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### General description

The Site is Matimba Power station located in Lephalale. The works to be executed will be at Matimba, below is weather data:

### Site Services provided by the *Employer*

#### 1.1. *Contractor's yard*

Should the *Contractor* qualify for a site, the *Employer* will provide a site within the premises of the Power Station for the *Contractor* to establish himself for the execution of the works. The *Project Manager* together with the Site Manager will allocate a site to the *Contractor*. A site close to the connection points of water, electricity and toilet facilities cannot be guaranteed.

A *Contractor* qualifies for a site if the answer to at least one of the following questions is affirmative:

1.1.1 Is the *Contractor* needed on site on a daily basis to carryout his/her contractual duties?

1.1.2 Does the nature of contract activities demand that the *Contractor* be involved continuously, with his/her contractual duties for the whole day for four (4) or more days in a week?

1.1.3 In a case of a break down, is the *Contractor* required to respond to the call out within 15 minutes?

1.1.4 Is there any statutory regulation/s that warrants that the *Contractor* must operate within the premises of Matimba Power Station for the delivery of contractual obligations?

The *Contractor* is responsible for keeping the site in good state of maintenance and is responsible to ensure that at the end of the Contract period, he informs the Site Manager to inspect the site at least thirty days (30) before the Contract end date. The *Contractor* shall vacate the site allocated to him at the end of the Contract or on termination of the Contract.

A written request, indicating the *Contractor's* requirements in locality and area of storage, office and workshop sites is submitted to the *Supervisor* as soon as possible after the Contract Date.

#### 1.2. Roads

The Employer makes every effort to maintain the roads on the Site in a fair condition and all construction traffic is limited to using these roads. Matimba traffic regulations are adhered to at all times. The Speed limit is 40km/h.

#### 1.3. Security

The Contractor is informed of the access procedures through Matimba Procedure PS/270/008, Rev 1, “Access Control and Protection of Eskom Assets” and should expect that such procedures may change depending on the prevailing security situation

Temporary entrance permits are issued to Contractors who are on site for less than 3 months. Names and Identity Numbers are required before the contract starts. Photo copies of Identity documents are also required. This must be arranged with the Project Manager. Lost permits will be

paid for by the Contractor to Protective Services at a cost of R30-00 per lost permit. All permits need to be returned to Security or the Project Manager upon completion of the contract.

The transport of any equipment onto the site must be declared and documented at Protective Services in order to facilitate the future removal thereof. Pro-active comprehensive listing of all tools and equipment brought to Matimba will considerably speed up entrance to the power station. If it is necessary to bring tools and equipment onto site a Matimba list of tools, as defined in PS/270/008, is submitted which is verified by security staff prior to tools entering the security area

The Contractor is restricted to the Site. The Contractor is forbidden to enter any other areas, and ensures that his employees abide by these regulations.

The Contractor's personnel are required to be in possession of a Contractor's Permit at all times inside Matimba Power Station.

Should any Contractor staff be transferred from Matimba or leave site, the Contractor ensures that personnel leaving site are transported out of the security area and that the permit is returned.

Only work vehicles with an approved permit will be allowed on site. These vehicles are to be in a serviceable condition and road worthy. Temporary vehicle permits are issued to Contractors who are on site for less than 3 months. This must be arranged with the Project Manager. Speed limit is 40km/h and 20km/h in some areas. Parking inside the power station is strictly forbidden, except for loading purposes. Arrangements must be made with the Project Manager well in advance to allow sub-Contractors and visitors onto site.

To bring cameras and cell phones with cameras on site, permission has to be obtained from the Power Station Manager, using the standard application forms for cameras. This must be arranged with the Project Manager. No firearms, weapons, alcohol and illegal substances are permitted on site. No "Private Work" is carried out for or on behalf of any Employer's employee. Any person suspected of being under the influence of alcohol is tested and if proved positive, is refused entry to the security area. No recruiting of casual labour may be done on Eskom premises, including the area outside the Power Station Security Gate.

Security personnel may search any premises, property or person within the security area of Matimba Power Station

Only authorised persons are permitted to enter Red Zone areas

#### **1.4. Supply of electricity**

Electric power for construction, both 220V AC and 380V 3-phase supply, is supplied at Site free of charge, but connection fees are for the Contractor's account. All installations comply with the details set out in Matimba Maintenance Procedure PAM/233/002 - Contractor's Temporary Electrical Equipment Supply, and Construction Power Supplies (Occupational Health and Safety Act - Act 85 of 1993) and the Matimba Safety, Health and Environmental Specification for Contractors, PS/270/003, Rev10.

The Employer does not guarantee continuity of supply and no claims for standing time as a result of power failures will be considered. The Employer connects distribution boards to a 380V three-phase AC power supply, only after the Contractor has submitted the valid Certificate of Compliance

A written request, indicating the Contractor's requirements is submitted to the Project Manager as soon as possible after the Contract Date.

#### **1.5. Water**

Potable and raw water for construction purposes if any are also available free of charge at the nearest point of supply as installed on site. A written request, indicating the Contractor's requirements is submitted to the Project Manager as soon as possible after the Contract Date.

### **1.6. Sanitary facilities**

Permanent toilets to serve the Power Station and urinals at the boundary area have been constructed by the Employer and all the Contractor's personnel may make use of these facilities if within allocated site for the execution of the Works.

### **1.7. Security**

Names and Identity numbers are required seven working days before the contract starts. Photo copies of Identity documents are also required. This must be arranged with the Employer's Representative.

Lost permits will be paid for by the Contractor to Protective Services at a cost of R30-00 per lost permit.

Only work vehicles with an approved permit will be allowed on site. No private vehicles will be allowed on site.

Arrangements must be made with the Employer's Representative well in advance to allow sub-contractors on site.

The transport of any equipment onto site must be declared and documented at Protective Services in order to facilitate the future removal thereof.

Eskom may at its discretion provide any spare parts, materials or equipment as may be required for the execution of the contract *works*.

## **2. SITE PROCEDURES AND INSTRUCTIONS**

### **2.1. Permits**

All *Contractors* will ensure that they are informed of all the requirements of Eskom's Plant Safety Regulations and ORHVS and that they at all times comply to the requirements of these Regulations.

All Supervisors of contracting companies, who are directly involved with Eskom's Permit to Work System, shall be trained and successful completion of Matimba's authorization / evaluation process, and must be authorized as Responsible Persons.

The Responsible Person shall ensure that:

- The conditions of permits and cautionary notices are strictly adhered to.
- The lockout procedures, mechanical as well as electrical, are strictly adhered to and any deviations shall be corrected immediately.
- The safe work procedures as laid down by Matimba Power Station and as determined by the Risk Assessment, shall be followed.
- The workers register and cautionary notices are discussed daily with workers

At least one supervisor shall be authorized as a Responsible Person in terms of the Eskom Plant Safety Regulations to take out Permits to Work on plant.

### **2.2. Medical Facility**

Medical Station is available on site during normal working hours 07:00 to 16:30. The emergency telephone number internal to Matimba is 5000 or 014-763-8311 from an external land line or cell phone and can be used to obtain emergency assistance. The Contractor should provide a COID number (Compensation for Occupational Injury and Disease) and associated documentation when the medical station is visited.