



NEC3 Engineering & Construction Contract

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

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

for Duvha North and South Lime plants upgrade
for period of 36 months

Contents:	No of pages
Part C1 Agreements & Contract Data	[•]
Part C2 Pricing Data	[•]
Part C3 Scope of Work	[•]
Part C4 Site Information	[•]

CONTRACT No. [Insert at award stage]

Part C1: Agreements & Contract Data

Contents:	No of pages
C1.1 Form of Offer and Acceptance	[•]
[to be inserted from Returnable Documents at award stage]	
C1.2a Contract Data provided by the <i>Employer</i>	[•]
C1.2b Contract Data provided by the <i>Contractor</i>	[•]
[to be inserted from Returnable Documents at award stage]	
C1.3 Proforma Guarantees	[•]

C1.1 Form of Offer & Acceptance

1.1 Offer

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

Duvha North and South Lime plants upgrade for period of 36 months

The tenderer, identified in the Offer signature block, has

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

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

Options A	The offered total of the Prices exclusive of VAT is	R [•]
Option A	The first forecast of the total Defined Cost plus the Fee exclusive of VAT is	R [•]
	Sub total	R [•]
	Value Added Tax @ 15% is	R [•]
	The offered total of the amount due inclusive of VAT is ¹	R [•]
	(in words) [•]	

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

Signature(s)

Name(s)

Capacity

**For the
tenderer:**

(Insert name and address of organisation)

Name &
signature of
witness

Date

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

Tenderer’s CIDB registration number (if applicable)

1.2 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.

1.3 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.

1.3.1.1 For the tenderer:

1.3.1.2 For the Employer

Signature _____

Name _____

Capacity _____

On behalf of _____
(Insert name and address of organisation)

Name & signature of witness _____

Date _____

Signature _____

Name _____

Capacity _____

On behalf of _____
(Insert name and address of organisation)

Name & signature of witness _____

Date _____

C1.2 ECC3 Contract Data

2 Part one - Data provided by the *Employer*

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

2.1 C l a u s e	Statement	Data
1	General	
	The <i>conditions of contract</i> are the core clauses and the clauses for main Option	
	dispute resolution Option	A: Priced contract with activity schedule W1: Dispute resolution procedure
	and secondary Options	X1: Price adjustment for inflation X2: Changes in the law X5: Sectional Completion X7: Delay damages X16: Retention X17: Low performance damages X18: Limitation of liability Z: <i>Additional conditions of contract</i>
	of the NEC3 Engineering and Construction Contract, April 2013 (ECC3)	
10.1	The <i>Employer</i> is (Name):	Eskom Holdings SOC Ltd (reg no: 2002/015527/30), a state owned company incorporated in terms of the company laws of the Republic of South Africa
	Address	Registered office at Megawatt Park, Maxwell Drive, Sandton, Johannesburg
10.1	The <i>Project Manager</i> is: (Name)	Ntebaleng More
	Address	Duvha Power Station
	Tel	+27 13 690 0763

Fax +27 86 600 0028

e-mail MoreNV@eskom.co.za

10.1	The <i>Supervisor</i> is: (Name)	Teboho Jakuja
	Address	Duvha Power Station
	Tel No.	+27 13 690 0471
	e-mail	JakujaT@eskom.co.za
11.2(13)	The <i>works</i> are	Duvha North and South Lime Plant Upgrade for the period of 36 months
11.2(14)	The following matters will be included in the Risk Register	Lime is a hazardous substance Safety risk of drowning in the clarifiers and working with lime
11.2(15)	The <i>boundaries of the site</i> are	Duvha Power Station Water Treatment Plant and Cooling Water System
11.2(16)	The Site Information is in	Part 4: Site Information of the scope of work
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	one week
	The Contractor's main responsibilities	Duvha North and South Lime Plant Upgrade for the period of 36 months

3 Time

11.2(3)	The <i>completion date</i> for the whole of the <i>works</i> is	30 June 2023	
11.2(9)	The <i>key dates</i> and the <i>conditions</i> to be met are:	Condition to be met	key date
		1 Start date	Completion: 36 months after the contract is awarded.
30.1	The <i>access dates</i> are:	Part of the Site	Date
		1 Cooling Water Treatment Plant-North and South Lime Plant (Water Treatment Plant)	After the contract is awarded
31.1	The <i>Contractor</i> is to submit a first programme for acceptance within	One (1) week of the Contract Start Date.	
31.2	The <i>starting date</i> is	01 June 2020	

32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than	One (1) week (Schedule and Cash flow)
35.1	The <i>Employer</i> is not willing to take over the <i>works</i> before the Completion Date.	[No data needed if this statement is included]

4 Testing and Defects

42.2	The <i>defects date</i> is	52 weeks after Completion of the whole of the works.
43.2	The <i>defect correction period</i> is	08 hours for emergencies or breakdowns and 4 calendar days for normal defects.
	except that the <i>defect correction period</i> for	Four (4) days
	and the <i>defect correction period</i> for	Four (4) days

5 Payment

50.1	The <i>assessment interval</i> is	25th day of each successive month.
51.1	The <i>currency of this contract</i> is the	South African Rand.
51.2	The period within which payments are made is	30 days
51.4	The <i>interest rate</i> is	<p>the publicly quoted prime rate of interest (calculated on a 365 day year) charged from time to time by the Standard Bank of South Africa Limited (as certified, in the event of any dispute, by any manager of such bank, whose appointment it shall not be necessary to prove) for amounts due in Rands and</p> <p>(ii) the LIBOR rate applicable at the time for amounts due in other currencies. LIBOR is the 6 month London Interbank Offered Rate quoted under the caption "Money Rates" in The Wall Street Journal for the applicable currency or if no rate is quoted for the currency in question then the rate for United States Dollars, and if no such rate appears in The Wall Street Journal then the rate as quoted by the Reuters Monitor Money Rates Service (or such service as may replace the Reuters Monitor Money Rates Service) on the due date for the payment in question, adjusted <i>mutatis mutandis</i> every 6 months thereafter and as certified, in the event of any dispute, by any manager employed in the foreign exchange department of The Standard Bank of South Africa Limited, whose appointment it shall not be necessary to prove.</p>

6 Compensation events

60.1(13)	The place where weather is to be recorded is:	Duvha Power Station
	The <i>weather measurements</i> to be recorded for each calendar month are,	the cumulative rainfall (mm)

the number of days with rainfall more than 10 mm

the number of days with minimum air temperature less than 0 degrees Celsius

the number of days with snow lying at 09:00 hours South African Time

and these measurements:

The *weather measurements* are supplied by

The South African weather Services

The *weather data* are the records of past *weather measurements* for each calendar month which were recorded at:

Duvha Power Station

and which are available from:

the South African Weather Bureau and included in Annexure A to this Contract Data provided by the *Employer*

60.1(13)	Assumed values for the ten year return <i>weather data</i> for each <i>weather measurement</i> for each calendar month are:	<p>As stated in Annexure A to this Contract Data provided by the <i>Employer</i>.</p> <p>Note: If this arrangement is used, delete the rows above for 60.1(13) and delete this note.</p>
7	Title	Duvha North and South Lime plants upgrade
8	Risks and insurance	
80.1	These are additional <i>Employer's</i> risks	Lime is a hazardous substance Safety risk of drowning in the clarifiers and working with lime
84.1	The <i>Employer</i> provides these insurances from the Insurance Table	<p>as stated for "Format A (Contractors All Risk insurance Policy) available on request from Eskom Insurance Management Services</p> <p>(See Annexure B for basic guidance)</p>
84.1	The <i>Contractor</i> provides these additional insurances:	<p>as stated for "Format A (Contractors All Risk insurance Policy) available on request from Eskom Insurance Management Services</p> <p>(See Annexure B for basic guidance)</p>
84.2	The minimum limit of indemnity for insurance in respect of loss of or damage to property (except the <i>works</i> , Plant, Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i>) caused by activity in connection with this contract for any one event is	whatever the <i>Contractor</i> deems necessary in addition to that provided by the <i>Employer</i>.
84.2	The insurance against loss of or damage to the <i>works</i> , Plant and Materials is to	

	include cover for Plant and Materials provided by the <i>Employer</i> for an amount of	R100 000.00
84.2	The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract for any one event is	As prescribed by the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 and the <i>Contractor's</i> common law liability for people falling outside the scope of the Act with a limit of Indemnity of not less than R500 000 (Five hundred thousand Rands).
9	Termination	Clause 90.1 In writing either party should send a notification giving reasons for terminating the contractor's obligation and if the reasons comply with this contract, then a termination certificate should be issued to both parties. Clause 90.2 The contractor may terminate only for the reasons identified in the termination table and the employer may terminate for any reason. Refer to Clause 90.3, 90.4 and 90.5
10	Data for main Option clause	
A	Priced contract with activity schedule	Option A to be used..
60.6	The <i>method of measurement</i> is	As stated in Part C2.1, Pricing Assumptions.
11	Data for Option W1	
W1.1	The <i>Adjudicator</i> is	the person selected from the ICE-SA Division (or its successor body) of the South African Institution of Civil Engineering Panel of Adjudicators by the Party intending to refer a dispute to him. (see www.ice-sa.org.za). If the Parties do not agree on an Adjudicator the Adjudicator will be appointed by the Arbitration Foundation of Southern Africa (AFSA).
	Address	TBA
	Tel No.	[•]
	Fax No.	[•]
	e-mail	[•]
W1.2(3)	The <i>Adjudicator nominating body</i> is:	the Chairman of ICE-SA a joint Division of the South African Institution of Civil Engineering and the London Institution of Civil Engineers. (See www.ice-sa.org.za) or its successor body.
W1.4(2)	The <i>tribunal</i> is:	arbitration.
W1.4(5)	The <i>arbitration procedure</i> is	the latest edition of Rules for the Conduct of Arbitrations published by The Association of Arbitrators (Southern Africa) or its successor body.
	The place where arbitration is to be held is	South Africa

	<p>The person or organisation who will choose an arbitrator</p> <ul style="list-style-type: none"> - if the Parties cannot agree a choice or - if the arbitration procedure does not state who selects an arbitrator, is 	<p>the Chairman for the time being or his nominee of the Association of Arbitrators (Southern Africa) or its successor body.</p>
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12 Data for secondary Option clauses

X1	Price adjustment for inflation			
X2	Changes in the law :			
	There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.			
X5	Sectional Completion			
X5.1	The <i>completion date</i> for each <i>section</i> of the <i>works</i> is:	Section	Description	Completion date, as per the programme
		1	North Lime Plant	
		2	South Lime Plant	
X7	Delay damages			
X7.1	Delay damages for Completion of the whole of the <i>works</i> are			R 5 000 per day to the maximum of 4 % aligned to the milestone contract value as per the baseline program.
X16	Retention			
	The <i>retention percentage</i> is			10% of the total contract value
X17	Low performance damages			
X17.1	<p>The amounts for low performance damages are:</p> <p>Performance level</p> <ul style="list-style-type: none"> The <i>Contractor</i> ensures that the complete design is performed by, or under the direction, control and supervision of an Engineering Council of South Africa (ECSA) registered professional person for each discipline as required by the scope of the design. The <i>Contractor</i> ensures that the complete design is signed off by an Engineering Council of South Africa (ECSA) registered professional person for each discipline as required by the scope of the design. In instances where the design is performed under the direction, control and supervision of a professional person, the professional person shall be responsible for signing off the design as applicable to his field of registration. A penalty of R3000 will be charged for each day that the correctly qualified people are not available. Any deviation from technical specifications (SOW), design standards, approved work 			

program, and SHEQ requirements will result in low performance damages that are aligned with delay damages

- The contractor to provide their own authorized responsible person
- The contractor to safeguard their own tool, and equipment from the start to the end of the project

X18	Limitation of liability	
X18.1	The <i>Contractor's</i> liability to the <i>Employer</i> for indirect or consequential loss is limited to:	5% of the contract value
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:	<p>the amount of the deductibles relevant to the event described in the insurance policy format selected in the data for clause 84.1 above, which policy is available on</p> <p>http://www.eskom.co.za/Tenders/InsurancePoliciesProcedures/Pages/EIMS_Policies_From_1_April_2014_To_31_March_2015.aspx</p>
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	<p>The greater of</p> <ul style="list-style-type: none"> • the total of the Prices at the Contract Date and • the amounts excluded and unrecoverable from the <i>Employer's</i> assets policy for correcting the Defect (other than the resulting physical damage which is not excluded) plus R15M first amount payable in terms of the <i>Employer's</i> assets policy.
X18.4	The <i>Contractor's</i> total liability to the <i>Employer</i> for all matters arising under or in connection with this contract, other than excluded matters, is limited to:	<p>the total of the Prices other than for the additional excluded matters.</p> <p>The <i>Contractor's</i> total liability for the additional excluded matters is not limited.</p> <p>The additional excluded matters are amounts for which the <i>Contractor</i> is liable under this contract for</p> <ul style="list-style-type: none"> • Defects due to his design which arise before the Defects Certificate is issued, • Defects due to manufacture and fabrication outside the Site, • loss of or damage to property (other than the <i>works</i>, Plant and Materials), • death of or injury to a person and • infringement of an intellectual property right.
X18.5	The <i>end of liability date</i> is	<p>(i) 1(One) year after the <i>defects date</i> for latent Defects and</p> <p>(ii) the date on which the liability in question prescribes in accordance with the Prescription Act No. 68 of 1969 (as amended or in terms of any replacement legislation) for any other matter.</p>

A latent Defect is a Defect which would not have been discovered on reasonable inspection by the *Employer* or the *Supervisor* before the *defects date*, without requiring any inspection not ordinarily carried out by the *Employer* or the *Supervisor* during that period. If the *Employer* or the *Supervisor* do undertake any inspection over and above the reasonable inspection, this does not place a greater responsibility on the *Employer* or the *Supervisor* to have discovered the Defect.

Z	The <i>Additional conditions of contract</i> are	Z1 to Z12 always apply.
Z1	Cession delegation and assignment	
Z1.1	The <i>Contractor</i> does not cede, delegate or assign any of its rights or obligations to any person without the written consent of the <i>Employer</i> .	
Z1.2	Notwithstanding the above, the <i>Employer</i> may on written notice to the <i>Contractor</i> cede and delegate its rights and obligations under this contract to any of its subsidiaries or any of its present divisions or operations which may be converted into separate legal entities as a result of the restructuring of the Electricity Supply Industry.	
Z2	Joint ventures	
Z2.1	If the <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 <i>Employer</i> , the persons or organisations notify the <i>Project Manager</i> within two weeks of the Contract Date of the key person who has the authority to bind the <i>Contractor</i> on their behalf.	
Z2.3	The <i>Contractor</i> does not alter the composition of the joint venture, consortium or other unincorporated grouping of two or more persons without the consent of the <i>Employer</i> having been given to the <i>Contractor</i> in writing.	
Z3	Change of Broad Based Black Economic Empowerment (B-BBEE) status	
Z3.1	Where a change in the <i>Contractor's</i> legal status, ownership or any other change to his business composition or business dealings results in a change to the <i>Contractor's</i> B-BBEE status, the <i>Contractor</i> notifies the <i>Employer</i> within seven days of the change.	
Z3.2	The <i>Contractor</i> is required to submit an updated verification certificate and necessary supporting documentation confirming the change in his B-BBEE status to the <i>Project Manager</i> within thirty days of the notification or as otherwise instructed by the <i>Project Manager</i> .	
Z3.3	Where, as a result, the <i>Contractor's</i> B-BBEE status has decreased since the Contract Date the <i>Employer</i> may either re-negotiate this contract or alternatively, terminate the <i>Contractor's</i> obligation to Provide the Works.	
Z3.4	Failure by the <i>Contractor</i> to notify the <i>Employer</i> of a change in its B-BBEE status may constitute a reason for termination. If the <i>Employer</i> 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	Ethics
Z4.1	Any offer, payment, consideration, or benefit of any kind made by the <i>Contractor</i> , which constitutes or could be construed either directly or indirectly as an illegal or corrupt practice, as an inducement or reward for the award or in execution of this contract constitutes grounds for terminating the <i>Contractor's</i> obligation to Provide the Works or taking any other action as appropriate against the <i>Contractor</i> (including civil or criminal action).
Z4.2	<p>The <i>Employer</i> may terminate the <i>Contractor's</i> obligation to Provide the Works if the <i>Contractor</i> (or any member of the <i>Contractor</i> where the <i>Contractor</i> constitutes a joint venture, consortium or other unincorporated grouping of two or more persons or organisations) is found guilty by a competent court, administrative or regulatory body of participating in illegal or corrupt practices.</p> <p>Such practices include making of offers, payments, considerations, or benefits of any kind or otherwise, whether in connection with any procurement process or contract with the <i>Employer</i> or other people or organisations and including in circumstances where the <i>Contractor</i> or any such member is removed from the an approved vendor data base of the <i>Employer</i> as a consequence of such practice.</p>
Z4.3	Notwithstanding the provisions of core clause 90.2, the procedures on termination in terms of this clause are P1, P2 and P3 as stated in the core clause 92 and the amount due is A1 and A3 as stated in core clause 93.
Z5	Confidentiality
Z5.1	The <i>Contractor</i> 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 <i>Contractor</i> , enters the public domain or to information which was already in the possession of the <i>Contractor</i> at the time of disclosure (evidenced by written records in existence at that time). Should the <i>Contractor</i> disclose information to Others in terms of clause 25.1, the <i>Contractor</i> ensures that the provisions of this clause are complied with by the recipient.
Z5.2	If the <i>Contractor</i> is uncertain about whether any such information is confidential, it is to be regarded as such until notified otherwise by the <i>Project Manager</i> .
Z5.3	In the event that the <i>Contractor</i> is, at any time, required by law to disclose any such information which is required to be kept confidential, the <i>Contractor</i> , to the extent permitted by law prior to disclosure, notifies the <i>Employer</i> 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 <i>Contractor</i> 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.
Z5.4	The taking of images (whether photographs, video footage or otherwise) of the <i>works</i> or any portion thereof, in the course of Providing the Works and after Completion, requires the prior written consent of the <i>Project Manager</i> . All rights in and to all such images vests exclusively in the <i>Employer</i> .
Z5.5	The <i>Contractor</i> ensures that all his subcontractors abide by the undertakings in this clause.
Z6	Waiver and estoppel: Add to core clause 12.3:
Z6.1	Any extension, concession, waiver or relaxation of any action stated in this contract by the Parties, the <i>Project Manager</i> , the <i>Supervisor</i> , or the <i>Adjudicator</i> 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.

Z7	Health, safety and the environment: Add to core clause 27.4
Z7.1	<p>The <i>Contractor</i> undertakes to take all reasonable precautions to maintain the health and safety of persons in and about the execution of the <i>works</i>. Without limitation the <i>Contractor</i>:</p> <ul style="list-style-type: none"> • accepts that the <i>Employer</i> 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 <i>works</i>; and • undertakes, in and about the execution of the <i>works</i>, 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 <i>Contractor</i>’s direction and control, likewise observe and comply with the foregoing.
Z7.2	<p>The <i>Contractor</i>, in and about the execution of the <i>works</i>, 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 <i>Contractor</i>’s direction and control, likewise observe and comply with the foregoing.</p>
Z8	Provision of a Tax Invoice and interest. Add to core clause 51
Z8.1	<p>Within one week of receiving a payment certificate from the <i>Project Manager</i> in terms of core clause 51.1, the <i>Contractor</i> provides the <i>Employer</i> with a tax invoice in accordance with the <i>Employer</i>’s procedures stated in the Works Information, showing the amount due for payment equal to that stated in the payment certificate.</p>
Z8.2	<p>If the <i>Contractor</i> does not provide a tax invoice in the form and by the time required by this contract, the time by when the <i>Employer</i> 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 <i>Employer</i> in terms of core clause 51.2 is then calculated from the delayed date by when payment is to be made.</p>
Z8.3	<p>The <i>Contractor</i> (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 <i>Employer</i>’s VAT number 4740101508 on each invoice he submits for payment.</p>
Z9	Notifying compensation events
Z9.1	<p>Delete from the last sentence in core clause 61.3, “unless the <i>Project Manager</i> should have notified the event to the <i>Contractor</i> but did not”.</p>
Z10	Employer’s limitation of liability
Z10.1	<p>The <i>Employer</i>’s liability to the <i>Contractor</i> for the <i>Contractor</i>’s indirect or consequential loss is limited to R0.00 (zero Rand)</p>
Z10.2	<p>The <i>Contractor</i>’s entitlement under the indemnity in 83.1 is provided for in 60.1(14) and the <i>Employer</i>’s liability under the indemnity is limited.</p>

Z11 Termination: Add to core clause 91.1, at the second main bullet point, fourth sub-bullet point, after the words "against it":

Z11.1 or had a business rescue order granted against it.

Z12 Addition to secondary Option X7 Delay damages (if applicable in this contract)

Z12.1 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.

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

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

Month	Weather measurement				
	Cumulative rainfall (mm)	Number of days with rain more than 10mm	Number of days with min air temp < 0 deg.C	Number of days with snow lying at 08:00 CAT	[Other measurements if applicable]
January	119	11	0	0	N/A
February	127	9	0	0	N/A
March	132	9	0	0	N/A
April	84	7	0	0	N/A
May	56	4	0	0	N/A
June	33	3	0	0	N/A
July	36	3	0	0	N/A
August	48	4	0	0	N/A
September	74	6	0	0	N/A
October	109	10	0	0	N/A
November	117	11	0	0	N/A
December	119	12	0	0	N/A

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

4 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.

1. 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”.

2. 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.

3. 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.
4. 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.
5. **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

5 Part two - Data provided by the Contractor

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

5.1 Clause	5.2 Statement	5.3 Data
10.1	The <i>Contractor</i> is (Name): Address Tel No. Fax No.	
11.2(8)	The <i>direct fee percentage</i> is The <i>subcontracted fee percentage</i> is	% %
11.2(18)	The <i>working areas</i> are the Site and	
24.1	The <i>Contractor's</i> key persons are: 1 Name: Job: Responsibilities: Qualifications: Experience: 2 Name: Job: Responsibilities: Qualifications: Experience:	
a		CV's (and further key persons data including CVs) are appended to Tender Schedule entitled .

PART C2: PRICING DATA PAGE 20 C2.1 ECC3/A PRICING ASSUMPTIONS

21 in SSCC	The published list of Equipment is the last edition of the list published by The percentage for adjustment for Equipment in the published list is	%		
22 in SSCC	The rates of other Equipment are:	Equipment	Size or capacity	Rate

Part 2: Pricing Data

ECC3 Option A

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

C2.1 Pricing assumptions: Option A

6 How work is priced and assessed for payment

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

Identified and defined terms	11	
	11.2	(20) The Activity Schedule is the <i>activity schedule</i> unless later changed in accordance with this contract.

(27) The Price for Work Done to Date is the total of the Prices for

- each group of completed activities and
- each completed activity which is not in a group.

A completed activity is one which is without Defects which would either delay or be covered by immediately following work.

(30) The Prices are the lump sum prices for each of the activities on the Activity Schedule unless later changed in accordance with this contract.

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

7 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.

8 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*.

9 Preparing the *activity schedule*

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

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

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

- Has taken account of the guidance given in the ECC3 Guidance Notes pages 19 and 20;
- Understands the function of the Activity Schedule and how work is priced and paid for;

- Is aware of the need to link the Activity Schedule to activities shown on his programme;
- Has listed and priced activities in the *activity schedule* which are inclusive of everything necessary and incidental to Providing the Works in accordance with the Works Information, as it was at the time of tender, as well as correct any Defects not caused by an *Employer's* risk;
- Has priced work he decides not to show as a separate activity within the Prices of other listed activities in order to fulfil the obligation to complete the *works* for the tendered total of the Prices.
- Understands there is no adjustment to the lump sum Activity Schedule price if the amount, or quantity, of work within that activity later turns out to be different to that which the *Contractor* estimated at time of tender. The only basis for a change to the Prices is as a result of a compensation event.

An activity schedule could have the following format:

Item No.	Programme Reference	Activity description	Price

C2.2 the *activity schedule*

The Prices List

MECHANICAL REQUIREMENTS				
	TASK	Quantity	RATE	TOTAL AMOUNT
1	Supply, install and commission Pulse jet fabric filter	4		
2	Supply, install and commission Over Pressure Valves	4		
3	Supply, install and commission Dehumidifier	3		
4	Supply, install and commission Vibrating bin	4		
5	Supply, install and commission Vibrating Bin Rubber (Spares)	2		
6	Supply, install and commission Interlocks	16		
7	Supply, install and commission Mild steel conical hopper	4		
8	Supply, install and commission Manual knife gate	6		
9	Supply, install and commission Pneumatic knife gate	4		
10	Supply, install and commission Diverter chute	2		
11	Supply, install and commission Dosing screw	4		
12	Supply, install and commission Intermediate bin	6		
13	Supply, install and commission Screw conveyor	2		
14	Supply, install and commission Mixing tank	4		
15	Supply, install and commission Mixing tank agitator and associated motor	4		
16	Supply, install and commission Wet scrubbers for mixing tanks with associated exhaust fan	4		
17	Supply, install and commission Slurry pump	12		
18	Supply, install and commission Non-return	16		
19	Supply, install and commission Manual butterfly valves	4		
20	Supply, install and commission Actuated butterfly valves	4		
21	Supply, install and commission Actuated gate valves	4		
22	Supply, install and commission Manual Pinch valves	12		
23	Supply, install and commission Actuated Pinch Valves	40		
24	Supply, install and commission HDPE (PE 100 PN10 90mm NB)	337m		
25	Supply, install and commission HDPE (PE 100 PN10 90mm NB) Seamless bends	40 bends		
26	Supply, install and commission 200m of 250NB Steel pipes	200m		
27	Supply, install and commission Flange, Gaskets, Bolts, Supply, install and commission Washes and Nuts			
28	Installation including Welding etc.			
29	North Side Raw water supply system			
30	Removal of Existing Equipment			
31	Supply, install and commission Corrosion Protection			
32	The Contractor shall provide a take-out price for the conversion of the soda ash system as per the works information to a system that is the same as the proposed lime system which in affect is a dual system with a dosing screw, screw conveyor, intermediate bin and diverter knife			

Duvha North and South Lime Plants Upgrade

	gate valve. Additional plant and material includes: <ul style="list-style-type: none"> 2500 kg/hr screw conveyor Intermediate Bin Level switch Knife gate valve Knife gate diverter valve Electrical cables and terminations C&I cables, terminations, programming, HMI configuration 			
	TOTAL TENDERED AMOUNT (Excluding VAT)			

ELECTRICAL REQUIREMENTS

	TASK	Quantity	RATE	TOTAL AMOUNT
1	Supply, install and commission Agitator mixer motor	4		
2	Supply, install and commission Vibrating bin activator motor	4		
3	Supply, install and commission Dosing screw motors	4		
4	Supply, install and commission Screw conveyor motors S	2		
5	Supply, install and commission Pulse jet fabric filter motor	4		
6	Supply, install and commission Dehumidifier motors	2		
7	Supply, install and commission Scrubber fan motors	4		
8	Supply, install and commission Actuators power supply	2		
9	Supply, install and commission Distribution boards	2		
10	Supply, install and commission LV cables for motors and DBs incomer cables			
11	Supply, install and commission dosing Screw motor VSDs	4		
12	Supply, install and commission Screw Conveyor motor VSDs	2		
13	Supply, install and commission Slurry pumps motors	12		
	TOTAL TENDERED AMOUNT (Excluding VAT)			

CIVIL AND STRUCTURAL REQUIREMENTS

	TASK	Quantity	RATE	TOTAL AMOUNT
1	Supply, install and commission Lining of Silos	4		
2	Check and validate existing plinths for structural resistance with new equipment loading			
3	Addition of new plinths, if required			
4	Modification of access walkways and cat ladders as per Eskom standard			
5	Sealing on top of silos for prevention of moisture ingress			
6	Perform Silo Repairs			
7	Perform natural frequency and harmonic response analysis on all four silos due to the addition of vibrating bins and modified hoppers			
8	Perform reinforced concrete wall check due to increasing the bulk solid material density (lime to soda ash)			
9	New Supports for Electrical Distribution Boards			

10	Corrosion Protection			
	TOTAL TENDERED AMOUNT (Excluding VAT)			

CONTROL AND INSTRUMENTATION REQUIREMENTS				
	TASK	Quantity	RATE	TOTAL AMOUNT
1	Supply, install and commission Field Equipment			
2	Supply, install and commission Instruments	48		
3	Supply, install and commission Limit of supply and services	48		
4	Supply, install and commission Input/output interface	48		
5	Supply, install and commission Input/output new modules	38		
6	Supply, install and commission Cabling and termination			
7	Supply, install and commission Electrically Actuated Valves			
8	Supply, install and commission Limits of Supply and Services	32		
9	Supply, install and commission input/output Interface	32		
10	Supply, install and commission Input/output new modules	53		
11	Perform Cabling and Termination			
12	Replacement of all KP panels			
13	Transfer North Soda Ash plant controls from the Siemens S7 300 PLC to the ABB 800xA			
14	Assessment of existing fibre optic cable from the panels to the DCS			
15	Supply and Installation of new fibre optic cable from the panels to the DCS			
16	Updating of the HMI graphics and Engineering as per the new operating and control philosophy.			
17	Updating of the station historian (VA)			
18	Updating of the infoplus21 historian			
19	Update field instrumentation as per the instrument schedule			
20	Update the drivers interface for the plant as per the drive schedule			
21	Install new tapping points for additional instrumentation			
22	Cabling, racking and power distribution			
23	Junction boxes			
24	All additional signals to be trended on the station historian			
	TOTAL TENDERED AMOUNT (Excluding VAT)			

GENERAL REQUIREMENTS				
	TASK	Quantity	RATE	TOTAL AMOUNT
1	FIRE PROTECTION AND DETECTION REQUIREMENTS			
2	ENGINEERING COSTS			
3	TRAINING			
4	DOCUMENTATION			
5	CONFIGURATION MANAGEMENT			
6	Drawings			

7	Coding and Labelling			
8	Hazop			
9	HAND-OVER			
10	TESTING AND COMMISSIONING			
11	HAND-OVER			
12	Health and safety			
13	Project management, quality assurance and control			
14	Site Establishment			
15	Site De-establishment			
16	Scaffolding			
	TOTAL TENDERED AMOUNT (Excluding VAT)			

SUMMARY OF COSTS		
TASK DESCRIPTION		TOTAL AMOUNT
1	Mechanical Requirements	
2	Electrical Requirements	
3	Civil and structural requirements	
4	control and instrumentation requirements	
5	General Requirements	
	TOTAL TENDERED AMOUNT (Excluding VAT)	

PART 3: SCOPE OF WORK

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C3.2	<i>Contractor's</i> Works Information	
	Total number of pages	

C3.1: EMPLOYER'S WORKS INFORMATION

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10 Description of the *works*

10.1 Executive overview

Duvha Power Station (PS) is in the process of upgrading the Cooling Water Treatment Plants (CWTPs) which are used for alkalinity control of the Cooling Water (CW). There are currently two CWTPs on the station, one serving the North CW system and one serving the South CW system.

Each CWTP is currently fitted with two operational silo systems (the South side CWTP has three silo's but only two are operational) with each silo system fitted with a silo cone, knife gate valves, aeration pads, lime mixing tank, slurry transfer pumps and all required pipework from the silo to the mixing tank and from the mixing tank to the clarifiers.

Post Upgrade, Each plant will consist of the two existing storage silos (one for hydrated lime and one for soda ash) as well as two slurry makeup and transfer systems. These makeup and transfer systems each consist of a vibrating bin unit connected to the storage silo fitted with a feeder setup. The chemicals are fed to a slurry dilution tank fitted with a mechanical stirrer. From the slurry dilution tank the slurry is supplied to the clarifiers' centre wells via piping. The upgrade will include all electrical, mechanical, civil and structural as well as control and instrumentation equipment.

The Technical Specification includes the following engineering design information:

- Design Assumptions
- Requirements for the CWTP system
- Process Flow Diagrams
- Process and Instrumentation Diagrams
- Interface Requirements

This Scope is inclusive of all activities necessary to address the upgrade of the CWTPs. The *Contractor* designs, manufactures, procures, installs and commissions all Mechanical, Structural and Civil, Electrical and Control & Instrumentation (C&I) plant required for the *works* as defined in this *Technical Specification*. This includes interfacing with and utilisation of existing Plant and Material as well as decommissioning and removal of existing Plant and Material that are no longer required for the functioning of the CWTPs. The *Contractor* is also responsible for skills transfer with regards to operation and maintenance of the upgraded CWTPs. It is important to note that the silos are already in existence however the *Contractor* shall ensure that they are suitably lined for their intended purpose.

The main plant issues that require resolution to ensure availability and reliability of the Cooling water treatment plants are as follows:

Duvha North and South Lime Plants Upgrade

1. The hang-up of lime in the silo is one of the major obstacles faced by the power station cooling water treatment plants. The lime is hygroscopic material which begins to cake in the presence of moisture. The ingress of moisture into the silo is a contributing factor to clogging of silos. The silos are fitted with aeration pads to achieve continuous flow through the rotary vane feeders. Aeration pads become clogged by fine materials such as soda ash and lime. In addition, aeration pads required a frequent air supply which leaves the silo vulnerable to additional moisture ingress. The air supply pressure to the aeration pads should be 0.5bar (gauge). The current air supply to the aeration pads is 6 bar (gauge). The implication of the current air supply pressure is poor agitation of lime/soda ash in the cone of the silo and could also cause damage to the aeration pads.
2. The concentration of the lime slurry at the north lime plant is approximately 9%. The current concentration of the lime slurry is 9% coupled with the transfer velocity of 0.5m/s will result in settling of lime within the transfer lines and is a contributing factor to the build-up of sludge in the piping system.
3. The lime transfer lines and slurry pumps cannot be flushed if there is a failure within the water system. This leaves the system vulnerable to sludge build-up and blockages.
4. The dilution water that is used to generate the lime slurry in the saturator is clarified raw water for both north and south.
5. Long plant downtimes and deficient flushing of the system has led to sludge build-up and blockage in the lime transfer lines and slurry pumps.
6. Sludge build-up and blockages in the lime transfer lines and slurry pumps has been a contributing factor to the burning out of the lime slurry pumps motors. Burning out of the lime slurry pump motors has been a major reoccurrence at the station.
7. The currently installed saturator tanks stirred are ineffective in keeping the lime slurry in suspension and thus results in the settling of lime in the saturator tanks. This results in a highly concentrated sludge build-up in the saturator tank and can also leads to blockages in the lime slurry pumps and pipework.
8. The sludge handling systems at the station have been inoperable for long periods of time due to the sludge pump motors burning out.
9. Due to the physical properties of lime all motors are exposed to extremely dusty environments. The current motor enclosures are IP55 rated and provide the motors with protection against slight dust and low pressure water. Also, the dusty environment causes thick layers of dust to collect onto the air intake parts of the motor cover thus preventing cooling air from entering the motor.

The scope entails procurement and fabrication of components (where specified), project management, commissioning, and performance testing of the entire engineering works to ensure fully functional cooling water lime/soda ash treatment plants (north/south) at Duvha Power Station as specified in the Technical Specification Report.

General Design Requirements

There are two Cooling Water Treatment Plants (CWTPs) at the station, one serving the North CW system and the other serving the South. Each upgraded plant shall consist of two storage silos (one for hydrated lime and one for soda ash) as well as a slurry makeup and transfer system per silo. The existing storage silos are to be used; however the rest of the system shall be re-designed. The available working area to install equipment is indicated in Appendix B of the *Technical Specification Report*. The drawings supplied are to be used for tender purposes only, the contractor will be required to perform measurements and compile new drawings of the plant. The makeup and transfer system, each consisting of a storage silo connected to a vibrating bin unit with the downstream feed rate being controlled via dosing screws and screw conveyors. Powder (the collective use of soda ash and lime will be labelled as powder in this Technical Specification) is fed to a slurry dilution tank/s, where the powder is mixed with water. The fully reacted lime/soda-ash slurry is pumped to the clarifiers centre well.

Battery Limits**Mechanical Battery Limits**

Silo:

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1. Battery limits will start from the interface (including the interface) where the lime/soda ash material enters the silo.
2. The Pulse Jet Fabric Filter at the top of the silo is included.
3. The silo's interior is included.
4. The silo's discharge is included
5. Connection between Silo and the mixing tank:
6. All equipment which affects the flow of lime/soda ash material
7. All interfaces and connections between the silo discharge and the mixing tank input.

Mixing tank:

1. The mixing tank as well as all internals and interfaces
2. The extraction scrubber as well as the interface between the scrubber and the mixing tank.

Raw Water Supply:

1. Scour valve 20VB10 S442
2. T-piece downstream of Non return valve 20VB10 S045

Slurry Pipe Line

1. The slurry pumps including all interfaces.
2. All pipelines responsible for transporting the slurry according to the operating procedure.
3. All pipe interfaces and valves that are part of the system to transport the slurry to the clarifiers centre well.
4. The interfacing valves between the clarifier centre well and the pipe line.

Electrical Battery Limits

The electrical scope shall be confined to the Water Plant Boards (South and North) and the Distribution Boards, including cable routes/trenches up to the termination point of the field equipment at the Lime Plant including motors.

Control & Instrumentation Battery Limits

The C&I battery limits starts from the field interface to the WTP DCS.

Civil and Structural Battery Limits

1. Silo Battery Limits (North and South side):
2. All four (4) Silos, which are to be fitted with vibration bins
3. One south Silo is to be internally lined with a suitable lining system and converted from storing lime to soda ash.
4. Access walkways within the plant
5. Equipment plinth supports which includes Electrical boards in the vicinity of the clarifiers

Design Criteria

1. Treated cooling water needs to adhere to the 240-55864767 Eskom Chemistry and Microbiology Standard for Condenser Cooling Water.

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2. The system must ensure ease of maintenance.
3. The system must be designed such that it is accessible and operable i.e. equipment must not be inaccessible and should not restrict operator and maintenance access.
4. Slurry transfer velocity must be sufficient to prevent settling and blockages. Industry investigations have shown 2.5 m/s to be the preferred slurry transfer velocity.
5. Operational parameters of pumps shall avoid cavitation.
6. The process design must be such that it eliminates the possibility of lime/soda ash hang-ups in the system.
7. The system design shall incorporate design features to support high reliability of safety significant equipment and high system availability.
8. As far as technically possible, to supply new loads from existing LV switchgear.

Employers Process Requirements

The Employers conceptual process design is indicated in Section 3.1.4 of the *Technical Specification Report*. The *Contractor* will develop this conceptual design further to meet the requirements of the *Technical Specification*. The *Contractor* will take design liability for the detailed design produced hence it is imperative that he adds any systems or processes to the *Employers* conceptual design that he deems necessary to assure the functionality of the overall system. In cases where the *Contractor* chooses to affect such changes he must clearly motivate the reason for the change. The motivation must at a minimum contain technical, financial, operational and maintenance information.

Operating and Control Description**General Requirements:**

1. The operation of the system will be automated as far as possible with minimum operator intervention required.
2. All equipment controlled via the WTP DCS should be capable of Auto and Manual Control.
3. All equipment controlled via the WTP DCS should have a local override to allow local control.
4. All pumps to have suction and discharge pressure transmitters and pressure gauges to protect the pumps from low suction or high discharge pressures.

Hydrated lime/soda ash inside the silo will be prompted to flow via the vibrating bin at the silo hopper discharge. The discharged lime/soda ash passes through the vibrating bin, into the following arrangements:

Normal operation***Vibrating bin:***

There should be an interlock on the vibration bin system, where this system will only activate once a feeder stream is activated:

Lime system

- Vibrating bin activation requirements:
 - Pneumatic actuated knife gate open
 - Dosing screw activated
- Vibrating bin activation requirements:
 - Pneumatic actuated knife gate open
 - Screw conveyor activated

Soda ash system

- Vibrating bin activation requirements:
 - Pneumatic actuated knife gate open
 - Dosing screw activated

Diverter Chute:

When the selected feed rates cross the 1000 kg/h feed rate (either from above 1000kg/h feed rate to less or the opposite) the diverter chute should change the active feed stream to either the dosing screw or screw conveyor stream.

- Feed rates of 0 – 999 kg/h : Dosing screw feed stream
- Feed rates of 1000 kg/h – 2500 kg/h : Screw conveyor feed stream

In order to perform this operation, the vibration bin should stop and the pneumatic actuated knife gate below the vibration bin should close. By closing this knife gate, while the active downstream feed streams are active, the material is being removed from the diverter chute section, this will allow the flap inside the diverter chute to switch stream without the danger of over-torque and damaging the actuators. The C&I signal which trigger the diverter chute will occur when the level sensors, located at the discharge section into the active stream's intermediate bin register empty. Once the diverter chute has selected the new feeder stream, the newly selected stream's feeder activates, followed by opening the pneumatic actuated knife and activating the vibration bin.

Diverter chute activation requirement:

- Signal to change streams from the control room
- Level sensor in currently active stream needs to register empty chute.

Hydrated lime system:

As the hydrated lime is being discharged via the vibrating bin, it enters the discharge pipe, where it passes through the pneumatic actuated knife gate and into one of the following streams: The diverter chute will select the dosing screw setup when the required feed rate is below 1000 kg/h and the screw conveyor setup when above 1000 kg/h. The dosing rate will be determined via the feedback of the flow measurements on the clarifiers and the control room's input based on the pH sensors. Take note, the soda-ash system does not contain this dual feed setup. It also does not contain a pneumatic actuated knife gate below the vibration bin.

Dosing screw setup selected:

The hydrated lime flows from the vibration bin, through the pneumatic actuated knife gate, diverter chute, manual knife gate, dosing screw's intermediate bin, dosing screw and discharges into the mixing tank. The dosing screw and intermediate bin is constructed as a unit and contains an agitator in the dosing screw's opening to promote flow into the dosing screw. The intermediate bin should be kept at a constant level.

Screw conveyor selected:

The hydrated lime flows from the vibration bin, through the pneumatic actuated knife gate, diverter chute, manual knife gate, into the intermediate bin which flows into the screw conveyor. The screw conveyor does not contain an agitator due to the sufficiently sized inlet. The hydrated lime is fed through the screw conveyor into the mixing tank. The intermediate bin should be kept at a constant level. All valve number specified in the technical specification report Appendix A.

Dilution Water supply:

Mixing tanks level control:

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The level in the mixing tank should remain constant, this will be achieved through variation in the dilution water feed via control valves 1 and 23. The level sensor in the mixing tanks should serve as the control valves feedback whether to open or close.

Timed Flushing (Refer to Figures 2 and 3):

The dilution water will also be supplying a flushing line, which will activate every 30 minutes by keeping valves 3 and 24 open and closing valves 4, 7, 10, 13, 16, 19 whilst stopping all pumps. This will flush any settled particles back into the mixing tank. After 5 seconds of reverse flushing, valves 2 and 22 closes and the appropriate pumps paired with the corresponding valves (4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21) will activate and for 3 minutes the lines will be flushed with dilution water. After the 3 minutes, valves 2 and 22 opens followed by closing valves 3 and 24.

Flushing during pump turnover:

There are three (3) centrifugal pumps on the hydrated lime system and identically on the Soda-ash system. Due to the worst flow rate scenario of two [2] clarifiers requiring supply at the same time, a maximum of two (2) pumps per lime/soda-ash system will be active at the same time. The third pump will be on standby. Whenever a pump needs to be shutdown the timed flushing sequence should be initiated with the active pump's pipe line's being flushed. The pump to be switched off will shut down after the 3 minutes flushing sequence.

Pump switch over:

The standby pump should be activated at least once every 6 hours, this will ensure all three pumps will have been flushed for at least one 30 minute cycle a day.

Selecting valves to clarifiers:

Refer to appendix A of the Technical specification Report.

Start-up procedure:

When the system is to be started, the following process should be followed:

1. Ensure mixing tank is at working level.
2. Valves (2/ 4/ 5/ 6/ 7/ 8/ 9/ 10/ 11/ 12) for lime and 13/ 14/ 15/ 16/ 17/ 18/ 19/ 20/ 21/ 22 for the soda ash) need to be correctly opened – see Appendix A in a technical specification report.
3. Pumps (1/ 2/ 3 for lime and 4/ 5/ 6 for the soda ash) should be started – see Appendix A of the Technical specification Report, as well as the dilution valves (1/ 23) in open status, this should allow an equal inflow as well as outflow of water and slurry and thus maintain the working level in the tank. The scrubber should also be started now)
4. Start the agitator in the mixer.
5. Activate the correct dosing stream.
6. Open the pneumatic actuated knife gates.
7. Activate the vibration bin.
8. Ensure the pulse jet fabric filter is active to ensure pulsing. On the soda-ash silo the dehumidifier should be active. The silo shall be pulsed every 6 hours during normal plant operation and every 30 minutes during silo in loading.

Mixing tank inactive with low level:

The dilution water, valve 1 for the lime side and valve 23 for the soda-ash side, should be active. Valve 2 for the soda-ash side and valve 22 for the soda-ash side should be closed and the pumps should be offline.

Duvha North and South Lime Plants Upgrade**Shutdown procedure**

When the system does not require the addition of lime/soda ash, the vibration cone is de-activated first, followed by the closure of the pneumatic actuated knife gate and then the de-activation of the dosing stream. The system should continue pumping dilution water through the system for 15 minutes, after which the flushing sequence will start, followed by shutdown of the active equipment.

Lime/Soda Ash Offloading System

Before the silos are refilled, the system should follow the shutdown sequence in section 0 of the Technical Specification Report.

The hydrated lime/soda ash powder is pneumatically loaded into the silo from road-going tankers with on-board air compression equipment. On the silo's roof an air filtration system is installed to prevent lime/soda ash dust laden air from

escaping the silo into the environment when loading into the silo as well as to prevent foreign particles from entering the silo when the level diminishes during operation and air is drawn into the silo. A guided radar level probe monitors the level of the silo. The connection point for the tanker's hose should contain a limit switch, which will activate once the tanker connects the hose. This limit switch should also close the pneumatic actuated knife gate after the vibration bin (in case it was not closed during the shutdown sequence). The manual knife gate after the vibration bin on the soda ash system will need to be closed manually before in loading of soda ash occurs.

Process/Chemical Requirements

Raw water is used as make-up to the CW system. Vaal water is supplied to the North CW system and Komati water is supplied to the South CW system. It has been indicated that the supply to the South might switch over to Vaal water in future. Based on the water quality analysed for the past 5 years, Table 1, clarifier flows as well as ash water recovery, the dosing requirements for lime and soda ash were calculated and summarised in Table 2.

Table 1: Raw Water Qualities as specified in technical specification report

Component	Unit	Vaal	Komati
Ca Hardness as CaCO ₃ equivalents	mg/kg	124	32.3
Anions	mEq/L	8.02	1.93
Cations	mEq/L	6.19	2
CaCO ₃ Precipitation Potential	-	1.4	-11.7
Cl ⁻	mg/kg	21.3	8.3
Conductivity @ 25 °C	µS/cm	634	383
Cu	mg/kg	0.238	0.34
F ⁻	mg/kg	0.5106	0.2
Fe	mg/kg	5.245	1.335
K ⁺	mg/kg	8.72	5.1
m-alk	mg/kg	130	45.4
Mg Hardness as CaCO ₃ equivalents	mg/kg	100	38.8
Mn	mg/kg	1.125	0.01
Na ⁺	mg/kg	34.2	10.3
NH ₃ -N	mg/kg	0.91	0.017
NO ₃ as N	mg/kg	0.1	1.22
pH	mg/kg	7.48	7.25
PO ₄ as P	mg/kg	40.1	15
SiO ₂	mg/kg	44	6
SO ₄ ²⁻	mg/kg	231	33.6

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Component	Unit	Vaal	Komati
Temperature	mg/kg	27.83	27.35
TOC as C	mg/kg	6	5.64
Total Hardness as CaCO ₃	mg/kg	224	71.1
Turbidity	NTU	86.41	12.6
Zn	mg/kg	0.42	0.29

Table 2: Dosing Requirements as specified in technical specification report

Description	North Plant		South Plant	
	Min	Max	Min	max
Hydrated Lime				
Mass flow (kg/h)	212	2500	107	1120
Soda Ash				
Mass Flow (kg/h)	86	523	24	463

Komati water contains certain amounts of non-carbonate hardness thus soda ash will have to be dosed in this system as

well. This will thus require that one of the silos in the South CWTP will have to be converted to a soda ash silo. This is also crucial in the case where the South CW system will be converted to the use of Vaal water.

It is the responsibility of the *Contractor* to ensure that the mechanical equipment such as the feeders, dilution- and slurry pumps selected are capable of delivering the required lime/ soda ash dosage to the clarifiers. Where existing plant will be used for the new system, the *Contractor* needs to verify that such plant is adequate.

Mechanical Requirements

The following requirements are a conceptual performance specification. The equipment and instrumentation types, as well as the values will be optimised during the contractor's detail design. The scope of work for the project entails the design, supply, fabrication, installation, commissioning and testing of the upgraded lime plant. This includes but is not limited to:

- Removal of existing equipment where necessary,
- Installation of a raw water supply line (North side only) for dilution and flushing water (including pipework and associated valves),
- Modification of existing dilution water piping internal to the silo structure (if required).
- Modification of compressed air piping (if required).
- Installation of Vibrating bins
- Installation of dosing screws and screw conveyors
- Installation of Mixing chamber/s (including pipework and associated valves),
- Installation of centrifugal pumps for use in pumping the lime/soda-ash slurry(including pipework and associated valves),
- Installation of Pipework and associated valves/flaps to the mixing chamber/s,
- Installation of Pipework from mixing chamber/s to the clarifiers,
- Installation of interfaces for lime/soda ash plant into the clarifier system,
- Installation of tapping points for pressure transmitters on the pipes,
- Testing and commissioning of the pumping system, associated valves and mixing chamber/s,

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- n. Supply as built drawings and documentation of the complete design to Eskom,
- o. Supply calculations as proof of the provided designs meeting the performance specifications as listed in the works information,
- p. Supply test certificates, commissioning procedures, data sheets, testing procedures and maintenance manuals to Eskom.

Design calculations should clearly identify the subject of the calculations and include, but are not limited to the following information:

- a) Project name
- b) Contractor's name
- c) Contract No.
- d) Date of calculation
- e) Revision No.
- f) Name of the item
- g) Page No.
- h) Assumptions used for design purposes
- i) Codes and standards used
- j) Computer programmes used
- k) Loading imposed by structures, plant and equipment during the erection, commissioning, operation and maintenance
- l) Safety factors and combinations of loads used
- m) Calculations of all components
- n) Settlement of plant and equipment foundations
- o) Reference sources (including text books and design manuals used)
- p) Reference to the appropriate drawings
- q) Selected materials and finishes
- r) Manufacturer's technical specifications

The final system should adhere to the performance requirements (Section **Error! Reference source not found.**) specified in this technical specification. To promote standardisation between plants and simplify spares, the soda ash system will be identical to the lime system, except for it only having the dosing screw setup due to the small variance in soda ash capacity required.

In Appendix B of the technical specification, the dimensions of the Lime and Soda ash buildings are given. This information should only be used for tender purposes, after the contract has been awarded, the contractor should measure the plant to ensure the designs are suited to the plant.

Silo and Hopper Design

Currently there are two useable (2) silos on the North as well as on the South plants. The one (1) silo will store lime and the other one (1) will store soda ash. The silo's dimensions will not be altered, except for the hopper discharge, which may need to be modified for the fitment of the vibration cone. Refer to the table below for the silo dimensions:

Table 3: Silo Dimensions – 0.57/3876 rev6 as specified in technical specification report

	North/South
Dimension	Value
Hopper half angle with the horizontal	60°
Hopper discharge diameter	200 NB
Hopper height	3.9 m
Total Silo height	15 m
Silo diameter (I.D)	5 m
Silo capacity	285 m ³
Silo cone capacity	28.3 m ³

The soda ash silo on the South plant must be lined with a suitable liner material. A dehumidifier must be installed on the soda-ash silos (both North and South). The pressure relief valves on all silos must be checked to ensure they are still functioning.

Pulse Jet Fabric Filter:

The current pulse jet fabric filter suppression systems must be removed and replaced with an adequate pulse jet fabric filter system which will prevent over pressurisation during lime/soda ash loading.

Dehumidifier:

The maximum strength dehumidifier should be selected which will ensure the soda ash silo's interior will be kept as dry as possible, while not requiring more than 5 kW power to operate and does not negatively affect the structural integrity of the silo.

Gravimetric Feed control:

The hopper of the lime/soda ash silos will have to be modified to install a vibration bin. The vibration bin should be adequately shaped and sized to prevent any blockages from occurring, promote reliable material feed to the downstream system and tie into the downstream discharge pipe. The vibration of the vibrating bin should not negatively impact the silo and surrounding structures.

Pneumatic Actuated Knife Gate:

Below the vibration bin, for the hydrated lime system, a pneumatic knife gate will be situated. This knife gate will be isolated during the switching of the feeder streams. When the dosing screw feed line needs to switch over to the screw conveyor feedline, the knife gate will isolate, allowing the downstream material to empty pass the diverter valve and thus allow the diverter valve to switch without material resistance. The knife gate will also be closed during in-loading of the silos, this is to prevent leakage through the dosing screw and screw conveyors.

Manual Knife Gate:

In each of the feeder streams, before the intermediate bins, manual knife gate will be situated. These knife gates will be isolated during maintenance of the dosing streams.

Diverter Chute:

Below the pneumatic actuated knife gate the 200 NB chute will bifurcate into the parallel feeder streams. To allow for the selection of a feeder stream, a pneumatic chute shall be installed. This chute should select the dosing screw feeder stream during feed rates that are between 0 – 999 kg/h and the intermediate bin and screw conveyor stream for feed rates 1000 kg/h and higher. This selection should occur automatically during plant operation.

Feeder Streams:

Table 4: Feeder Parameters of the technical specification report

Description	North		South	
	min	Max	min	max
Hydrated Lime				
Mass flow (kg/h)	212	2500	107	1120
Soda Ash				
Mass Flow (kg/h)	86	433	24	463

The dilution water supply should be designed to be able to supply 20% above the maximum dilution water required to maintain the mixing tank's level constant.

Dosing screw feeder (0 – 999 kg/h):

This stream will feed into a dosing screw. The dosing screw should have an integrated intermediate bin, feeding into the dosing screw, thus allowing for accurate feed control from the dosing screw. The dosing screw will be rubber lined. The intermediate bin should be sufficiently shaped to allow for radial stress fields at the bin's discharge into the dosing screw.

Table 5: Dosing Screw specifications from the technical specification report

Installed power	Less than 5 kW
Capacity throughput	0 – 1000 kg/h

Intermediate bin + screw conveyor (>1000 kg/h):

This stream will feed into an intermediate bin, which discharges into a screw conveyor. The intermediate bin should be sufficiently shaped to allow for radial stress fields at the bin's discharge into the screw conveyor.

Table 6: Screw conveyor specifications from the technical specification

Installed Power	Less than 5 kW
Capacity throughput	1000 kg/h – 2500 kg/h

The screw conveyor will have a rubber lined screw.

Mixing Tank:

The mixing tank should have a maximum capacity to accommodate a hydrated lime inflow at a maximum rate of 2500 kg/h that will mix with a maximum amount of dilution water at 100 m³/h. At the same time the slurry pumps from the tank will be fixed speed and pump at 49.49 m³/h, while the dilution water must match this flow through the control of the actuated valve on the inlet line to the mixing tank. The tank level should be kept constant during operation to minimise build-up on the tank walls. The tank is designed for a retention time of approximately 11 minutes when only 49.49 m³/h is removed via one active slurry pump.

The slurry suction line will be connected to the mixing tank at a suitable level to ensure reliable operation. The mixing tank will contain a drainage line as well as an overflow, refer to **Error! Reference source not found.** at the technical specification report. The mixing tank must be fitted with a manhole that will allow the maintenance crew access to the tank floor. A half-moon shaped wash-out drain should be fitted to the side of the tank with the bottom surface of the drain flush with the floor of the tank to allow complete cleaning out of the tank should this be required. A further inspection manhole with a bolted safety grid must be fitted to the roof of the tank. A hinged lid on the inspection manhole should allow for inspection of the tank or slurry without the risk of falling into the tank. The existing mixing tank is currently fitted with an ultrasonic level probe, this must be changed to guided radar, which is used to control the level of the tank. The agitator must be designed to ensure efficient mixing of the powder with the water but not vigorously enough to entrain air into the water. The mixing tank will have a drain line, taking suction from the bottom of the mixing tank. A manual gate valve will be installed on this drainage line.

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Scrubber:

A wet scrubber shall be fitted to the top of the mixing tank to prevent the dust escaping to the environment. The filtered dust should be returned to the tank. The scrubber shall have an exhaust fan that keeps the mixing tank under a light vacuum at all times. It will be ensured that no dust escapes from any of the openings, such as the overflow pipe. All the dilution water runs through the scrubber before dropping into the mixing tank and in this manner any dust particles are entrained in the water and dropped back into the mixing tank.

- Power requirement : less than 5 kW.
- Volumetric flow : 100 m³/h

The *Contractor* is responsible for supplying all tanks. The *Contractor* is responsible for noting the requirements of commonality of supply/type in so far as possible. All tanks are supplied by a certified manufacturer whose equipment has been proven for similar or more demanding duties. All mixing tanks are tested in accordance with the relevant codes and standards. The mixing chamber shall have the capability to mix a liquid and a solid to form a homogenous solution. The solid shall be slaked lime and soda ash with physical property parameters obtained from the assigned lime and soda ash supplier for Duvha P.S. The liquid shall be raw water with properties listed in Table 1 of the technical specification report. The mixing shall occur on a continuous basis. Data books, to include all necessary material and test certificates maintained as part of the QA documentation and made available for inspection if so requested by the *Project Manager*. The mixing chamber shall be designed according to applicable guides, codes and standards. All required nozzles for inflow, outflow, breathing, cleaning, overflow etc. needs to be specified as well as the requirements for manholes for inspection and cleaning.

Applicable Codes and Standards to be selected for design, fabrication and construction, for a mixing tank the following standards needs to be adhered to (For a mixing chamber that is not of a tank design should adhere to the applicable international standards). In instances where the standards contradict each other, use the more stringent standard:

SANS 10329, The design and construction of sectional steel tanks for storage of liquids at or above ground level

BS EN 14015, Specification for the design and manufacture of site built, vertical, cylindrical, flat-bottomed, above ground, welded, steel tanks for the storage of liquids at ambient temperature and above

SANS 53121, GRP tanks and vessels for use above ground

Slurry pumps:

The North and South plants each will have a lime silo and soda ash silo. Each silo will have three centrifugal slurry pumps (Refer to **Error! Reference source not found.** of the technical specification). The maximum flow operation will have two of the pumps in operation while the third pump is on standby. The piping after the pumps will have a cross-over as to allow each pump to supply any of the clarifiers. This selection will be achieved via pinch valves which will be used as isolation valves. The pumps should contain a drain which will allow the pumps as well as the up and downstream connecting pipelines, up to any isolating valves, to be drained. Pressure transmitters and pressure gauges should be located at the suction and discharge of the slurry pumps.

Table 7: Centrifugal Pumps Specifications (per pump)

Installed Power	Less than 5 kW
Capacity	49.49 m ³ /h

Centrifugal pumps shall supply the required flowrate (49.49 m³/hr) at the pressure required by the mixing chamber and the pump system shall have a 100% redundancy. Centrifugal pumps shall meet the requirements of the Eskom Centrifugal Pumps Specification (240-56030558). All pumps must be of standard manufacture and proven reliability in similar service conditions. Complete details of all pumps, motors and auxiliary equipment being offered to complete the works in accordance with design codes and specifications should be provided by the *Contractor*.

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Each pump assembly is supplied complete with electric motors, couplings, seals, bearings, piping and fittings, valves, instrumentation, orifices, gears, leak-off equipment as necessary, drains and all components necessary for safe and efficient operation.

Each pump operates without undue strain or wear and without damage to any part of the pumping unit. It is the responsibility of the *Contractor* to determine the exact type of pump design which will provide such service without operating difficulty or undue replacement of parts and ensure maximum availability, reliability, efficiency and optimisation of the works. All parts of each pump unit are designed to withstand stresses resulting from a full voltage start of the motor. The *Contractor* is responsible for determining that each pump and driver operates in dynamic balance as a unit without undue vibration according to applicable vibration standards.

- **Piping:**

The HDPE piping will be made of PE 100. The HDPE wall thickness will be based on SANS 4427 Part 2.

Table 8: Slurry Piping Specifications from the technical specification report

Diameter	90 mm NB
Nominal pressure in bar	10
Pipe Series	SDR17
Maximum wall thickness	6.1 mm
Minimum wall thickness	5.4 mm

Actuated Valves

There are actuated valves installed on the dilution input line to the scrubber of the mixing tank. These valves must be able to control the volume flow of dilution water.

Manual pinch valves

There is a manual pinch valve located before each slurry pump. These valves will be of the manual pinch valve type, also corresponding to the 80 mm inside diameter.

Electric actuated pinch valves:

The actuated valves in the piping streams will be of the electric actuated pinch valve type and suitable for the 80 mm inside diameter of the HDPE pipes.

- **Valves**

The *Contractor* is responsible for supplying all valves, adaptor mountings, fittings and associated actuators deemed necessary to ensure a safe reliable and efficient workable system. The *Contractor* is responsible for noting the requirements of commonality of supply/type in so far as possible. All valves are supplied by a certified manufacturer whose equipment has been proven for similar or more demanding duties. All valves shall meet the requirements of the Eskom Standard for Low Pressure Valves (240-105020315) Data books, to include all necessary material and test certificates maintained as part of the QA documentation and made available for inspection if so requested by the Project Manager.

Operated valves should be positioned for ease of operation and maintenance from permanent floors, galleries or access platforms. Special consideration should be given to the operating mechanism and correct lubrication of all valves to ensure a minimum of maintenance and ease of operation. All valves shall be furnished with nameplates, which are easily readable and of lasting construction. All isolating and control valves shall have a position indicator on the valve yoke to indicate whether they are open or shut. All valves should be functionally tested at manufacturer's facilities and test certificates are required as part of the QA documentation.

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The Contractor is responsible for providing control valves including the associated electrical equipment specified (Controls & Instrumentation and Electrical Technical Specification) and as required to make the systems complete and functional.

- **Couplings**

All mechanical couplings are of the solid type.

- **Seals**

The *Contractor* ensures that arrangements are made to prevent any leakage.

- **Bearings**

- The *Contractor* ensures that Lubricating oil is provided to all bearings and in sufficient quantity to ensure that an adequate lubrication is achieved; it shall be done according to the OEM's lubrication specification.
- The bearing housing prevents oil or oil vapours from leaking out and air from leaking in. Sight glasses are located on all bearing drains and are easily read and accessible.

Piping:

All piping to be designed in accordance with 240-123801640 Low Pressure Pipelines Standard and 240-105020315, Standard for Low Pressure Valves. The existing ground supports will be utilised (where possible), but the contractor will be responsible to assess the existing supports and modify where needed.

The design code to be used for all steel piping is BS EN 13480 Part 1 to 8.

Dilution water piping:

The existing dilution water supply system will be modified as required for the new system. All modifications to this system, including additional piping and equipment, will be in accordance with the currently installed piping and equipment and the relevant codes/standards.

The North Plant pipeline to be connected to the raw water pipeline has the following specification to match the current raw water piping:

- Piping in accordance with table C1 (Carbon Steel and fittings for 1,0MPa systems) of 240-123801640: Standard for Low Pressure Pipelines

Compressed Air piping:

The existing compressed air system will be utilised and therefore all modifications that might be required to the system will be in accordance with the currently installed piping and equipment and the relevant codes/standards. Any other additions to the compressed air system will be in accordance with 240-105929225, Compressed Air System Standard. The piping installation needs to be such that different sections can be isolated individually. The system also requires sufficient moisture traps throughout.

Slurry piping:

The contractor takes responsibility for the design and construction of the slurry pipeline. The system should be easily maintainable, have high reliability, minimum downtime, avoid blockages and integrate well into the existing system.

The HDPE pipelines will be equipped with the following:

- Concrete support plinths.
- Long radius (> 3 x NB) ceramic lined 90° bends.
- All direction changes shall be ceramic lined.
- All direction changes shall be equipped with concrete anchor blocks.
- Internal diameter of pipelines shall be maintained under all above circumstances.

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- Inclined pipeline sections should be avoided as far as possible. The deposition velocity reaches a maximum at an inclination of 30° to the horizontal and can be as much as 50% higher than for a horizontal pipe.
- The utilisation of flanges and flexible couplings can be optimised to reduce cost of overland slurry pipelines

Valves:

- Manual isolation valves shall be utilised at pump suction and deliveries, to facilitate maintenance.
- Valves should be kept to the absolute minimum required to operate the system safely.
- If required, valves suitable for slurry applications should be utilised.
- Valves shall be actuated as far as practically possible.

Civil Requirements

All civil works are to meet the requirements as set out in the SANS 1200 & 2001 Standardised Specification for Civil Engineering Construction Series and Eskom's Structural Design and Engineering Standard (240-56364545 & Australian Standard- Loads on Bulk Solids Containers (AS 3774)

Civil requirements include:

- Conversion of one (1) Lime Silo to a Soda Ash silo (South Side Plant) with approved lining system lining, subject to the *Project Manager*
- Check and validation of existing equipment plinths for structural resistance with new equipment loading
- Modification of access walkways as per Eskom's Standard Stair and Handrails Details (drawing number 0.00/2901)
- Sealing on top of silos for prevention of moisture ingress
- Natural frequency & harmonic response analysis on all four (4) silos due to the addition of vibrating bins & modified hoppers
- Reinforced concrete wall check due to increasing the bulk solid material density (lime to soda ash).

If excessive stresses develop in the Silo walls and the modified/new hopper during the analysis due to the change of bulk solid material, the *Contractor* is to recommend, by means of design calculations, a safe storage level within the converted Silo which is still aligned with the chemical requirements for the CWTP processes. The *Contractor* shall furthermore provide a mechanical method, over and above the use of level instrumentation, to ensure that the safe storage level within the silo is not exceeded.

▪ Civil Structural Design

- **Steelwork:**
- All work is required 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 are required to be verified on site by the *Contractor* before any fabrication of steelwork commences.

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- All welding is required to be conducted by coded welders. Supporting documentation is also required to be submitted to the *Project Manager* for acceptance. All welding is required to comply with AWS D1.1.
- All welds are required to be inspected using visual aids, see clauses below.
- The *Contractor* is required to supply all bolts, washers, nuts etc. for the structural steelwork.
- All structural steel used is required to be grade S355JR in accordance with SANS 50025
- Welded connections are required to be welded all around with a minimum of 6 mm fillet welds or the appropriately designed fillet weld size. Butt welds are required to be full penetration welds
- Grade 8.8 bolts are to be used throughout
- Minimum thickness of gusset plates is to be 10 mm.

The table below indicates particular specifications pertaining to SANS 2001-CS1 and must be read in conjunction with the code. Note, the numbering numbers refers to the technical specification report.

Clause	Particular Specification
4.1	Materials
4.1.1	Add the following: <ul style="list-style-type: none"> • All structural steelwork is required to be grade S355JR
4.1.4.1	<ul style="list-style-type: none"> • Electrodes for electric welding are required to be E7018.
4.1.5.1	<ul style="list-style-type: none"> • Ordinary bolts to be grade 8.8 with class 8 nuts, as a minimum
4.6	Workmanship – Erection
4.6.5	1. On site welding is not permitted
5.3	Non-destructive testing of welds
5.3.3	<ul style="list-style-type: none"> • Fillet welds are required to undergo magnetic particle inspection (20 % of welds)
5.3.4	<ul style="list-style-type: none"> • All butt welds and full penetration welds are required to undergo ultrasonic non-destructive testing (100 % of welds)

▪ Corrosion protection

- All structural steel is required to be hot dipped galvanised.
- All galvanising is required be done in accordance with SANS 121. Preparation of steel prior to galvanising and coating thickness is also required to be in accordance with SANS 121.
- The *Contractor* designs, modifies, supplies and installs the walkways within the CWTP limits in accordance Eskom's Standard Stair and Handrails Details (drawing number 0.00/2901)
- The *Contractor* designs, modifies, supplies and installs additional equipment supports The *Contractor* performs all
- design works according to the 240-56364545 - Structural Design and Engineering Standard.
- The *Contractor* is to provide drawings indicating the new/modified hopper and vibration bin details.
- Where the Eskom standards are limited on the design information, the *Contractor shall use the relevant SANS standards*.
- The *Contractor* performs all steel design works according to the relevant SANS 1200 & 2001 standards.

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- Prior to the execution of the *works*, all design documents and method statements from the *Contractor* are to be submitted to the *Project Manager* for review and acceptance by the *Employer's* design office.
- **Concrete**
 1. All concrete work is required to be in accordance with SANS 2001-CC1 and SANS 10100-2 unless otherwise stated.
 2. All concrete surfaces and cast-in items is required to be inspected and accepted by the *Project Manager* in writing before casting of concrete may commence.
 3. The *Contractor* is required to obtain written acceptance from the *Project Manager* 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)
 4. Compaction of concrete is required to be done by means of mechanical vibrators only.
 5. The *Contractor* is required to submit the concrete mix design to the *Project Manager* for acceptance.
 6. 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.
 7. All concrete is required to have a maximum water/cement ratio of 0.45 with a minimum cement content of 420 kg/m³
 8. 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 table below indicates particular specifications pertaining to SANS 2001-CC1 and must be read in conjunction with the code. Note, the numbering numbers refers to the technical specification report.

Clause	Particular Specification
3.5	Concrete – Strength characteristics
3.4.3	Concrete Grade is required to be: <ul style="list-style-type: none"> • Class 15 MPa/ 19 mm for Blinding Concrete (28 days), • Class 35 MPa/ 19 mm for Structural Concrete (28 days).
4.2	Materials
4.2.7	In general, one of the following types of non-shrink grout are required to be used: <ol style="list-style-type: none"> 2. Cement-based non-shrink grout, not less than 50 MPa; 3. Special proprietary non-shrink or expansive grout, not less than 50 MPa.
4.2.3.5	The following tests are required: <ol style="list-style-type: none"> 4. drying shrinkage on fine and course aggregates; 5. drying shrinkage of concrete; 6. flakiness index of the stone; 7. alkali-silica reaction.
4.4	Reinforcement
4.4	Add the following: <p style="text-align: center;">All reinforcement is stamped with a SANS quality assurance mark</p>
4.4.3.1	Cast in-situ concrete cover is required to be a minimum of: <ul style="list-style-type: none"> • 50 mm for exposed to earth or water; • 40 mm for above ground or not in contact with soil.

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Clause	Particular Specification
4.7	Quality of Concrete
4.7.1.1	<ul style="list-style-type: none"> Contractor submits to the Supervisor full details and samples of all materials which he proposes to use for making concrete at least 28 days before the concreting of the works is due to commence.
4.7.10	Add the following: <ul style="list-style-type: none"> A layer of blinding concrete of 50 mm minimum thickness is required to be placed under foundations. A polyethylene sheet with a minimum thickness of 250 microns is required under ground slabs
4.7.12.2.3	<ul style="list-style-type: none"> All angled corners are chamfered 20 mm x 20 mm, unless such other larger size is detailed on the Drawings.
4.7.19.3	<ul style="list-style-type: none"> Contractor submits a detailed procedure for acceptance by the Supervisor on how he intends to carry out the repairs of structural concrete defects
4.7.22	<ul style="list-style-type: none"> For concrete pour records, the Contractor submits a detailed Quality Control Plan to the Supervisor for acceptance. In addition the Contractor supplies the Supervisor with two copies of these records each day covering works carried out the preceding day.
5.1	Testing
5.1.1.4	<ul style="list-style-type: none"> Six 150 mm cube samples taken from each batch or place of concrete deposition, three cubes are tested at 7 days and three at 28 days. Strength at 7 days is required to be at least two thirds of 28 day strength.
5.1.2.1	<ul style="list-style-type: none"> Any of the cube samples tested indicating a result more than 3 MPa below the specified strength is disregarded.
5.1.3.3	Add the following: <ul style="list-style-type: none"> ..., unless no more than three batches of concrete is being mixed.
5.2	Tolerances
5.2.1	<ul style="list-style-type: none"> Tolerances on all concrete work is required to be a level II degree of accuracy as specified in SANS 2001-CC1 with and is to be carefully maintained throughout the construction.
5.2.2.1 Table 11	Add the following under "Location of holding-down bolts": <ul style="list-style-type: none"> 3) The permissible deviation between any two bolts that share the same base-plate is limited to 2mm for bolt sizes up to and including M24, and 3mm for bolts larger than M24.

- Considering the existing CWTP system, the Contractor determines the most ideal arrangement to install the mixing tanks, taking into account the existing equipment plinths and mixing tank supports. The Contractor is responsible for ensuring that the structural stability of equipment plinths & access walkways.
- Where modifications are required to the concrete works, the Contractor ensures that structural stability and concrete resistance is maintained or improved.
- Prior to the execution of the works, all design documents and method statements from the Contractor are to be submitted to the Project Manager for review and acceptance by the Employer's design office.

- **Structural Analysis & Design of Modifications to Silos**

- The *Contractor* conducts an analysis of the Silo's for the imposed load of the bulk solid materials taking into account all dynamic and vibration effects of the load and vibrating bin.
- The *Contractor* determines the extent to which vibrations are transmitted to adjacent structural members and walls
- The *Contractor* takes into account loading from adjacent structures
- The *Contractor* provides a detailed design for the modifications required to the access walkways
- The *Contractor* submits the detailed design report and drawings for acceptance before any construction can take place.

- **Contractor's Design**

- The *Contractor* takes full professional accountability and liability for the existing structure for the loads induced by the drive units, new equipment as well as any modifications carried out to the structure.
- The *Contractor* provides the following to the *Project Manager* for review and acceptance:
 - A Level 3 schedule (schedule with defined activities) for the design scope clearly highlighting all activities involved, major milestones and provision.
 - Consolidated detailed design report signed by a Professional Civil Engineer which includes:
 - Survey drawings, design criteria/parameters, specifications and standards that were used, loadings, assumptions, calculations and results including detailed design calculations, design models, sources of information and any record of other information associated with the completed works.
- Detailed drawings for construction. Drawings are also submitted in CAD formats (.DGN).
- All submitted drawings to be signed by a Professional Civil Engineer with ECSA registration number stated on drawing.
- Construction Specifications for the *works* including measurement and payment items
- Bill of Quantities for the *works*
- Any discrepancy or ambiguity between the *Employer's* Specifications or requirements is immediately brought to the attention of the *Project Manager* for clarification.
- The *Contractor* shall be liable, as per Section 6 of the Construction Regulations 2014, for any necessary construction supervision activities that facilitate and enable the Designer/Design Authority to verify that the construction of the works is carried out in accordance with the authorised design. The *Contractor* is informed that the *Employers* representative will not be responsible to carry out such inspections.

- **C&I Requirements**

Duvha Power Station CWTP is divided into North and South plants. On the South Plant there are 2 lime silos (2 and 3). The two lime silos are controlled via the WTP DCS. On the north there is one lime silo (silo 12) and one soda ash silo (silo 11). Lime silo 12 is also controlled via the WTP DCS. The Soda ash silo is controlled locally by a Siemens S7-300 PLC. Originally the plant was also controlled via the WTP DCS and the control of the plant was moved to a Siemens PLC when the silo was converted for the use of soda ash dosing. Each slurry tank/mixer tank has an ultrasonic level detector to measure level of the tank continuously. The mixer tank ultrasonic level detector will be replaced by a guided wave radar level detector.

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Lime silo 11 ultrasonic level detectors has already been replaced by a guided radar level detector, Duvha Power Station is in the process of replacing ultrasonic level detectors with radar level detectors on the remaining silos, therefore this will not form part of this scope.

Figure 4 in the technical specification report shows the WTP ABB Symphony Infi90 DCS Architecture. In Figure 4, the North CWTP interfaces the DCS using the Harmony network (Hnet) via remote I/O panels (20KP02, 20KP03) and substation interface panels (20JW02). The Hnet is a redundant, high speed serial network. From the KP panels and substation interface panel, the interface with DCS is via a Repeater Mounting Unit (RMU). The RMU provides mounting slots for the Hnet repeaters used to communicate with remote enclosures. The North CWTP interfaces with the DCS using Process Control Unit (PCU) 8. The PCUs reside in the control network (Cnet) which is a high-speed data communication highway between nodes in the WTP DCS. Cnet provides a data path among PCUs, HMI and computers. The PCU is the fundamental control node of the Symphony Infi90 DCS. It connects to Cnet through a Cnet-to-PCU interface. The PCU cabinet contains the Harmony controllers and input/output devices. The actual process control and management takes place at this level.

Similarly, the South CWTP interfaces the DCS using the Harmony network (Hnet) via I/O panels (10KP56, 10KP57) and substation interface panels (10JW14). From the KP panels and substation interface panel, the interface with DCS is via a Repeater Mounting Unit (RMU). The South CWTP interfaces the DCS using Process Control Unit (PCU) 16. Figure 5 as specified in a technical specification report shows the Symphony Infi90 DCS Architecture. In the architecture all the cubicles that will be replaced have been highlighted in light blue.

10.2 Employer's objectives and purpose of the works

The Employer's objective is to minimise the volume of raw water added to the CW system by maximising the cycles of concentration in the CW system by ensuring adequate and reliable CW treatment. The purpose of the works is to improve the availability and reliability of the CWTPs at Duvha Power Station. This will be achieved through this plant modification.

10.3 Interpretation and terminology

10.4 Definitions

Definition	Description
Acceptance	The Employer accept the condition or design but does not take responsibility from the Contractor
Approval	Written agreement or authorization by Employer. All requests for approval must be submitted in writing and any proposed deviation from specified requirements must be fully justified and agreed by Employer.
Architect Engineer	Architect Engineer - When Eskom acts as the Architect Engineer on a project/package/plant/system/asset, the reviewer(s) are to review the design documentation issued by the Design Authority to ensure that: the design satisfies the stakeholder requirements (i.e. validation of design deliverables against stakeholder requirements); the design is integrated by identifying all interfaces with other packages/plant systems/assets and ensuring that these interfaces are catered for; foreseen technical risks are identified and addressed/challenged with the Design Authority; general technical oversight is provided over the design.
Contractor	Refers to the corporation appointed to perform the engineering, procurement, and construction works required for the project.
Design freeze	Is a binding decision that defines the whole product, its parts or parameters and allows the continuation of the design based on that decision (no further changes can be made to the design, it is cut-off for the engineers)
Employer	Refers to Eskom Holdings State Owned Company
Eskom Plant Engineering	Refers to the Eskom Engineering team who will perform the reviews and provide technical assistance for the work performed by the appointed Contractor.
Maintenance	Maintenance can be defined as the function of keeping components or equipment in, or restoring them to a serviceable condition so that they comply

Definition	Description
	with design and statutory requirements and employer standards. Maintenance includes the cleaning, removal of contaminants and waste, correct adjustment and setting, tightening, testing, fixing, refill, lubrication, rust prevention, touch up, refrigeration charge, servicing, inspection, replacement, re-installation, troubleshooting, calibration, condition determination, repair, modification, overhaul and rebuilding of equipment. Maintenance can be either preventative or corrective of nature.
Maintenance Management	Maintenance Management can be described as the management (planning, organising, leading and control) actions needed to ensure effective maintenance execution to provide the most efficient and optimum availability (capable of being used) and reliability (consistent quality) of the equipment installed.
Owners Engineer	Owners Engineer - When Eskom acts as the Owners Engineer on a project/package/plant/system/asset, the reviewer(s) are to review the design documentation issued by the Design Authority to ensure that: the design satisfies the stakeholder requirements (i.e. validation of design deliverables against stakeholder requirements). General technical oversight is provided over the design.
Specification	The document/s forming part of the contract in which the methods of executing the various items of work to be done is described, as well as the nature and quality of the materials to be supplied and it includes technical schedules and drawings attached thereto as well as all samples and patterns
The Client	The end user will be Eskom who will be represented by client throughout the duration of the Project.

11 Management and start up.

11.1 Management meetings

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

Title and purpose	Approximate time & interval	Location	Attendance by:
Risk register and compensation events	Weekly on Mondays at 13h00	Projects/ WTP Boardroom	Employer, <i>Contractor</i> , Supervisor
Overall contract progress and feedback	Monthly on Thursdays at 13h00	Projects/ WTP Boardroom	Employer, <i>Contractor</i> , Supervisor
Monthly Safety meeting, weekly during implementation	Monthly on Mondays at 14h00	Projects/ WTP Boardroom	Employer, <i>Contractor</i> , Supervisor, Safety Officers
Quality and NCR/Defect/Concessions meeting	Monthly on Mondays at 15h00	Projects/ WTP Boardroom	Employer, <i>Contractor</i> , Supervisor, Quality managers and Officers
Weekly contract progress and feedback	Weekly on Mondays at 08h00	Projects/ WTP Boardroom	Employer, <i>Contractor</i> , Supervisor, Quality managers
Daily contract progress and feedback	Daily at 09h00	Projects/ WTP Boardroom	Employer, <i>Contractor</i> , Supervisor, Quality, managers

- (2) 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.
- (3) Records of these meetings shall be submitted to the Project Manager by the person convening the meeting within five days of the meeting.

- (4) All meetings shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting.
- (5) Such minutes or register shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the conditions of contract to carry out such actions or instructions.
- (6) Meetings of a specialist nature may be convened as specified elsewhere in this Works Information or if not so specified by persons and at times and locations to suit the Parties, the nature and the progress of the works. Records of these meetings shall be submitted to the Project Manager by the person convening the meeting within five days of the meeting.
- (7) All meetings shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the conditions of contract to carry out such actions or instructions.

11.2 Documentation control

- (1) The Contractor's site manager must submit a daily log, which needs to be signed by the Employer's Supervisor / Project Manager daily.
- (2) The project manager will arrange for necessary documentations to allow component removal from Duvha P/S.

11.3 Health and safety risk management

- (1) Refer to Safety, health and environmental procedure Appendix F.

11.4 Environmental constraints and management

- (2) Refer to Safety, health and environmental procedure Appendix F.

11.5 Quality assurance requirements

- (1) The Contractor complies with the Employer's Quality Requirements as specified in Eskom Generation Standard QM 58
- (2) Appendix C to this Standard indicates the specific application thereof.
- (3) All quality control documentation (QCP) is submitted to the Project Manager on delivery.

11.6 Programming constraints

- (1) The Contractor submits a programme within 1 week of the contract date.
- (2) The program shall be in Microsoft Excel or Projects format (preferably 2003 version or lower)
- (3) The programme indicates
 - i. The hour duration of each activity
 - ii. The working calendar (number of hours per day, days per week)
 - iii. The exact quantity of people per day.
 - iv. All phases and interfaces.

11.7 Invoicing and payment

- (1) Within one week of receiving a payment certificate from the Project Manager in terms of core clause 51.1,

(2) The Contractor provides the Employer with a tax invoice showing the amount due for payment equal to that stated in the Project Manager's payment certificate. The *Contractor* shall address the tax invoice to Eskom Holdings SOC Ltd and include on each invoice the following information:

- i. Name and address of the Contractor and the Project Manager;
- ii. The contract number and title;
- iii. Contractor's VAT registration number;
- iv. The Employer's VAT registration number 4740101508;
- v. Description of service provided for each item invoiced based on the Price List;
- vi. Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT;
- vii. (add other as required)
- viii. Add procedures for invoice submission and payment (e. g. electronic payment instructions)

11.8 Insurance provided by the *Employer*

(1) Refer to the Contract Data Section 8 – Risks and Insurance.

11.9 Contract change management

(1) The contractor or the Project Manager notifies each other of any event which may lead to a change in agreed terms as per NEC 3.

11.10 Provision of bonds and guarantees

- (1) The form in which a bond or guarantee required by the conditions of contract (if any) is to be provided by the Contractor is given in Part 1 Agreements and Contract Data, document C1.3, Sureties.
- (2) The Employer may withhold payment of amounts due to the Contractor until the bond or guarantee required in terms of this contract has been received and accepted by the person notified to the Contractor by the Project Manager to receive and accept such bond or guarantee. Such withholding of payment due to the Contractor does not affect the Employer's right to termination stated in this contract.

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

(1) The *Contractor* may keep records of payment and assessments of compensation events if he deems it necessary.

4 Procurement

1.1 People

4.1.1 Minimum requirements of people employed on the Site

Only qualified and experienced people to be employed.

The Contractor shall comply with Basic Condition of Employment Act and Labour Relation Act for the use of labour in executing the works to give effect to the right to fair labour practices referred to in section 23 (1) of the Constitution by establishing and making provision for the regulation of basic conditions of employment;

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and thereby to comply with the obligations of the Republic as a member state of the International Labour Organisation; and to provide for matters connected therewith.

- (1) The contractor must have at least 2 of Supervisory and Artisan staff authorized in Plant Safety Regulations and/or High Voltage Regulations. In order for any person to do work at the Power Station, this person should be authorized to take out a permit to work.

The courses for this will be presented free of charge to contractors and bookings must be done via the Project Manager.

- i. N.B Access to the switchgear/equipment rooms the Contractor to comply to the following prior to access being granted:
 - a. The Contractor's Supervisor to attend the Arc Flash Course (PSR Module 5) and pass the required test. The course will be offered by the Employer at no cost and Course dates will be announced after Contract Award.
 - b. Contractor to ensure that all personnel working in the room wear special overalls due to the nature of equipment in the rooms.

Overall specification – Arch Flash Proof Overall Class 2, Material: Protera (ATPV 12CA/cm2) Colour: Blue. Suggested Supplier: Quality Safety 1990 Pty Tel 016 365 5770.

BBBEE and preferencing scheme

The Employer formal Black Economic Empowerment (BEE) programme was first initiated in 1995 with the publication of its policy regarding procurement from Black Suppliers (ESKADAAT6). ESKADAAT6 has set the standard for BEE programmes within Eskom and across South Africa as a whole.

Eskom's policy is to maximise purchases from Black or Black Empowering Enterprises (BEE's) whether Black Woman-owned, small or Large Black or Black empowering suppliers. The purpose is to promote entrepreneurship in black communities and give black business access to the mainstream of business opportunity.

Eskom will concentrate its development efforts on black suppliers in the manufacturing, construction and mining /extraction sector of the economy and provide support.

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

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* ASGI-SA Compliance Schedule stated below

The *Contractor* shall keep accurate records and provide the *Project Manager* with reports on the *Contractor's* actual delivery against the above stated ASGI-SA criteria. [Elaborate on access to and format of records and frequency of submission etc.]

The *Contractor's* failure to comply with his ASGI-SA obligations constitutes substantial failure on the part of the *Contractor* to comply with his obligations under this contract.

Subcontracting**Preferred subcontractors**

The Contractor shall make use of any supplier for sourcing of equipment, tools and material whatever that the contractor will use to execute works shall comply with the SABS

Subcontract documentation, and assessment of subcontract tenders

- (1) The Contractor shall submit the proposed contract data for each subcontracting for acceptance to the Project Manager.
- (2) The Contractor shall prepare subcontracting document as according to NEC contract.
- (3) The Contractor must inform the Employer's representative when intending to subcontract some of the works from the contract scope.
- (4) The Contractor shall not subcontract a contractor that has lower or higher level accreditation than his/her according to CIDB.

Visual Automation Interface Scope

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The contractor of The station Historian Visual Automation 4 (VA 4) is SAM. It is recommended that the contractor may consult SAM to obtain assistance for establishing a link between the WTP and VA.

Limitations on subcontracting

- (1) The Contractor shall not subcontract more than 25% of the contract scope

Attendance on subcontractors

- (1) The Contractor shall in writing inform the Employer's representative about the subcontractor intentions for site visit.

1.2 Plant and Materials**4.2.1 Quality**

Refer to Duvha quality manual - See Appendix 5

Plant & Materials provided "free issue" by the Employer

- a) The *Employer* will provide power supply, water and land for the storage of equipment and material.
- b) The *Contractor shall* supply all the necessary equipment and material required to execute the *Works*.
- c) Should the *Contractor* need to use of any of the *Employer's* Equipment, including compressed air, electricity, water supply and crane, it must be specified by the Contractor. The *Employer* does not guarantee continuity of supply of any of these items.

Contractor's procurement of Plant and Materials

- (1) The *Contractor* shall make use of SABS approved plant and material.
- (2) Test certificates shall be given to the *Project Manager* of the project.

Spares and consumables

- (1) The *Contractor* shall provide any spares and consumables as they are required for this fault finding and solutions to the defective plant items
- (2) The *Contractor* must supply a recommendation for spares holding based on the project requirements and the *Employer's* goals.

4.3 Tests and inspections before delivery

- (1) The *Contractor* does not bring to the working area those plant and material which the works information states are to be tested or inspected before delivery until the supervisor has notified the contractor that they have passed the test.

5 Construction**Temporary works, Site services & construction constraints****Employer's Site entry and security control, permits, and Site regulations**

Refer to Access Control document - see Appendix 6

Restrictions to access on Site, roads, walkways and barricades

- (1) Pedestrian crossings on the road, should be used when crossing the road.
- (2) Inside the plant walkways are clear; they should be used when walking inside the plant to keep safe on any object that might fall.
- (3) Barricades are provided where there are open trenches and around the sumps and manholes.
- (4) The contractor shall occupy only such ground as is necessary to carry out the works.
- (5) All fences and other structure that have been damaged or interfered with by the contractor shall be restored to be a condition at least equivalent to their original condition

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

- (1) The LAR is for the person in charge of the plant to maintain control over activities taking place on his plant that are not covered by the Plant Safety Regulation and Operating Regulations for High Voltage Systems.
- (2) Activities that are allowed to be carried out under the LAR must not require a permit and must satisfy the following criteria:
- (3) They must not involve danger to the person carrying out the activity;
- (4) No plant isolations must be required;
- (5) The activity must be performed by a skilled person and there must be no risk of a production loss;
- (6) The duration of the activity must be less than 24 hours
- (7) The Supervisor accompanies the Contractor during the first instances of working under a LAR on a specific plant area.
- (8) It is very important that the person who plans to do an activity on a plant under the LAR informs the person in charge of the plant (ASS on the panel or Operating Supervisor) of what will be done.
- (9) This means verbally telling the person in charge of the plant what will be done and not just signing the LAR book. The LAR book is also signed.
- (10) It is also important that as soon as the activity is completed the person, who was doing the activity, notify (verbally) the person in charge of the plant that conditions are back to normal and that the LAR has been signed off. Just signing the LAR book is not sufficient.
- (11) For more information please refer to Plant Safety Regulation C11.

Health and safety facilities on Site

- (1) Refer to Health and Safety Specification document see attached Appendix 7

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

- (1) Refer to Environmental Policy See Appendix 7

Title to materials from demolition and excavation

- a) The Contractor has no title to an object of value or historical or other interest within the site
- b) The Contractor shall notify the Project Manager when such an object is found and the Project Manager will instruct the Contractor how to deal with it.
- c) The Contractor does not move the object without instruction.
- d) The Contractor has title to material from excavation and demolishing only as stated in the works information.

Cooperating with and obtaining acceptance of others

The Contractor shall co-operate with others in obtaining and providing information which they need in connection with the works.

The Contractor shall share the working area with others in executing the works.

Publicity and progress photographs

- a) Should publicity and/or progress photographs be required, an application shall be made via the Project Manager.

Contractor's Equipment

- a) The Contractor's attention is drawn to the applicable regulation framed under the Machinery and Occupational Safety Act, 1983 (Act No. 6 OF 1983)
- b) When working in built-in areas, the contractor shall provide and use suitable and effective silencing devices for pneumatic tools and other plant that would otherwise cause a noise level exceeding 85 Db(A) during excavation and other works.
- c) Alternatively the Contractor shall by means of barriers, effectively isolate the source of any such noise in order to comply with the said regulation.

Equipment provided by the Employer

Duvha North and South Lime Plants Upgrade

- a) Should the Contractor require using any of the Employer's Equipment, including compressed air, electricity, water supply and crane, it must be specified by the Contractor during the kick off meeting. The Employer does not guarantee continuity of supply of any of these items.
- b) The Employer shall be entitled to withdraw use of the said Equipment, should proper maintenance and cleanliness not be ensured. In that event, the *Contractor* shall be obliged to provide the necessary Equipment at his own cost.
- c) The *Contractor* is responsible for the repair, replacement or correction as necessary of all pieces of tools and equipment supplied by the *Employer* which are damaged and / or lost whilst in the *Contractor's* custody and control.
- d) The *Contractor* site manager must ensure that any one of his employees or Sub-*Contractor*, operating hoist equipment belonging to the *Employer*, is authorised by an Accredited Company and retraining is done annually. Arrangements for training courses can be made via Duvha Power Station Maintenance Training but the *Contractor* will absorb costs.
- e) A copy of this accredited and valid training certificate must be given to the *Employer's Supervisor*, who will then arrange access for usage.

Site services and facilities**a) Potable Water Supply**

- Potable water is available at the existing points.

b) Electrical Power Supply

- Power is available at the existing points.
- The Contractor provides his own portable 380V electrical distribution boards, and supply cables to and from the boards, for all his power supply requirements to execute the works.
- Contractors' Electrical Distribution Boards complies with OHSA as referred to in the Electrical Installation Regulations and the Electrical Machinery Regulations.
- Each board brought onto site must have a Certificate of Compliance issued by an accredited person.
- The Contractors' electrical distribution boards are installed at the works on a time negotiated with the project manager, prior to the possession date.
- The Employer connects distribution boards to a 380V three-phase AC power supply, only after the Contractor has submitted the valid Certificate of Compliance.
- All Contractors' Electrical Distribution Boards are earthed to the steel structure of the plant.

c) Toilet Facilities

- The Employer provides the Contractor access to existing toilet facilities. The Contractor is to provide this facility should the existing facilities not be within reasonable distance from the working area.

d) Catering Facilities

- The Contractor are not allowed to use the Employer's dining facilities, unless a specific agreement has been made between the Contractor and Eskom Catering and Accommodation Services (ECAS).
- The Contractor may buy take away meals from the fast foods outlet on Site.

e) Medical Facilities

- The *Contractor* provides a First Aid service to his employees and subcontractors. In the case where these prove to be inadequate, like in the event of a serious injury, the *Employer's* Medical Centre and facilities will be available.
- Outside the *Employer's* office hours, the *Employer's* First Aid Services are only available for serious injuries and life threatening situations.
- The *Employer* recovers the costs incurred, in the use of the above *Employer's* facilities, from the *Contractor*.

Facilities provided by the Contractor

- The contractor should provide facilities they deem necessary in executing the work. This must be discussed with the Project Manager prior to commencement of work.

Survey control and setting out of the works

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- a) The Contractor shall properly deal with and disposal of water to ensure that the works are kept sufficiently dry for their proper execution.
- b) The contractor shall provide, operate and maintain in sufficient quantity such pumping equipment, well points, pipes and other equipment as may be necessary.
- c) The Contractor shall also provide temporally works as may be necessary to minimise damage, inconvenience or interference.

Survey control and setting out of the works

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- c) The Contractor shall also provide temporally works as may be necessary to minimise damage, inconvenience or interference.

Excavations and associated water control

- a) The contractor will be held responsible for any damage to known services (services that are within the site of the works and are known/shown on drawings or highlighted by employer) and he shall take all the necessary measure to protect them.
- b) All works or protective measure shall be subjected to approval.
- c) In the event of service being damaged the contractor shall immediately notify the authority concerned as well the project manager and the engineer.
- d) The contractor shall not repair any such service unless instructed to do so by the project manager.
- e) The contractor shall complete such an investigation well in advance, prior to the start of construction work in the said section and shall submit a report in good time to enable the engineer to make whatever arrangements that are necessary for the protection, removal or diversion of the service before any construction works commences.
- f) As soon as any underground service not shown in the in the drawing is discovered, it shall be deemed to be known service and the contractor will be held responsible that the contractor for any subsequent damage to it.
- g) If such service is damaged during the course of its discovery, the cost of rectifying the damage will be met by the employer unless it is established that the contractor did not exercise reasonable diligence and that the damage was avoidable.
- h) Where the authority concerned elects to carry out on site own account any alteration or protective measure, the contractor shall co-operate with and allow such authority reasonable access and sufficient space and time to carry out the required work.
- i) Permanent alteration or permanent diversion of service necessitated by the execution of the works and authorized will be paid for in terms of the conditions of contract, but no such work will be paid for if it has not been previously inspected and if no proper written instruction was given.

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

Where underground cables and pipes are present in the area, care must be exercised to ensure that they are not damaged. In the case of damage to existing components, the contractor will be held liable for replacement/repair thereof.

Control of noise, dust, water and waste

- a) The Contractor shall take all responsible measure to minimise any dust nuisance, pollution of stream and inconvenience to or interference with public as a result of the execution of the works.
- b) Remove all rubble and dispose to appropriate facility as according Duvha waste management procedure (EVP0005)

Sequences of construction or installation

All work must be inspected and approved as per QCP holding points by the system engineer and project manager. The contractor's supervisor is still entirely responsible for ensuring that the work is carried out as per the complete QCP

Giving notice of work to be covered up

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All work must be inspected and approved by the system engineer and project manager before it may be covered up.

On or before the Completion Date the *Contractor* shall have done everything required to Provide the Works except for the work listed below which may be done after the Completion Date but in any case before the dates stated. The *Project Manager* cannot certify Completion until all the work except that listed below has been done and is also free of Defects which would have, in his opinion, prevented the *Employer* from using the *works* and Others from doing their work.

Item of work	To be completed by
Performance testing of the <i>works</i> in use as specified in paragraph 1.1 of this Works Information.	Contractor in the presence of <i>Project Manager</i> and engineer

3.7.1. 5.1 Use of the works before Completion has been certified

The *Employer* may use any part of the *works* before completion has been certified. If he does so, he takes over the part of the *works* when he begins to use it except if the use is:

- a) For a reason stated in the works information
- b) To suite The Contractors method of working

The *Project Manager* certifies the date upon which the *Employer* takes over any part of the *works* and its extension within one week of the date.

3.7.2. 5.2 Materials facilities and samples for tests and inspections

The Contractor and the *Employer* provide material, facilities and samples for test and inspection as stated in the Works Information.

3.7.3. 5.3 Commissioning

The *Contractor* supplies personnel to assist the *Employer* with commissioning of the *works*.

The plant is commissioned by running the system fully manual and testing each piece of Plant and Material for full functionality.

3.7.4. 5.4 Start-up procedures required to put the works into operation

The Contractor shall carry out sufficient checks to satisfy himself that the materials used and the workmanship comply consistently with the specified requirements and the results of those checks shall, if so ordered, be made available to the Engineer.

The Engineer may carry out such check as he deems necessary at any point or any depth or any layer, as the result of the Engineer's check shall be made available to the contractor.

1.2.1 5.5 Take over procedures

Take-over will be on or before the Completion Date the *Contractor* shall have done everything required to provide the *works* and the Engineer has done all the necessary inspection and the approval of the *works* done

1.2.2 5.6 Access given by the Employer for correction of Defects

The Supervisor issues the Defect certificate at the later defect date and the end of the last defect correction period. The *Employer's* right in respect of the defect which the supervisor has not found and notified are not affected by the issue of the defect certificate

The Contractor contacts the *Project Manager* to gain access to the site to correct defects.

1.2.3 5.7 Performance tests after Completion

The Contactor shall conduct performance test after installation in the presence of the *Project Manager* and the Engineer according to the QCP, the end user and functional requirements.

1.2.4 5.8 Training and technology transfer

The *Contractor* shall provide any associated transfer of technology and knowledge to the *Employer*.

7.4 Appendix D Access Control Visitors Appointment



Access Control
Visitors Appointment (

7.5 Appendix E AKZ Plant labelling standard



Microsoft Word
97-2003 Document

7.6 Appendix F SHE Requirements



32-726 (0) SHE
Requirements for the

PART 4: SITE INFORMATION

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

PART 4: SITE INFORMATION

5. C4.1: Information about the *site* at time of tender which may affect the work in this contract

Safety Risk Management

- 1) The Contractor complies with the requirements of the Duvha Power Station Safety, Health & Environmental Specifications SAS 0012 rev 8.
- 2) **The documents are completed by the Contractor and submitted to the Employer before taking possession of the works.**
- 3) These documents are valid for the duration of the works.
- 4) The Contractor and all his personnel attend a Health and Safety Induction Course prior to starting with the works.
- 5) The induction course is presented by the Safety Risk Department at Duvha Power Station.
- 6) The Contractor makes arrangements with Project manager who will arrange with Safety Risk Management, for a slot and the date scheduled for the course.
- 7) The Contractor submits all the documents as indicated in the Safety, Health & Environmental Specifications relevant to the work to Safety Risk Management before the induction course.
- 8) The Contractor completes all appointments required and ensures that the appointee and appointees fully understand their responsibilities and are competent and trained to execute their duties.
- 9) The appointees/appointee ensures that all duties are carried out and records are kept by the Contractor for review/audit by the Employer or Inspector of Machinery.
- 10) Duvha Safety Risk Management has the right and authority to visit and inspect the Contractor's work place or Site establishment.
- 11) The Contractor supplies and ensures that his employees wear the necessary PPE according the risk assessments performed on the specific tasks to be carried out.
- 12) The Contractor ensures that everyone entering Duvha Power Station under his supervision are medically, physically and psychologically fit to enter Duvha Power Station.
- 13) The medical examination, at the Contractors cost, is carried out by a Registered Professional Occupational Health Practitioner and the examination shall include the following tests:
 - a. Eye Test, Blood Pressure,
 - b. Heart Function,
 - c. Hearing Test and
 - d. Lung Function.
- 14) A thorough examination is done and previous physical injuries, as well as occupational diseases/complications are covered.
- 15) If at any point in time during the execution of the works, the Contractor has a radiation-related incident/exposure, the onus is on the Contractor to immediately notify the Employer, the Medical Station, the Risk Manager and the Safety Risk Management Department.
- 16) The onus thereafter is for the Contractor to immediately arrange, at his/her cost, for blood samples to

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be taken by a Registered Laboratory and for this sample to be sent to the Excellerator Laboratory in Cape Town for full radiation exposure tests. This test results are then to be discussed with the Duvha Occupational Health Practitioners, who will then advise the Power Station Management on the risk, if any, of the incident/exposure.

- 17) The Contractor takes full responsibility and accountability for all other people/staff/personnel/labour that he/she employs or utilises, whether in full-time/part-time/contract basis, in executing the works or other work whilst on the Employers premises.
- 18) The Contractor ensures that Safety Harnesses are used for all work carried out in elevated positions, as defined in the Occupational Health and Safety Act, No 85 of 1993 or any other Code of Practice or standard or the Construction Regulations.
- 19) All safety equipment or Machinery used complies with the SANS Codes of Quality and Practice or any Code as stipulated in the Occupational Health and Safety Act, No 85 of 1993, and any amendments thereto.
- 20) The Contractor at all times consider himself as "Employer" as defined in the Occupational Health and Safety Act, No 85 of 1993 and do not consider himself as under supervision or management of the Employer with regard to Health and Safety Requirements but only from a Commercial Contractual Condition of Contract. Under no circumstances does the Contractor consider himself a sub-ordinate or being given supervision.
- 21) The Contractor provides and maintains his own facilities as required in the Occupational Health and Safety Act, No 85 of 1993 or any other Code of Practice or standard or the Construction Regulations, if not agreed contractually or arranged by the Employer.
- 22) The Contractor has Safety Systems in place at his premises for the total contract period and these shall include the following:
 - a. Safety Management Structure and Compliance to these.
 - b. Statutory Appointments.
 - c. Records and documentation of all Risk and Hazard Analyses.
 - d. Planned Job Observations Records and Documents.
 - e. Employment history and records of all personnel, part-time or full-time or contract labour.
 - f. Medical History of all personnel, part-time or full-time or contract labour
 - g. Training and Competency Records with regard to Safety, Health and Environment.
 - h. Training and Competency Records with regard to the skills he uses to carry out the works or any other works in the Employers premises.
 - i. Compensation Commissioner records and proof of registration.
 - j. Records and documentation with regard to any sub-contractor or labour-only contracts he places or uses to carry out the works or any other works in Employers premises.
 - k. Personal Protective Equipment and Safety Equipment Inspection, training and competency records and documentation.
 - l. Employment contracts for all sub-contractor or labour-only contracts.
 - m. Compliance to a Safety System, such as NOSA or any other system that is similar in nature.
 - n. Records of all incidents or accidents, and vehicle accidents, incurred during execution of this

works or any other works in the Employers premises.

o. Records of all man-hours, including sub-contractors or labour-only contracts, the Contractor spends on the Employers premises.

p. Written Safe Work Procedures for all hazardous tasks the Contractor executes on the Employers premises.

q. A Fall Protection Plan for all elevated work the Contractor does on the Employers premises.

r. Environmental Plan and awareness training.

s. Induction training records of his staff by himself/herself.

t. Minimum wage compliance for the different skills and to which Bargaining Council compliance is made to and proof of membership, if any.

u. Risk Assessment of this type of works

v. Proof of authorisation/accreditation from Department of Labour and or other Statutory Body for this type of works, if applicable

w. Emergency Evacuation and Rescue Plan for the hazardous tasks related to the works.

Specific Risks

23) The following risks are identified by the Employer and Contractor specifically addresses these risks to ensure that the works is carried out safely:

a. Working at heights

b. High temperatures

c. Low temperatures

d. High pressures

e. High voltage

f. Windy conditions

g. Dusty conditions

h. High noise area

i. Work is being carried out overhead

j. Work is being carried out below

k. Possibility of drowning exists

l. Work in confined spaces

m. Possibility of noxious gasses

n. Possibility of steam release

o. Possibility of fires or explosions

p. Chemicals

q. Biological Hazards

24) Gaskets used are fit for the type of liquid, solid or gas being transported and do not contain any asbestos fibres.

25) The ash dust is harmful if inhaled and the Contractor provides proper dust masks to all his personnel working in dusty environments.

Plant Safety Regulations

- 26) The Employer, on request from the Contractor, isolates required plant from all sources of danger as described in the Plant Safety Regulations.
- 27) The Project Manager, on request, makes available a copy of the latest revision of the Plant Safety Regulations available to the Contractor.
- 29) The Contractor conforms to all rules and regulations applicable to plant safety and completes the Workman's Register prior to working on the plant.
- 30) The Contractor declares any grinding and welding to be carried out on the workers register.
- 31) At every permit change the Contractor withdraws himself/herself/his staff for that period of permit suspension/revocation and thereafter only proceeds with the works after signing onto the new permit.
- 32) The Contractor ensures that he/she/all sub-contractors/personnel/staff/his visitors are medically, physically and psychologically fit to enter the Duvha Power Station, and specifically any confined space.
- 33) The Contractor is prohibited from entering Radiation Areas.
- 34) The onus is on the Contractor to ensure that the correct confined space requirements and tests have been done/met by the Employer prior to entry into any confined space or hazardous plant areas.
- 35) The Contractor ensures that all personnel are competent to carry out the works.
- 36) Proof of competency for technical and safety aspects must be available as and when required on site.

Limited Access Register (LAR)

- 37) The LAR is for the person in charge of the plant to maintain control over activities taking place on his plant that are not covered by the Plant Safety Regulation and Operating Regulations for High Voltage Systems.
- 38) Activities that are allowed to be carried out under the LAR must not require a permit and must satisfy the following criteria:
- 39) They must not involve danger to the person carrying out the activity;
- 40) No plant isolations must be required;
- 41) The activity must be performed by a skilled person and there must be no risk of a production loss;
- 42) The duration of the activity must be less than 24 hours
- 43) The Supervisor accompanies the Contractor during the first instances of working under a LAR on a specific plant area.
- 44) It is very important that the person who plans to do an activity on a plant under the LAR informs the person in charge of the plant (ASS on the panel or PPO at WTP) of what will be done.
- 45) This means verbally telling the person in charge of the plant what will be done and not just signing the LAR book. The LAR book is also signed.
- 46) It is also important that as soon as the activity is completed the person, who was doing the activity, notify (verbally) the person in charge of the plant that conditions are back to normal and that the LAR

has been signed off. Just signing the LAR book is not sufficient.

47) For more information please refer to Plant Safety Regulation C11.

Fire precautions

48) Any tampering with the Employer's fire equipment is strictly forbidden.

49) All exit doors, fire escape routes, walkways, stairways, stair landings and access to electrical distribution boards must be kept free of obstruction, and not be used for work or storage at any time. Fire fighting equipment remains accessible at all times.

50) In case of a fire, report the location and extent of the fire to the Electrical Operating Desk at extension 2222.

51) Take the necessary action to safe guard the area to prevent injury and spreading of the fire.

52) Reporting of accidents

53) The Employer follows an accident prevention policy that includes the investigation of all accidents involving personnel and property. This is done with the intention of introducing control measures to prevent a recurrence of the same incidents.

54) The Contractor is expected to fully co-operate to achieve this objective.

55) The Project Manager is informed immediately of any Category B or C incidents. Category A incidents and any damage to property or equipment must be reported to the Supervisor within 24 hours.

56) Radiation incidents must be reported immediately.

57) In reporting Category C and D incidents, the Contractor submits the following documents, or any additional as required by the Employers investigation team.

- a. Proof of Contract of Employment.
- b. Proof of WCL notification to Department of Labour.
- c. Proof of Medical Doctors Note/Certificate detailing nature of injury and period of rest.
- d. Death Certificate, if Category C fatality.
- e. Risk and Hazard Analysis, if not in place prior to injury.
- f. Written Safe Working Procedure, if not in place prior to injury.

NOTE! This report does not relieve the Contractor of his legal obligation to report certain incidents to the Department of Labour, or to keep records in terms of the Occupational Health and Safety Act, and Compensation for Occupational Injuries and Diseases Act.

Occupational Health and Safety Act 1993 - SECTION 37

58) The Contractor and Employer agrees to the arrangements and procedures between them to ensure compliance by the main Contractor (as the mandatory) with the provisions of Section 37.2 of the Occupational Health and Safety Act, No 85 of 1993.

59) The Contractor complies with:

- a. the Occupational Health and Safety Act, 1993, and all Regulations made hereunder;
- b. all Eskom Safety and Operating Procedures.

60) The Contractor acknowledges that he is fully aware of the requirements of all the above and undertakes to employ only people who have been duly authorised in terms thereof and who received

sufficient safety training to ensure that they can comply therewith.

- 61) 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.
- 62) The Contractor appoints a person who liaises with the Eskom Safety Officer responsible for the premises relevant to the Contract.
- 63) The person so appointed on request:
- a. supplies the Eskom Safety Officer with copies of minutes of all Health and Safety Committee meetings, whenever he is required to do so;
 - b. supplies the Eskom Safety Officer with copies of all appointments in respect of employees employed on this Contract, in terms of the Act and Regulations and notifies the Eskom Safety Officer of any changes thereto.
- 64) Eskom may, at any stage during the currency of this agreement, be entitled to:
- a. Do safety audits at the Contractor's premises, its work-places and its employees;
 - b. Refuse any employee, Subcontractor or agent of the Contractor access to its premises if such person has been found to commit any unsafe act or any unsafe working practice or is found to be not authorised or qualified in terms of the Act;
 - c. issue the Contractor with a work stop order or a compliance order should Eskom become aware of any unsafe working procedures or conditions or any non-compliance with the Act, Regulations and Procedures referred to in the Occupational Health and Safety Act - 1993 and all Regulations made there under as well as all Eskom Safety and Operating Procedures.
- 65) No extension of time will be allowed, as a result of any action taken by Eskom in terms of the foregoing Clause and the Contractor has no claim against Eskom as a result thereof.

Hazardous Substances

- 66) It is required in terms of the General Administrative Regulation (Regulation 7) that any Manufacture, Importer, Seller or Supplier of hazardous chemical substance supplies the receiver, free of charge, with sufficient information for the user.

Radiation protection

- 67) The Contractor conforms to Duvha procedure HMS0002 when performing any industrial radiography. Thermal insulation containing asbestos.
- 68) The Contractor does not disturb any thermal insulating material on the plant until it has been positively identified as not containing asbestos. Approval is obtained from the Supervisor before any thermal insulation is disturbed.
- 69) All stripping of asbestos material is undertaken strictly in accordance with the Employer's Standard, SAP 0022, available from Safety Risk Management.
- 70) The Project Manager advises the Contractor whether areas that are to be stripped of lagging have been identified as containing asbestos.
- 71) The Contractor is obliged to ascertain from the Project Manager in advance whether areas required to be stripped, are non-asbestos. Any contractor, other than the contractor appointed to remove

asbestos strips no lagging material containing asbestos fibres.

- 72) The Contractor appointed to remove asbestos, does not begin removal without first obtaining the necessary permission from the Deputy Director of Labour and the Project Manager.

Barricading and screens

- 73) The Contractor provides and installs barricades and warning devices to ensure that equipment and persons are not exposed to danger or to prevent access to dangerous areas.
- 74) Additional to barricading, the Contractor installs screening, such as black plastic, on the roadside to keep dust away from the road. This is in the interest of transport safety.
- 75) All welding, flame cutting and grinding work is prohibited inside and directly outside the fabric filter plant area. All such work is done on ground level.
- 76) All gratings are covered with adequate protective screening when welding or flame cutting in the vicinity.

Housekeeping

- 77) The Contractors equipment does not impair the operation of the plant or access to the plant.

Vehicle Safety

- 78) No driver may disregard road signs, drive recklessly, exceed the speed limit, exceed the alcohol limit, or do anything contrary to the National Road Traffic Act while on Eskom business.
- 79) No driver may drive a vehicle while holding a cellular or mobile telephone or radio in one or both hands or with any other part of the body. A cellular or mobile telephone or radio equipment may only be used while driving if such telephone or radio device is fitted with a hands-free device, otherwise it must be switched off.
- 80) All drivers including contractor and contractor employees, when performing work for Eskom, must ensure that they and their passengers remain seated and wear seatbelts at all times.
- 81) No employee may be transported in the back of an open vehicle.
- 82) No driver should park a car in such a way that it will be a hazard to other road users.
- 83) No driver may use a vehicle without being authorised.
- 84) No employee is allowed to drive any Eskom-owned or scheme vehicle if not in possession of a valid national driver's licence as well as an Eskom driver permit.

1. Quality assurance requirements

- 1) All work will be carried out under the constant Supervision of an Experienced Competent Supervisor.

Topographical

Duvha Power Station is situated in the Mpumalanga Province in Bethal Road off the Johannesburg Witbank N12 motorway

Plant Area

North and South Lime Plant by the Cooling towers