



NEC3 Engineering & Construction Contract

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

and

For **Design and Construction of North Gate Parking
Facility**

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CONTRACT No.

Part C1: Agreements & Contract Data

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[to be inserted from Returnable Documents at award stage]

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[to be inserted from Returnable Documents at award stage]

C1.3 Proforma Guarantees

C1.1 Form of Offer & Acceptance

Offer

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

Kusile Power Station Design and Construction of North Gate Parking Facility

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

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

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

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

Signature(s)

Name(s) _____

Capacity _____

For the tenderer:

(Insert name and address of organisation)

Name & signature of witness

Date

Tenderer's CIDB registration number (if applicable)

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

Acceptance

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

The terms of the contract, are contained in:

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

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

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

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

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

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

Signature(s)

Name(s)

Capacity

**for the
Employer**

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

Name &
signature of
witness

Date

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

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

Note:

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

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

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

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

For the tenderer:

For the Employer

Signature _____

Name _____

Capacity _____

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

(Insert name and address of organisation)

Name & signature of witness _____

Date _____

C1.2 ECC3 Contract Data

Part one - Data provided by the *Employer*

Clause	Statement	Data
1	General	
	<p>The <i>conditions of contract</i> are the core clauses and the clauses for main Option</p> <div style="background-color: #cccccc; width: 100px; height: 60px; margin-bottom: 10px;"></div> <p>dispute resolution Option and secondary Options</p>	<p>B: Priced contract with bill of quantities</p> <p>W1: Dispute resolution procedure</p>
		<p>X2 Changes in the law</p> <p>X5: Sectional Completion</p> <p>X7: Delay damages</p> <p>X15: Limitation of <i>Contractor's</i> liability for design to reasonable skill and care</p> <p>X16: Retention</p> <p>X 18: Limitation of liability</p> <p>Z: Additional conditions of contract</p>
	<p>of the NEC3 Engineering and Construction Contract, April 2013 (ECC3)</p>	
10.1	<p>The <i>Employer</i> is (Name):</p> <p>Address</p>	<p>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</p> <p>Registered office at Megawatt Park, Maxwell Drive, Sandton, Johannesburg</p>
10.1	<p>The <i>Project Manager</i> is: (Name)</p> <p>Address</p>	<p>Kusile Power Station, R545 Balmoral/Kendal Road, Haartebeesfontein Farm, Witbank</p>

Tel

Fax

N/A

e-mail

10.1 The *Supervisor* is: (Name)

Address

**Kusile Power Station, R545 Balmoral/Kendal Road,
 Haartebeesfontein Farm, Witbank**

Tel No.

Fax No.

N/A

e-mail

11.2(13) The *works* are

Kusile Power Station Design and Construction of North Gate Parking Facility

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

1. **Dust Inhalation**
2. **Slip, Trip & Fall**
3. **Falling Objects**
4. **Electric Shock**
5. **Permit to Work**
6. **Working at heights**
7. **Quality**
8. **Time**

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

Kusile North Gate

11.2(16) The Site Information is in

Part 4: Site Information

11.2(19) The Works Information is in

Part 3: Scope of Work and all documents and drawings to which it makes reference.

12.2 The *law of the contract* is the law of

the Republic of South Africa

13.1 The *language of this contract* is

English

13.3 The *period for reply* is

3 days

2 The Contractor's main responsibilities

Data required by this section of the core clauses is provided by the Contractor in Part 2 and terms in italics used in this section are identified elsewhere in this Contract Data.

3 Time

11.2(3) The *completion date* for the whole of the works is

TBC

11.2(9) The *key dates* and the *conditions* to be met are:

<i>Condition to be met</i>	<i>key date</i>
1 Submit Programme for approval	2 Weeks after Kick off meeting
2 Submit QCP's	1 weeks after completed

		3	Submit safety file for approval	section works
			All tools & equipment to be used to be readily available and inspected	1 Week after kick off meeting
				As soon as safety file is approved

30.1	The <i>access dates</i> are:	Part of the Site	Date
		1	Kick Off Meeting
			After Contract Award
			Kusile Northgate security area
		2	Kusile Northgate parking area
			After Safety File Approval
			2 Days after Site Establishment and Permit to work approval

31.1	The <i>Contractor</i> is to submit a first programme for acceptance within	2 Weeks after the kick off meeting
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31.2	The <i>starting date</i> is	Contract Signature date
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32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than	5 days
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35.1	The <i>Employer</i> is not willing to take over the <i>works</i> before the Completion Date.	The takeover will be after the completion of all the works
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4 Testing and Defects

42.2	The <i>defects date</i> is	52 weeks after Completion of the whole of the works.
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43.2	The <i>defect correction period</i> is	10 days After the Contractor being notified
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5 Payment

50.1	The <i>assessment interval</i> is	On the 25th day of each successive month.
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51.1	The <i>currency of this contract</i> is the	South African Rand.
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51.2	The period within which payments are made is	4 weeks.
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51.4	The <i>interest rate</i> is	the publicly quoted prime rate of interest (calculated on a 365 day year) charged from time to time by the Standard Bank of South Africa Limited (as certified, in the event of any
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dispute, by any manager of such bank, whose appointment it shall not be necessary to prove) for amounts due in Rands and

(ii) the LIBOR rate applicable at the time for amounts due in other currencies. LIBOR is the 6 month London Interbank Offered Rate quoted under the caption "Money Rates" in The Wall Street Journal for the applicable currency or if no rate is quoted for the currency in question then the rate for United States Dollars, and if no such rate appears in The Wall Street Journal then the rate as quoted by the Reuters Monitor Money Rates Service (or such service as may replace the Reuters Monitor Money Rates Service) on the due date for the payment in question, adjusted *mutatis mutandis* every 6 months thereafter and as certified, in the event of any dispute, by any manager employed in the foreign exchange department of The Standard Bank of South Africa Limited, whose appointment it shall not be necessary to prove.

6 Compensation events

60.1(13) The place where weather is to be recorded is:

Kusile Power Station

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

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 *weather data* for each *weather measurement* for each calendar month are:

As stated in Annexure A to this Contract Data provided by the *Employer*.

Note: If this arrangement is used, delete the rows above for 60.1(13) and delete this note.

7 Title

8 Risks and insurance

80.1	These are additional <i>Employer's</i> risks	Late design approval, late equipment supply, and commencement of the works.		
9 Termination				
10 Data for main Option clause				
B	Priced contract with bill of quantities			
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	[•]		
	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		
	The person or organisation who will choose an arbitrator			
	- if the Parties cannot agree a choice or	the Chairman for the time being or his nominee of the Association of Arbitrators (Southern Africa) or its successor body.		
	- if the arbitration procedure does not state who selects an arbitrator, is			
12 Data for secondary Option clauses				
X2 Changes in the law				
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

		1	Project Execution & Commissioning & Hand Over Kusile Power Station Design and Construction of North Gate Parking Facility	TBC
X5 & X7	Sectional Completion and delay damages used together			
X7.1 X5.1	Delay damages for late Completion of the <i>sections</i> of the <i>works</i> are:	<i>section</i>	<i>Description</i>	<i>Amount per day</i>
		1	Project Execution & Commissioning & Hand Over Kusile Power Station Design and Construction of North Gate Parking Facility	1% of Total Prices per day
	Remainder of the <i>works</i>			
	The total delay damages payable by the <i>Contractor</i> does not exceed:	10% of the Total Prices		
	Limitation of the Contractor's liability for his design to reasonable skill & care			
	Retention (not used with Option F)			
X16.1	The <i>retention free amount</i> is	R0		
	The <i>retention percentage</i> is	5% for every assessment		
X18	Limitation of liability			
X18.1	The <i>Contractor's</i> liability to the <i>Employer</i> for indirect or consequential loss is limited to:	R0.0 (zero Rand)		
	For any one event, the <i>Contractor's</i> liability to the <i>Employer</i> for loss of or damage to the <i>Employer's</i> property is limited to:	the amount of the deductibles relevant to the event		
	The <i>Contractor's</i> liability for Defects due to his design which are not listed on the Defects Certificate is limited to	The greater of		
		• the total of the Prices at the Contract Date and the amounts excluded and unrecoverable from the Employer's assets policy for correcting the Defect (other than the resulting physical damage which is not excluded) plus the applicable deductible as at contract date.		
X18.4	The <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:	the total of the Prices other than for the additional excluded matters.		
		The Contractor's total liability for the additional excluded matters is not limited.		

		<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.
<p>X18.5</p>	<p>The <i>end of liability date</i> is</p>	<p>(i) [•] years after the <i>defects date</i> for latent Defects and</p> <p>(ii) the date on which the liability in question prescribes in accordance with the Prescription Act No. 68 of 1969 (as amended or in terms of any replacement legislation) for any other matter.</p> <p>A latent Defect is a Defect which would not have been discovered on reasonable inspection by the <i>Employer</i> or the <i>Supervisor</i> before the <i>defects date</i>, without requiring any inspection not ordinarily carried out by the <i>Employer</i> or the <i>Supervisor</i> during that period. If the <i>Employer</i> or the <i>Supervisor</i> do undertake any inspection over and above the reasonable inspection, this does not place a greater responsibility on the <i>Employer</i> or the <i>Supervisor</i> to have discovered the Defect.</p>
<p>Z</p>	<p>The <i>Additional conditions of contract</i> are</p>	<p>Z1 to Z15 always apply.</p>
<p>Z1</p>	<p>Cession delegation and assignment</p>	<p>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>.</p> <p>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.</p>
<p>Z2</p>	<p>Joint ventures</p>	<p>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.</p> <p>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.</p> <p>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.</p>

Z3

Z3.1 Change of Broad Based Black Economic Empowerment (B-BBEE) status

Z3.2 Where a change in the *Contractor's* legal status, ownership or any other change to his business composition or business dealings results in a change to the *Contractor's* B-BBEE status, the *Contractor* notifies the *Employer* within seven days of the change.

Z3.3 The *Contractor* is required to submit an updated verification certificate and necessary supporting documentation confirming the change in his B-BBEE status to the *Project Manager* within thirty days of the notification or as otherwise instructed by the *Project Manager*.

Z3.4 Where, as a result, the *Contractor's* B-BBEE status has decreased since the Contract Date the *Employer* may either re-negotiate this contract or alternatively, terminate the *Contractor's* obligation to Provide the Works.

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

Z4 Confidentiality

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

Z4.2 The *Contractor* does not disclose or make any information arising from or in connection with this contract available to Others. This undertaking does not, however, apply to information which at the time of disclosure or thereafter, without default on the part of the *Contractor*, enters the public domain or to information which was already in the possession of the *Contractor* at the time of disclosure (evidenced by written records in existence at that time). Should the *Contractor* disclose information to Others in terms of clause 25.1, the *Contractor* ensures that the provisions of this clause are complied with by the recipient.

Z4.3 If the *Contractor* is uncertain about whether any such information is confidential, it is to be regarded as such until notified otherwise by the *Project Manager*.

Z4.4 In the event that the *Contractor* is, at any time, required by law to disclose any such information which is required to be kept confidential, the *Contractor*, to the extent permitted by law prior to disclosure, notifies the *Employer* so that an appropriate protection order and/or any other action can be taken if possible, prior to any disclosure. In the event that such protective order is not, or cannot, be obtained, then the *Contractor* may disclose that portion of the information which it is required to be disclosed by law and uses reasonable efforts to obtain assurances that confidential treatment will be afforded to the information so disclosed.

Z4.5 The taking of images (whether photographs, video footage or otherwise) of the *works* or any portion thereof, in the course of Providing the Works and after Completion, requires the prior written consent of the *Project Manager*. All rights in and to all such images vests exclusively in the *Employer*.

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

Z5 Waiver and estoppel: Add to core clause 12.3:

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

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

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

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

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

Z8 Notifying compensation events

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

Z9 Employer's limitation of liability

- Z9.1 The *Employer's* liability to the *Contractor* for the *Contractor's* indirect or consequential loss is limited to R0.00 (zero Rand)
- Z9.2 The *Contractor's* entitlement under the indemnity in 83.1 is provided for in 60.1(14) and the *Employer's* liability under the indemnity is limited.

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

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

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

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

Z12 Ethics

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

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

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

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

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

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

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

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

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

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

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

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

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

Z13 Insurance

Z 13.1 **Replace core clause 84 with the following:**

Insurance cover 84

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

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

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

INSURANCE TABLE A

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

Z 13.2

Replace core clause 87 with the following:

The *Employer* provides the insurances stated in the Insurance Table B.

INSURANCE TABLE B

Insurance against or name of policy	Minimum amount of cover or minimum limit of indemnity
Assets All Risk	Per the insurance policy document

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

Z14 Nuclear Liability

- Z14.1 The *Employer* is the operator of the Koeberg Nuclear Power Station (KNPS), a nuclear installation, as designated by the National Nuclear Regulator of the Republic of South Africa, and is the holder of a nuclear licence in respect of the KNPS.
- Z14.2 The *Employer* is solely responsible for and indemnifies the *Contractor* or any other person against any and all liabilities which the *Contractor* or any person may incur arising out of or resulting from nuclear damage, as defined in Act 47 of 1999, save to the extent that any liabilities are incurred due to the unlawful intent of the *Contractor* or any other person or the presence of the *Contractor* or that person or any property of the *Contractor* or such person at or in the KNPS or on the KNPS site, without the permission of the *Employer* or of a person acting on behalf of the *Employer*.
- Z14.3 Subject to clause Z14.4 below, the *Employer* waives all rights of recourse, arising from the aforesaid, save to the extent that any claims arise or liability is incurred due or attributable to the unlawful intent of the *Contractor* or any other person, or the presence of the *Contractor* or that person or any property of the *Contractor* or such person at or in the KNPS or on the KNPS site, without the permission of the *Employer* or of a person acting on behalf of the *Employer*.
- Z14.4 The *Employer* does not waive its rights provided for in section 30 (7) of Act 47 of 1999, or any replacement section dealing with the same subject matter.
- Z14.5 The protection afforded by the provisions hereof shall be in effect until the KNPS is decommissioned.

Z15 Asbestos

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

- AAIA** means approved asbestos inspection authority.
- ACM** means asbestos containing materials.
- AL** means action level, i.e. a level of 50% of the OEL, i.e. 0.1 regulated asbestos fibres per ml of air measured over a 4 hour period. The value at which proactive actions is required in order to control asbestos exposure to prevent exceeding the OEL.
- Ambient Air** means breathable air in area of work with specific reference to breathing zone,

which is defined to be a virtual area within a radius of approximately 30cm from the nose inlet.

Compliance Monitoring	means compliance sampling used to assess whether or not the personal exposure of workers to regulated asbestos fibres is in compliance with the Standard's requirements for safe processing, handling, storing, disposal and phase-out of asbestos and asbestos containing material, equipment and articles.
OEL	means occupational exposure limit.
Parallel Measurements	means measurements performed in parallel, yet separately, to existing measurements to verify validity of results.
Safe Levels	means airborne asbestos exposure levels conforming to the Standard's requirements for safe processing, handling, storing, disposal and phase-out of asbestos and asbestos containing material, equipment and articles.
Standard	means the <i>Employer's</i> Asbestos Standard 32-303: Requirements for Safe Processing, Handling, Storing, Disposal and Phase-out of Asbestos and Asbestos Containing Material, Equipment and Articles.
SANAS	means the South African National Accreditation System.
TWA	means the average exposure, within a given workplace, to airborne asbestos fibres, normalised to the baseline of a 4 hour continuous period, also applicable to short term exposures, i.e. 10-minute TWA.

- Z15.1 The *Employer* ensures that the Ambient Air in the area where the *Contractor* will Provide the Services conforms to the acceptable prescribed South African standard for asbestos, as per the regulations published in GNR 155 of 10 February 2002, under the Occupational Health and Safety Act, 1993 (Act 85 of 1993) ("Asbestos Regulations"). The OEL for asbestos is 0.2 regulated asbestos fibres per millilitre of air as a 4-hour TWA, averaged over any continuous period of four hours, and the short term exposure limit of 0.6 regulated asbestos fibres per millilitre of air as a 10-minute TWA, averaged over any 10 minutes, measured in accordance with HSG248 and monitored according to HSG173 and OESSM.
- Z15.2 Upon written request by the *Contractor*, the *Employer* certifies that these conditions prevail. All measurements and reporting are effected by an independent, competent, and certified occupational hygiene inspection body, i.e. a SANAS accredited and Department of Employment and Labour approved AAIA. The *Contractor* may perform Parallel Measurements and related control measures at the *Contractor's* expense. For the purposes of compliance the results generated from Parallel Measurements are evaluated only against South African statutory limits as detailed in clause Z15.1. Control measures conform to the requirements stipulated in the AAIA-approved asbestos work plan.
- Z15.3 The *Employer* manages asbestos and ACM according to the Standard.
- Z15.4 In the event that any asbestos is identified while Providing the Services, a risk assessment is conducted and if so required, with reference to possible exposure to an airborne concentration of above the AL for asbestos, immediate control measures are implemented and relevant air monitoring conducted in order to declare the area safe.
- Z15.5 The *Contractor's* personnel are entitled to stop working and leave the contaminated area forthwith until such time that the area of concern is declared safe by either Compliance Monitoring or an AAIA approved control measure intervention, for example, per the emergency asbestos work plan, if applicable.
- Z15.6 The *Contractor* continues to Provide the Services, without additional control measures presented, on presentation of Safe Levels. The contractually agreed dates to Provide the Services, including the Completion Date, are adjusted accordingly. The contractually agreed dates are extended by the notification periods required by regulations 3 and 21 of the Asbestos Regulations, 2001.

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

C1.2 Contract Data

Part two - Data provided by the Contractor

Clause	Statement	Data
10.1	The <i>Contractor</i> is (Name): Address Tel No. Fax No.	
11.2(8)	The <i>direct fee percentage</i> is The <i>subcontracted fee percentage</i> is	% %
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:	CV's (and further key persons data including CVs) are appended to Tender Schedule entitled .
11.2(3)	The <i>completion date</i> for the whole of the <i>works</i> is	
11.2(14)	The following matters will be included in the Risk Register	
11.2(19)	The Works Information for the <i>Contractor's</i> design is in:	
31.1	The programme identified in the Contract Data is	
B	Priced contract with bill of quantities	

11.2(21)	The <i>bill of quantities</i> is in			
11.2(31)	The tendered total of the Prices is	(in figures) (in words), excluding VAT		
B	Priced contract with bill of quantities	Data for the Shorter Schedule of Cost Components		
41 in SSCC	The percentage for people overheads is:	%		
21 in SSCC	The published list of Equipment is the last edition of the list published by The percentage for adjustment for Equipment in the published list is	Minus %		
22 in SSCC	The rates of other Equipment are:	Equipment	Size or capacity	Rate
61 in SSCC	The hourly rates for Defined Cost of design outside the Working Areas are Note: Hourly rates are estimated 'cost to company of the employee' and not selling rates. Please insert another schedule if foreign resources may also be used	Category of employee		Hourly rate
62 in SSCC	The percentage for design overheads is	%		
63 in SSCC	The categories of design employees whose travelling expenses to and from the Working Areas are included in Defined Cost are:			

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

Document reference	Title	No of pages
C2.1	Pricing assumptions: Option B	
C2.2	The <i>bill of quantities</i>	

C2.1 Pricing assumptions: Option B

1. How work is priced and assessed for payment

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

Identified and defined terms 11
11.2

(21) The Bill of Quantities is the *bill of quantities* as changed in accordance with this contract to accommodate implemented compensation events and for accepted quotations for acceleration.

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

- the quantity of the work which the *Contractor* has completed for each item in the Bill of Quantities multiplied by the rate and
- a proportion of each lump sum which is the proportion of the work covered by the item which the *Contractor* has completed.

Completed work is work without Defects which would either delay or be covered by immediately following work.

(31) The Prices are the lump sums and the amounts obtained by multiplying the rates by the quantities for the items in the Bill of Quantities.

This confirms that Option B is a re-measurement contract and the bill comprises only items measured using quantities and rates or stated as lump sums. Value related items are not used. Time related items are items measured using rates where the rate is a unit of time.

2. Function of the Bill of Quantities

Clause 55.1 in Option B states, "Information in the Bill of Quantities 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 Bill, 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 Bill of Quantities. The Bill of Quantities is only a pricing document.

3. Guidance before pricing and measuring

Employers preparing tenders or contract documents, and tendering contractors are advised to consult the sections dealing with the bill of quantities in the NEC3 Engineering and Construction Contract Guidance Notes before preparing the *bill of quantities* or before entering rates and lump sums into the *bill*.

There is no general provision in Option B for payment for materials on Site before incorporation into the *works*. If secondary Option X14 Advanced payment has not been used then the tendering contractor may obtain the same effect by inserting appropriate items in the method related charges where the *method of measurement* allows, or alternatively making allowance in the rates of the *bill of quantities* for the financing of Plant and Materials until they are incorporated in the *works*.

When compensation events arise, the default position is that the Bill of Quantities is not used to calculate the cost effect of the event. Defined Cost and the resulting Fee is used and Defined Cost includes all components of cost which the *Contractor* is likely to incur, including so called P & G items. Rates and lump sums from the Bill of Quantities, or from any other source, may be used instead of Defined Cost and the Fee only if the *Contractor* and *Project Manager* agree. If they are unable to agree, then Defined Cost

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plus Fee is used.

4. Measurement and payment

4.1. Symbols

The units of measurement described in the Bill of Quantities are metric units abbreviated as follows:

Abbreviation	Unit
%	percent
h	hour
ha	hectare
kg	kilogram
kl	kilolitre
km	kilometre
km-pass	kilometre-pass
kPa	kilopascal
kW	kilowatt
l	litre
m	metre
mm	millimetre
m ²	square metre
m ² -pass	square metre pass
m ³	cubic metre
m ³ -km	cubic metre-kilometre
MN	meganewton
MN.m	meganewton-metre
MPa	megapascal
No.	number
sum	Lump sum
t	tonne (1000kg)

4.2. General assumptions

- 4.2.1. Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance has been made in the quantities for waste.
- 4.2.2. The Prices and rates stated for each item in the Bill of Quantities shall be treated as being fully inclusive of all work, risks, liabilities, obligations, overheads, profit and everything necessary as incurred or required by the *Contractor* in carrying out or providing that item.
- 4.2.3. An item against which no Price is entered will be treated as covered by other Prices or rates in the *bill of quantities*.
- 4.2.4. The quantities contained in the Bill of Quantities may not be final and do not necessarily represent the actual amount of work to be done. The quantities of work assessed and certified for payment by the *Project Manager* at each assessment date will be used for determining payments due.
- 4.2.5. The short descriptions of the items of payment given in the *bill of quantities* are only for the purposes of identifying the items. Detail regarding the extent of the work entailed under each item is provided in the Works Information.

4.3. Departures from the *method of measurement*

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4.3.1.

4.4. Amplification of or assumptions about measurement items

The following is provided to assist in the interpretation of descriptions given in the *method of measurement*. In the event of any ambiguity or inconsistency between the statements in the *method of measurement* and this section, the interpretation given in this section shall be used.

4.4.1.

C2.2 the bill of quantities

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ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ITEM 1				
1	PRELIMINARIES AND GENERALS				
	Fixed Items:				
1.1.1	Site Establishment for: Delivery of Office Converted Containers (3m x 12m)(1 Off)	Once Off	1		
1.1.2	Site Establishment for: Delivery of Kitchen Converted Container (3m x 6m)(1 Off)	Once Off	1		
1.1.3	Site Establishment for: Delivery of Ablution Container (3m x 9m)(1 Off)	Once Off	1		
1.1.4	Site Establishment for: Delivery of Storage Containers (3m x 12m)(1 Off)	Once Off	1		
1.1.3	Site Establishment for: Delivery of Grader (1 Off)	Once Off	1		
1.1.4	Site Establishment for: Delivery of Smooth roller (1 Off)	Once Off	1		
1.1.4	Site Establishment for: Delivery of TLB(1 Off)	Once Off	1		
1.1.5	De Establishment - Kitchen: 3m x 6m (1 Off)	Once Off	1		
1.1.6	De Establishment - Office Converted Containers (3m x 12m) (1 Off)	Once Off	1		
1.1.7	De Establishment - Ablution: 3m x 12m - 11 Toilet Split M/F (1 Off)	Once Off	1		
1.1.8	De Establishment - Storage Containers (3m x 12m) (1 Off)	Once Off	1		
1.1.3	De Establishment - Grader (1 Off)	Once Off	1		
1.1.4	De Establishment - 10 Ton Smooth roller (1 Off)	Once Off	1		
1.1.4	De Establishment- 4x4 TLB (1 Off)	Once Off	1		
1.1.11	Safety file	Once Off	1		
1.1.12	PPE	Per Person	38		
1.1.13	Medicals - Entry (Per Person)	Per Person	38		
1.1.14	Medicals - Exit (Per Person)	Per Person	38		
1.1.15	Security Clearance Certification (Per Person)	Per Person	38		
	Sub-total Item 1.1 (Fixed P&G Items) carried to Summary:				
1.2	Time Related Items:				
1.2.1	Rental of 4x2 Double Cab Bakkie (2 Off)	Monthly	20		

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1.2.2	Rental of 14 Seater Bus (2 Off)	Monthly	20		
1.2.3	Rental of 3 x 12m Office Converted Container (1 Off)	Monthly	10		
1.2.4	Rental of 6 x 3m Kitchen Converted Container (1 Off)	Monthly	10		
1.2.5	Rental of 3 x 12m Storage Container (1 Off)	Monthly	10		
1.2.6	Rental of Portable Flushable Toilet with handwash basin (To be serviced once a week) (1 Off)	Monthly	10		
1.2.7	Rental of Grader (1 Off)	Monthly	10		
1.2.8	Rental of 4 X 4 Backhoe Loader -TLB (1 Off)	Monthly	10		
1.2.9	Rental of 10 Ton Smooth Roller (1 Off)	Monthly	10		
1.2.10	Rental of 12 Cubed Tipper Truck (2 Off)	Monthly	20		
1.2.11	8 Ton Crane Truck	Monthly	5		
1.3	Trainings				
1.3.1	First Aid (Valid for 3 years)	Per Person	2		
1.3.2	Basic Fire Fighting (Valid for 2 years)	Per Person	2		
1.3.3	OHS Act (Valid for 2 years)	Per Person	2		
1.3.4	Legal Liability (Once Off) (2 Off)	Per Person	2		
1.3.5	Supervisory Safety (Valid for 2 years) (2 Off)	Per Person	2		
1.3.6	Planned Job Observation (Once Off)	Per Person	1		
1.3.7	HIRA (Valid for 2 years))	Per Person	1		
1.3.8	Incident Investigator (Valid for 2 years)	Per Person	1		
1.3.9	Training (Working at heights) (Per Person)	Per Person	21		
	Sub-total Item 1.2 (Time Related P&G Items carried to Summary:				
	Total Item 1 (Preliminary & General) carried to Summary:				
	<u>ITEM NO. 2</u>				
2.0	<u>RESOURCES</u>				
2.1	<u>DESIGN TEAM</u>				
2.1.1	Architect (Professional with SACA with 5 Years Relevant experience) (1 Off)	Hours	660		
2.1.2	Project /Site Manager (Professional with SACMP with 5 Years Relevant experience) (1 Off)	Hours	660		
2.1.3	Structural Engineer (Professional with ECSA with 5 Years Relevant experience) (1 Off)	Hours	660		
2.1.4	Civil Engineer (Professional with ECSA with 5 Years Relevant experience) (1 Off)	Hours	660		
2.1.5	Mechanical Engineer (Professional with ECSA with 5 Years Relevant experience) (1	Hours	660		

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	Off)				
2.1.6	Electrical Engineer (Professional with ECSA with 5 Years Relevant experience) (1 Off)	Hours	660		
2.1.7	Land Surveyor (Professional with SAGC with 5 Years Relevant experience) (1 Off)	Hours	660		
2.1.8	Safety Officer (Professional with SACPMP with 5 Years Relevant experience) (1 Off)	Hours	660		
2.1.9	Quantity Surveyor (Professional with SACQSP with 5 Years Relevant experience) (1 Off)	Hours	660		
2.1.10	Geotechnical Engineer (Professional with ECSA with 5 Years Relevant experience) (1 Off)	Hours	660		
2.1.11	Control and Instrumentation Engineer (Professional with ECSA with 5 Years Relevant experience) (1 Off)	Hours	660		
2.1.12	Draughts person (5 Years Relevant experience) (2 Off)	Hours	1320		
	Sub-total Item 2.1 (Design Team) carried to Final Summary:				
2.2	<u>CONSTRUCTION TEAM</u>				
2.2	Normal Hours				
2.2.1	Site Manager (5 Years Relevant experience) (1 Off)	Hours	1664		
2.2.2	Site Agent / Supervisor (5 Years Relevant experience) (1 Off)	Hours	1664		
2.2.3	Electrical Technician Trade (3 Years Relevant experience) (1 Off)	Hours	1664		
2.2.4	C&I Electrician Trade (3 Years Relevant experience) (1 Off)	Hours	1664		
2.2.5	Mechanical Technician Trade (3 Years Relevant experience) (1 Off)	Hours	1664		
2.2.6	Civil Electrician Trade (3 Years Relevant experience) (1 Off)	Hours	1664		
2.2.7	Structural Technician Trade (3 Years Relevant experience) (1 Off)	Hours	1664		
2.2.8	Safety Officer (3 Years Relevant experience) (1 Off)	Hours	1664		
2.2.9	Rigger (3 Years Relevant experience) (1 Off)	Hours	1664		
2.2.10	Document Controller (3 Years Relevant experience) (1 Off)	Hours	1664		
2.2.11	Storeman (3 Years Relevant experience) (1 Off)	Hours	1664		
2.2.12	Semi-skilled site support (3 Years Relevant experience) (4 Off)	Hours	6656		
2.2.13	General Labour (1-3 Years Relevant experience) (8 Off)	Hours	13312		
2.2.14	Driver (For 14 Bus Seater) (2 Off)	Hours	3328		
	Sub-total for item 2.2 (Normal Hours) carried to Final Summary :				

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2.3	Saturday Overtime				
2.3.1	Site Agent / Supervisor (5 Years Relevant experience) (1 Off)	Hours	258		
2.3.2	Electrical Technician Trade (3 Years Relevant experience) (1 Off)	Hours	258		
2.3.3	C&I Electrician Trade (3 Years Relevant experience) (1 Off)	Hours	258		
2.3.4	Mechanical Technician Trade (3 Years Relevant experience) (1 Off)	Hours	258		
2.3.5	Civil Electrician Trade (3 Years Relevant experience) (1 Off)	Hours	258		
2.3.6	Structural Technician Trade (3 Years Relevant experience) (1 Off)	Hours	258		
2.3.7	Safety Officer (3 Years Relevant experience) (1 Off)	Hours	258		
2.3.8	Rigger (3 Years Relevant experience) (1 Off)	Hours	258		
2.3.9	Document Controller (3 Years Relevant experience) (1 Off)	Hours	258		
2.3.10	Storeman (3 Years Relevant experience) (1 Off)	Hours	258		
2.3.11	Semi-skilled site support (3 Years Relevant experience) (4 Off)	Hours	1032		
2.3.12	General Labour (1-3 Years Relevant experience) (8 Off)	Hours	2064		
2.3.13	Driver (For 14 Bus Seater) (2 Off)	Hours	516		
	Sub-total item 2.3 (Saturday Overtime) carried to Final Summary :				
2.4	Overtime - Sundays and Public Holidays				
2.4.1	Site Agent / Supervisor (5 Years Relevant experience) (1 Off)	Hours	330		
2.4.2	Electrical Technician Trade (3 Years Relevant experience) (1 Off)	Hours	330		
2.4.3	C&I Electrician Trade (3 Years Relevant experience) (1 Off)	Hours	330		
2.4.4	Mechanical Technician Trade (3 Years Relevant experience) (1 Off)	Hours	330		
2.4.5	Civil Electrician Trade (3 Years Relevant experience) (1 Off)	Hours	330		
2.4.6	Structural Technician Trade (3 Years Relevant experience) (1 Off)	Hours	330		
2.4.7	Safety Officer (3 Years Relevant experience) (1 Off)	Hours	330		
2.4.8	Rigger (3 Years Relevant experience) (1 Off)	Hours	330		
2.4.9	Document Controller (3 Years Relevant experience) (1 Off)	Hours	330		
2.4.10	Storeman (3 Years Relevant experience) (1 Off)	Hours	330		
2.4.11	Semi-skilled site support (3 Years Relevant experience) (4 Off)	Hours	1320		
2.4.12	General Labour (1-3 Years Relevant experience) (8 Off)	Hours	2640		
2.4.13	Driver (For 14 Bus Seater) (2 Off)	Hours	660		
	Sub-total item 2.4 (Overtime - Sundays and Public Holidays) carried to Final Summary :				

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	Sub-total item 2 (Resources) carried to Final Summary :				
	<u>ITEM 3</u>				
3	<u>TOOLS AND EQUIPMENT</u>				
3.1	Tool Boxes	No	5		
3.2	Cable Tester	No	2		
3.3	Multimeter	No	1		
3.4	Fibre Splicing	No	3		
3.5	Hand Drills	No	5		
3.6	Grinders	No	3		
3.7	Welding tools	No	4		
3.8	Ladders	No	2		
	Sub-total Item 3 (Tools and Equipment) carried to Summary				
	<u>SECTION 2</u>				
	<u>ITEM NO. 1:</u>				
	<u>CONSTRUCTION</u>				
1.0	<u>PARKING</u>				
1.1	<u>Earthworks</u>				
1.1.1	Excavation for footing (500*500*350mm)	No	126		
1.1.2	Hardcore and compaction	m3	11		
1.1.3	25MPa Concrete	m3	11		
1.1.4	Steel Reinforcement rebars	kg	1 100		
1.1.5	Formwork to sides	m2	252		
1.2	<u>Supply and Compact of Sub-base material</u>				
1.2.1	150mm G9 Material under floors, steps, pavings, etc.	Ton	13 680		
1.2.2	150mm G7 Material under floors, steps, pavings, etc.	Ton	13 680		
1.2.3	150mm G5 Material under floors, steps, pavings, etc.	Ton	13 680		
1.2.5	125mm G4 Material under floors, steps, pavings, etc.	Ton	11 400		
1.3	<u>Asphalt Surfacing</u>				
1.3.1	30mm Asphalt surfacing	m2	48 000		
1.3.2	Prime coat	m2	48 000		
1.3.3	Tack coat	m2	48 000		
1.4	<u>Structural Steel</u>				
1.4.1	200 x 100 x 22, Hot rolled parallel flange 22.4kg/m Mild steel IPE 200 colum (2.4m long)	kg	6 774		
1.4.2	200 x 100 x 22, Hot rolled parallel flange 22.4kg/m Mild steel IPE 200 colum (6.5m long)	kg	36 691		
1.4.3	175 x 75 x 20 x 2.5mm Cold rolled lipped	kg	47		

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	channels, 6.31kg/m mild steel purlins		325		
1.4.4	80mm M8 expansion bolt	No	1 000		
1.4.5	M10 x 100mm long galvanised bolts drilled and 50mm epoxied into existing concrete	No	504		
1.4.6	350x350x10mm Base plate	No	126		
1.5	<u>Roof Structure and Coverings</u>				
1.5.1	Roof Sheeting - 0.8mm IBR	m2	6 875		
1.5.2	Roof fastener	No	5 000		
1.5.3	Box Gutters	m	500		
1.5.4	Downpipes	m	254		
1.6	<u>Stormwater Management</u>				
1.6.1	Stormwater channels	M	1 000		
1.6.2	Catch pits	No	168		
1.6.3	300mm Stormwater pipes	M	500		
1.7	<u>Painting</u>				
1.7.1	Standard Parking lines	m	6 518		
1.7.2	Arrow parking signs	No	120		
1.7.3	Warning signs	No	50		
1.7.4	Disabled parking sign	No	20		
1.8	<u>Electrical Installation</u>				
1.8.1	Excavation for cabling	m ³	300		
1.8.2	Backfill Materials	m ³	129		
1.8.3	35MPa Concrete	m ³	52		
1.8.4	Formwork	m ²	121		
1.8.5	Foundation bolts and templates suitable for highlight mast	No	10		
1.8.6	Grouting (Similar to Prostruct 531) to fill the space between the base plate and top of foundation plinth	No	10		
1.8.7	10mm Reinforcement Bar (Y10)	m	5 212		
1.8.8	16mm Reinforcement Bar (Y16)	m	35 222		
1.8.9	25mm Reinforcement Bar (Y25)	m	7 190		
1.8.10	30m High mast Pole Galvanised C/W 6 Way Bracket and Spike	No	10		
1.8.10	100W Eurolux Round Large grid bulbhead light	No	60		
1.8.11	4 Core 35mm ² Cu Conductors with galvanised SWA	m	500		
1.8.12	Single Drum Winch	No	10		
1.8.13	Hydraulic Power Tool with Remote	No	10		
1.8.14	Test Lead (5Pin, 16A, 8m long)	No	10		
1.8.15	4 Core 4mm ² Cu unarmoured	m	2 576		
1.8.16	3CR12 Connection Stubby Hinge Lockable to be mounted at Mast	No	10		
1.8.17	Energy Saving 600W LED Flood Light Fitting	No	60		
1.8.18	80A 25 kA (J25S) 3 Phase Circuit Breakers Mounted in MINISUBS/ Transformer	No	10		
1.8.19	Earthing Comprising of 2 x Earth-Spike (s) with 70mm-Square Bare-Copper-Earth-Wire	No	10		
1.8.20	Labelling including Tapes, Lugs, Ferrules, Staples, Bandit Strap	No	10		

DESIGN AND CONSTRUCTION OF NORTHGATE PARKING FACILITY AT KUSILE POWER STATION

1.8.21	Internal fibreglass DB with Photocell, Splinter box and 5c x 2.5mm trailing cable	No	10		
1.8.22	3-Pole MCB	No	10		
1.8.23	1-Pole MCB 20A	No	1		
1.8.24	1-Pole MCB 10A	No	10		
1.8.25	DP 30mA 40A	No	1		
1.8.26	3-Pole Contactor	No	1		
1.8.27	Connection of existing electrical line	item	1		
1.9	<u>Mechanical Installation</u>				
1.9.1	Supply, delivery, installation, connection, testing, and commissioning of a completely functioning hose reel installation as itemised below:				
1.9.2	50 mm diameter medium quality (SANS 62) black steel hose reel supply pipework including breaking in, elbows, fittings, hangers, offsets around structure, etc.	M	50		
1.9.3	25 mm diameter (horizontal main) medium quality (SANS 62) black steel hose reel supply pipework including breaking in, elbows, fittings, hangers, offsets around structure, etc.	M	60		
1.9.4	Hose reels with 30 metres of 25mm diameter approved hose and metal nozzle (not plastic) (Complete).	No	2		
1.9.5	5kg CO2 fire extinguishers fully installed on Varnished meranti backing boards	No	4		
1.9.6	9kg DCP fire extinguishers fully installed on Varnished meranti backing boards	No	4		
1.9.7	Connection of Mechanical services to existing services	Item	1		
	Sub-Total Item 1 (Parking) carried to Final Summary:				
	<u>ITEM NO. 2</u>				
	<u>GUARD HOUSE CONSTRUCTION (2.4 X 2.4m with ablution)</u>				
2.1	<u>Earthworks</u>				
2.1.1	Excavation for footing	m3	2		
2.1.2	Hardcore and compaction	m3	2		
2.1.3	25MPa Concrete	m3	3		
2.1.4	Steel Reinforcement rebars	kg	60		
2.1.5	Damp Proof Membrane	m2	6		
2.2	<u>Walls and Brickwork</u>				
2.2.1	230mm Bricks / Blocks	m2	20		
2.2.2	Brick force	m	80		
2.3	<u>Roof Structure and Coverings</u>				
2.3.1	Roof trusses (Timber/Steel)	Item	1		
2.3.2	Roof Sheeting - 0.8mm IBR	m2	7		
2.3.3	Roof fastener and flashings	Item	1		
2.3.4	Roof Insulation	m2	7		

DESIGN AND CONSTRUCTION OF NORTHGATE PARKING FACILITY AT KUSILE POWER STATION

2.4	<u>Doors and Windows</u>				
2.4.1	External Security door including frame	No	1		
2.4.2	Aluminium windows	No	2		
2.4.3	Internal door including frame and ironmongery	No	1		
2.4.4	Window and door buglar guards	No	4		
2.5	<u>Floor and Finishes</u>				
2.5.1	Floor Screed	m2	6		
2.5.2	Floor Tiles	m2	6		
2.5.3	Wall tiles	m2	1		
2.5.4	Ceiling (Gypsum/Board)	m2	6		
2.5.5	Internal and External plaster	m2	70		
2.5.6	Internal and External painting	m2	70		
2.6	<u>Plumbing</u>				
2.6.1	Toilet (WC)	No	1		
2.6.2	Wash Hand Basin and Tap	No	1		
2.6.3	PVC Drainage pipe & Fittings	m	4		
2.6.4	Wate Outlet and Traps	m2	1		
2.6.5	Waterproof to wet area	m2	3		
2.7	<u>Electrical and Mechanical Installation</u>				
2.7.1	Distribution Board	No	1		
2.7.2	Cable and Conduit	m	15		
2.7.3	LED Internal lights	No	2		
2.7.4	LED External bulkheads	No	3		
2.7.5	Switches and Socket	No	6		
2.7.6	Earthing System	Item	3		
2.7.7	12000 BTU air conditioner	No	1		
2.7.8	Analogue addressable optical smoke detectors	No	1		
2.7.9	Supply and installation of flexible galvanized steel conduit with steel couplings	M	100		
2.7.10	PH120 cabling of appropriate diameter for the wiring of fire detection system to specification. (PH-120 only – 1.0mm ² minimum - 2 core)	M	100		
	Sub-Total Item 2 (Guard House) Carried to Final Summary:				
	<u>ITEM NO. 3</u>				
	<u>FENCING</u>				
3.1	<u>Earthworks</u>				
3.1.1	Excavation for 500x500x900mm bases	No	141		
3.1.2	Disposal of excavated material	m3	32		
3.1.3	25MPa reinforced concrete bases (500x500x900mm)	m3	32		
3.1.4	Steel Reinforcement rebars	kg	1 200		
3.1.5	Formwork to sides	m2	100		
3.2	<u>Fencing</u>				

DESIGN AND CONSTRUCTION OF NORTHGATE PARKING FACILITY AT KUSILE POWER STATION

3.2.1	2.6m heavy-duty galvanized steel posts	No	141		
3.2.2	Gate posts (heavy-duty)	No	4		
3.2.3	Gate locking mechanism	No	2		
3.2.4	Y-Arms	No	141		
3.2.5	Anti-rust coating / galvanizing	Item	1		
3.2.6	2.6m high anti-climb fence panels (358 mesh or similar)	m	351		
3.2.7	Panel clamps & fixings	Set	1 000		
3.2.8	Anti-tamper bolts	No	423		
3.2.9	Double-leaf vehicular gate (6m wide x 2.6m high)	No	1		
3.2.10	Pedestrian gate (1.2m wide x 2.6m high)	No	1		
3.2.11	single strand barbed wire	m	351		
3.2.12	Barbed wire	m	351		
3.2.13	TITAN 4: four arm, full height, bi-directional single turnstile - Single turnstile - Polyester exterior grade powder coat - charcoal blue - Fail Secure with Biometric/fingerprint reader mounting bracket - Polyester exterior grade powder coat - charcoal blue and with Set of two batteries - 12V 7aH with connection leads .	No	2		
	Sub-Total for Fencing carried to Final Summary:				
	ITEM 4				
4	CCTV				
4.1	<u>Supply and Delivery of 128 - Channel NVR system, Software, monitoring Station, Fibre Network, & Cabling</u>				
1.1.1	<u>128 Channel NVR</u>				
4.1.1.1	32 GB memory; 16 TB storage, 2U,12 bay racking mount kit with locking bezel' 2 x USB Front, 2 x USB 3.0; 4 x RJ45 Network; 1 x VGA, Rear, 1 x VGA Front; 110/220 VAC 50/60 Hz Input Voltage; 110V/220V Auto Sensing; Average BTU rating = 880 BTU/Hr, peak 2800 BTU/Hr; Recording and Monitoring Performance: 380 fps @1080p, 1-way audio, 800 Mbps, Including NVR Software Licences	No	1		
4.1.2	<u>Software</u>				
4.1.2.1	Webserver, CCTV Software, Digital Video Splitter, Firewall	No	1		
4.1.3	<u>Monitoring Station</u>				
4.1.3.1	Windows PC with operating System, 2 x 24 inch screens & software	No	1		
4.1.3.2	Wireless Mouse	No	1		
4.1.3.3	HDMI Cable	No	1		
4.1.3.4	Back-up Storage	No	1		
4.1.3.5	2 kVA UPS	No	1		

DESIGN AND CONSTRUCTION OF NORTHGATE PARKING FACILITY AT KUSILE POWER STATION

4.1.4	<u>Fibre Network Switches</u>			
4.1.4.1	32-Port Ethernet Switch	No	1	
4.1.4.2	64-Port Ethernet Switch	No	1	
4.1.4.3	8-Port Ethernet Switch	No	2	
4.1.4.4	Fibre Network/Ethernet link	No	2	
4.1.4.5	12U Rack Cabinet IP55	No	1	
4.1.4.6	PSU 48VDC 3A Power Pack	No	2	
4.1.4.7	48V DC 9AH Rechargeable Sealed Battery	No	2	
4.1.5	<u>Cabling</u>			
4.1.5.1	4 mm2/4C/PCV/SWA/PVC Power Supply	M	80	
4.1.5.2	CAT 7/7A Network Cable ST Pure Copper Ethernet Cable	M	80	
4.1.5.3	12 Core 50/125 Multimode (Corrugated Steel Tape)	M	480	
4.1.5.4	10mm ² PVC Earth wire	M	80	
4.1.6	<u>Cable Termination</u>			
4.1.6.1	4 mm2/4C/PCV/SWA/PVC Cable termination	No	1	
4.1.6.2	Fibre optic Splicing (12 Core)	No	3	
4.1.6.3	Fibre Optic Flyleads	No	6	
4.1.6.4	CAT 7/7A RJ45 Termination	No	10	
4.1.6.5	10mm ² PVC PVC Earth Wire termination	No	5	
4.1.7	<u>Cable Routing</u>			
4.1.7.1	Galvanised Steel Conduit 20mm diameter	M	40	
4.1.7.2	Galvanised Steel Conduit PVC Round Boxes 1-4 way	M	6	
4.1.7.3	110mm 6m PE, pipe/sleeve, include sealing and draw wires	No	10	
4.1.7.4	OL 8300	m	60	
4.2.5.5	COC	no	1	
4.1.8	<u>Cameras</u>			
4.1.8.1	IR Fixed Bullet Camera 1/2.7"; CMOS Sensor 1080p or 5MP; WDR, IP Based, 3.6mm lens, 12VDC, IP 67 IP ONVIF	No	20	
4.1.8.2	Camera Enclosure	No	20	
4.1.8.3	Camera Dust Proof Junction Box	No	20	
4.1.8.4	Wall Mounted Bracket	No	20	
4.1.8.5	Camera lightning protection	No	20	
4.1.8.6	KKS Labelling	No	150	
	Sub-Total for CCTV carried to Final Summary:			
	<u>ITEM 5</u>			
5	<u>LANDSCAPING</u>			
5.1.1	Supply and Install landscaping on the unpaved areas	m2	220	
	Sub-Total for Landscaping carried to Final Summary:			
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DESIGN AND CONSTRUCTION OF NORTHGATE PARKING FACILITY AT KUSILE POWER STATION

	PRELIMINARIES AND GENERAL				
	RESOURCES				
	TOOLS AND EQUIPMENTS				
	PARKING				
	GUARD HOUSE				
	FENCING				
	CCTV				
	LANDSCAPING				
	Sub-Total for Fencing carried to Final Summary:				

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1 Description of the works

Introduction

Kusile Power Station was designed with a parking facility outside the access control building. However, the available parking does not have enough parking spaces to accommodate employee and visitor vehicles. Kusile is currently looking to appoint a suitable contractor to design, construct and commission parking facilities. These facilities shall accommodate light and heavy vehicles. A suitably qualified Contractor is required to undertake the design and construction of these facilities. The Contractor shall assume professional design liability and accountability for all the designs that will be provided to the Employer. The design and construction work is multidisciplinary and will include the following:

- Civil and Structures
- Electrical
- Low Pressure services (Fire System)
- Control and Instrumentation

Supporting Clauses

1) Purpose

The purpose of this document is to outline the project specifications for the intended *Works* at Kusile Power Station.

2) Applicability

This document shall apply to Kusile power Station

3) Effective date

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

b) Normative/Informative References

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

4) Normative

- [1] KUS-20251144: Kusile Power Station North Gate Parking Facility Concept Design Report
- [2] ISO 9001 Quality Management Systems
- [3] 240-53114002: Engineering Change Management Procedure
- [4] 240-53113685: Design Review Procedure
- [5] 240-53665024: Engineering Quality Manual
- [6] National Environmental Management Act, Act 107 of 1998
- [7] National Water Act, 1998 (Act No. 36 OF 1998)

- [8] 203-770: Kusile Concrete Specification
- [9] 240-56364545: Structural Design and Engineering
- [10] 240-85549846: Design of Drainage and Sewerage Infrastructure
- [11] 240-57127951: Standard for the Execution of Site Investigations
- [12] 240-76368574: High Security Mesh Fencing Standard
- [13] 0.90/137 – Kusile Power Station Layout
- [14] TRH 4 – Structural Design of Flexible Pavements for Interurban and Rural Roads
- [15] TRH16 – Traffic Loading for Pavement and Rehabilitation Design
- [16] TRH 17 – Geometric Design of Rural Roads
- [17] TMH 7: Code of Practice for the Design of Highway Bridges and Culverts in South Africa
- [18] TMH 16:South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual
- [19] SANRAL Pavement Engineering Manual, Second Edition 2014, Chapter 10
- [20] AASHTO. 1986. Guide for Design of Pavement Structures, American Association of State Highway and Transportation Officials
- [21] 240-54937450 - Eskom Fire Protection & Life Safety Design Standard.
- [22] SANRAL Geometric Design Guidelines South African Manual for Parking Standards, Department of Transport

5) Informative

- [1] 36-681: Eskom Plant Safety Regulations
- [2] 474-58 (Rev1): Document and Records Management
- [3] 240-105658000: Supplier Quality Management Specification
- [4] 146838-FS-00014 Kusile Power Station Undergrounds and Foundations layout Rev 42
- [5] KUS-20251058 Kusile Power Station Stakeholder Requirements Definition for North Gate Parking Facility Rev 1
- [6] KUS-20251144 Kusile Power Station North Gate Parking Facility Concept Design Report

Table 1: Employer Standards

Code	Description
Applicable Standards	
240-4332798	Engineering policy
240-5311685	Design Review Procedure
240-53114026	Engineering Change Management Procedure
240-71432150	Plant Labelling Standard
240-93576498	Coding Standard
240-76992014	Project/Plant Specific Technical Document and Records Management Work Instruction
240-65459834	Gx Projects Documentation Deliverable Requirements Specification
240-57127953	Execution of Site Preparation and Earthworks Standard
240-57127955	Geotechnical and Foundation Engineering Standard
240-107981296	Constructability Assessment Guideline Standard
240-56364545	Structural Design and Engineering Standard
203-770	Kusile Specification for Structural Concrete
240-86973501	Engineering drawing Standard
240-66920003	Documentation Management Review and Handover Procedure for Gx CoalProjects
203-103437	Technical Document Submission and Review Work Instruction
203-770	Kusile Power station specification for structural concrete
240-55714363	Coal Fired Power Stations Lighting and small power installation standard
240-93576498	KKS Coding Standard
240-56227443	Requirements for Control and Power Cables for Power Stations Standard
240-56356396	Earthing and Lightning Protection Standard
240-55714363	Coal Fired Power Stations Lighting and small power installation standard
BS EN 62676-4	Video Surveillance Systems for use in Security Applications
240-91190304 -	Specification for CCTV Surveillance with Intruder Detection

SANS 10222-5	Electrical Security Installations Part 5: CCTV installations
240-102220945	Specification for Integrated Access Control System (IACS) for Eskom sites
240-86738968	Specification for Integrated Security Alarm System for Protection of Eskom Install and Subsidiaries
240-55410927	Cyber Security Standard for Operational Technology
240-78980848	Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) for Protection of Eskom Installations and its Subsidiaries
240-64720986	Emergency Preparedness Public Address System – For Large Area Deployment
240-131050729	Hybrid Coding Standard
240-109607732	Eskom Plant labelling Abbreviation Standard
240-106365693	Standard for the External Corrosion Protection of Plant, Equipment and Associated Piping with Coatings

Table 2: Definitions

Definition	Explanation
Consultant	Service provider contracted to provide a specific service to Eskom, Kusile Power Station.
Controlled Disclosure	Controlled disclosure to external parties (either enforced by law, or discretionary).
Employer	Eskom, Eskom Kusile Power Station or representative
Services	Services on a project for which the <i>Consultant</i> is engaged
Subconsultant	Party employed by the Consultant for specialized work (i.e., Electrical, Mechanical and Civil and Structural installations)
Technical Specification	The document/s forming part of the contract which describe the method of executing the project scope works
Works	Activities on a project for which Contractors are under contract to perform including the supply of goods and equipment

Table 3: Abbreviations

Abbreviation	Explanation
CCTV	Closed Circuit Television
C&I	Control & Instrumentation
ECSA	Engineering Counsel of South Africa
EEPA	Emergency Exit Public Address
HVAC	Heating, Ventilation and Air Conditioning
ISO	International Organization for Standardization
ITP	Inspection, Testing Plan
LPS	Low Pressure Services
QA	Quality Assurance

QC	Quality Control
QCP	Quality Control Plan
SANS	South African National Standards
SAGC	South African Geomatics Council
SAQCC	South African Qualification and Certification Committee
SOW	Scope Of Work
UPS	Uninterruptible Power Supply
CBMS	Consolidated Building Management System
CoC	Certificate of Completion
NKP	National Key Point
OHS Act	Occupational Health and Safety Act
O&M	Operating and Maintenance
PEC	Professional Engineering Certificate
uPVC	Unplasticized Poly Vinyl Chloride

Description of the works

Executive Overview

The station intends to appoint a suitable external Consultant for engineering professional and construction services to undertake the design and construction of a parking facility for heavy vehicles and light vehicles to meet the end-user's needs. The Consultant shall take full liability for all their designs and Services provided to the Employer.

This section of the document provides the requirements and specification for the design and construction of the following facilities:

- a) Light vehicles covered parking
- b) Heavy vehicles parking
- c) Fencing, guardhouse and lockable gates.
- d) Walkways to access control building.
- e) Pavement design and modification of access roads.

The work includes but not limited to the following:

- a) **Architectural design**
 - Schematic designs and design concepts
- b) **Site investigations**
 1. Topographical Surveys
 2. Geotechnical investigations
 3. Underground services detection, etc.
 4. Traffic study for pavement design purposes

c) Civil & Structural

1. Structural Design and construction of Building elements
2. Structural design and construction of carport structures and associated elements
3. Pavement design and construction of parking and Access roads
4. Design and construction Fencing and locking gate systems
5. Design and construction of drainage systems (surface and sub-surface)
6. Design and construction of Sewage reticulation systems and associated water supply.
7. Landscaping

d) Electrical design and construction

1. Lighting and Small Power
2. Earthing and lightning protection

e) Low Pressure systems

1. Fire Protection
2. HVAC (where required)
3. Design and construction of potable water supply system

f) Control and Instrumentation systems

1. Design and construction of a Closed-Circuit TV (CCTV) cameras for monitoring of the parking areas
2. Design and implementation of Access Control System
3. Emergency Exit Public Address (EEPA) System

Codes and Standards

The scope of Services shall be done in accordance with SANS standards, prescribed Eskom standards and any other applicable codes of practice, specifications, and regulations. Reference to standards or manuals of any society, organization, or association, whether such reference is specific or by implication, shall mean the latest standard, manual, or code in effect at the time of the contract award. The Contractor adheres to the latest editions of the listed standards (where applicable) and normative references in section 2.1.4. If there is any contradiction within the codes and standards, the Contractor liaises with the Employer for clarification. The Contractor notes that the provided lists are not all-inclusive and do not relieve the Contractor from complying with all applicable design codes.

Roles and Responsibilities

Contractor

- a) Completes the *Works* as outlined in this works information and service agreement
- b) Ensures compliance with all requirements of the Occupational Health and Safety Act no 85 of 1993 and its regulations.
- c) Takes full professional accountability and liability for all temporary and permanent *Works*
- d) The *Contractor* is responsible to issue Professional Engineering Certificates and/or Certificates of Completion for the *Works*
- e) Ensures all employees are medically, physical and psychologically fit to perform the *Works*.
- f) Ensures all employees undergo the relevant training as per their function requirement.
- g) Ensures compliance with Eskom's SHE policy, procedures, standards, guidelines, specifications and site regulations.
- h) Ensures employees have a valid medical certificate of fitness specific to the work to be performed.
- i) Ensures employees are informed of hazards identified in the risk assessment before commencement of *Works*. The Method Statement shall also be communicated to the employees before commencement of *Works*.
- j) Ensures that all safety and health related incidents around site or working areas and threats that pose a danger to one's life or health are reported immediately.
- k) Ensures sufficient health and safety information as well as resources are made available.
- l) Ensures that all employees undergo safety induction on-site.
- m) Ensures that all power tools are inspected as and when required.
- n) Ensures that prescribed PPE for the specified works are worn at all times. The provision of PPE shall be the responsibility of the *Contractor*.
- o) Ensures that correct site drawings are obtained and communicated to the employees undertaking the *Works*.
- p) Provides adequate resources for the required *Works*
- q) Manages costs and the scheduled time frame for the *Works*
- r) Provides regular feedback on the status of the *Works* as requested

Employer

- a) Provides engineering support and information relevant to the scope of *works*
- b) Reviews and accepts the *Contractor's* design documentation, method statement procedure, QCP and ITP.
- c) Is present for all applicable points of the ITP and commissioning activities, where required.

Site Description

The Kusile Power Station site is located approximately 37km northwest of eMalahleni in the Mpumalanga Province. The site is accessed from the R686 road between highways, N4 and N12. The Employer has identified potential sites for the new facilities, for consideration. The Consultant shall be responsible for evaluating the suitability of the sites for the intended purpose

and Works. The Consultant shall identify alternative sites, where deemed necessary, and the sites shall suit project objectives and requirements.

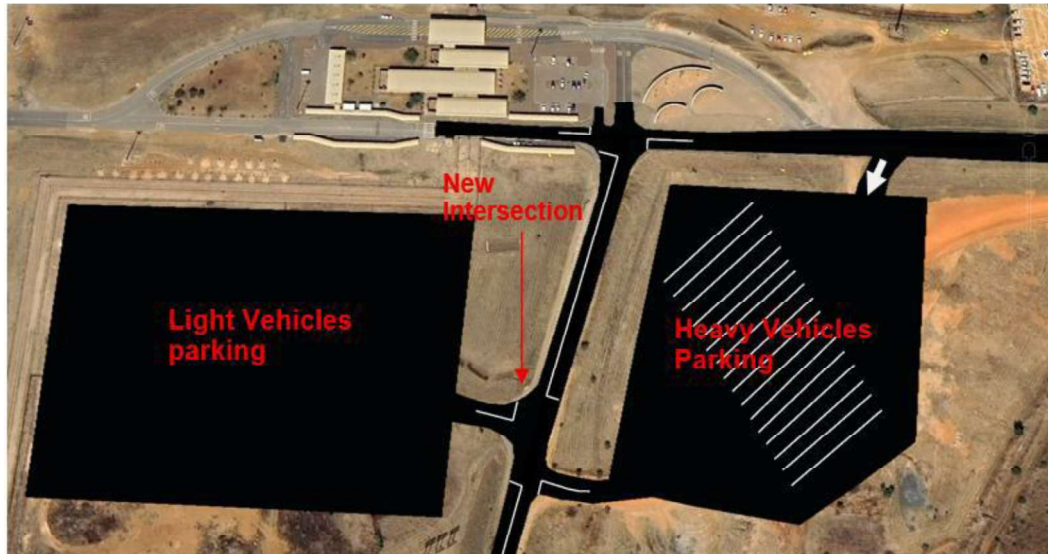


Figure 1: Proposed Locations of Facilities

General Scope of the Works

Description of the Services

The scope entails the following:

The Contractor provides engineering design services in accordance with the Engineering Profession Act, 46 of 2000, Guideline for Professional Fees: Scope of services and Tariff of Fees for Registered Persons as well as the construction, commissioning and certification of the approved designs

The scope includes the following but not limited to:

Design and construction of a new parking facility for light and heavy vehicles with all associated services and infrastructure.

The infrastructure includes but not limited to:

1. Structural design and construction
2. Sewage system
3. Pavement design of the parking facilities including associated traffic studies
4. Potable water supply system
5. Fire water supply system
6. Drainage (Surface and Sub-surface)
7. Small power & lighting
8. Fire protection
9. Security Control and Monitoring system
10. Access Control System

11. Closed Circuit Television (CCTV) Surveillance
12. Emergency Exit Public address (EIPA) systems
13. IT Infrastructure, etc.
14. Landscaping

The Contractor appoints and manages his Subcontractors for the scope of Services and construction works. The Consultant co-ordinates the work of discipline specific design Subconsultants as relevant and satisfies the relevant requirements of the National Building Regulations, Act 103 of 1977, amongst others. The Consultant co-ordinates interfaces to ensure design and construction integration for all components of the Works.

Inception

The Contractor liaises with the project team and stakeholders to assess and establish the user needs and client requirements.

The Contractor establishes the need for specialist advice, studies, tests, investigations, and surveys relevant to the scope of Services, including the appointment of such specialist resources and services.

The Contractor performs and co-ordinates all studies, tests and surveys required for the scope of works. The Consultant collates outputs of specialist studies, surveys, and advises on implications of the findings. The findings are reported and communicated to the Employer.

The Contractor assesses the existing infrastructural elements to ensure integration between existing and proposed new works.

The Contractor obtains, investigates, and collates available data and drawings relating to the scope of Services.

Basic and Detail design development

Employer will supply the concept designs that have been developed and the contractor shall further improve proposed concepts and develop the basic and detailed design from the concepts and proposed locations and required services

The Contractor develops the basic and detail designs and related documentation per the scope requirements. The Contractor ensures that the Employer requirements are fully met in the designs. The Contractor submits his detailed designs to the Employer for review and acceptance.

The Contractor incorporates the Employer's detailed requirements into the design.

The Contractor incorporates his Subcontractor's designs and requirements into the design.

The Contractor performs temporary and permanent design changes necessary to complete his designs. The Contractor submits the design changes to the Employer for review and acceptance.

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

All design reports, working or construction drawings prepared by the Contractor, are signed off by an ECSA Professionally registered Engineer who takes full professional accountability and liability for the designs.

The Contractor prepares detailed specifications for all components of Works for inclusion in the construction/installation scope of works. The Contractor defines amongst others, the performance, quality, operating and maintenance requirements etc. of the required services.

The Contractor prepares detailed construction/installation cost estimates.

Construction

The contractor shall carry out construction once all designs are approved by the employer

Construction works shall be supervised by a registered professional Engineer with the Engineering Counsel of South Africa (ECSA)

All construction works shall be executed with complete adherence to good practice industry standards.

Additional Services of the Project.

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

The Contractor performs all required topographical, analyses, tests and investigations necessary to carry out the Services.

Preparing record drawings related to alterations to works.

Development of as-built drawings and professional Engineering certification post construction works

Boundary of the Services

The extent of the works includes but not limited to the following:

The Contractor shall design and construct the following facilities but not limited to:

- 1-off Heavy vehicles parking
- 1-off Covered light vehicles parking with associated structures and other installations
- 1-off guardhouse and associated perimeter fencing will lockable access-controlled gates
- CCTV perimeter monitoring system
- Fire Protection system
- Modification of existing access roads to tie-in new facilities
- Lighting and power supply for the facility
- Tie-in of new services to existing services

Consultants Key Persons

The Contractor shall submit a detailed organogram of all the key project personnel of the principal contractor and his subcontractors. If the Contractor intends on making use of the services of a subcontractor/s for sections of the scope, the delegation of duties and responsibilities should be clearly indicated. The Contractor's key persons become a contractual obligation upon contract award. Any proposed change should be handled formally through a written request to the Employer for approval. Replacement personnel shall have the necessary competencies and experience as those initially appointed.

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

- a) Project Manager registered with SACPCMP.

- b) Architectural Professional professionally registered with the SACA, with 5 years related experience in architectural design. Resource has a formal engineering degree (or equivalent qualification) in the relevant discipline i.e., BSc/B.Tech (Architecture)/MArch,
- c) Structural Engineer, professionally registered with ECSA with 5 years related experience. Resource has a formal engineering degree (or equivalent qualification) in the relevant engineering discipline i.e., BSc/BEng/BTech/Meng, with demonstrable experience in structural design.
- d) Civil Engineer, professionally registered with ECSA with ECSA with 5 years related experience. Resource has a formal engineering degree (or equivalent qualification) in the relevant engineering discipline i.e., BSc/BEng/BTech/Meng, with demonstrable experience in civil design.
- e) Geotechnical Engineer, professionally registered with ECSA with 5 years related experience. Resource has a formal engineering degree (or equivalent qualification) in the relevant engineering discipline i.e., BSc/BEng/BTech/Meng, with demonstrable experience in conducting geotechnical site investigations and design.
- f) Electrical Engineer, professionally registered with ECSA with 5 years related experience. Resource has a formal engineering degree (or equivalent qualification) in the relevant engineering discipline i.e., BSc/BEng/BTech/Meng, with demonstrable experience in electrical system design.
- g) Mechanical Engineer/ Technologist, professionally registered with ECSA with 5 years related experience in the following:
 - Heating, Ventilation and Air Conditioning Systems
 - Wet services i.e., potable and fire systems
- h) C&I Engineer, professionally registered with ECSA with 5 years related design experience in the following: Access control systems
 - Closed Circuit Television (CCTV)
 - Fire detection systems
 - Public address systems
- i) Draughts persons to produce mechanical/civil/structural/architectural/C&I drawing designs, with 5 years draughting experience. Resource to have at least a Grade 12 qualification or equivalent.
- j) Professional quantity surveying service provider/s, in good standing with SACQSP. Resource to have 5 years working experience in engineering projects.
- k) Professional Land Surveyor professionally registered with the SAGC.
- l) Safety Officer
- m) Site Supervisor

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

Engineering Scope

Civil & Structural Scope

All relevant and applicable SANS standards shall be adhered to when executing the design and construction works. This shall include all relevant organizational standards as referenced in sections 2.2 and 3.2. Designs shall be practical, functional, feasible and aesthetically pleasing. The architecture of the parking facilities and other associated structures shall align to the existing station designs. The designs to integrate to the existing station systems and infrastructure, as far as possible.

The below figure depicts the proposed location of the parking facilities. The proposed locations are outside the bounds of the NKP, access for the parking areas will be from the contractor's yard road and will be located east of the access control building. It is important to note that the light vehicles parking will interface with a proposed induction building project. Fencing shall interface seamlessly with the existing station fencing.

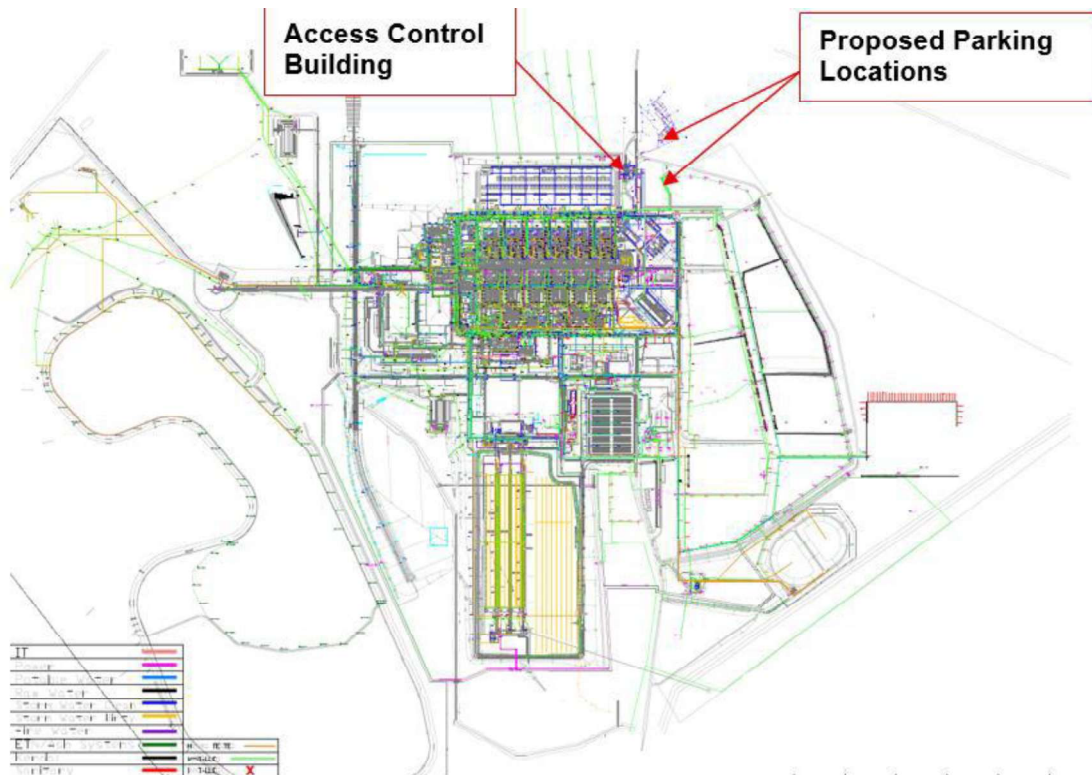


Figure 2: Proposed Location of parking facilities

Parking facilities Layout

The figure below represents the proposed layout of the parking facility which consists of a light vehicles parking area and a heavy vehicles parking area. The light vehicles parking area is a covered parking which consists of fencing, lockable gates and a guard house. The area will also accommodate a new building which is meant for induction purposes and is a future project.

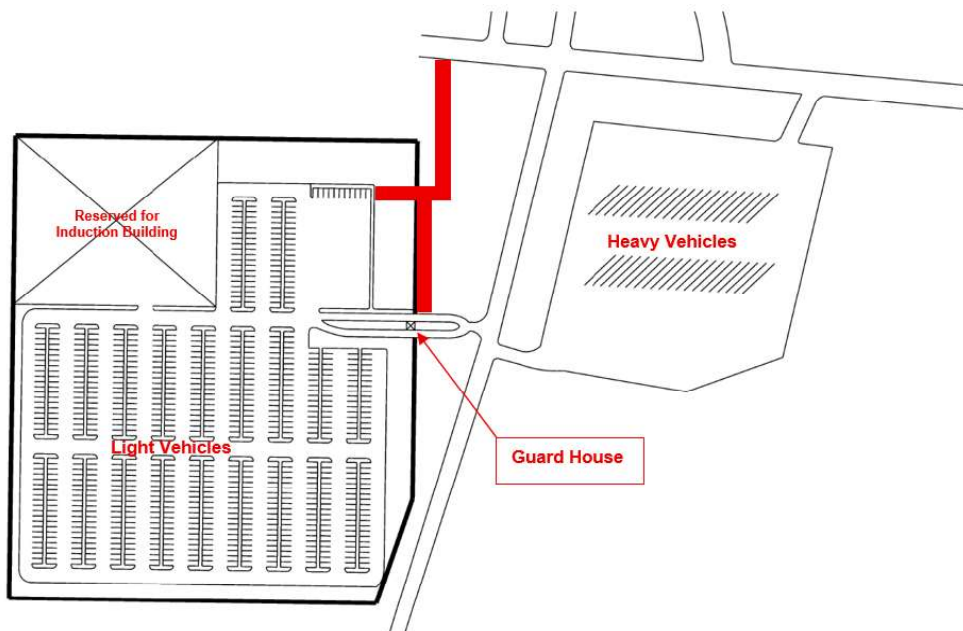


Figure 3: Parking Facilities Layout

Specifications of Parking Areas and user requirements

Heavy Vehicles Parking

- a) The heavy vehicles parking shall accommodate at least 30 heavy vehicles.
- b) The total allocated area for the heavy vehicles parking is 13 000m²
- c) Pavement shall be designed to consist of asphalt surfacing
- d) All associated drainage shall be design and constructed to discharge at the lowest point towards the stream and shall be graded to at least a 2% slope

Light Vehicles Parking

- a) The heavy vehicles parking shall accommodate at least 500 vehicles. With parking for minibus taxis and buses. The parking areas shall also be equipped with a drop off and pick-up zone that consists of covered walkways. The light vehicles parking shall consist of a covered walkway to the access control building.
- b) The total allocated area for the light vehicles parking is 35 000m²
- c) Pavement shall be designed to consist of asphalt surfacing
- d) All associated drainage shall be design and constructed to discharge at the lowest point towards the stream and shall be graded to at least a 2% slope. The drainage system shall interface accordingly with the existing drainage system.
- e) Each parking bay shall be 2.
- f) Parking Bay Dimensions 5m x 2.5m
- g) Parking bays shall also be designed for persons with disabilities.
- h) Isle Dimensions 3.5m per lane (total 7m)
- i) All pedestrian walkways shall consist of interlocked block paving surfacing and the pavement layers designed accordingly in line with the associated guidelines and standards.

- j) The **carport structures** shall be designed in accordance with relevant SANS standards to carry wind loading, self-weight, live loads as well as loading of 20kg per 1.7m² to accommodate future installation of domestic solar panels. The carport structures shall be sloped at an angle of 29°. The structure shall be similar to proposed structure below with associated drainage systems.

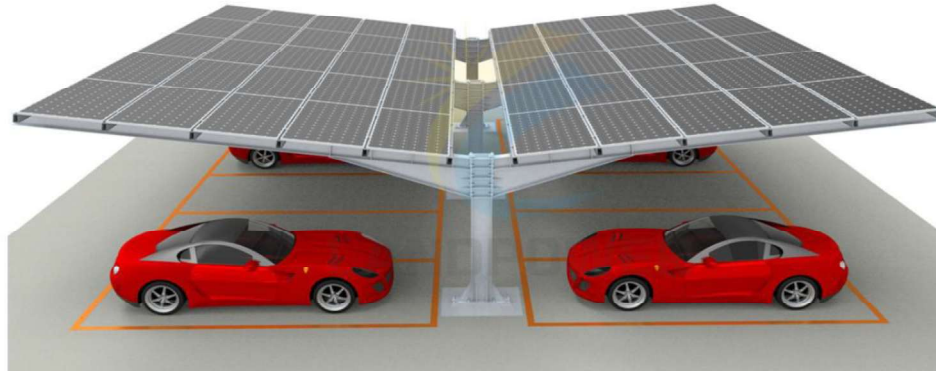


Figure 4: Proposed Carport Structure

Fencing: the fencing shall interface with existing perimeter fencing and shall have a minimum height of 2.6m and an installed barbwire. Poles are to be mounted in concrete and as per figure 7 below to a depth of at least 700mm. the fencing shall be anti-cut and Anti-climb, total length of perimeter fencing is 350m. Lockable gates shall also be provided in the design and construction works.

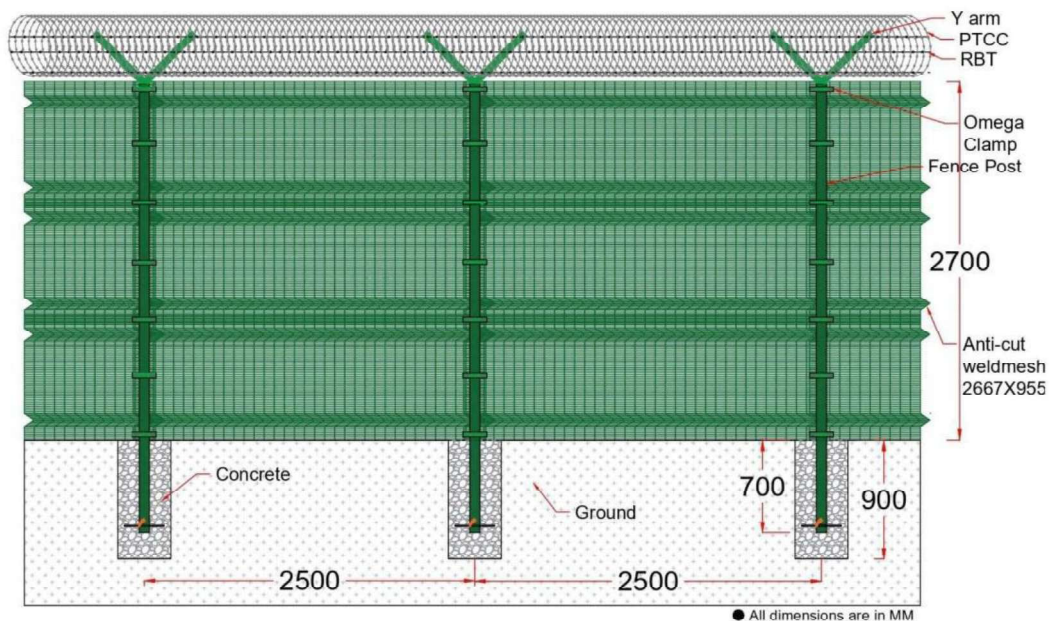
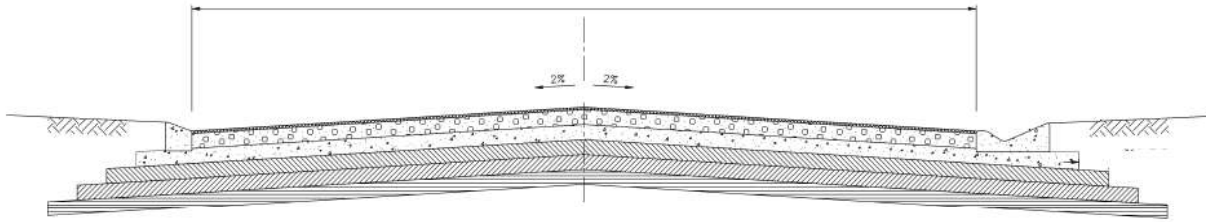


Figure 5: Fencing General Arrangement

The driveways layer works shall be as per general illustration figure below



1. Figure 6: Proposed Layer works

The pavement layers are therefore selected as follows:

- a) 30mm asphalt surfacing
- b) 125mm G4 Material
- c) 150mm G5 Material
- d) 150mm G7 Material
- e) 150mm G9 Material

1. A 4-way intersection is proposed between the parking facilities and the existing contractors yard road. For the proposed intersection, there is a possibility of a traffic congestion in the morning and during knock off time. To eliminate the risk of a traffic congestion, it is required that a detailed traffic study be conducted in the design phase and determine if there is a need for widening the road. These findings are to be incorporated in the design and once approved be implemented in the construction phase of the project.
2. All associated drainage shall be designed and constructed by the contractor in line with relevant standards.

Geotechnical Investigation

The Contractor conducts a geotechnical investigation to characterize the soil condition/properties of the proposed project site, to permit acceptable designs and construction of the Works. The Contractor submits to the Employer a report on the findings from the conducted investigation. The content of the written report must confirm what is pointed out in the investigation/s and if necessary, discussed with the Employer, highlight the extent and location of the investigation area.

Surveys

The Contractor conducts topographical surveys necessary to complete his designs for the project sites. The surveys services shall also be utilized during the construction phase to ensure that the designs are implemented accordingly. The Contractor submits to the Employer a report on the findings from the conducted surveys. The report findings, if necessary, are discussed with the Employer.

Landscaping and Access Roads

The Contractor performs the landscaping design for the new facilities to create an aesthetically pleasing environment. The landscaping should preserve and enhance the architectural and natural features of the surroundings. The access roads shall be interfaced with existing access roads.

Corporate Identity requirements

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

Electrical Scope

The contractor shall design and construct lighting for the parking facilities and LED lights are preferred for lighting purposes. The lights are to be mounted on 30m mast structures. The lighting structures shall be designed to be similar to the proposed arrangement in the below figure. These structures are to be mounted on a reinforced concrete foundation designed for the respective loading. Additional lighting shall be designed and mounted on carport structures to improve visibility in the covered areas.

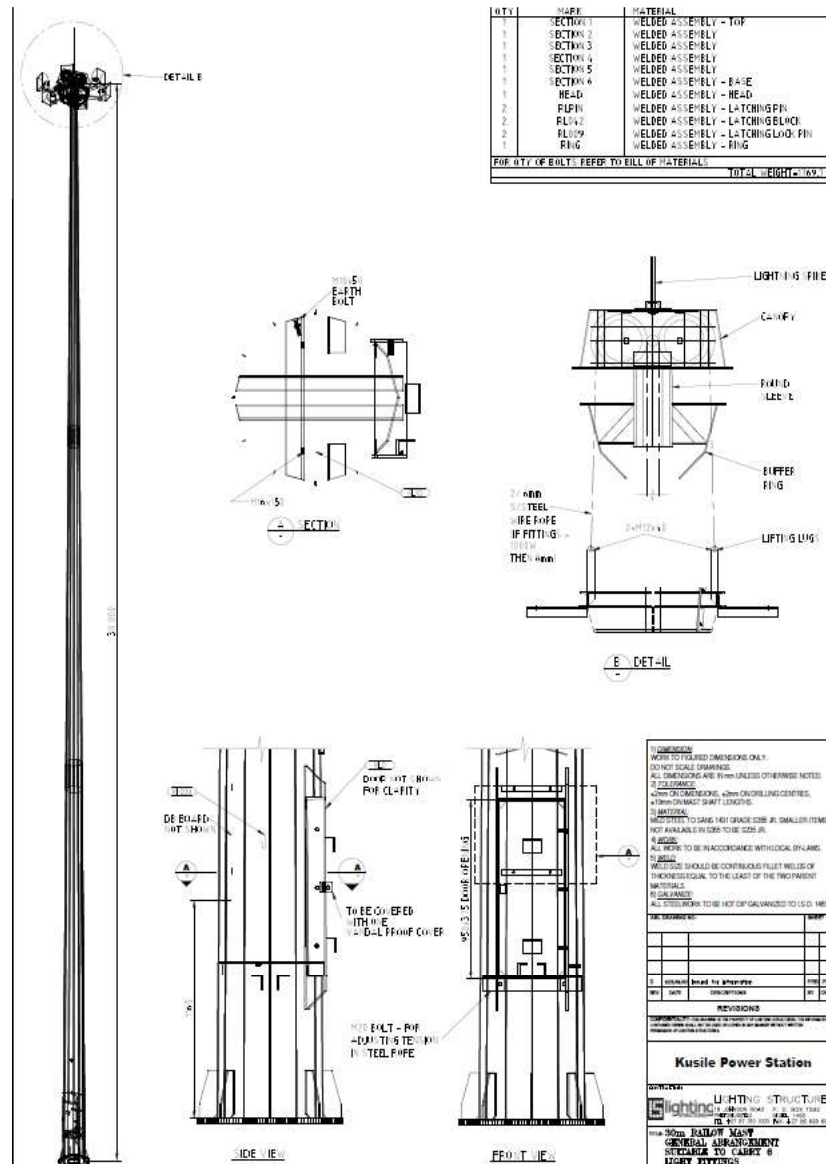


Figure 7: Proposed lighting structures

The scope of Services includes the following:

- a) Electrical Supply:
 1. Provisions are made for sufficient power supply to meet the demands of the facilities.
 2. The Contractor coordinates with electrical Contractors to establish designated supply points near the selected locations.

- b) Lighting Systems:

1. All light sources to be installed must be LEDs for both covered and uncovered areas to ensure visibility and safety. The Contractor adheres to design and construction specifications and safety standards for efficient illumination.
 2. Guardhouse shall be fitted with lighting and shall be standardized with lighting installed on similar structures in the station
- c) Earthing Systems:
1. Implementation of effective earthing systems to protect personnel and equipment from electrical faults and lightning strikes.
 2. Utilization of high-quality materials and techniques to ensure proper grounding throughout the facility.
- d) Cable Routing:
1. Planning and implementation of efficient cable routing strategies to minimize interference, maximize reliability, and ensure ease of maintenance.
 2. Utilization of cable racks, trunking, conduits, and appropriate labelling to organize and protect electrical cables.
- e) Site Assessment:
1. The Contractor conducts a thorough assessment of existing electrical infrastructure and identifies areas requiring modification or expansion.
- f) Planning, Design and Construction:
1. Develop detailed electrical plans in coordination with engineering teams to ensure seamless integration with existing infrastructure.
 2. Implement design inline with associated design and construction standards.

Control & Instrumentation Scope

Consolidated Building Management System

The control and instrumentation scope includes but not limited to the design and implementation of the following:

- a) Access Control
- b) CCTV system
- c) Public address system

There is a CBMS system already existing in the station. The CBMS is based on the Honeywell EBI architecture. The CCTV portion of the CBMS is based on the DVM VMS. The modifications to be made under the project may impact on the existing CBMS systems.

The CBMS covers Access Control, CCTV, HVAC interface, Fire Detection and Public Address System.

The following are the Consultant's duties:

- a) The Contractor designs in detail the below listed systems to ensure monitoring, operation, and administration capability from the existing CBMS. In cases where newer technology is available which the Consultant proposes for use, the Consultant states this clearly in the design. Both hardware and software aspects of the systems are designed, nothing more.
- b) An electronic Integrated Access Control System (ACS) based on the existing Honeywell Tema Server TS02 technology.
- c) CCTV system covering the perimeter of the parking and any other blind spot areas (as per user requirement). The system is interfaced to the existing DVM CCTV system.
- d) A Public Address system running over the EBI infrastructure utilizing network speakers.
- e) An appropriate Fire Detection System complying to SANS10139. A Honeywell hardware platform is required.
- f) Independent Back-Up Power Systems which will satisfy the requirements of all systems' design standards.
- g) Network for integrating all sub-systems (Switches, cabling etc.)

1. Familiarizes themselves with the existing CBMS in the areas where modifications will be made under this project.
2. Identifies and collects all drawings required to perform the work.
3. Indicates where civil and/or other changes made under this project will impact the existing CBMS.
4. Indicates where changes to the existing CBMS have been made due to the civil and/or other changes under this project.
5. Ensures that changes to the existing installations do not lead to non-conformance of the installations to applicable design standards e.g., in the case where a smoke detector needs to be moved, it will be moved to a position where it will conform to SANS 10139.
6. Prescribe construction/installation methodology for their design to maintain adherence to the applicable standard.
7. Marks-up drawings of the existing CBMS installations to indicate where changes will be required. Provides marked up drawings as part of the CBMS design.
8. Reviews the entire design(s) (new and modified installations) and confirms that they meet applicable design codes and standards.
9. Ensures that the design of the Fire Detection System is performed by parties who have been found competent as Designers of Fire Detection Systems, compliant to SANS10139:2012. SAQCC or FDIA issued certificates of Competence are required.

Mechanical Scope

Fire Protection

The scope for the fire protection system includes:

Design and construction of a fire protection system that interfaces with existing infrastructure

The following requirements shall be adhered to:

- a) The user of the standard, 240-56737450 shall follow the deemed to satisfy approach. SANS 10400 sets out the different possible ways of demonstrating compliance with functional regulations, including a range of prescriptive provisions that are “deemed to satisfy”. If a design is complaint to SANS10400 and any of the normative SANS, documents referenced within, then the design can be classified as deemed to satisfy.
- b) The Contractor shall perform a Rational Fire Design where the South African National Standards does not address a specific fire risk or area of plant. This will require referral to codes of practise i.e., NFPA etc.
- c) The person who using this document, 240-56737450, for the purpose of designing the Fire Protection systems, must be a competent person as specified in the National Building Regulation [NBR], section A19 and AZ4.
- d) The Employer requires that the person undertaking the design shall have at least the following qualifications:
 - Bachelor’s degree in engineering or higher
 - Registered Professional Engineer with ECSA
 - At least 4 years of experience in fire engineering
- e) Fire Suppression Systems (if any) shall adhere to standard 240-56737450: Fire Protection and Life Safety Design Standard.
- f) The responsible Contractor shall be responsible for the following:
 1. Design fire protection system for the parking facilities and guardhouse.
 2. Coordinate with structural and architectural plans to integrate system components seamlessly into the design.
- g) Fire Rated Construction:

The Contractor ensures compliance with local codes and regulations regarding fire resistance ratings for doors, walls, and floors.

h) Documentation and Compliance:

The Contractor maintains detailed documentation of all fire protection systems, including design reports, drawings, etc.

i) Emergency Evacuation Planning

The Contractor develops an emergency evacuation plan detailing evacuation route, assembly areas, and procedures for occupants in the event of a fire.

j) Construction and Commissioning

The contractor shall construct and commission the fire system in line with Employer's requirements.

Sub-Contracting Services

The Contractor submits the name of each proposed Subcontractor to the Employer for acceptance. The Contractor does not appoint a proposed Subcontractor until the Employer has accepted him. The Contractor submits the proposed conditions of contract for each subcontract to the Employer for acceptance unless an NEC contract is proposed, or the Employer has agreed that no submission is required. The Contractor does not appoint a Subcontractor on the proposed subcontract conditions submitted, until the Employer has accepted them.

Engineering and the Consultant's Design

Employer's Design

The extent of the Employer's design is as described in the Employer's drawings and proposed layouts of the facility. The Employer will make available all the available and required available native files to the Contractor to enable completion of his designs, design reviews, construction and updating of the Employer's drawings.

Parts of the Works Which the Contractor is to Design and Construct.

Responsibility for Design

- a) The Contractor provides designs that are fit for purpose and in accordance with relevant standards, regulations, and sound engineering principles.
- b) The Contractor assumes full design accountability and liability for his designs.
- c) An ECSA Professionally Registered Engineer signs off all designs, design reports and construction design drawings, as-built drawings prepared by the Contractor and his Subcontractor.
- d) The Contractor is responsible for the design of all temporary Works required for implementation.
- e) Where the Contractor requires additional information to design certain components of the Works, the contractor notifies the Employer of the requirement/s timeously.
- f) The Employer may review, and will only accept, the Contractor's designs. The responsibility to ensure compliance remains with the Contractor.
- g) All changes required for construction or manufacturing, that impact or change the Employer's design is redlined on drawings by the Contractor. The redline drawings include notes for clarification purposes. The Contractor submits the redlined drawings to the Employer for acceptance.
- h) The Contractor is mandated in terms of Construction Regulations 2014: Duties of Designer, 6(1) g to fulfil the duties described therein or the detailed designs done by the Consultant.

Any risks associated with the Contractor's design is highlighted to the Employer together with the mitigation measures.

- i) The Contractor submits design reports, for all his designs, to the Employer for his acceptance. Design reports to include the following as a minimum:
- Design philosophy
 - Assumptions made with regard to the design.
 - Design criteria/ parameters used.
 - List of applicable codes and literature that was used in the design.
 - Design results and calculations for all elements
 - Software input and output files including design models.
 - Materials used; and
 - Submit Operation and Maintenance Manuals, where applicable.
- j) Submit multidisciplinary detailed design drawings for the full scope of work, capturing all necessary details.

System Interface & Design Integration

- a) The Contractor is responsible for all system interfaces which form part of the project scope. The Contractor caters for all the identified interfaces, taking into consideration all packages required. The Contractor's design considers all existing services ensuring no clashes with existing infrastructure.
- b) The Contractor is responsible for all interfaces that form part of the scope and shall cater for these in his design and construction scope.
- c) The Contractor notes that the project areas have existing services. The Contractor shall avoid any clashes with existing services as well as cater for this in his design.

Use of the Contractor's Design

The Contractor, as specified in this Works Information, supplies all design documentation for the Works to the Employer. The Contractor notes that all design documentation supplied to the Employer become the property of the Employer upon completion of the Works. *The* Contractor notes that the Employer has total rights to use the Consultant's design, as the Employer requires. The ensure that the approved designs are implemented inline with associated codes and standards.

Contractor's Programme

- a) The Contractor submits to the Employer, a level 4 single integrated programme for the design and construction scope.
- b) The Contractor submits an electronic copy of his programme in MS Project (MPP) format.
1. The Starting date and completion date
 2. Order and timing of activities which the Contractor is to perform in order to provide the services.
 3. For each activity, a statement of how the Contractor plans to perform the services, identifying the resources required to perform the activity.
- c) The Contractor to make the following provisions in his programme:
1. Time allowance for receiving information to be provided by the Employer.
 2. Time risk allowances
 3. Health and safety requirements

Submission Of Revised Programmes and Progress Reporting

Revised Programme

The Contractor submits his revised programme bi-weekly or as instructed by the Employer. The Contractor indicates on each revised programme:

- a) Actual progress achieved on each project activity and its effect on the timing of the remaining work.
- b) Management of delays encountered etc.

Monthly Progress Report

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

- a) Executive summary (narrative identifying major movement within the reporting period).
- b) Revised Programme indicating, actual progress of work against last Accepted Programme.
- c) A one-month look ahead work window.
- d) Activities completed, activities in progress during current reporting period and Critical Path activities report.
- e) Key issues and risks of concern and mitigation actions.
- f) Early warning and Compensation Event Register
- g) Report selecting all the activities of the Employer and Others
- h) Resource Schedule Histogram.
- i) Statement and report on work ahead and behind progress.
- j) Resource Plan.

Procedure for Submission and Acceptance of Contractor's Design

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

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

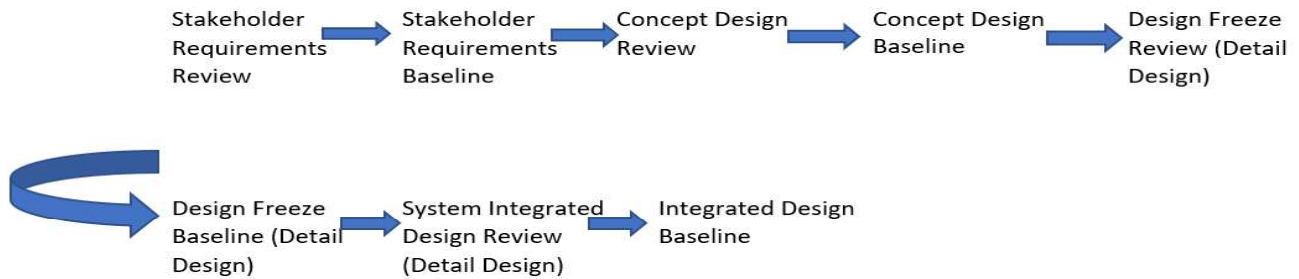
The following documentation review process is followed for submission of documents:

- The *Contractor* submits the documents to the *Project Manager* for review. The *Contractor* shall allow the *Project Manager* 21 days to review and respond to the *Contractor's* document submission i.e., from time of receipt by the *Project Manager*
- The *Employer's* project team reviews the documents and submit all comments to the *Project Manager*. On receipt of the reviewed documentation, the *Contractor* makes any modifications requested by the project team and resubmits the revised documents to the *Project Manager* within two (2) weeks of receipt. Queries regarding comments/changes made by the *Employer's* project team are addressed with the *Project Manager* prior re-submittal of documentation. Document re-submittals which have not included the comments identified, will be returned to the *Contractor* for correction. The *Contractor* shall re-issue the revised documentation incorporating all comments and details not included in the previous document issue, within 2 (two) working days of receipt.

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

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

The design review process follows the below process flow;



Change Management

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

Acceptance of the *Contractor's* Design

The *Contractor* implements the following for design acceptance:

- The *Employer* accepts the *Contractor's* design upon completion of reviews by the *Employer's* project team.
- The *Contractor* stamps, dates and signs his designs, to signify approval of his designs.
- The *Contractor* informs the *Employer* in writing of any deviation in the *Contractor's* drawings, from the scope requirements.

Other Requirements of the *Contractor's* Design

Construction & Commissioning Monitoring

The *Contractor* provides construction and commissioning supervision in accordance with Level 4 of the ECSA Guideline Scope of Services and Tariff of Fees for Registered Persons [Engineering Profession Act, 2000, (Act No. 46 of 2000)]. The *Works* include the provision of on-site personnel during construction, as deemed necessary by the *Contractor*. These services shall be required for the duration of the *Works*. The duties of the *Contractor* are detailed below but not limited to the following:

- Perform technical oversight of the project i.e., respond to technical queries during construction and commissioning activities including but not limited to the review of construction work procedures, quality control plans, material approvals, survey approvals, requests for information, concessions, data books etc.
- Monitor construction and commissioning activities to ensure compliance with the project scope requirements
- Management of project interfaces etc.

Site Supervision

The *Contractor* provides a full-time construction supervision team on site for construction and commissioning activities. The following key responsibilities shall apply:

- Supervise and report on *Contractor's* performance;

- Submit daily diaries/daily progress reports to the *Employer*
- Should 24-hour construction monitoring be required, additional resources will be required to manage the work load
- Comply to all *Employer* and site related governance and safety, health, environment, risk requirements

As-built Drawings, operating manuals and maintenance schedules

As-built Drawings

The *Contractor* provides “As Built” drawings/documentation for all his designs. The designs to embody all modifications made during construction. “As Built” documentation to be provided for the entire project scope i.e., Architectural, Civil & Structural, Mechanical, Electrical and C&I works etc.

Drawings issued to the *Employer* will be a minimum of one hardcopy and an electronic copy. The *Contractor* is required to submit drawings electronically in both native CADD format and PDF format. Drawings issued to the *Employer* may not be “Right Protected” or encrypted.

Operating Manuals and Maintenance schedules

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

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

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

Construction

Temporary works, Site services & construction constraints

General

The *Contractor* duties include the following:

- Submits a cost proposal for the *Works*
- Submits a project specific safety file to the *Employer* for acceptance, prior to the start of *Works*
- Submit a detailed level 4 schedule for the works to the *Project Manager* for acceptance after contract award
- Manage his activities on site to ensure that no interference takes place between his work and that of others.

- Supply to the *Employer*, all consumer power requirements, potable water requirements and any other termination interface requirements that are required to complete the *Works*
- The *Contractor* confirms the available space in the site area for construction of the *Works* taking note of all existing services, pipes, structures, and any obstructions to the
- The *Contractor* to furnish all material, labour, and equipment necessary to perform and complete the *Works*.
- Provides a detailed Construction Method Statement for all work activities and details the activity durations. All method statements are reviewed and accepted by the *Employer* prior commencement of the *Works*. The *Contractor* in his method statements includes the following as a minimum:
 - A comprehensive construction methodology of the project activities.
 - A clear description of the responsibilities of the *Contractor's* personnel involved in the activity,
 - Health, safety and quality control considerations for the activity.
 - All plant, equipment and machinery required to complete the project activity.
 - Temporary works to be used for the *Works*.
 - Technical Data Sheets for all materials used including product description, composition, material and performance properties, installation, application procedures and product use limitations etc.
 - Plans for confining, collecting, and disposing of waste materials as a result of removal operations, where applicable.
 - *Works* required to safeguard existing infrastructure and services
- The *Contractor* shall arrange for all required test works for process control.
- The *Contractor* is responsible for quality control and management of the assigned *Works*
- The *Contractor* submits as-built drawings for all the components of the finished *Works* to the
- The *Contractor* shall compile and submit a data package for the completed *Works*. The documentation shall include but not limited to the following:
 - Construction drawings used to execute the *Works*
 - Approved construction method statement, QCP/ITPs
 - Material certificates/data sheets

Surveying and Setting Out of the *Works*

- a) The *Contractor* is responsible for the complete surveying and setting out of the *works* including establishment and protection of any benchmarks required to complete the *works*.
- b) The *Contractor* is required to submit as-built and/or red-line data and drawings of the completed *works* to the *Project Manager* upon handover. As-built drawings are submitted in PDF and native CAD (.DGN) formats.
- c) The *Contractor* is responsible for the verification of all survey data relating to setting out and to immediately inform the *Project Manager* of any discrepancies as soon as these are discovered.
- d) The final position of the new infrastructure i.e., ablution block, guardhouse, potable and fire water infrastructure is determined by the *Contractor* with the ideal location indicated on the issued drawings.

Site Preparation & Clearance

The *Contractor* shall prepare the site for construction by clearing, removing and disposing of all unsuitable material and obstructions not forming part of the *Works*. The construction works include the removal of ~700m of razor mesh fencing and preparation of the site along the fencing line. The *Contractor* adheres to the latest revision of the *Employer's* Execution of Site Preparation and Earthworks Standard [19], SANS 1200 series and SANS 2001 BE1. The *Contractor* shall be responsible for the disposal of all waste within the construction area. All excavated excess or unsuitable materials shall be disposed of at a designated spoil site. Hazardous waste shall be disposed of at a registered waste disposal site, to be approved by the *Employer*.

Excavations and Associated Water Control

Excavations & Scanning of Underground Services

No excavations are permitted without an excavation permit obtained from the *Project Manager*. The *Contractor* complies with the requirements of the Construction Regulations, Execution of Site Preparation and Earthworks [19] and the Kusile Trench and Excavation Procedure [203-13626]. Scanning of underground services shall precede all excavation works. The *Contractor* performs geophysical assessments for detection of subsurface utilities, prior undertaking excavations. The geophysical scanning method employed is at the discretion of the *Contractor*. The *Contractor* therefore considers the work area prior to selection of test methodology and equipment. The *Contractor* submits the results of the scans to the *Project Manager* and indicates possible services which may interfere with the *works*. The *Contractor* shall obtain all relevant drawings, indicating the position of potential underground services around the work area. Care shall be taken by the *Contractor* to properly demarcate and protect all underground utilities. If any service or structure is damaged by the *Contractor*, that should have been located or protected by the *Contractor*, the *Contractor* shall be liable for the repair works. All excavation *works* shall be carried out in accordance with the SANS 1200 series and SANS 2001 BE1.

Water Control on the Works

The *Contractor* is responsible for the control of water during construction including the dewatering of excavations, to ensure the safety of the *Works*. The *Contractor* provides, operates and maintains all required equipment for this purpose i.e., pump equipment, well points etc. The *Contractor* is responsible for the design, construction and maintenance of all temporary drainage controls i.e., sumps, drains, trenches and any other temporary works that may be necessary for the dewatering and protection of the permanent *Works*.

The *Contractor* re-instates temporary drainage controls, when no longer required. The *Contractor* is responsible for the repair of damaged *Works* caused by floods, water, or failure of any part of the dewatering and flood protection controls. The *Contractor's* attention is drawn to the fact that, during rain events and seasons, high water tables may be encountered on site. The cost of the protection works, including rectification of damages, shall be borne by the *Contractor*.

Temporary Works

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

Completion, Testing, Commissioning and Correction of Defects

Testing Requirements

The *Contractor* shall be responsible for all testing of the *Works*. The *Works* shall be tested in accordance with the latest standards and procedures as outlined in the South African National Standards (SANS) as well as other applicable codes of practice. The cost of testing undertaken by the *Contractor* in terms of his obligations under the contract including the taking of samples, reinstating where samples have been taken and all testing equipment, labour, materials, etc. must be included in the rates tendered for and will not be paid for separately.

The following tests are conducted by the *Contractor* but not limited to:

- Field and laboratory testing associated with the construction works i.e., concrete and earthworks. Below is a list of tests that the *Contractor* shall perform on soil samples, as a minimum:
 - Identification tests - Atterberg Limits and Sieve analysis
 - Soil compaction tests i.e. moisture/density relationship at Modified AASHTO compaction effort and California Bearing Ratio (CBR)

Laboratory Testing

All laboratory testing is conducted in accordance with the latest standard methods and procedures as outlined by the appropriate authorities (B.S/ Euro Code equivalent, A.S.T.M, A.A.S.H.T.O, I.S.R.M, S.A.B.S / S.A.N.S).

Materials facilities and samples for test and inspections

- a) The *Contractor* provides all materials, facilities and/or samples required for all tests and inspections.
- b) The *Employer* reserves the right to call for samples of equipment offered to inspect the workmanship as the work proceeds and either accepts or rejects the equipment or workmanship. The *Contractor* remains fully liable to provide complete and proper working plant.

1) Miscellaneous Materials and Services

The *Contractor* makes provision for the following but not limited to:

- Erection tools, special tools and test equipment required for erection, testing, startup, and operation of the equipment, including shipping/delivery costs to and from the jobsite.
- Construction services, storage facilities, and utilities specified herein.
- Other miscellaneous materials and services required to complete the work that is not specifically indicated herein.
- Provision of construction power and temporary lighting, including designing, furnishing, erecting, maintaining, and removal thereof, when no longer required
- Supply, install and remove all temporary support structures.

- Survey and lay out the work from the *Employer's* or Project Field Manager's designated control points.
- All welding materials, equipment and consumables required for attachment of equipment, piping, or structural steel furnished under these specifications.
- Protection of existing underground utilities, foundations, buildings, and equipment.
- Solvents and cleaning materials.
- Hazardous Material Safety Data Sheets (MSDS) for all materials supplied by *Contractor*.
- Construction consumables.
- Supply, surface preparation and application of painting and galvanizing of all *Contractor*-furnished piping and structural steel, in accordance with Eskom Standard SSZ_45-17, Medupi Power Station Corrosion Protection Specification.
- Touch-up prime and touch-up finish paint all furnished painted piping, piping attachments and accessories, and structural steel members. *Contractor* shall furnish all materials required for surface preparation and painting. No touch-up galvanizing will be permitted except to exposed threads after assembly or per *Employer* review and approval. Materials shall be re-dipped if touch up galvanizing is required.
- Restoration of *Contractor* damage to the site.
- Furnish and install symbolic safety signs per SANS 1186 for *Contractor* installed equipment.
- Maintenance of accurate as-built drawings for all erection work and delivery of final as-built drawings to the *Employer*.
- Attendance at coordination meetings at the site at a time selected by the *Employer* to discuss matters relative to the execution of this contract.
- Initial and final fill of oils, greases, and other lubricants to equipment installed by the *Contractor*.
- Grout, pour concrete, set, align and erect all furnished pipe support foundations that are to be installed under this contract, including foundations, foundation bolts, and bolt sleeves, *Contractor* shall furnish and erect for all pipe support foundations all grouting materials and the placing thereof.

Pre-Commissioning Tests and Commissioning

- The *Contractor* is responsible for all commissioning activities of mechanical, electrical and C&I systems, installed by the *Contractor*, including but not limited to the planning, provision of labour, plant, material, equipment and supervision of the activities. Commissioning activities are performed in accordance with the On-Site Commissioning for Low Pressure Systems Standard [240-56356376] etc.
- The *Contractor* shall perform all tests as required by Sections or Clauses of the *Works Information* and all tests required by the *Employer's* Specifications annexed thereto, and all tests required by any applicable South African National Standard, or other Standard, and/or as directed by the *Employer's* and the *Project Manager*.

- Commissioning procedures are prepared by the *Contractor* for each plant system. The procedures are reviewed and approved by the *Employer* prior commencement of activities.
- The *Contractor* shall supply all relevant test equipment, monitoring devices etc. required to test and commission the complete *Works*.
- Accurate records of commissioning and test activities are submitted as part of handover documentation.

Factory Acceptance Testing

The *Contractor* shall perform all routine factory tests on selected electrical and mechanical plant, as required by the *Employer*. FATs are performed at the supplier's premises before equipment is despatched to site. The *Contractor* provides test reports, certificates and any other statutory documentation, where applicable, for applicable equipment. The test reports contain the following information as a minimum:

- Technical data of component
- Test type/method
- Test evaluation results

Performance Testing

The *Contractor* carries out performance tests on selected electrical and mechanical equipment, as required by the *Employer*. Performance tests are performed at the supplier's premises before dispatchment of equipment to site. The *Contractor* prepares and submits for review and acceptance, testing procedures, Quality Control Plans and the acceptance criteria, prior commencement of tests. A representative of the *Employer* shall witness the performance tests but in doing so, the *Contractor* notes that the *Employer* assumes no responsibility or accountability for the proper functionality of plant or equipment. The *Contractor* arranges with the *Project Manager* for witnessing of test activities. The *Contractor* submits all test certificates and/or records for the test activities. The *Contractor* to supply all labour, materials, plant, and equipment for this purpose.

Site Acceptance Tests

The *Contractor* performs site acceptance testing for selected plant and equipment, as required by the *Employer*. SATs are performed at the *Employer's* premises and witnessed by a representative of the *Employer*. Installations shall be comprehensively tested and commissioned as individual and integrated systems as may be required by the configuration, after completion of *Works*. The *Contractor* shall provide adequate and competent personnel for testing and commissioning activities, for the full duration of the commissioning process. The *Contractor* to supply all labour, materials, plant, and equipment for the required tests. The *Contractor* notes that witnessing of tests by the *Employer*, shall only be made after the *Contractor* has pre-commissioned the equipment and satisfied himself that it is in working or running order.

The *Contractor* arranges with the *Project Manager* for the witnessing of test activities. The *Contractor* submits all test certificates/records as well as any prescribed statutory documents, where applicable, certifying that the equipment is in complete working order. Where required, the

Contractor to provide the initial fill of oil/lubrication/grease and any other consumables, for the commissioning and test activities.

Commissioning Procedures and Programme

The *Contractor* submits to the *Project Manager*, a detailed programme of the planned commissioning activities at least 14 days before commissioning commences. The commissioning programme to include the following but not limited to:

- A schedule of equipment to be commissioned, the proposed tests to be conducted and the testing methods
- Commissioning check sheets
- Commissioning programme dates and duration.

Access for Correction of Defects

Should the *Contractor* need to return to the site after completion of the *works* to conduct an improvement or repair, the *Contractor* arranges all resources, plant and equipment required to

Plant and Materials standards and workmanship

Materials, Workmanship and Products

- Materials and Workmanship

Only new and undamaged materials are to be used in the *Works*. Materials to be permanently installed into the *Works* are not to be used for any temporary purposes on site. Work is required to be for the acceptance of the *Employer* and is executed in accordance with the relevant manufacturer's written recommendations and instructions.

Civil engineering and structural works

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

Structural steelwork

The *Contractor* adheres to the latest issue of the listed standards/codes/publications. The *Contractor* notes that the list is not all-inclusive and does not relieve the *Contractor* from complying with all applicable codes.

Table 4: List of Applicable Standards for Structural Steelwork

Code	Description
SANS 121	Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods
SANS 455	Covered electrodes for manual arc welding of carbon steels
SANS 517	Light Steel Frame Building
SANS 657	Steel tubes for non-pressure purposes
SANS 679	Zinc chromate primers for steel
SANS 681	Undercoats for paints
SANS 684	Structural steel paint
SANS 1273	Fasteners for roof and wall coverings in the form of sheeting
SANS 1465	Steel castings for general engineering applications
SANS 1700	Fasteners
SANS 1921-3	Construction and management requirements for works contracts, Part 3: Structural steelwork
SANS 2001-CS1	Construction works Part CS1: Structural steelwork
SANS 3834	Quality requirements or fusion welding of metallic materials
SANS 4042	Fasteners – Electroplated coatings
SANS 10044	Welding
SANS 10064	The preparation of steel surfaces for coating
SANS 10085	The design, erection, use and inspection of access scaffolding
SANS 10094	The use of high-strength friction grip bolts
SANS 10104	Hand railing and balustrading (safety aspects)
SANS 10120	Code of practice for use with standardised specifications for civil engineering construction and contract documents
SANS 10162	The structural use of steel
SANS 10177	Fire testing of materials, components and elements used in buildings
SANS 10237	Roof and side cladding
SANS 10400	The application of the National Building Regulations
SANS 10684	Fasteners – Hot dip galvanized coatings
SANS 14399	High strength structural bolting assemblies for preloading
SANS 14713	Protection against corrosion of iron and steel in structures – zinc and aluminium coatings – guidelines (ISO 14713)
SANS 15609	Specification and qualification of welding procedures for metallic materials – welding procedure specification
SANS 15614	Specification and qualification of welding procedures for metallic materials – welding procedure test
SANS 16961	Petroleum, petrochemical and natural gas industries – Internal coating and lining of steel storage tanks
SANS 23279	Non-destruction
SANS 50025	Hot rolled products of structural steels
SANS 50028	Flat products made of steels for pressure purposes
SANS 50219	Cold formed welded structural hollow sections of non-alloy and fine grain steels Part 1 – Technical delivery
EN 10210-1	Hot finished structural hollow sections of non-alloy and fine grain steels – Part 1: Technical delivery requirements
EN 10210-2	Hot finished structural hollow sections of non-alloy and fine grain structural steels – Part 2: Tolerances, dimensions and sectional properties
ANSI/AWS A5.1/A5.1M	Specification for carbon steel electrodes for shielded metal arc welding

Code	Description
ANSI/AWS A5.17/A5.17M	Specification for carbon steel electrodes and fluxes for submerged arc welding
ANSI/AWS A5.18/A5.18M	Specification for carbon steel electrodes and rods for gas shielded arc welding
ANSI/AWS A5.20	Specification for carbon steel electrodes for flux cored arc welding
ASTM A 6/A 6Mb	Standard specification for general requirements for rolled structural steel bars, plates, shapes and sheet piling
ANSI/AWS D1.1/D1.1M	Structural welding code – steel
BS 4-1	Structural steel sections – Part 1: Specification for hot-rolled sections
DIN 1026-1	Hot rolled steel channels – Part 1: Taper flange steel channels - dimensions, masses and sectional properties
EN 10024	Hot rolled taper flange I sections – Tolerances on shape and dimensions
EN 10025-2	Hot rolled products of structural steels – Part 2: Technical delivery conditions for non-alloy structural steels
EN 10034	Structural steel I and H sections – Tolerances on shape and dimensions
EN 10056-2	Structural steel equal and unequal leg angles – Part 2: Tolerances on shape and dimensions
ISO 8501-1	Preparation of steel substrates before application of paints and related products – Visual assessment of surface cleanliness – Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of precious coatings

Corrosion protection

The *Employer* uses extracts and variations from SANS 1200HC as part of the *Employer's* requirements, even though this standard has been withdrawn. All corrosion protection conforms to the requirements of 240-106365693 'Standard for the External Corrosion Protection of Plant, Equipment and Associated Piping with Coatings' as a minimum. The *Contractor* adheres to the latest issue of the listed standards/codes/publications. The Contractor notes that the list is not all-inclusive and does not relieve the Contractor from complying with all applicable codes.

Table 5: List of Applicable Standards for Structural Steelwork

Code	Description
34-1658	Distribution Standards – Part 0: Corrosion Protection Specification for New Indoor and Outdoor distribution Equipment, components, materials and structures manufactured from steel
240-106365693	Standard for the External Corrosion Protection of Plant, Equipment and Associated Piping with Coatings
ASTM E376	Measuring coating thickness by magnetic field or eddy current electromagnetic test methods
ASTM D4541	Standard method for pull-off strength of coatings using portable adhesion testers
ISO 12944	Paint and varnishes – Corrosion protection of steel structures by protective paint systems
ISO 4624	Paints and varnishes – Pull-off test for adhesion
ISO 4628	Paints and varnishes
ISO 8501-1	Preparation of steel substrates before application of paints and related products - Visual assessment of surface cleanliness – Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous

Code	Description
	coatings
ISO 8501-4	Preparation of steel substrates before application of paints and related products - Visual assessment of surface cleanliness – Part 4: Initial surface conditions, preparation grades and flash rust grades in connection with high-pressure water jetting.
ISO 8502-3	Preparation of steel substrates before application of paint and related products – Tests for the assessment of surface cleanliness-Part 3: Assessment of dust on steel surfaces prepared for painting (pressure sensitive tape method).
ISO 8503-4	Preparation of steel substrates before application of paint and related products – Surface roughness characteristics of blast cleaned steel substrates – Part 4: Method for the calibration of ISO surface profile comparators and for the determination of surface profile – stylus instrument procedure
ISO 8504	Preparation of steel substrates before application of paint and related products – Surface preparation methods
ISO 9001	Quality Management System
SANS 110	Sealing compounds for the building industry, two-component, polysulphide base
SANS 121	Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods
SABS 763	Hot-dip (galvanised) zinc coatings (other than on continuously zinc-coated sheet and wire)
SANS 1077	Sealing compounds for the building and construction industry, two-component, polyurethane-base
SANS 1091	National colour standard
SANS 1217	Internal and external organic coating protection for buried steel pipelines
SANS 1700-5-8	Fasteners Part 5: General requirements and mechanical properties Section 8: Mechanical properties of corrosion-resistant stainless-steel fasteners - Bolts, screws and studs
SANS 1700-5-9	Fasteners Part 5: General requirements and mechanical properties Section 9: Mechanical properties of corrosion-resistant stainless-steel fasteners - Nuts
SANS 1700-5-10	Fasteners Part 5: General requirements and mechanical properties Section 10: Mechanical properties of corrosion-resistant stainless-steel fasteners - Set screws and similar fasteners not under tensile stress
SANS 1700-5-18	Fasteners Part 5: General requirements and mechanical properties Section 18: Fasteners - Non-electrolytically applied zinc flake coatings
SANS 2063	Thermal spraying - Metallic and other inorganic coatings - Zinc, aluminium and their alloys
SANS 2808	Paints and varnishes – Determination of film thickness
SANS 5159	Adhesion of paint and varnish films (cross cut test)
SANS 5769	Cleanliness of blast cleaned surfaces for painting (assessed by freedom from dust and debris)
SANS 5772	Profile of blast cleaned surfaces for painting (determined by a micrometre profile gauge)
SANS 5870	Hardness of vulcanized rubbers of hardness 30 — 95 degrees
SANS 10064	The preparation of steel surfaces for coating
SANS 10104	Hand railing and balustrading (safety aspects)
SANS 10120-2 HC	Code of practice for use with standardized specifications for civil engineering construction and contract documents Part 2: Project specification Section HC: Corrosion protection of structural steelwork
SANS 10120-4 HC	Code of practice for use with standardized specifications for civil engineering construction and contract documents Part 4: Typical schedule of quantities Section HC: Corrosion protection of structural steelwork
SANS 10120-5 HC	Code of practice for use with standardized specifications for civil engineering construction and contract documents Part 5: Contract administration Section HC: Corrosion protection of structural steelwork
SANS 10121	Cathodic protection of buried and submerged structures

Code	Description
SANS 10140	Identification colour marking
SANS 10214	The design, fabrication and inspection of articles for hot-dip galvanising
SANS 12944-1	Paints and varnishes - Corrosion protection of steel structures by protective paint systems Part 1: General introduction
SANS 12944-2	Paints and varnishes - Corrosion protection of steel structures by protective paint systems Part 2: Classification of environments
SANS 12944-3	Paints and varnishes - Corrosion protection of steel structures by protective paint systems Part 3: Design considerations
SANS 12944-4	Paints and varnishes - Corrosion protection of steel structures by protective paint systems Part 4: Types of surface and surface preparation
SANS 12944-5	Paints and varnishes - Corrosion protection of steel structures by protective paint systems Part 5: Protective paint systems
SANS 12944-6	Paints and varnishes - Corrosion protection of steel structures by protective paint systems Part 6: Laboratory performance test methods
SANS 12944-7	Paints and varnishes - Corrosion protection of steel structures by protective paint systems Part 7: Execution and supervision of paint work
SANS 12944-8	Paints and varnishes - Corrosion protection of steel structures by protective paint systems Part 8: Development of specifications for new work and maintenance
SANS 14713-1	Zinc coatings - Guidelines and recommendations for the protection against corrosion of iron and steel in structures Part 1: General principles of design and corrosion resistance
SANS 14713-2	Zinc coatings - Guidelines and recommendations for the protection against corrosion of iron and steel in structures Part 2: Hot dip galvanizing
SANS 14713-3	Zinc coatings - Guidelines and recommendations for the protection against corrosion of iron and steel in structures Part 3: Sherardizing
SIS 055900	Swedish Code of Practice – Pictorial surface preparation standard for painted steel surfaces

Concrete works

The *Contractor* adheres to the latest issue of the listed standards/codes/publications. The *Contractor* notes that the list is not all-inclusive and does not relieve the *Contractor* from complying with all applicable codes.

Table 6: List of applicable standards for Concrete Works

Code	Description
Admixtures	
SANS 50934-1	Admixtures of concrete, mortar and grout, Part 1, Common requirements
SANS 50934-2	Admixtures of concrete, mortar and grout, Part 2, Concrete admixtures: definitions, requirements, conformity, marking and labelling
SANS 50934-3	Admixtures for concrete, mortar and grout, Part 3, Admixtures for masonry mortar - definitions, requirements, conformity and marking and labelling
SANS 50934-4	Admixtures for concrete, mortar and grout, Part 4, Admixtures for grout for prestressing tendons - definitions, requirements, conformity, marking and labelling
SANS 50934-5	Admixtures for concrete, mortar and grout, Part 5, Admixtures for sprayed concrete - definitions, requirements, conformity, marking and labelling
SANS 50934-6	Admixtures for concrete, mortar and grout, Part 6, Sampling, conformity control and evaluation of conformity
Aggregates	

Code	Description
SANS 195	Sampling of aggregates
SANS 197	Preparation of Test Samples of Aggregates
SANS 201	Sieve Analysis, Fines Content and Dust Content of Aggregates
SANS 202	Chloride Content of Aggregates
SANS 794	Aggregates of low density
SANS 1083	Aggregates from natural sources – Aggregates for concrete
SANS 1090	Aggregates from natural sources - Fine aggregates for plaster and mortar
SANS 3001-AG1	Civil engineering test methods. Part AG1, Particle size analysis of aggregates by sieving
SANS 3001-AG2	Civil engineering test methods. Part AG2, Determination of the average least dimension of aggregates by direct measurement
SANS 3001-AG3	Civil engineering test methods. Part AG3, Determination of the average least dimension of aggregates by computation
SANS 3001-AG4	Civil engineering test methods. Part AG4, Determination of the flakiness index of coarse aggregate
SANS 3001-AG5	Civil engineering test methods. Part AG5, Sand equivalent value of fine aggregates
SANS 3001-G10	Civil engineering test methods. Part AG10, ACV (aggregate crushing value) and 10% FACT (fines aggregate crushing test) values of coarse aggregates
SANS 3001-G12	Civil engineering test methods. Part AG12, Soundness of aggregates (magnesium sulphate method)
SANS 3001-G13	Civil engineering test methods. Part AG13, Determination of the soundness of mudrock aggregates
SANS 3001-G14	Civil engineering test methods. Part AG14, Determination of the ethylene glycol durability index for rock
SANS 3001-G15	Civil engineering test methods. Part AG15, Determination of rock durability using 10% FACT (fines aggregate crushing test) values after soaking in ethylene glycol
SANS 3001-G16	Civil engineering test methods. Part AG16, Determination of the durability mill index values for aggregates
SANS 3001-G23	Civil engineering test methods. Part AG23, Particle and relative densities of aggregates
SANS 5831	Presence of chlorides in aggregates
SANS 5832	Organic impurities in fine aggregates (limit test)
SANS 5833	Detection of sugar in fine aggregates
SANS 5834	Soluble deleterious impurities in fine aggregates (limits test)
SANS 5835	Estimation of the effect of fine aggregates on the water requirement of concrete
SANS 5836	Effect of fine and coarse aggregate on the shrinkage and expansion of cement: aggregate mixes (mortar prism method)
SANS 5837	Low density materials content of aggregates
SANS 5838	Sand equivalent value of fine aggregates
SANS 5840	Shell content of fine aggregate
SANS 5841	Aggregate crushing value of coarse aggregates
SANS 5842	FACT value (10% fines aggregate crushing value) of coarse aggregates
SANS 5844	Particle and relative densities of aggregates
SANS 5845	Bulk densities and voids content of aggregates
SANS 5846	Abrasion resistance of coarse aggregates (Los Angeles machine method)
SANS 5847	Flakiness index of coarse aggregates
SANS 5848	Polished-stone value of aggregates
SANS 5849	Total water-soluble salts content of fines in aggregates
SANS 5850-1	Sulphates content of fines in aggregates. Part 1, Water-soluble sulphates in fines in aggregates

Code	Description
SANS 5850-2	Sulphates content of fines in aggregates. Part 2, Acid-soluble sulphates in fines in aggregates
SANS 5851	Liquid limit of fines in aggregates for base-courses
SANS 5854	pH value of fines in aggregates for base-courses
SANS 5855	Free water content of aggregates
SANS 5856	Bulking of fine aggregates
SANS 6239	Aggregate impact value of coarse aggregate
SANS 6240	Electric conductivity of fine aggregate
SANS 6241	Particle size distribution of material of diameter smaller than 75 micron in fine aggregate (hydrometer method)
SANS 6242	Acid insolubility of aggregates
SANS 6243	Deleterious clay content of the fines in aggregate (methylene blue adsorption indicator test)
SANS 6244	Particles of diameter not exceeding 20micron and not exceeding 5micron and smaller, respectively, in fine aggregate (pipette method)
SANS 6245	Potential reactivity of aggregates with alkalis (accelerated mortar prism method)
SANS 6246	Treton impact value of aggregates
Cementitious Materials	
SANS 1745	Cementitious grouting capsules for use with tendon-based support systems
SANS 5748	Specific surface of cement
SANS 5754	Autoclave expansion of cement
SANS 6151	Free water content of Portland cementitious materials
SANS 6152	Available alkali content of cement extenders (complying with SANS 50197-1)
SANS 6154	Glass content of granulated metallurgical slag (transmitted-light microscopy method)
SANS 6155	Effect of extenders, used with cement, on the reduction of expansion caused by alkali-silica reaction (accelerated mortar prism method)
SANS 50196-1	Methods of testing cement. Part 1, Determination of strength
SANS 50196-2	Methods of testing cement. Part 2, Chemical analysis of cement
SANS 50196-3	Methods of testing cement. Part 3, Determination of setting times and soundness
SANS 50196-4	Methods of testing cement. Part 4, Quantitative determination of constituents
SANS 50196-5	Methods of testing cement. Part 5, Pozzolanicity test for pozzolanic cement
SANS 50196-6	Methods of testing cement. Part 6, Determination of fineness
SANS 50196-7	Methods of testing cement. Part 7, methods of taking and preparing samples of cement
SANS 50197-1	Cement. Part 1, Composition, specifications and conformity criteria for common cements
SANS 50197-2	Cement. Part 2. Conformity evaluation
SANS 50413-1	Masonry cement. Part 1, Composition, specifications and conformity criteria
SANS 50413-2	Masonry cement. Part 2, Test methods
SANS 50450-1	Fly ash for concrete. Part 1, Definition, specifications and conformity criteria
SANS 50450-2	Fly ash for concrete. Part 2, Conformity evaluation
SANS 50451-1	Method of testing fly ash. Part 1, Determination of free calcium oxide content
SANS 50451-2	Method of testing fly ash. Part 2, Determination of fineness by wet sieving
SANS 53263-1	Silica fume for concrete. Part 1, Definitions, requirements and conformity criteria
SANS 53263-2	Silica fume for concrete. Part 2, Conformity evaluation
SANS 55167-1	Ground granulated blast furnace slag for use in concrete, mortar and grout. Part 1, Definitions, specifications and conformity criteria.
SANS 55167-2	Ground granulated blast furnace slag for use in concrete, mortar and grout. Part 2, conformity evaluation

Code	Description
Concrete	
SANS 878	Ready-mixed concrete
SANS 5860	Concrete tests - Dimensions, tolerances and uses of cast test specimens
SANS 5861-1	Concrete tests - Mixing fresh concrete in the laboratory
SANS 5861-2	Concrete tests -Sampling of freshly mixed concrete
SANS 5861-3	Concrete tests - Making and curing of test specimens
SANS 5862-1	Concrete tests - Consistence of freshly mixed concrete - slump test
SANS 5862-2	Concrete tests - Consistence of freshly mixed concrete - flow test
SANS 5862-3	Concrete tests - Consistence of freshly mixed concrete - vebe test
SANS 5862-4	Concrete tests - Consistence of freshly mixed concrete. Part 4, Compacting factor and compaction index
SANS 5863	Concrete tests - compressive strength of hardened concrete
SANS 5864	Concrete tests - flexural strength of hardened concrete
SANS 5865	Concrete tests - the drilling, preparation, and testing for compressive strength of cores taken from hardened concrete
SANS 6085	Concrete tests - initial drying shrinkage and wetting expansion of concrete
SANS 6250	Concrete tests - density of compacted freshly mixed concrete
SANS 6251	Concrete tests - density of hardened concrete
SANS 6252	Concrete tests - air content of freshly mixed concrete - pressure method
SANS 6253	Concrete tests - tensile splitting strength of concrete
SANS 6254	Mortar tests - initial drying shrinkage and wetting expansion of mortar
SANS 6255	Mortar tests - compressive strength of mortar
SANS 50206	Concrete – Specification, performance, production and conformity
Design	
SANS 993	Modular co-ordination in building
SANS 10100-1	The structural use of concrete. Part 1, Design
SANS 10160	Basis of structural design and actions for buildings and industrial structures.
Construction	
SANS 2001 CC1	Construction works: Part CC1: Concrete works (structural)
SANS 2001 CC2	Construction works: Part CC2: Concrete works (minor works)
SANS 10100-2	The structural use of concrete. Part 2, Materials and execution of work
SANS 10109-1	Concrete floors. Part 1, Bases to concrete floors
SANS 10109-2	Concrete floors. Part 2, Finishes to concrete floors
SANS 10155	Accuracy in buildings
SANS 53670	Execution of concrete structures
SANS 55392	Sustainability in building construction: general principles
Reinforcement	
SANS 282	Bending dimensions and scheduling of steel reinforcement for concrete
SANS 920	Steel bars for concrete reinforcement
SANS 1024	Welded steel fabric for reinforcement of concrete
SANS 10144	Detailing of steel reinforcement for concrete
Water	
SANS 51008	Mixing of water for concrete – Specification for sampling, testing and assessing the suitability of water, including water recovered from processes in the concrete industry, as mixing water for concrete

Code	Description
Concrete and Related Products	
SANS 266	Gypsum plasterboard
SANS 470	Concrete poles for telephone, power and lighting purposes
SANS 508	Concrete retaining blocks
SANS 541	Precast concrete paving slabs
SANS 676	Reinforced concrete pressure pipes
SANS 677	Concrete non-pressure pipes
SANS 685	Fibre-cement sheets (flat and profiled)
SANS 803	Fibre-cement boards
SANS 819	Fibre-cement pipes, couplings and fittings for sewerage, drainage and low-pressure irrigation
SANS 927	Precast concrete kerbs, edgings and channels
SANS 975	Prestressed concrete pipes
SANS 986	Precast reinforced concrete culverts
SANS 1058	Concrete paving blocks
SANS 1215	Concrete masonry units
SANS 1223	Fibre-cement pressure pipes and couplings
SANS 1294	Precast concrete manhole sections and components
SANS 1372	Prefabricated concrete components for fences
SANS 1504	Pre-stressed concrete lintels
SANS 1879	Precast concrete suspended slabs
SANS 1882	Polymer concrete surface boxes, manhole and inspection covers, gully gratings and frames
SANS 50771-3	Specification for masonry units. Part 3, Aggregate concrete masonry unite (dense and lightweight aggregates)
SANS 50771-4	Specification for masonry units. Part 4, Autoclaved aerated concrete masonry units
SANS 10904	Fibre-cement corrugated sheets and fittings for roofing and cladding
Laboratory Practice and Equipment in General	
SANS 1649	Non-automatic self-indicating, semi-self-indicating and non-self-indicating weighing instruments with denominated verification scale intervals
SANS 2859-1	Sampling procedures for inspection by attributes. Part 1, Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection
SANS 3310-1	Test sieves - technical requirements and testing. Part 1, Test sieves of metal wire cloth
SANS 3310-2	Test sieves - Technical requirements and testing. Part 2, Test sieves of perforated metal plate
SANS 6150	Verification of compression testing machines for concrete: calibration of load scale
SANS 10378	General requirements for the competence of verification laboratories
SANS 17025	General requirements for the competence of testing and calibration laboratories
Other Standards	
SANS 53584	Products and systems for the protection and repair of concrete structures – Test methods – Determination of creep in compression for repair products
SANS 1200 G	Standardized specification for civil engineering construction Section G: Concrete (structural)

Site clearance

As part of site clearance, the *Contractor* adheres to the latest revision of the *Employer's* Execution of Site Preparation and Earthworks Standard, document number 240-57127953, SANS 2001 BS1: Site Clearance and SABS 2001 C: Site Clearance (Only Clause 8 – Measurement and Payment)

Earthworks

As part of Earthworks, the *Contractor* adheres to the latest revision of the, listed standards and references, but not limited to:

- 240-57127953 - *Employer's* Execution of Site Preparation and Earthworks Standard
- SANS 2001 BE1: Earthworks (General)
- SANS 1200 D: Earthworks (Only Clause 8 – Measurement and Payment)
- SANS 2001 DP1: **Earthworks for buried pipelines & prefabricated culverts**
- SANS 1921-5: Construction and management requirements for works contracts, Part 5: Earthworks activities which are to be performed by hand

Stormwater drainage

The following codes are adhered to but not limited to the following:

- SANS 2001 DP5: **Stormwater Drainage**
- SANS 677: Concrete non-pressure pipes
- SANS 1200 LE: Stormwater Drainage (Only Clause 8 – Measurement and Payment)

OTHER REQUIREMENTS FOR THE WORKS

Spares

The *Contractor* to submit a priced schedule or list of spare parts, which are recommended to be kept by the *Employer* for the long-term operation and maintenance of plant equipment and machinery. This shall detail the full particulars of the items as well as their serial numbers. The *Contractor* also submits Technical Data Sheets or Material Certificates of the mentioned spares.

Special Tools Requirements

The *Contractor* to identify and submit to the *Employer* a priced list of all special tools required for the operation and maintenance of the plant equipment and machinery. These shall include the following but not limited to:

- OEM specific tools/devices
- Tools required for on-going maintenance of the equipment

Configuration Management Requirements

The *Contractor* supplies a comprehensive configuration management program in accordance to ISO 10007 (2nd Edition) to ensure that plant structures, components etc conform to approved design requirements. In addition, the as-built *Works* shall be accurately reflected in selected documents and databases, including those for design, procurement, construction, operation, testing and training. The configuration program shall be applicable for use throughout all phases of the project life cycle, including management of spare parts, replacement parts and product upgrades, and shall form part of deliverables for hand-over to the *Employer* for use during the operation and maintenance phases of the plant.

Plant Codification

Plant Coding shall be undertaken by the *Contractor*. The KKS system shall be used for classifying and designating both plant and related documentation. The *Contractor* complies with the requirements of the Technical documentation classification and designation standard [240-54179170]], Eskom Hybrid Coding Standard [240-131050729], publication KKS power plant classification (B105e) 5th Edition 2003 and the KKS Applications: Guideline and explanations A, B1-4 (B106e) etc. All maintainable plant shall be coded up to KKS breakdown level 3 (i.e., Mechanical, Electrical, C&I and Civil systems)). Omissions or deviations from the latter requirements shall not be permitted without approval from the *Employer*.

Detailed nameplates or label lists with the service legends, including the KKS Code shall be prepared by the *Contractor* and submitted to the *Employer* for review and acceptance before commencing manufacture of the labels. All maintainable plant equipment and components shall be labelled by the *Contractor*, including all pipework.

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

- Breakdown level 3 component code -> not used in P&ID's and PFUP's, only used by control hardware supplier.
- Breakdown level 0: will be shown as a general remark on the P&ID not on the individual KKS number.
- F0-level is not used; FN level is free -> no general decoding system.

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

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

Plant Labelling

New labels shall be provided for all plant, material and equipment provided as part of the *Works*. The *Contractor* manufactures and installs labels according to 240-71432150 - KKS Plant Labelling and Equipment Descriptions Standard.

Documentation Requirements

The *Contractor* ensures that the Technical Documents and Records Management Work Instruction, [240-76992014] is adhered to for all documentation requirements. The *Contractor* is responsible for the compilation and the supply of all documentation during the various project stages. The *Contractor* makes provision in their programme for the submission of design documentation. For consistency, it is important that all documents used within the project follow the same layout, style and formatting as described in the Technical Documents and Records Management Work Instruction. Documents such as QCP's, Method Statements etc. that impact the project works to be approved by the *Employer* at least 3 working days prior to commencement of *works*.

Each revision of a document or drawing shall be accompanied with a list of comments made by the *Employer* on previous revisions, if applicable. The responses/corrective actions taken by the *Contractor* to be recorded in a revision table contained in each drawing/document.

Documents and drawings to indicate the *Employer's* unique identification number as allocated by the *Employer*. The *Contractor* may also have his own internal document or drawing number on the document or drawing.

Document Identification

The *Contractor* shall ensure that documents have the following minimum attributes on the coverpage:

- Document title
- Document unique identification number (Eskom number)
- *Contractor* document number, if applicable
- Document status
- Revision number
- Document type
- Document revision table/history
- Page number on the footer
- Document author/authorizer
- Document originator

The following additional attributes are important for technical documents:

- Package/system name/sub-system name
- Unit number
- *Contractor* name
- Contract number
- Plant identification codes

Format and Layout of Documents

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

Layout and Typography

Every document should comply with the following font specifications:

- Font Colour: Black
- Main Headings Font Type: Arial, Bold, Capital Letters
- Main Heading Font Size: 12pt
- Subheadings Font Type: Arial, Bold, Title Case
- Subheadings Font Size: 11pt
- Body Font Type: Arial, Sentence Case i.e., only the first letter of the first word is a capital letter.
- Body Text Font size: 11pt
- Line Spacing: 1.5 line spacing.
- Margins: Standard
- Alignment: Full justification to be used
- Paragraphing: One line skip between paragraphs
- Pagination: Centred page numbers (about 0.5 inches from bottom)
- Indentations: Standard tab for all paragraphs (about 0.4 to 0.5 inches)
-

Document Headers

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

Naming of files

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

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

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

Document Submissions

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

Information Requirements

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

- a) Design reviews and interface management of the *works*,
- b) Quality assurance and control,
- c) Operations, maintenance, training etc.

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

Table 7: Typical Document Requirement List (As-built) (where applicable)

Document Group	Description of document type (includes information data sets)
General	Equipment arrangement drawings Piping & Instrument Diagrams (P&ID's) 3D model Equipment list Isometric Drawings Valve list Pipeline list Hanger list Equipment specifications & data sheets Drawings and data for all equipment and material Installation, Operation, and Maintenance (IOM) Manuals Spare parts list Factory Acceptance Test (FAT) report etc. Databooks
Civils & Structures	Site layout Structural drawings Drainage layouts Foundation drawings Geotechnical report Survey report Design report

Document Group	Description of document type (includes information data sets)
Construction	Transportability study/report (including heavy haul study) Site management plan (QA, Safety, Environmental etc.) Construction schedule Site storage requirements for major equipment Construction test records (hydrotest, concrete strength, pile integrity test, etc.) Maintenance records of all equipment while stored on site Constructability report Etc.
Commissioning	Commissioning schedule Commissioning procedures Performance test procedure Performance test reports Field test reports and certificates Etc.
Quality Assurance	Quality assurance manual Quality control plans Quality control reports Weld summary index Material traceability certificates Manufacturing test reports Manufacturing Non-Conformance Reports (NCR's)
Operations	Operating procedure Maintenance procedures and schedules Operating and maintenance manuals Etc.
Logistic Support	Maintenance concept Plant maintenance documentation ISI plan/program Spare parts assessment Plant RAM analysis Equipment access and removal paths assessment Fault finding diagrams Etc.

Document Group	Description of document type (includes information data sets)
Training	Training plan Training manuals and instructions Etc.
Safety & Protection	Fire hazard analysis Waste management plan Etc.
Design Analyses	Reliability model and analysis Transient / Transition Analysis Flow dynamics analysis Thermo-hydraulic analysis Pipe Stress Analysis Maintainability analysis FMECA / FMEA analysis HAZOP analysis 3D model interference checks Etc.
Electrical	Motor list Electrical load list Circuit list Raceway list Single line diagram Protection schematic diagram Electrical load flow and fault studies report Cable block diagrams Cabling routing and cable racking layout diagrams Cable termination diagrams EMC and earthing standards report Earthing layout drawings Lighting layout drawings Design reports Etc.

Document Group	Description of document type (includes information data sets)
C&I	Alarm and set-point schedule Instrument schedule Instrument data sheets Mechanical hook-up drawings Electrical hook-up drawings Cable Schedule Termination Schedules Junction Box GA and Internal Layout Junction Box and Instrument location drawings Instrument Stand GA Maintenance Manuals and procedures Operating and Control Philosophies Functional Logic diagrams Field device calibration certificates Level measurement installation report

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

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

Drawings

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

Project Deliverables

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

- Detailed design reports for entire *Works*. Report to be signed off by an ECSA Professionally Registered Engineer
- Approved construction drawings for the entire *Works* signed off by an ECSA Professionally Registered Engineer

- Construction quality assurance plans.
- Construction method statement and QCP/ITP
- Results and records of test works
- As-built drawings and all handover documentation is required to be submitted within 6 weeks of construction completion.
- PECs and/or CoCs for completed *Works* is required to be submitted within 6 weeks of construction completion
- Data sheets/material certificates
- Geotechnical investigation and survey reports
- All construction supervision related documentation as detailed in this scope document.

Apart from statutory data packages required, the *Contractor* also compiles and supplies a data package of the relevant drawings, test certificates etc. to the *Employer's* Representative for acceptance.

- Concrete 7 day and 28 day cube test results
- Slump test results
- Concrete mix designs including all required test results e.g. aggregate test results
- Pile Integrity Test Results (if required)
- Pile Load Test Results (if required)
- Foundation Certificate
- Welding procedure specifications
- Welder qualifications
- Non-destructive weld test results
- Weld test certificates
- Steel grade certificates
- Bolt grade certificates
- Hydrostatic tests of pipes and tanks
- Pre-concrete and post concrete surveys
- As-built data and drawings of the completed *Works* upon handover. As-built drawings are submitted in PDF and DWG formats
- Structural Certificate signed by the *Contractor's* Professionally Registered Engineer confirming that structure has been constructed in accordance with the design.

2 Management and start up

2.1 Management meetings

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

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

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

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

2.2 Documentation control

The Contractor shall submit all relevant and necessary documentation requested by the Employer and both electronic and hard copy versions of all required documentation. The Contractor shall prepare and submit operations and maintenance manual including as built documents.

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

1. Document Identification: Each document shall carry a unique alphanumeric identifier. This code will indicate the document source, recipient, and communication number, making the document easily traceable.
2. Document Format: All contractual communications must be in the form of properly compiled letters or forms attached to emails. Messages within the body of an email will not be considered formal communication. Documents should be formatted as PDFs unless otherwise specified.
3. Document Routing: Specific routing requirements must be adhered to. All contractual documents must be issued directly to the relevant party as stipulated in the ECC. The project manager will ensure the documentation is appropriately disseminated and acknowledged.
4. Record Keeping: All communications must be logged in a communication register maintained by the Contractor. The register will document the date, source, recipient, communication number, and a brief summary of the document content.

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

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

2.3 Health and safety risk management

A Safety, Health, Environment and Quality (SHEQ) specification is Kusile Power Station's minimum requirements detailing also constraints, which are required to be met for the specific contract and for the duration of the contract period by the Contractor.

The Contractor is expected to develop a SHEQ plan which meets these requirements as well as relevant and other legal and other requirements applicable to the issued scope of work.

Kusile Power Station in no way assumes the contractor's legal responsibilities. The contractor is and remains accountable for the quality and the execution of his/her health and safety programme for his/her employees and appointed contractor employees.

This SHEQ specification reflects minimum requirements and should not be construed as all encompassing. The Contractor shall comply with (SHEQ) requirements contained in Annexure A of this Works Information.

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

2.4 Environmental constraints and management

A Safety, Health, Environment and Quality (SHEQ) specification is Kusile Power Station's minimum requirements detailing also constraints, which are required to be met for the specific contract and for the duration of the contract period by the Contractor.

The Contractor is expected to develop a SHEQ plan which meets these requirements as well as relevant and other legal and other requirements applicable to the issued scope of work.

Kusile Power Station in no way assumes the contractor's legal responsibilities. The contractor is and remains accountable for the quality and the execution of his/her health and safety programme for his/her employees and appointed contractor employees.

This SHEQ specification reflects minimum requirements and should not be construed as all encompassing. The Contractor shall comply with (SHEQ) requirements contained in Annexure A of this Works Information

The *Contractor* shall comply with the environmental criteria and constraints stated in Annexure **A**

2.5 Quality assurance requirements

The quality requirements are as per ISO 9001 and Employer Quality Requirements as specified in the SHEQ specification in Annexure A.

This quality management philosophy is developed from the basis that suppliers produce quality products, supervisor oversees the process, checks quality but liability for quality remains with the Contractor. The Contractor submits a QMS as a returnable schedule and uses it for all phases of the Project. The QMS complies with the requirements of ISO 9001:2008 standard. The Contractor provides evidence of a fully implemented QMS as and when requested by the Project manager. The Project Manager may at his sole discretion carry out an audit on the Contractor, the Contractor's suppliers and Sub-Contractors

Quality control plans will be produced by the Contractor or manufacturer which will indicate the level of product quality control to be applied. The CQP must be aligned to, and reference ISO 10006 QMS, guidelines for quality plans and in compliance with the guideline in 240-105658000. The CQP will make reference to the Contractor's QMS Procedures to be used in this Contract. This plan will be reviewed by the Project Manager. The project team monitors that these plans are being implemented and that it is yielding the expected results through process and product verifications.

The Contractor shall comply with (SHEQ) requirements contained in Annexure A of this Works Information.

2.6 Programming constraints

The Contractor shall execute the Works per the submitted schedule or as agreed between the Contractor and the Employer. The Contractor shall notify the Employer timeously should there be any changes in the submitted programme. The Contractor shall also acquaint themselves with the work involved and verify all quantities, materials etc. necessary to undertake the Works, for proper programming and co-ordination.

Programme format – The Contractor to issue the programme using either MS Projects (soft copy) or Primavera (soft copy)

The program should be updated as per the changes on Outage listing

Programme is to be submitted as indicated in the Contract Data.

2.7 Contractor's management, supervision and key people

The Contractor must submit an organogram one month after Contract Start Date, to the Project Manager, based on the Contractor's plan and their lines of authority / communication.

2.8 Invoicing and payment

The Z clauses make reference to invoicing procedures stated here in this Service Information. Also include a list of information which is to be shown on an invoice.

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

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

- Name and address of the *Contractor* and the *Project Manager*;
 - The contract number and title;
 - *Contractor's* VAT registration number;
 - The *Employer's* VAT registration number 4740101508;
 - Description of service provided for each item invoiced based on the Price List;
 - Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT;
- The invoice is to be submitted to **invoiceseskomlocal@eskom.co.za** once confirmed with the payment certificate.

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

2.9 Insurance provided by the *Employer*

As stated in the Contract Data

2.10 Contract change management

All changes to the Contract, such as Contractor management changes or Compensation events shall be communicated through standard NEC ECC 3 forms.

2.11 Provision of bonds and guarantees

Not applicable

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

Not applicable

2.13 Training workshops and technology transfer

Not Applicable

3 Engineering and the Contractor's design

Employer to keep the designs after the contract lapse, after approval from the Employers side

3.1 Employer's design

The contractor to provide design after the service completion

3.2 Parts of the works which the Contractor is to design

Contractor to provide Supports designs and Drawings as per the Scope of Work

3.3 Procedure for submission and acceptance of Contractor's design

All designs and specifications to be submitted to the Project Manager and approved by the Engineer of the Employer prior construction works commence.

"As built" drawings, compliance certificates, guarantees to be submitted to the Project Manager as part of handover before Completion of the works.

3.4 Other requirements of the Contractor's design

Applicable as per the Scope of Work

3.5 Use of Contractor's design

- Detailed drawings for fabrication and construction. Drawings shall be submitted in DWG/DGN and PDF formats.
- All submitted drawings to be signed by an applicable Professionally Registered Engineer.
- Construction/installation Specifications for the works including measurement and payment items

3.6 Design of Equipment

To be incorporated within the main design

3.7 Equipment required to be included in the works

As per the scope of work, Contractor to provide their own Equipment

3.8 As-built drawings, operating manuals and maintenance schedules

The Contractor is responsible to plan for the supply of the commissioning manual, maintenance manual, functional description, and operating manual of the system including safety procedures for operating and maintain the system. The Contractor shall provide P&ID, Piping drawings, and wiring drawings for the system.

The Contractor shall develop and submit as-built data and drawings of the completed Works upon handover. As-built drawings shall be submitted in PDF and DGN/DWG formats

4 Procurement

4.1 People

4.1.1 Minimum requirements of people employed on the Site

Minimum requirements of people employed

- All staff required to perform the activities within the works information
- All relevant personnel names and titles must be specified to the Service Manager
- All Contractors personnel specified in this contract as per 2.3 to be on site at all times
- All new staff to be appointed in writing.
- Contract Staff are not allowed to work on any other contract.
- All new staff to do induction training
- All replacements of staff will be in the same discipline (like an artisan with an artisan with proof of qualifications)
- All new staff to be approved by Service Manager before entering the site or commencing work
- All new staff must hand in all qualifications and relevant documentation to the Service Manager
- When changing personnel a new access to work form to be completed by the Contractor
- Only required specified approved amount of personnel to be allowed on site, pre-arrange with Service Manager

4.1.2 BBEE and preferencing scheme

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

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

Transport and PPE for General workers to be given to a local supplier to render the services

4.2 Subcontracting

4.2.1 Preferred subcontractors

Not Applicable

4.2.2 Subcontract documentation, and assessment of subcontract tenders

Not Applicable

4.2.3 Limitations on subcontracting

Not Applicable

4.2.4 Attendance on subcontractors

Not Applicable

4.3 Plant and Materials

4.3.1 Quality

Refer to Quality Requirements

4.3.2 Plant & Materials provided “free issue” by the *Employer*

- Water
- Ablution Facilities
- Electricity

4.3.3 Contractor's procurement of Plant and Materials

Contractor to procure plant and material to fulfil the technical requirements for the works.

4.3.4 Spares and consumables

No spares required

4.4 Tests and inspections before delivery

To ensure the quality and performance of the work, the inspections of supports must be carried out before the delivery of Supports to the Working Areas. These procedures aim to mitigate risks and ensure that the project adheres to the agreed specifications and standards.

Inspection by the Employer's Engineer and Project Manager: The Employer's Engineer and Project Manager are to carry out a thorough inspection of the Supports prior to delivery.

This inspection will involve checking the physical condition of the Supports, its alignment with design specifications, and its readiness for installation. The contractor must facilitate this inspection, providing all necessary documentation and access.

4.5 Marking Plant and Materials outside the Working Areas

Not applicable

4.6 Contractor's Equipment (including temporary works).

The Contractor to purchase all equipment required for the works.

4.7 Cataloguing requirements by the Contractor

The Contractor is required to submit technical specification of all components for cataloguing. The Employer will furnish the Contract with forms to complete according to Procurement Instruction Number 1 of 2018 – Incorporating Cataloguing into the Procurement Environment, Unique Identifier 240-1289988974 after Contract award for submission after completion of the works.

5 Construction

5.1 Temporary works, Site services & construction constraints

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

The Contractor is to inform the Project Manager of the request for access to Site prior to the date of reporting to Site.

The Contractor to report to the Kusile Power Station Security gate on arrival, to comply with all security requirements.

- Lifesaving rules to be adhered at all times
- All personnel must attend induction before working on site and must obtain gate permits via the Project Manager.
- Contractor to comply to the Eskom values and rules, e.g No taking Pictures without approval, no walking and texting
- Access is limited and controlled by Plant Safety Regulations requirements.
- No employee will be allowed to access the plant or to work without access permit issued.
- All personnel to work on the plant must be registered on the Worker's Register by the Responsible Person.
- Each personnel to have an Identification card at all times
- Unauthorized access to site is prohibited. The personnel are expected to be at their working site area at all times.
- No recruitment on site or at the main access gates or any Premises of the Employer is allowed.

- All activities to comply with the OSHACT and Regulations
- All activities on plant must be preceded by a plant risk assessment – Risk assessment as per the standard of the Employer, to be current at all times (Live Document)
- All work to be done according to the construction regulations at all times

5.1.2 Restrictions to access on Site, roads, walkways and barricades

Site restructuration on site to be shared after contract date.

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

The Contractor is responsible for management and administration of his people to comply with all the Employer's requirements for the duration of the contract.

Normal working hours: 07h00 to 16h30 (Monday to Thursday)
07h00 to 12h00 Fridays

The Contractor keeps records of his people working on the Affected Property
Time sheets to be controlled weekly and signed of by the Employer Supervisor.
No valuable assets of the Contractor to be left onsite without security approval.

5.1.4 Health and safety facilities on Site

Refer to Section 2.3

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

Refer to Section 2.4

5.1.6 Title to materials from demolition and excavation

Not applicable

5.1.7 Cooperating with and obtaining acceptance of Others

- 1) The Contractor will be required to work with Others with whom the Contractor may be required to share the Affected Property.
- 2) Requirements for liaison with and acceptance from statutory authorities or inspection agencies will be communicated when required

5.1.8 Publicity and progress photographs

The Contractor to Comply to Eskom rules of no Photography

5.1.9 Contractor's Equipment

Contractor to declare their equipment's and tools

- Contractor's equipment (Cell phones with Camera's, Computers, Camera's etc.) to be and signed in at security.
- All test equipment must be calibrated and tested regularly and certificates must be handed in to the Service Manager for record keeping
- All equipment and tools needs to be marked and a list off all tools with the identification number to be provided to the Service Manager when entering site.
- All lost equipment and tools to be declared to the Service Manager and full details of incident.

5.1.10 Equipment provided by the Employer

The Contractor supplies equipment required for the works.

5.1.11 Site services and facilities

The Employer will provide the Contractor with the following services whilst doing work on the Affected Property

1. Water
2. Electricity
3. Ablution Facilities
4. Fire Protection equipment
5. Waste disposal Facilities
6. Other facilities e.g., Canteens for personal accounts are available on site.
7. The Employer shall provide a Contractor's employee with internet access for communication purposes.
8. Contractor shall provide everything else necessary for providing the Works.

5.1.12 Facilities provided by the Contractor

The Contractor is to provide for himself the following:

1. Vehicles
2. Site Establishment containers
3. Personal Protective Equipment (branded with the Contractor's name) as per safe work requirements.
4. Contractor shall provide everything else necessary for providing the works.

5.1.13 Existing premises, inspection of adjoining properties and checking work of Others

The contractor shall do inspections as per Scheduled Work Order and report all defects to the Employer's Supervisor / Employer

5.1.14 Survey control and setting out of the works

The Contractor is responsible for setting out of the works.

5.1.15 Excavations and associated water control

Excavation is not required

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

Contractor to assess area of works as report risks prior to works commence.

5.1.17 Control of noise, dust, water and waste

- All necessary and relevant PPE must be used at all time when entering or working on plant
- Risk assessments must be completed before commencing with any task to be current at all times (Live Document)
- All relevant procedures to be used at all times

5.1.18 Sequences of construction or installation

Sequence to be detailed by the Contractor in the submitted programme

5.1.19 Giving notice of work to be covered up

- The Supervisor to be notified within the notification period as per Contract Data
- The employer shall Issue notice as early as possible as per the ECC contract

5.1.20 Hook ups to existing works

Contractor to assess area of works and report hook ups prior to works commence. Hooking up on heights is a non-negotiable Lifesaving rule of Eskom. Kusile Power Station applies Zero Tolerance to non-compliance of this rule or any other Lifesaving rule. The same disciplinary process procedure will be followed when any of the Lifesaving rules have been breached

5.2 Completion, testing, commissioning and correction of Defects

5.2.1 Work to be done by the Completion Date

All work is to be done by the Completion Date.

5.2.2 Use of the *works* before Completion has been certified

Completion is when the Contractor has done all the work, which the Works Information states he is to do by the Completion Date and has corrected notified Defects, which would have prevented the Employer from using the works. The Site is handed back to the Employer in a condition acceptable to the Project Manager

5.2.3 Materials facilities and samples for tests and inspections

The Contractor shall be responsible for the testing of the Works. The Works shall be tested in accordance with the latest standards and procedures as outlined by the South African Bureau of Standards (SABS)/South African National Standards (SANS) as well as any other applicable and relevant standards and specifications.

5.2.4 Commissioning

Refer to the scope of works for commissioning works. Commissioning is performed with the involvement of the Employer and Others.

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

Contractor to issue procedures to the employer

5.2.6 Take over procedures

Takeover is at the same time as Completion.

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

The Project Manager arranges in time to allow the Contractor access to and use of a part of the works which has been taken over if needed to correct a Defect. After the works have been put into operation, the Employer may require the Contractor to undertake certain procedures before such access can be granted.

5.2.8 Performance tests after Completion

Upon the completion of the installation, the Contractor will be required to perform comprehensive performance tests on the Installed Supports to demonstrate that it operates correctly and meets all the requirements specified in the Contractor's Works Information. The performance tests should follow a well-defined procedure, and any deviations from the expected performance should be duly reported, with appropriate corrective measures taken.

The performance tests should assess the following aspects:

- Functionality: Confirm that all features of the GRP Supports operate as intended.
- Reliability: Determine the ability of the Supports to perform consistently over time.
- Compatibility: Ensure the Supports structure integrates seamlessly with the existing infrastructure

5.2.9 Training and technology transfer

N/A

5.2.10 Operational maintenance after Completion

The Employer will require the Contractor before the defects date to perform fault finding and repairs should there be a standing fault as a result of a defect as per notification of the Employer.

6 Plant and Materials standards and workmanship

6.1 Investigation, survey and Site clearance

Not applicable

6.2 Building works

Applicable as per Scope of Work

6.3 Civil engineering and structural works

Applicable as per Scope of Work

6.4 Electrical & mechanical engineering works

Applicable as per Scope of Work

6.5 Process control and IT works

Not applicable

6.6 Other [as required]

Fire Suppression and Protection Works

7 List of drawings

7.1 Drawings issued by the *Employer*

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

Note: List of Drawings and Standards

Table 4: List of Applicable Standards for Structural Steelwork

Code	Description
SANS 121	Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods
SANS 455	Covered electrodes for manual arc welding of carbon steels
SANS 517	Light Steel Frame Building
SANS 657	Steel tubes for non-pressure purposes
SANS 679	Zinc chromate primers for steel
SANS 681	Undercoats for paints
SANS 684	Structural steel paint
SANS 1273	Fasteners for roof and wall coverings in the form of sheeting
SANS 1465	Steel castings for general engineering applications
SANS 1700	Fasteners
SANS 1921-3	Construction and management requirements for works contracts, Part 3: Structural steelwork
SANS 2001-CS1	Construction works Part CS1: Structural steelwork
SANS 3834	Quality requirements or fusion welding of metallic materials

Code	Description
SANS 4042	Fasteners – Electroplated coatings
SANS 10044	Welding
SANS 10064	The preparation of steel surfaces for coating
SANS 10085	The design, erection, use and inspection of access scaffolding
SANS 10094	The use of high-strength friction grip bolts
SANS 10104	Hand railing and balustrading (safety aspects)
SANS 10120	Code of practice for use with standardised specifications for civil engineering construction and contract documents
SANS 10162	The structural use of steel
SANS 10177	Fire testing of materials, components and elements used in buildings
SANS 10237	Roof and side cladding
SANS 10400	The application of the National Building Regulations
SANS 10684	Fasteners – Hot dip galvanised coatings
SANS 14399	High strength structural bolting assemblies for preloading
SANS 14713	Protection against corrosion of iron and steel in structures – zinc and aluminium coatings – guidelines (ISO 14713)
SANS 15609	Specification and qualification of welding procedures for metallic materials – welding procedure specification
SANS 15614	Specification and qualification of welding procedures for metallic materials – welding procedure test
SANS 16961	Petroleum, petrochemical and natural gas industries – Internal coating and lining of steel storage tanks
SANS 23279	Non-destruction
SANS 50025	Hot rolled products of structural steels
SANS 50028	Flat products made of steels for pressure purposes
SANS 50219	Cold formed welded structural hollow sections of non-alloy and fine grain steels Part 1 – Technical delivery
EN 10210-1	Hot finished structural hollow sections of non-alloy and fine grain steels – Part 1: Technical delivery requirements
EN 10210-2	Hot finished structural hollow sections of non-alloy and fine grain structural steels – Part 2: Tolerances, dimensions and sectional properties
ANSI/AWS A5.1/A5.1M	Specification for carbon steel electrodes for shielded metal arc welding
ANSI/AWS A5.17/A5.17M	Specification for carbon steel electrodes and fluxes for submerged arc welding
ANSI/AWS A5.18/A5.18M	Specification for carbon steel electrodes and rods for gas shielded arc welding
ANSI/AWS A5.20	Specification for carbon steel electrodes for flux cored arc welding
ASTM A 6/A 6Mb	Standard specification for general requirements for rolled structural steel bars, plates, shapes and sheet piling
ANSI/AWS D1.1/D1.1M	Structural welding code – steel
BS 4-1	Structural steel sections – Part 1: Specification for hot-rolled sections
DIN 1026-1	Hot rolled steel channels – Part 1: Taper flange steel channels - dimensions, masses and sectional properties
EN 10024	Hot rolled taper flange I sections – Tolerances on shape and dimensions
EN 10025-2	Hot rolled products of structural steels – Part 2: Technical delivery conditions for non-alloy structural steels
EN 10034	Structural steel I and H sections – Tolerances on shape and dimensions

Code	Description
EN 10056-2	Structural steel equal and unequal leg angles – Part 2: Tolerances on shape and dimensions
ISO 8501-1	Preparation of steel substrates before application of paints and related products – Visual assessment of surface cleanliness – Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings

Table 5: List of Applicable Standards for Structural Steelwork

Code	Description
34-1658	Distribution Standards – Part 0: Corrosion Protection Specification for New Indoor and Outdoor distribution Equipment, components, materials and structures manufactured from steel
240-106365693	Standard for the External Corrosion Protection of Plant, Equipment and Associated Piping with Coatings
ASTM E376	Measuring coating thickness by magnetic field or eddy current electromagnetic test methods
ASTM D4541	Standard method for pull-off strength of coatings using portable adhesion testers
ISO 12944	Paint and varnishes – Corrosion protection of steel structures by protective paint systems
ISO 4624	Paints and varnishes – Pull-off test for adhesion
ISO 4628	Paints and varnishes
ISO 8501-1	Preparation of steel substrates before application of paints and related products - Visual assessment of surface cleanliness – Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings
ISO 8501-4	Preparation of steel substrates before application of paints and related products - Visual assessment of surface cleanliness – Part 4: Initial surface conditions, preparation grades and flash rust grades in connection with high-pressure water jetting.
ISO 8502-3	Preparation of steel substrates before application of paint and related products – Tests for the assessment of surface cleanliness-Part 3: Assessment of dust on steel surfaces prepared for painting (pressure sensitive tape method).
ISO 8503-4	Preparation of steel substrates before application of paint and related products – Surface roughness characteristics of blast cleaned steel substrates – Part 4: Method for the calibration of ISO surface profile comparators and for the determination of surface profile – stylus instrument procedure
ISO 8504	Preparation of steel substrates before application of paint and related products – Surface preparation methods
ISO 9001	Quality Management System
SANS 110	Sealing compounds for the building industry, two-component, polysulphide base
SANS 121	Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods
SABS 763	Hot-dip (galvanised) zinc coatings (other than on continuously zinc-coated sheet and wire)
SANS 1077	Sealing compounds for the building and construction industry, two-component, polyurethane-base
SANS 1091	National colour standard
SANS 1217	Internal and external organic coating protection for buried steel pipelines
SANS 1700-5-8	Fasteners Part 5: General requirements and mechanical properties Section 8: Mechanical properties of corrosion-resistant stainless-steel fasteners - Bolts, screws and studs
SANS 1700-5-9	Fasteners Part 5: General requirements and mechanical properties Section 9: Mechanical properties of corrosion-resistant stainless-steel fasteners - Nuts
SANS 1700-5-10	Fasteners Part 5: General requirements and mechanical properties Section 10:

Code	Description
	Mechanical properties of corrosion-resistant stainless-steel fasteners - Set screws and similar fasteners not under tensile stress
SANS 1700-5-18	Fasteners Part 5: General requirements and mechanical properties Section 18: Fasteners - Non-electrolytically applied zinc flake coatings
SANS 2063	Thermal spraying - Metallic and other inorganic coatings - Zinc, aluminium and their alloys
SANS 2808	Paints and varnishes – Determination of film thickness
SANS 5159	Adhesion of paint and varnish films (cross cut test)
SANS 5769	Cleanliness of blast cleaned surfaces for painting (assessed by freedom from dust and debris)
SANS 5772	Profile of blast cleaned surfaces for painting (determined by a micrometre profile gauge)
SANS 5870	Hardness of vulcanized rubbers of hardness 30 — 95 degrees
SANS 10064	The preparation of steel surfaces for coating
SANS 10104	Hand railing and balustrading (safety aspects)
SANS 10120-2 HC	Code of practice for use with standardized specifications for civil engineering construction and contract documents Part 2: Project specification Section HC: Corrosion protection of structural steelwork
SANS 10120-4 HC	Code of practice for use with standardized specifications for civil engineering construction and contract documents Part 4: Typical schedule of quantities Section HC: Corrosion protection of structural steelwork
SANS 10120-5 HC	Code of practice for use with standardized specifications for civil engineering construction and contract documents Part 5: Contract administration Section HC: Corrosion protection of structural steelwork
SANS 10121	Cathodic protection of buried and submerged structures
SANS 10140	Identification colour marking
SANS 10214	The design, fabrication and inspection of articles for hot-dip galvanising
SANS 12944-1	Paints and varnishes - Corrosion protection of steel structures by protective paint systems Part 1: General introduction
SANS 12944-2	Paints and varnishes - Corrosion protection of steel structures by protective paint systems Part 2: Classification of environments
SANS 12944-3	Paints and varnishes - Corrosion protection of steel structures by protective paint systems Part 3: Design considerations
SANS 12944-4	Paints and varnishes - Corrosion protection of steel structures by protective paint systems Part 4: Types of surface and surface preparation
SANS 12944-5	Paints and varnishes - Corrosion protection of steel structures by protective paint systems Part 5: Protective paint systems
SANS 12944-6	Paints and varnishes - Corrosion protection of steel structures by protective paint systems Part 6: Laboratory performance test methods
SANS 12944-7	Paints and varnishes - Corrosion protection of steel structures by protective paint systems Part 7: Execution and supervision of paint work
SANS 12944-8	Paints and varnishes - Corrosion protection of steel structures by protective paint systems Part 8: Development of specifications for new work and maintenance
SANS 14713-1	Zinc coatings - Guidelines and recommendations for the protection against corrosion of iron and steel in structures Part 1: General principles of design and corrosion resistance
SANS 14713-2	Zinc coatings - Guidelines and recommendations for the protection against corrosion of iron and steel in structures Part 2: Hot dip galvanizing
SANS 14713-3	Zinc coatings - Guidelines and recommendations for the protection against corrosion of iron and steel in structures Part 3: Sherardizing
SIS 055900	Swedish Code of Practice – Pictorial surface preparation standard for painted steel surfaces

Table 6: List of applicable standards for Concrete Works

Code	Description
Admixtures	
SANS 50934-1	Admixtures of concrete, mortar and grout, Part 1, Common requirements
SANS 50934-2	Admixtures of concrete, mortar and grout, Part 2, Concrete admixtures: definitions, requirements, conformity, marking and labelling
SANS 50934-3	Admixtures for concrete, mortar and grout, Part 3, Admixtures for masonry mortar - definitions, requirements, conformity and marking and labelling
SANS 50934-4	Admixtures for concrete, mortar and grout, Part 4, Admixtures for grout for prestressing tendons - definitions, requirements, conformity, marking and labelling
SANS 50934-5	Admixtures for concrete, mortar and grout, Part 5, Admixtures for sprayed concrete - definitions, requirements, conformity, marking and labelling
SANS 50934-6	Admixtures for concrete, mortar and grout, Part 6, Sampling, conformity control and evaluation of conformity
Aggregates	
SANS 195	Sampling of aggregates
SANS 197	Preparation of Test Samples of Aggregates
SANS 201	Sieve Analysis, Fines Content and Dust Content of Aggregates
SANS 202	Chloride Content of Aggregates
SANS 794	Aggregates of low density
SANS 1083	Aggregates from natural sources – Aggregates for concrete
SANS 1090	Aggregates from natural sources - Fine aggregates for plaster and mortar
SANS 3001-AG1	Civil engineering test methods. Part AG1, Particle size analysis of aggregates by sieving
SANS 3001-AG2	Civil engineering test methods. Part AG2, Determination of the average least dimension of aggregates by direct measurement
SANS 3001-AG3	Civil engineering test methods. Part AG3, Determination of the average least dimension of aggregates by computation
SANS 3001-AG4	Civil engineering test methods. Part AG4, Determination of the flakiness index of coarse aggregate
SANS 3001-AG5	Civil engineering test methods. Part AG5, Sand equivalent value of fine aggregates
SANS 3001-G10	Civil engineering test methods. Part AG10, ACV (aggregate crushing value) and 10% FACT (fines aggregate crushing test) values of coarse aggregates
SANS 3001-G12	Civil engineering test methods. Part AG12, Soundness of aggregates (magnesium sulphate method)
SANS 3001-G13	Civil engineering test methods. Part AG13, Determination of the soundness of mudrock aggregates
SANS 3001-G14	Civil engineering test methods. Part AG14, Determination of the ethylene glycol durability index for rock
SANS 3001-G15	Civil engineering test methods. Part AG15, Determination of rock durability using 10% FACT (fines aggregate crushing test) values after soaking in ethylene glycol
SANS 3001-G16	Civil engineering test methods. Part AG16, Determination of the durability mill index values for aggregates
SANS 3001-G23	Civil engineering test methods. Part AG23, Particle and relative densities of aggregates
SANS 5831	Presence of chlorides in aggregates
SANS 5832	Organic impurities in fine aggregates (limit test)
SANS 5833	Detection of sugar in fine aggregates
SANS 5834	Soluble deleterious impurities in fine aggregates (limits test)
SANS 5835	Estimation of the effect of fine aggregates on the water requirement of concrete
SANS 5836	Effect of fine and coarse aggregate on the shrinkage and expansion of cement:

Code	Description
	aggregate mixes (mortar prism method)
SANS 5837	Low density materials content of aggregates
SANS 5838	Sand equivalent value of fine aggregates
SANS 5840	Shell content of fine aggregate
SANS 5841	Aggregate crushing value of coarse aggregates
SANS 5842	FACT value (10% fines aggregate crushing value) of coarse aggregates
SANS 5844	Particle and relative densities of aggregates
SANS 5845	Bulk densities and voids content of aggregates
SANS 5846	Abrasion resistance of coarse aggregates (Los Angeles machine method)
SANS 5847	Flakiness index of coarse aggregates
SANS 5848	Polished-stone value of aggregates
SANS 5849	Total water-soluble salts content of fines in aggregates
SANS 5850-1	Sulphates content of fines in aggregates. Part 1, Water-soluble sulphates in fines in aggregates
SANS 5850-2	Sulphates content of fines in aggregates. Part 2, Acid-soluble sulphates in fines in aggregates
SANS 5851	Liquid limit of fines in aggregates for base-courses
SANS 5854	pH value of fines in aggregates for base-courses
SANS 5855	Free water content of aggregates
SANS 5856	Bulking of fine aggregates
SANS 6239	Aggregate impact value of coarse aggregate
SANS 6240	Electric conductivity of fine aggregate
SANS 6241	Particle size distribution of material of diameter smaller than 75 micron in fine aggregate (hydrometer method)
SANS 6242	Acid insolubility of aggregates
SANS 6243	Deleterious clay content of the fines in aggregate (methylene blue adsorption indicator test)
SANS 6244	Particles of diameter not exceeding 20micron and not exceeding 5micron and smaller, respectively, in fine aggregate (pipette method)
SANS 6245	Potential reactivity of aggregates with alkalis (accelerated mortar prism method)
SANS 6246	Treton impact value of aggregates
Cementitious Materials	
SANS 1745	Cementitious grouting capsules for use with tendon-based support systems
SANS 5748	Specific surface of cement
SANS 5754	Autoclave expansion of cement
SANS 6151	Free water content of Portland cementitious materials
SANS 6152	Available alkali content of cement extenders (complying with SANS 50197-1)
SANS 6154	Glass content of granulated metallurgical slag (transmitted-light microscopy method)
SANS 6155	Effect of extenders, used with cement, on the reduction of expansion caused by alkali-silica reaction (accelerated mortar prism method)
SANS 50196-1	Methods of testing cement. Part 1, Determination of strength
SANS 50196-2	Methods of testing cement. Part 2, Chemical analysis of cement
SANS 50196-3	Methods of testing cement. Part 3, Determination of setting times and soundness
SANS 50196-4	Methods of testing cement. Part 4, Quantitative determination of constituents
SANS 50196-5	Methods of testing cement. Part 5, Pozzolanicity test for pozzolanic cement
SANS 50196-6	Methods of testing cement. Part 6, Determination of fineness
SANS 50196-7	Methods of testing cement. Part 7, methods of taking and preparing samples of cement

Code	Description
SANS 50197-1	Cement. Part 1, Composition, specifications and conformity criteria for common cements
SANS 50197-2	Cement. Part 2. Conformity evaluation
SANS 50413-1	Masonry cement. Part 1, Composition, specifications and conformity criteria
SANS 50413-2	Masonry cement. Part 2, Test methods
SANS 50450-1	Fly ash for concrete. Part 1, Definition, specifications and conformity criteria
SANS 50450-2	Fly ash for concrete. Part 2, Conformity evaluation
SANS 50451-1	Method of testing fly ash. Part 1, Determination of free calcium oxide content
SANS 50451-2	Method of testing fly ash. Part 2, Determination of fineness by wet sieving
SANS 53263-1	Silica fume for concrete. Part 1, Definitions, requirements and conformity criteria
SANS 53263-2	Silica fume for concrete. Part 2, Conformity evaluation
SANS 55167-1	Ground granulated blast furnace slag for use in concrete, mortar and grout. Part 1, Definitions, specifications and conformity criteria.
SANS 55167-2	Ground granulated blast furnace slag for use in concrete, mortar and grout. Part 2, conformity evaluation
Concrete	
SANS 878	Ready-mixed concrete
SANS 5860	Concrete tests - Dimensions, tolerances and uses of cast test specimens
SANS 5861-1	Concrete tests - Mixing fresh concrete in the laboratory
SANS 5861-2	Concrete tests -Sampling of freshly mixed concrete
SANS 5861-3	Concrete tests - Making and curing of test specimens
SANS 5862-1	Concrete tests - Consistence of freshly mixed concrete - slump test
SANS 5862-2	Concrete tests - Consistence of freshly mixed concrete - flow test
SANS 5862-3	Concrete tests - Consistence of freshly mixed concrete - vebe test
SANS 5862-4	Concrete tests - Consistence of freshly mixed concrete. Part 4, Compacting factor and compaction index
SANS 5863	Concrete tests - compressive strength of hardened concrete
SANS 5864	Concrete tests - flexural strength of hardened concrete
SANS 5865	Concrete tests - the drilling, preparation, and testing for compressive strength of cores taken from hardened concrete
SANS 6085	Concrete tests - initial drying shrinkage and wetting expansion of concrete
SANS 6250	Concrete tests - density of compacted freshly mixed concrete
SANS 6251	Concrete tests - density of hardened concrete
SANS 6252	Concrete tests - air content of freshly mixed concrete - pressure method
SANS 6253	Concrete tests - tensile splitting strength of concrete
SANS 6254	Mortar tests - initial drying shrinkage and wetting expansion of mortar
SANS 6255	Mortar tests - compressive strength of mortar
SANS 50206	Concrete – Specification, performance, production and conformity
Design	
SANS 993	Modular co-ordination in building
SANS 10100-1	The structural use of concrete. Part 1, Design
SANS 10160	Basis of structural design and actions for buildings and industrial structures.
Construction	
SANS 2001 CC1	Construction works: Part CC1: Concrete works (structural)
SANS 2001 CC2	Construction works: Part CC2: Concrete works (minor works)
SANS 10100-2	The structural use of concrete. Part 2, Materials and execution of work
SANS 10109-1	Concrete floors. Part 1, Bases to concrete floors

Code	Description
SANS 10109-2	Concrete floors. Part 2, Finishes to concrete floors
SANS 10155	Accuracy in buildings
SANS 53670	Execution of concrete structures
SANS 55392	Sustainability in building construction: general principles
Reinforcement	
SANS 282	Bending dimensions and scheduling of steel reinforcement for concrete
SANS 920	Steel bars for concrete reinforcement
SANS 1024	Welded steel fabric for reinforcement of concrete
SANS 10144	Detailing of steel reinforcement for concrete
Water	
SANS 51008	Mixing of water for concrete – Specification for sampling, testing and assessing the suitability of water, including water recovered from processes in the concrete industry, as mixing water for concrete
Concrete and Related Products	
SANS 266	Gypsum plasterboard
SANS 470	Concrete poles for telephone, power and lighting purposes
SANS 508	Concrete retaining blocks
SANS 541	Precast concrete paving slabs
SANS 676	Reinforced concrete pressure pipes
SANS 677	Concrete non-pressure pipes
SANS 685	Fibre-cement sheets (flat and profiled)
SANS 803	Fibre-cement boards
SANS 819	Fibre-cement pipes, couplings and fittings for sewerage, drainage and low-pressure irrigation
SANS 927	Precast concrete kerbs, edgings and channels
SANS 975	Prestressed concrete pipes
SANS 986	Precast reinforced concrete culverts
SANS 1058	Concrete paving blocks
SANS 1215	Concrete masonry units
SANS 1223	Fibre-cement pressure pipes and couplings
SANS 1294	Precast concrete manhole sections and components
SANS 1372	Prefabricated concrete components for fences
SANS 1504	Pre-stressed concrete lintels
SANS 1879	Precast concrete suspended slabs
SANS 1882	Polymer concrete surface boxes, manhole and inspection covers, gully gratings and frames
SANS 50771-3	Specification for masonry units. Part 3, Aggregate concrete masonry unite (dense and lightweight aggregates)
SANS 50771-4	Specification for masonry units. Part 4, Autoclaved aerated concrete masonry units
SANS 10904	Fibre-cement corrugated sheets and fittings for roofing and cladding
Laboratory Practice and Equipment in General	
SANS 1649	Non-automatic self-indicating, semi-self-indicating and non-self-indicating weighing instruments with denominated verification scale intervals
SANS 2859-1	Sampling procedures for inspection by attributes. Part 1, Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection
SANS 3310-1	Test sieves - technical requirements and testing. Part 1, Test sieves of metal wire cloth

Code	Description
SANS 3310-2	Test sieves - Technical requirements and testing. Part 2, Test sieves of perforated metal plate
SANS 6150	Verification of compression testing machines for concrete: calibration of load scale
SANS 10378	General requirements for the competence of verification laboratories
SANS 17025	General requirements for the competence of testing and calibration laboratories
Other Standards	
SANS 53584	Products and systems for the protection and repair of concrete structures – Test methods – Determination of creep in compression for repair products
SANS 1200 G	Standardized specification for civil engineering construction Section G: Concrete (structural)

C3.2 *CONTRACTOR'S WORKS INFORMATION*

- The Contractor shall execute the Works per the submitted schedule or as agreed between the Contractor and the Employer. The Contractor shall notify the Employer timeously should there be any changes in the submitted programme. The Contractor shall also acquaint themselves with the work involved and verify all quantities, materials etc. necessary to undertake the Works, for proper programming and co-ordination.
- Programme format – The Contractor to issue the programme using either MS Projects (soft copy) or Primavera (soft copy)
- The program should be updated as per the changes on Outage listing
- Programme is to be submitted as indicated in the Contract Data.

PART 4: SITE INFORMATION

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

PART 4: SITE INFORMATION

Core clause 11.2(16) states

“Site Information is information which

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

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

1. General description

Site	:	Kusile Power Station
Regional Authority	:	Emalahleni Local Municipality, Mpumalanga Province
Nearest Towns	:	Emalahleni – 42km north east of power station Bronkhorstspuit – 41km south of power station Delmas – 45km north of power station There are informal settlements within a 10 km radius of the power station.
Infrastructure	:	Kusile Power Station is situated approximately 3km from the N4 highway and is connected to it by means of a tarred road. There is also a secondary tarred road connecting the site with the R545 and D686.
Latitude & longitude	:	
Landowner	:	Portions of Horingkraans Farm
River catchment	:	Wilge River
Regional Climate	:	Kusile Power Station is situated in the Mpumalanga Province on the Highveld in the western part of Mpumalanga province on the escarpment, at an average height of 1551 m above sea level. The winters are generally dry and cold with regular frost and temperatures varying between -7°C and 23°C. The summers are mild with most of the rainfall occurring during this season. Temperatures vary between 12° & 32° C. Data from the Emalahleni weather station shows that Kusile Power Station is sited in such a way that for most of the year (291 days) the wind direction is from the power station in a direction that is North West.
Wind direction	:	
Rainfall	:	Based on information recorded at the Emalahleni weather station, the average annual rainfall for the Emalahleni area is approximately 691 mm. (Weather Bureau, Pretoria).

2. Existing buildings, structures, and plant & machinery on the Site

- The Contractor will be required to work with others with whom the Contractor may be required to share the Affected Property.
- Requirements for liaison with and acceptance from statutory authorities or inspection agencies will be communicated when required
- Any risk arises due to buildings, structures, and plant & machinery on the Site to be communicated with the project manager prior to work commencement.

3. Subsoil information

Not Applicable

4. Hidden services

Not Applicable

5. Other reports and publicly available information

Not Applicable