

NEC3 Engineering & Construction Contract

Between **NTCSA SOC Ltd**
(Reg No. 2021/539129/30)

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

for **PUBLIC ADDRESS SYSTEM INSTALLATION AT VICTORIA
LAKE INN, SIMMERPAN GERMISTON FOR A PERIOD OF
SIX MONTHS**

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

CONTRACT No. [Insert at award stage]

Part C1: Agreements & Contract Data

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

C1.1 Form of Offer & Acceptance

Offer

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

PUBLIC ADDRESS SYSYTEM INSTALLATION AT VICTORIA LAKE INN, SIMMERPAN GERMISTON FOR A PERIOD OF SIX (06) MONTHS

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

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

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

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

Signature(s)

Name(s)

Capacity

**For the
tenderer:**

(Insert name and address of organisation)

Name &
signature of
witness

Date

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**

Megawatt Park Maxwell Drive Sunninghill Sandton ; Postal Address: P.O Box 1091
Johannesburg 2001

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)	Megawatt Park Maxwell Drive Sunninghill Sandton; Postal Address: P.O Box 1091 Johannesburg 2001
Name & signature of witness	_____	_____
Date	_____	_____

C1.2 ECC3 Contract Data

Part one - Data provided by the *Employer*

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

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

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

Clause	Statement	Data
1	General	
	The <i>conditions of contract</i> are the core clauses and the clauses for main Option	
		B: Priced contract with bill of quantities
	dispute resolution Option	W1: Dispute resolution procedure
	and secondary Options	X2: Changes in the law
		X7: Delay damages
		X16: Retention
		X18: Limitation of liability
		X20: Key performance indicators
		Z: Additional conditions of contract
	of the NEC3 Engineering and Construction Contract, April 2013 (ECC3)	
10.1	The <i>Employer</i> is (Name):	NTCSA SOC Ltd (reg no: 2021/539129/30), a state owned company incorporated in terms of the company laws of the Republic of South Africa
	Address	Registered office at Megawatt Park, Maxwell Drive, Sandton, Johannesburg
10.1	The <i>Project Manager</i> is: (Name)	TBC
	Address	TBC

	Tel	TBC	
	Fax	TBC	
	e-mail	TBC	
10.1	The <i>Supervisor</i> is: (Name)	TBC	
	Address	TBC	
	Tel No.	TBC	
	Fax No.	TBC	
	e-mail	TBC	
11.2(13)	The <i>works</i> are	To supply and installation of Public Address System at Simmerpan complex, VLI and Hume	
11.2(14)	The following matters will be included in the Risk Register	Risks to be identified at the project risk meeting	
11.2(15)	The <i>boundaries of the site</i> are	The boundaries of the Eskom property at Simmerpan, Germiston	
11.2(16)	The Site Information is in	Part 4: Site Information	
11.2(19)	The Works Information is in	Part 3: Scope of Work and all documents and drawings to which it makes reference.	
12.2	The <i>law of the contract</i> is the law of	the Republic of South Africa	
13.1	The <i>language of this contract</i> is	English	
13.3	The <i>period for reply</i> is	Two weeks	
2	The Contractor's main responsibilities	Data required by this section of the core clauses is provided by the <i>Contractor</i> in Part 2 and terms in italics used in this section are identified elsewhere in this Contract Data.	
3	Time	Six (06) Months	
11.2(3)	The <i>completion date</i> for the whole of the <i>works</i> is	TBC	
11.2(9)	The <i>key dates</i> and the <i>conditions</i> to be met are:	Condition to be met	key date
		1 Security clearance of personnel & Induction	TBC
		2 Submission of SHEQ implementation file	TBC
		3 Establish Site	TBC
30.1	The <i>access dates</i> are:	Part of the Site	Date
		1 Simmerpan Complex,	TBC

Victoria lake inn & Hume

31.1	The <i>Contractor</i> is to submit a first programme for acceptance within	Two weeks of the contract start date.
31.2	The <i>starting date</i> is	TBC
32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than	Two weeks.
35.1	The <i>Employer</i> is not willing to take over the works before the Completion Date.	

4 Testing and Defects

42.2	The <i>defects date</i> is	52 weeks after Completion of the whole of the works. Defects which the Supervisor notifies may jeopardise the performance of the works in use is the shortest possible time starting immediately upon notification of the Defect. Defects which the Supervisor notifies require urgent correction in 48 (forty-eight) hours.
43.2	The <i>defect correction period</i> is	Two weeks

5 Payment

50.1	The <i>assessment interval</i> is	between the 25 day of each successive month.
51.1	The <i>currency of this contract</i> is the	South African Rand.
51.2	The period within which payments are made is	5 weeks.
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 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 <i>mutatis mutandis</i> every 6

months thereafter and as certified, in the event of any dispute, by any manager employed in the foreign exchange department of The Standard Bank of South Africa Limited, whose appointment it shall not be necessary to prove.

6 Compensation events

60.1(13)	The place where weather is to be recorded is: The <i>weather measurements</i> to be recorded for each calendar month are, The <i>weather measurements</i> are supplied by The <i>weather data</i> are the records of past <i>weather measurements</i> for each calendar month which were recorded at: and which are available from:	Germiston, South Africa 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 Contractor as verified by the Supervisor Germiston the South African Weather Bureau and included in Annexure A to this Contract Data provided by the Employer
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60.1(13)	Assumed values for the ten year return <i>weather data</i> for each <i>weather measurement</i> for each calendar month are:	As stated in Annexure A to this Contract Data provided by the Employer.
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7	Title	There is no reference to Contract Data in this section of the core clauses and terms in italics used in this section are identified elsewhere in this Contract Data.
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8 Risks and insurance

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9	Termination	There is no reference to Contract Data in this section of the core clauses and terms in italics used in this section are identified elsewhere in this Contract Data.
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10 Data for main Option clause

A	Priced contract with activity schedule	There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.
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B	Priced contract with bill of quantities	
60.6	The <i>method of measurement</i> is	The Standard System of Measurement published by ASAQA and amended as stated in Part C2.1, Pricing Assumptions.
11	Data for Option W1	
W1.1	The <i>Adjudicator</i> is	the person selected from the ICE-SA Division (or its successor body) of the South African Institution of Civil Engineering Panel of Adjudicators by the Party intending to refer a dispute to him. (see www.ice-sa.org.za). If the Parties do not agree on an Adjudicator the Adjudicator will be appointed by the Arbitration Foundation of Southern Africa (AFSA).
	Address	TBC
	Tel No.	TBC
	Fax No.	TBC
	e-mail	TBC
W1.2(3)	The <i>Adjudicator nominating body</i> is:	the Chairman of ICE-SA a joint Division of the South African Institution of Civil Engineering and the London Institution of Civil Engineers. (See www.ice-sa.org.za) or its successor body.
W1.4(2)	The <i>tribunal</i> is:	arbitration.
W1.4(5)	The <i>arbitration procedure</i> is	the latest edition of Rules for the Conduct of Arbitrations published by The Association of Arbitrators (Southern Africa) or its successor body.
	The place where arbitration is to be held is	Johannesburg, South Africa
	The person or organisation who will choose an arbitrator	
	- if the Parties cannot agree a choice or	the Chairman for the time being or his nominee
	- if the arbitration procedure does not state who selects an arbitrator, is	of the Association of Arbitrators (Southern Africa) or its successor body.
12	Data for secondary Option clauses	
X2	Changes in the law	There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.
X7	Delay damages (but not if Option X5 is also used)	
X7.1	Delay damages for Completion of the whole of the <i>works</i> are	0.1% per day up to a limit of 10% of contract value

X15	Limitation of the Contractor's liability for his design to reasonable skill & care	There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.
X16	Retention (not used with Option F)	
X16.1	The retention percentage is	5% to be retained in each payment certificate to a maximum of 10% of the contract amount (5% payable when the works is taken over on project completion and 5% on the expiry of the defects period which is 52 weeks after the works has been taken over)
X18	Limitation of liability	
X18.1	The Contractor's liability to the Employer for indirect or consequential loss is limited to:	R0.0 (zero Rand)
X18.2	For any one event, the Contractor's liability to the Employer for loss of or damage to the Employer's property is limited to:	the amount of the deductibles relevant to the event
X18.3	The Contractor's liability for Defects due to his design which are not listed on the Defects Certificate is limited to	The greater of - the total of the Prices at the Contract Date and - the amounts excluded and unrecoverable from the Employer's assets policy for correcting the Defect (other than the resulting physical damage which is not excluded) plus the applicable deductible as at contract date.
X18.4	The Contractor's total liability to the Employer for all matters arising under or in connection with this contract, other than excluded matters, is limited to:	the total of the Prices other than for the additional excluded matters. The Contractor's total liability for the additional excluded matters is not limited. The additional excluded matters are amounts for which the Contractor is liable under this contract for - Defects due to his design which arise before the Defects Certificate is issued, - Defects due to manufacture and fabrication outside the Site, - loss of or damage to property (other than the works, Plant and Materials), - death of or injury to a person and - infringement of an intellectual property right.
X18.5	The end of liability date is	(i) 7 (Seven) years after the defects date for latent Defects and (ii) the date on which the liability in question prescribes in accordance with the Prescription

Act No. 68 of 1969 (as amended or in terms of any replacement legislation) for any other matter.

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

Z The *Additional conditions of contract* are

Z1 to Z15 always apply.

Z1 Cession delegation and assignment

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

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

Z2 Joint ventures

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

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

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

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

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

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

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

Z3.4 Failure by the *Contractor* to notify the *Employer* of a change in its B-BBEE status may

constitute a reason for termination. If the *Employer* terminates in terms of this clause, the procedures on termination are P1, P2 and P3 as stated in clause 92, and the amount due is A1 and A3 as stated in clause 93.

Z4 Confidentiality

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

Z5 Waiver and estoppel: Add to core clause 12.3:

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

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

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

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

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

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

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

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

Z8 Notifying compensation events

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

Z9 Employer's limitation of liability

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

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

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

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

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

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

Z12 Ethics

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

Affected Party means, as the context requires, any party, irrespective of whether it is the *Contractor* or

a third party, such party's employees, agents, or Subcontractors or Subcontractor's employees, or any one or more of all of these parties' relatives or friends,

- Coercive Action** means to harm or threaten to harm, directly or indirectly, an Affected Party or the property of an Affected Party, or to otherwise influence or attempt to influence an Affected Party to act unlawfully or illegally,
- Collusive Action** means where two or more parties co-operate to achieve an unlawful or illegal purpose, including to influence an Affected Party to act unlawfully or illegally,
- Committing Party** means, as the context requires, the *Contractor*, or any member thereof in the case of a joint venture, or its employees, agents, or Subcontractor or the Subcontractor's employees,
- Corrupt Action** means the offering, giving, taking, or soliciting, directly or indirectly, of a good or service to unlawfully or illegally influence the actions of an Affected Party,
- Fraudulent Action** means any unlawfully or illegally intentional act or omission that misleads, or attempts to mislead, an Affected Party, in order to obtain a financial or other benefit or to avoid an obligation or incurring an obligation,
- Obstructive Action** means a Committing Party unlawfully or illegally destroying, falsifying, altering or concealing information or making false statements to materially impede an investigation into allegations of Prohibited Action, and
- Prohibited Action** means any one or more of a Coercive Action, Collusive Action Corrupt Action, Fraudulent Action or Obstructive Action.

- Z12.1 A Committing Party may not take any Prohibited Action during the course of the procurement of this contract or in execution thereof.
- Z12.2 The *Employer* may terminate the *Contractor's* obligation to Provide the Services if a Committing Party has taken such Prohibited Action and the *Contractor* did not take timely and appropriate action to prevent or remedy the situation, without limiting any other rights or remedies the *Employer* has. It is not required that the Committing Party had to have been found guilty, in court or in any other similar process, of such Prohibited Action before the *Employer* can terminate the *Contractor's* obligation to Provide the Services for this reason.
- Z12.3 If the *Employer* terminates the *Contractor's* obligation to Provide the Services for this reason, the amounts due on termination are those intended in core clauses 92.1 and 92.2.
- Z12.4 A Committing Party co-operates fully with any investigation pursuant to alleged Prohibited Action. Where the *Employer* does not have a contractual bond with the Committing Party, the *Contractor* ensures that the Committing Party co-operates fully with an investigation.

Z13 Insurance

Z 13.1 Replace core clause 84 with the following:

Insurance cover 84

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

termination certificate.

INSURANCE TABLE A

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

Business Interruption	
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.

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

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

Month	Weather measurement				
	Cumulative rainfall (mm)	Number of days with rain more than 10mm	Number of days with min air temp < 0 deg.C	Number of days with snow lying at 08:00 CAT	[Other measurements if applicable]
January	[•]	[•]	[•]	[•]	
February	[•]	[•]	[•]	[•]	
March	[•]	[•]	[•]	[•]	
April	[•]	[•]	[•]	[•]	
May	[•]	[•]	[•]	[•]	
June	[•]	[•]	[•]	[•]	
July	[•]	[•]	[•]	[•]	
August	[•]	[•]	[•]	[•]	
September	[•]	[•]	[•]	[•]	
October	[•]	[•]	[•]	[•]	
November	[•]	[•]	[•]	[•]	
December	[•]	[•]	[•]	[•]	

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

C1.2 Contract Data

Part two - Data provided by the *Contractor*

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

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

Notes to a tendering contractor:

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

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

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:	

¹ Available from Engineering Contract Strategies Tel 011 803 3008, Fax 011 803 3009 or see www.ecs.co.za

		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 works is	TBC	
11.2(14)	The following matters will be included in the Risk Register	Trip and fall, strike, late delivery of material, etc	
11.2(19)	The Works Information for the <i>Contractor's</i> design is in:	N/A	
31.1	The programme identified in the Contract Data is	Will be discussed during execution	
A	Priced contract with activity schedule		
11.2(20)	The <i>activity schedule</i> is in	N/A	
11.2(30)	The tendered total of the Prices is	N/A	
B	Priced contract with bill of quantities		
11.2(21)	The <i>bill of quantities</i> is in	C2.2	
11.2(31)	The tendered total of the Prices is	(in figures) (in words), excluding VAT	
C	Target contract with activity schedule		
11.2(20)	The <i>activity schedule</i> is in	N/A	
11.2(30)	The tendered total of the Prices is	N/A	
D	Target contract with bill of quantities		
11.2(21)	The <i>bill of quantities</i> is in	N/A	
11.2(31)	The tendered total of the Prices is	N/A	
F	Management contract		
20.2	Work which the <i>Contractor's</i> will do himself is	Activity	price (lump sum or rate)
		N/A	N/A
		N/A	N/A
		N/A	N/A
	Data for Schedules of Cost Components	Note "SCC" means Schedule of Cost Components starting on page 60, and "SSCC" means Shorter Schedule of Cost Components starting on page 63 of ECC3 (April 2013).	
A	Priced contract with activity schedule	N/A	
B	Priced contract with bill of quantities	Data for the Shorter Schedule of Cost Components	
41 in SSCC	The percentage for people overheads is:	N/A	
21 in SSCC	The published list of Equipment is the last edition of the list published by	N/A	

	The percentage for adjustment for Equipment in the published list is	N/A		
22 in SSCC	The rates of other Equipment are:	Equipment	Size or capacity	Rate
		N/A	N/A	N/A
		N/A	N/A	N/A
		N/A	N/A	N/A
		N/A	N/A	N/A
		N/A	N/A	N/A
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	
		N/A	N/A	
		N/A	N/A	
		N/A	N/A	
		N/A	N/A	
62 in SSCC	The percentage for design overheads is	N/A		
63 in SSCC	The categories of design employees whose travelling expenses to and from the Working Areas are included in Defined Cost are:	N/A		
	If Option C, D or E is used	Data for Schedule of Cost Components		
23 in SCC	The listed items of Equipment purchased for work on this contract, with an on cost charge, are:	Equipment	Time related charge	Per (time period)
		N/A	N/A	N/A
		N/A	N/A	N/A
		N/A	N/A	N/A
		N/A	N/A	N/A
		N/A	N/A	N/A
24 in SCC	The rates of special Equipment are:	Equipment	Size or capacity	Rate
		N/A	N/A	N/A
		N/A	N/A	N/A
		N/A	N/A	N/A
		N/A	N/A	N/A
		N/A	N/A	N/A

44 in SCC	The percentage for Working Areas overheads is:	N/A		
51 in SCC	The hourly rates for Defined Cost of manufacture or fabrication 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	
		N/A	N/A	
		N/A	N/A	
		N/A	N/A	
		N/A	N/A	
52 in SCC	The percentage for manufacture and fabrication overheads is	N/A		
	If Option C, D, or E is used	Data for both schedules of cost components		
61 in SCC & SSSC	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	
		N/A	N/A	
		N/A	N/A	
		N/A	N/A	
		N/A	N/A	
62 in SCC & SSSC	The percentage for design overheads is	N/A		
63 in SCC & SSSC	The categories of design employees whose travelling expenses to and from the Working Areas are included as a cost of design of the <i>works</i> and Equipment done outside the Working Areas are:	N/A		
	If Option C, D or E is used	Data for the Shorter Schedule of Cost Components		
41 in SSSC	The percentage for people overheads is:	N/A		
21 in SSSC	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	N/A		
22 in SSSC	The rates of other Equipment are:	Equipment	Size or capacity	Rate
		N/A	N/A	N/A
		N/A	N/A	N/A
		N/A	N/A	N/A

	N/A	N/A	N/A
	N/A	N/A	N/A

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 <i>bill of quantities</i> 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 <i>Contractor</i> 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 <i>Contractor</i> 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

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	meganeutron
MN.m	meganeutron-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

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*

Simmerpan Public Address System Phase 2

ITEM NO	DESCRIPTION	UOM	QTY	RATE	AMOUNT
<u>SECTION A: PRELIMINARIES AND GENERAL</u>					
<u>Establishment of Facilities on the Site for Contractor</u>					
The sums stated for items under this heading shall cover the cost of providing, establishing and commissioning on the site the facilities adequately equipped to enable all the work to commence and to proceed to completion as required in terms of the contract. The Bill must be completed using the technical specification of the project. The works information is provided and no claims arising from brevity of description of items fully described in the said works information will be entertained Works Information/scope of work are incorporated to satisfy the requirements of this project. Such information shall take precedence The contractor's prices for all items throughout this document must take account of and include for all obligations, requirements and specifications given in the said works information/scope of work. No variation will be entertained on the items clearly listed in works information					
<u>BILL NO : 1 PRELIMINARY AND GENERAL</u>					
<u>Fixed related P&Gs</u>					
	Site Establishment	Sum	1		
	Construction and setting out of survey beacons (Including fiber line layout)	Item	1		
	Barricading	Item	1		
	Site De establishment	Item	1		
<u>Health and Safety</u>					
	Preparation of Health and Safety File	Once	1		

	off	
Pre-employment medical examination	Per Person	1
Exit -medical examination	Per Person	1
Personal Protective Clothing and Equipment (Overall, Hardhat, Gloves, Goggles, ect.)	Per Person	1
Police Clearance	Per Person	1

Training

Training NTCSA Staff (Supervisors and Technicians)	Sum	1
--	-----	---

TIME RELATED P&GS

Project Management/Supervision	Monthly	6
Safety Personnel	Monthly	6
Transportation for workers	Monthly	6
Accommodation (Including meals)	Monthly	6
Consumables (Drills, bolts, cable ties, bolts and nuts)	Monthly	6
Fiber splicing tool/machine	Monthly	6

Section Summary carried Forward

SECTION B

BILL NO : 2 EARTHWORKS

DEMOLITIONS AND SITE CLEARANCE

Demolitions:

Breaking up and removing surface concrete	m ²	1800
Breaking up and removing road surface	m ²	1800
Disposal of excavated material	m ³	270

Site Clearance:

Removal of rubbish, debris, vegetation, hedges, shrubs and trees not exceeding 200mm girth, bush, etc	m ²	2
---	----------------	---

EXCAVATIONS, FILLINGS, ETC

Excavate in situ material not exceeding 1.5m deep and set aside for backfilling:

Cable trenches	m ³	1200
----------------	----------------	------

Backfill using material obtained from excavation

Cable trenches	m ³	3000
----------------	----------------	------

Bedding:

Riversand bedding around cables	m ³	15
---------------------------------	----------------	----

Keeping excavation free from water:

Keeping excavations free of all water other than subterranean water	Item	1
---	------	---

Compaction of surfaces:

Compaction of natural excavated ground surfaces	m ²	6000
---	----------------	------

Grassing, pitching, etc:

Grassing	m ²	2400
----------	----------------	------

Section Summary carried Forward

BILL NO : 3 CONCRETE, FORMWORK AND REINFORCEMENT

25Mpa/19mm:

Walkways	m ³	450
----------	----------------	-----

Reinforcement:

High tensile steel	Ton	3
--------------------	-----	---

Mild tensile steel	Ton	3
--------------------	-----	---

Section Summary carried Forward

BILL NO: 4 ELECTRICAL WORK

CABLES - To include all necessary accessories i.e terminations, splicing, etc

Fibre optic single mode heavy duty duct (HDD) fibre cable as specified in ground, in ducts, on cable ladder, fixed to the surface, etc Rate to exclude excavations which are measured elsewhere. Quantities are provisional and subject to re-measure

24 Core	m	10000.00
---------	---	----------

Ethernet cabling fixed to surface, including all accessories i.e termination, etc

Cat5e STP	m	3000.00
-----------	---	---------

Cat6a	m	1500.00
-------	---	---------

PH30 Fire/Alarm as specified in ducts, on cabling ladder, fixed to the surface, etc to exclude excavations which are measured elsewhere.
Quantities are provisional and subject to re-measure

1.5mm SWA - 4 Core	m	2500.00
--------------------	---	---------

1.00mm - 4 Core	m	10000.00
-----------------	---	----------

1.5mm - 2 Gore	m	2500.00
----------------	---	---------

1.00mm - 2 Core	m	15000.00
-----------------	---	----------

Conduits

Supply and install PVC Conduit including couplings, ends, round outlet/draw boxes, cutting, bending, waste, cleaned and ready for wiring:

20mm layed in ground	m	3000
----------------------	---	------

20mm fixed in brickwall	m	3000
-------------------------	---	------

Supply and install steel Conduit including couplings, ends, round outlet/draw boxes, cutting, bending, waste, cleaned and ready for wiring:

20mm layed in gorund	m	2000
----------------------	---	------

20mm fixed in brickwall	m	2000
-------------------------	---	------

HDPE Pipe

Road crossing

40mm OD for fibre optic cabling	m	10000
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ELECTRONIC INSTALLATIONS

EQUIPMENT

Zone 4 Simmer Centre EMPD Building

Equipment rack 600mm wide, 800mm Deep, 42U	No.	1
--	-----	---

AC Distribution panel	No.	1
-----------------------	-----	---

24 Way single mode patch panel	No.	1
--------------------------------	-----	---

8 x 10/100/1000 RJ45, 4 x 100/1000SFP	No.	1
Voice recorder with spare SD/CF card	No.	1
FM/USB/SD card audio player 1U 19 inch rack size	No.	1
Voice evacuation frame 4AB for the VX-3000	No.	2
Digital power amplifier module 300W	No.	3
Services terminal (HMI)	No.	1
Emergency power supply for the VX 3000	No.	1
12 Volt 100 A/H battery (Special seal battery certified for use with VA system)	No.	2
2 way fan tray at the panel of each rack	No.	2
Lockable pull out tray for human machine interface	No.	1

Zone 5 Central Grid Building

Equipment rack 600mm wide, 800mm Deep, 42U	No.	1
AC Distribution panel	No.	1
24 Way single mode patch panel	No.	1
8 x 10/100/1000 RJ45, 4 x 100/1000SFP	No.	1
Voice recorder with spare SD/CF card	No.	1
FM/USB/SD card audio player 1U 19 inch rack size	No.	1
Voice evacuation frame 4AB for the VX-3000	No.	2
Digital power amplifier module 300W	No.	3
Services terminal (HMI)	No.	1
Emergency power supply for the VX 3000	No.	1
12 Volt 100 A/H battery (Special seal battery certified for use with VA system)	No.	2
2 way fan tray at the panel of each rack	No.	2
Lockable pull out tray for human machine interface	No.	1

Zone 6 Safety Risk Management Building

Compact voice alarm system based on the VX 3000 system	No.	1
Battery box for VX - 3308WM	No.	1
24-Way single mode patch panel	No.	1
8x10/100/1000 RJ45, 4x100/1000 SFP	No.	1

Digital power amplifier module 300W	No.	1
12 Volt 65 A/H battery (Special seal battery certified for use with VA system)	No.	2
<u>Zone 7 Live Line Building</u>		
Compact voice alarm system based on the VX 3000 system	No.	1
Battery box for VX - 3308WM	No.	1
24-Way single mode patch panel	No.	1
8x10/100/1000 RJ45, 4x100/1000 SFP	No.	1
Digital power amplifier module 300W	No.	1
12 Volt 65 A/H battery (Special seal battery certified for use with VA system)	No.	2
<u>Zone 8 School of Technology</u>		
Compact voice alarm system based on the VX 3000 system	No.	1
Battery box for VX - 3308WM	No.	1
24-Way single mode patch panel	No.	1
8x10/100/1000 RJ45, 4x100/1000 SFP	No.	1
Digital power amplifier module 300W	No.	1
12 Volt 65 A/H battery (Special seal battery certified for use with VA system)	No.	2
<u>Zone 9 Victoria Lake Inn (VLI)</u>		
Equipment rack 600mm wide, 800mm Deep, 42U	No.	1
AC Distribution panel	No.	1
24 Way single mode patch panel	No.	1
8 x 10/100/1000 RJ45, 4 x 100/1000SFP	No.	1
Voice recorder with spare SD/CF card	No.	1
FM/USB/SD card audio player 1U 19 inch rack size	No.	1
Voice evacuation frame 4AB for the VX-3000	No.	2
Digital power amplifier module 300W	No.	3
Services terminal (HMI)	No.	1
Emergency power supply for the VX 3000	No.	1

12 Volt 100 A/H battery (Special seal battery certified for use with VA system)	No.	2
---	-----	---

2 way fan tray at the panel of each rack	No.	2
--	-----	---

Lockable pull out tray for human machine interface	No.	1
--	-----	---

Zone 10 PTMC Engineering Building

Equipment rack 600mm wide, 800mm Deep, 42U	No.	1
--	-----	---

AC Distribution panel	No.	1
-----------------------	-----	---

24 Way single mode patch panel	No.	1
--------------------------------	-----	---

8 x 10/100/1000 RJ45, 4 x 100/1000SFP	No.	1
---------------------------------------	-----	---

Voice recorder with spare SD/CF card	No.	1
--------------------------------------	-----	---

FM/USB/SD card audio player 1U 19 inch rack size	No.	1
--	-----	---

Voice evacuation frame 4AB for the VX-3000	No.	2
--	-----	---

Digital power amplifier module 300W	No.	3
-------------------------------------	-----	---

Services terminal (HMI)	No.	1
-------------------------	-----	---

Emergency power supply for the VX 3000	No.	1
--	-----	---

12 Volt 100 A/H battery (Special seal battery certified for use with VA system)	No.	2
---	-----	---

2 way fan tray at the panel of each rack	No.	2
--	-----	---

Lockable pull out tray for human machine interface	No.	1
--	-----	---

Zone 11 Hume Building

Equipment rack 600mm wide, 800mm Deep, 42U	No.	1
--	-----	---

AC Distribution panel	No.	1
-----------------------	-----	---

24 Way single mode patch panel	No.	1
--------------------------------	-----	---

8 x 10/100/1000 RJ45, 4 x 100/1000SFP	No.	1
---------------------------------------	-----	---

Voice recorder with spare SD/CF card	No.	1
--------------------------------------	-----	---

FM/USB/SD card audio player 1U 19 inch rack size	No.	1
--	-----	---

Voice evacuation frame 4AB for the VX-3000	No.	2
--	-----	---

Digital power amplifier module 300W	No.	3
-------------------------------------	-----	---

Services terminal (HMI)	No.	1
-------------------------	-----	---

Emergency power supply for the VX 3000	No.	1
--	-----	---

12 Volt 100 A/H battery (Special seal battery certified for use with VA system)	No.	2
---	-----	---

2 way fan tray at the panel of each rack No. 2

Lockable pull out tray for human machine interface No. 1

Zone 12 Switchgear Building

Equipment rack 600mm wide, 800mm Deep, 42U No. 1

AC Distribution panel No. 1

24 Way single mode patch panel No. 1

8 x 10/100/1000 RJ45, 4 x 100/1000SFP No. 1

Voice recorder with spare SD/CF card No. 1

FM/USB/SD card audio player 1U 19 inch rack size No. 1

Voice evacuation frame 4AB for the VX-3000 No. 2

Digital power amplifier module 300W No. 3

Services terminal (HMI) No. 1

Emergency power supply for the VX 3000 No. 1

12 Volt 100 A/H battery (Special seal battery certified for use with VA system) No. 2

2 way fan tray at the panel of each rack No. 2

Lockable pull out tray for human machine interface No. 1

Microphones

Remote microphone for VX 3000 series No. 4

Remote microphone extension for the RM 300X desk top remote microphone No. 4

Firemans microphone for VX 3000 series No. 1

Firemans microphone extension for RM 300MF No. 1

System cabinets and Housing (Including all required accessories i.e 4 way fan, shelves, castors, panel brush, nuts, etc)

600mm (W) x 800mm (D) floor-standing cabinets No. 35

600mm (W) x 2250mm (D) floor-standing cabinets No. 6

Fittings, equipment, including terminations, mounting plates, brackets, connectors, etc:

Horn Speakers 15W No. 39

Ceiling Speakers (Single cone) No. 146

Wall-Mount Box (Cabinet) Speakers (6W)	No.	5
--	-----	---

Box Speaker W/O Attenuator (15W)	No.	81
----------------------------------	-----	----

Bi-Directional Projection Speaker	No.	52
-----------------------------------	-----	----

Attenuators and Attenuator Mountings, including back boxes

Attenuator 12W	No.	15
----------------	-----	----

Attenuator 30W	No.	20
----------------	-----	----

Commissioning

Rack Testing	Item	1
--------------	------	---

Factory Acceptance Testing	Item	1
----------------------------	------	---

Site Acceptance Testing	Item	1
-------------------------	------	---

Configuration / Commissioning / Integration	Item	1
---	------	---

Certificate of electrical compliance	Item	1
--------------------------------------	------	---

Documentation (Manuals / schematics / architecture / data sheets/layout)	Item	1
--	------	---

Section Summary carried Forward

SECTION C

BILL NO:1 ROADWORKS

DAYWORK

Personnel

Unskilled	Hrs	43.75
-----------	-----	-------

Semi-skilled	Hrs	43.75
--------------	-----	-------

Skilled	Hrs	43.75
---------	-----	-------

Equipment

Vibratory roller (660mm)	Hrs	43.75
--------------------------	-----	-------

Generator	Hrs	43.75
-----------	-----	-------

Jack hammer	Hrs	43.75
-------------	-----	-------

Temporary traffic-control facilities

Portable STOP and GO-RY signs	No.	5
Road sign, R-and TR-series, (600mm)	No.	5
Road signs, TW-series, (600mm)	No.	5
Mounted back to back	No.	5
Road signs TIN SERIES	No.	5

Base repair, sawcut, excavate to maximum 200mm, compact insitu, backfill, excluding material costs

Saw cut existing asphalt surface	m ²	900
Excavate existing material	m ³	450
150mm layer selected imported delorite (wearing course layer) compacted to 93% MOD AASHTO - G1	m ³	135
200mm layer selected imported delorite (wearing course layer) compacted to 93% MOD AASHTO - G6	m ³	180

Prime coat

MC-30 cut back bitumen	litre	20
------------------------	-------	----

Asphalt surfacing 30mm thick using 60/70 penetration-grade bitumen

Continuously graded, medium grade	m ³	67.5
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Kerbing

Fig 8c kerb	m	25
Fig 8b kerb	m	25

Concrete

25 Mpa Concrete edgebeam (150 x 150mm)	m ³	12
--	----------------	----

Section Summary carried Forward

SUMMARY

PRELIMINARY AND GENERAL
EARTHWORKS
CONCRETE, FORMWORK AND REINFORCEMENT
ELECTRICAL WORK
ROADWORK

Total Summary carried forward to the form of offer
and acceptance

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

C3.1: EMPLOYER'S WORKS INFORMATION

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1 Description of the works

1.1 Executive overview

The entire Simmerpan Complex has been declared a National Key Point. The complex houses two primary Control Centre facilities operating around the clock, all year round, with three active control rooms. Alongside these control centres, the complex comprises various workshops, storage facilities, laboratories, offices, and boardrooms. Additionally, several buildings are situated adjacent to the main complex on Power Street, while conference and accommodation facilities are positioned alongside Victoria Lake.

The PA system is required and will primarily be used to broadcast informative and guidance voice instructions during an emergency to ensure correct implementation of the emergency response plan. The main function of the PA system is to ensure effective communication to all employees, *Contractor*, and visitors during emergency evaluation. System shall primarily use to provide clear one-way voice communication and audio alarm tones during an emergency to affect a rapid and orderly evacuation of everyone in response to the emergency.

The PA system is essential and will primarily serve to broadcast informative and directional voice instructions in emergencies, ensuring the accurate execution of the emergency response plan. Its principal purpose is to facilitate effective communication to all employees, contractors, and visitors during emergency evaluation. The system will predominantly be utilized to deliver clear one-way voice communication and audible alarm tones during emergencies, facilitating a swift and organized evacuation of all individuals in response to the emergency.

1. Description of the works

- The Scope of "Works" is an extension of the drawings, specifications and bills of quantities listed.
- The Contractor shall notify the Employer's representative of any discrepancies before commencement of the Works.
- The Contractor supplies all material, labour, plant, equipment, loose tools, consumables and transport for the duration and completion of the project.
- The Contractor shall provide all costs for the execution of the Works of the complete project as indicated on the drawings, specifications and in the Bill of Quantities.
- The contractor needs to detect the route to check the existing services before start excavations.
- The contractor to excavate the trench on the approve route.
- The contractor will lay HDPE pipe, blow fibre optic cable, terminate cable, and test.
- The contractor to do thrust boring to cross a busy road inside and outside the complex.
- The contractor will do re-instatement using tar/paving and lawn.
- The contractor will install fibre cabinets, amplifiers, zone selector panels/patch panels and speakers.

1.2 Employer's objectives and purpose of the works

The aim of this project is to provide a de-centralised EN-54 Voice Alarm (Public Address) Evaluation system ensuring compliance with the standards and specifications outlined in this document for the purposes of managing safety on site. This scope forms the 2nd phase of the project and caters for the areas as listed in the document. The system shall be scalable to ultimately provide a single integrated system to cater for broadcasts to all or selected areas / zones of the entire Simmerpan complex. The detailed requirements for the 2nd phase are as specified in this document. The system shall be highly reliable and provide a certain degree of redundancy. The system shall be capable of self-monitoring in real time and capable of isolating system failures. The proposed system shall require minimum or limited maintenance.

The project is applicable to following areas:

- Medical Centre
- Safety Risk Management
- Transport Building (Distribution)
- Live Line Building
- School of Technology
- Psychometric (Transport Building)
- PTM&C, Switchgear
- T System
- Tom Store
- Victor Lake Inn
- Hume Building
- Transit Building
- Risk Management
- Gymnasium
- Transmission Stores
- Metering Lab
- West Gate Offices,
- WP&CS – Prefab, ET Stores
- Telecoms
- Central Grid
- Maintenance Workshop
- Instrument Workshop
- Panel Workshop (Eng. Ground Floor)
- BIPM (Eng. 1st Floor)
- Simmer Centre EPMD
- Simmer Centre finance
- Simmer Centre HR
- Central Grid
- HV Lab (Live work test facility)
- DC Lab.

1.3 Interpretation and terminology

The following abbreviations are used in this Works Information:

Abbreviation	Meaning given to the abbreviation
ECC3	NEC 3 Engineering and Construction contract
TRE	Transmission Real Estate
ITP	Inspection and Test plan
MWP	Megawatt Park
NEC	New Engineering Contract
SABS	South African Bureau of Standards
SANS	South African National Standards

SHEQ	Safety, Health, Environment & Quality
CAD	Computer Aided Draughting
ISO	International Organisation for Standardisation
UV	Ultra Violet
SOP	Safe Operating Procedure
UV	Ultra Violet
EMP	Environmental Management Plan
QM	Quality Management
SHE	Safety Health Environment
AFC	Approved for construction
OBL	Outside battery limits
AFC	Approved for construction
OBL	Outside battery limits

2 Management and start up.

2.1 Management meetings

General

Formal routine meetings shall be held once a month throughout the duration of the contract. Should the requirement arise for any other additional meeting such meetings will be schedule accordingly. These meetings provide a forum for review of contractors' operations, assessment of progress and schedule, discussion and resolution of problems facing the Contractor and Project Manager and coordination of the activities of all parties concerned.

All safety meetings will be held as per attached SHE specification.

Pre-Construction kick off meeting.

The kick off meeting will take place prior to the Contractor mobilising to site between Employer and the Contractor. This meeting will be held at a location to be determined by the Employer.

Minutes of Meeting

The Project manager will prepare minutes of meeting for all meetings held between Employer and Contractor. The Minutes of Meeting contain all significant aspects of the meeting recorded together with any

actions placed and is presented to the Contractor for signature within 7 working days after the meeting. The Contractor needs to sign off the minutes as acceptance within 3 working days. After the Contractor has signed the minutes of meeting, the minutes are to be officially published.

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

Title and purpose	Approximate time & interval	Location	Attendance by:
Risk register, SHEQ, technical clarification and compensation events	To be advised by the Project Manager	Simmerpan and/or Microsoft Teams	Employer, Contractor, Supervisor, and SHEQ and other representatives as required.
Overall contract progress and feedback	To be advised by the Project Manager	Simmerpan and/or Microsoft Teams	Employer, Contractor, Supervisor, and other representatives as required.
Risk register, SHEQ, technical clarification and compensation events	To be advised by the Project Manager	Simmerpan and/or Microsoft Teams	Employer, Contractor, Supervisor, and SHEQ and other representatives as required.

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

Specify how documentation will be identified with an alpha numeric which indicates source, recipient, communication number etc. Provide details of any particular format or other constraints; for example, that all contractual communications will be in the form of properly compiled letters or forms attached to e mails and not as a message in the e mail itself. State any particular routing requirements but note from ECC who issues what to whom.

The language of all documentation is in English. The *Contractor* includes the *Employer's* drawing number in the drawing title block. This requirement only applies to design drawings developed by the *Contractor* and its Sub-*Contractors*. Drawing numbers are assigned by the *Employer* as drawings are developed.

Documentation control by the *Employer* will be done using the NTCSA project group standard documentation management system and using opentext for electronic filing.

All correspondence from the *Employer* to the *Contractor* will be referenced using the following reference.

The naming convention is explained as follows.

- YYYYMMDD refers to the date of the document in the format Year/Month/Date. This is the date of approval if the document is approved. For a new document that has just been created, it will be the date that the document was created on.
- Type refers to the latest folder/collection level in the WBS filing structure in which the document is published. Hence it refers to the folder/collection location of the documents. This is in line with the current practice within Tx RE of including the folder name in the naming of files/documents.

The various types to choose from are on the left-hand side as follows:

➤ Incoming Correspondence	(Communication)
➤ Outgoing Correspondence	(Communication)
➤ Presentation	(Meetings)
➤ Minutes	(Meetings)
➤ Project Audit Report	(Project Reporting)
➤ Weekly Report (Historic)	(Project Reporting)
➤ Technical Report	(Engineering and Design)
➤ Designs and Proforma Bill of Materials	(Engineering and Design)
➤ Specification	(Engineering and Design)
➤ Project Schedule	(Schedule Management)
➤ Tender	(Commercial Management)
➤ Contract	(Commercial Management)
➤ Risk	(Risk Management)
➤ Insurance	(Risk Management)
➤ Safety and Health	(SHEQ)
➤ Environment	(SHEQ)
➤ Quality	(SHEQ)
➤ Invoices and Payments	(Financial Management)
➤ Project Monthly Expenditure/Cash flows	(Financial Management)
➤ Finalisation	(Financial Management)
➤ Incoming Transmittal Form	(Transmittals)
➤ Outgoing Transmittal Form	(Transmittals)
➤ Site Personnel Details	(Human Resource Management)
➤ Task Schedule	(Human Resource Management)
➤ Commissioning and Handover	(Commissioning and Handover)
➤ Photo	(Photos)
➤ Project Close-out	(Project Close-out)

- Revision refers to the revision status of the document that has been approved.

File Extension refers to the file types such as doc, pdf, tif, xls, ppt, mpp. This is by default indicated on the file name.

Summary of the documentation required from the Contractor before and during construction which includes the following.

Document	Before	During
Programme	x	x
Resource Schedule	x	x
Health and Safety Plan	x	
Quality Assurance Plan	x	
Method Statements	x	
Material Inventory		x
Drawing Register	x	x
Progress Schedule		x
Application for payment		x
Weather Data	x	x
Monthly Safety Report		x
Progress Photographs		x

Contractual correspondence

- Properly compiled letters on official company letter head or forms attached to an email and not as a message in an email itself.
- Alpha numeric identification- reference: **Date/ VLI Skylight roof replacement/ communication Number**

- All correspondence to be addressed to the Project Manager

Contractual forms to be used (To be forwarded to Contractor)

- ECC- Early Warning by Contractor
- ECC- Notification of CE (Compensation Event) by the Contractor

Site Communications

Contractor site diary signed daily by the Supervisor.

Contractor daily site diary (Minimum requirements on Contractor daily Site Diary are):

Contract No.

Date

Work hours- Start, Finish and Overtime

Rainfall (mm)

Temperature

Visitors to site

Contractor employees on site and description (site Agent, Foreman, Skilled, Etc)

List of Plant and Equipment

Brief description of the day's activities

Toolbox talk topic.

Daily site diary should be signed daily by the Employer- Site manager/ Supervisor and Contractor-Contract Manager/ Site Agent

Daily Contractor's attendance registers to be attached to the daily site diary.

Site Instructions issued by the Supervisor.

Site Memorandums addressed to the Supervisor.

2.3 Health and safety risk management

In addition to the requirements of the laws governing health and safety, NTCSA may have some additional requirements particular to the works and the Working Areas for this contract. The text below provides for these being attached as an Annexure to this Works Information. PLEASE ALSO READ CORE CLAUSE 27.4 TOGETHER WITH Z7 IN THE ADDITIONAL CONDITIONS OF CONTRACT TO MAKE SURE THAT WHATEVER IS INCLUDED IN THE ANNEXURE FOLLOWS ON FROM THOSE CLAUSES.

The Contractor shall comply with the health and safety requirements – Safety, Health and Environmental Specification for the Simmerpan complex, VLI and HUME contained in Annexure (SHE Specification 240-155821967) to this Works Information.

2.4 Environmental constraints and management

The Contractor shall have an Environmental Management System in place that will ensure that the requirements are effectively implemented and managed.

The Contractor is required to ensure that all goods, services or works supplied in terms of the contract conform to all applicable environmental legislation.

The Contractor shall have an environmental management system in place that will ensure that the requirements of the environmental management plan are effectively implemented and managed.

Campsite establishment and de-establishment are to be managed in accordance with specification.

The layout should be such that it facilitates a circular traffic route that eliminates the need to reverse when loading and off-loading.

The Contractor shall comply with the environmental criteria and constraints stated in Annexure (SHE Specification 240-155821967)

2.5 Quality assurance requirements

The *Contractor* shall comply with the quality criteria stated in the 240-105658000 Supplier Quality Management Specification attached to this Works Information. The *Contractor* is to provide a quality inspection and test plan for the design, manufacture, delivery, and installation as stated in the Scope of Work, for approval.

2.6 Programming constraints

Tenderers will be evaluated with due consideration to the resources (both personnel and equipment) committed to the project as indicated in the tender programme. All proposed Subcontractors and Suppliers are to be identified at tender stage and will be included in the evaluation process.

The programme is to be submitted for acceptance in accordance with Core Clause 31 in the ECC3, in terms of which resources to complete each activity must be clearly identified. The programme is to be submitted within two weeks of the *starting date*. It is suggested that Gantt or bar chart formats be used for project planning, while progress graphs/schedules be submitted at monthly meetings to monitor progress.

The programme is to include the following information.

- Method statements which identify the equipment and other resources which the *Contractor* plans to use for the execution of the various activities of the project.
- Planned sectional completion dates as required as well as the completion date for the whole of the works.
- The order and timing of the operations which the *Contractor* plans to do in order to provide the works

provisions for:

- Float
- Time risk allowances
- Health, Safety and Quality requirements
- Environmental compliance requirements

The *Contractor* shall submit the first programme to the *Project Manager* for acceptance within two (2) weeks of the *starting date*. The programme must be in Primavera or Microsoft Project format.

The *Contractor* revises the programme as required in accordance to Core Clause 32 of ECC3. Each time the programme is revised, the *Contractor* is to submit a revised forecast rate of invoicing to the *Project Manager*.

2.7 Contractor's management, supervision and key people

The *Contractor* must submit an organogram which clearly indicates the people resources that will be utilised for this project. The organogram must clearly indicate lines of authority as well as lines of communication. Site staff as well as head office staff must be indicated. It must state any additional constraining requirements on *Contractor's* supervision and key people that are not already stated in other sections such as for Health and Safety. The Person carrying out and signing off any designs and installation needs to be a Competent Person with the required professional registration.

2.8 Invoicing and payment

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 NTCSA 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 4710303126;
- 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;
 - NTCSA order number must be clearly indicated on the invoice with the line number on the order for billing.
 - Only PDF invoices must be submitted.
 - Each PDF file should contain one invoice, one debit, and credit note only as NTCSA's SAP system does not support more than one PDF being linked into workflow at a time.
 - Only one PDF file per email (one invoice or debit note or credit note).
 - Send all invoices in PDF straight from your system to an NTCSA email address (see the email address below).
 - When it comes to foreign invoices, suppliers will be required to physical deliver the hard copies of original documents to the respective documentation management centers – though invoices emailed. NTCSA is still seeking clarity from the South African Reserve Bank for foreign invoices and currency. Current requirements are that these manual invoices should be submitted. Invoice copy can be sent to the email address indicated below.
 - All submitted invoices electronically must comply with the Tax Requirements.
 - If there is a Cost Price Adjustment on the invoice, NTCSA recommends separate invoice for CPA to avoid delays on payment, if there are issues for the CPA.
 - The introduction of electronic invoicing does not guarantee payment but will ensure visibility of all invoices and ensure that no invoices get lost. If the goods receipt is not done, the invoice will be parked, and the system will automatically send an email to the end user to do good receipt. This is also tracked by NTCSA through the park invoice report.
 - The Contractor can request a park invoice report from the Finance Shared Services (FSS) contact centre which can then be followed up and corrected.
 - The Contractor is welcome to forward the details of invoices corrected to the FSS contact centre.
 - All invoices for payment must be submitted to invoicesntcsalocal@ntcsa.co.za.

2.9 Insurance provided by the *Employer*

Insurance related queries for this project can be addressed to the *Project Manager* who will then refer the query to the applicable NTCSA specialist with regards to insurance matters for this project. The insurance policy provided by the Employer will be dealt with as specified in Clause 86.1.

2.10 Contract change management

This is not applicable.

2.11 Training workshops and technology transfer

Compliance to the SD&L requirements.

3 Engineering and the *Contractor's* design

3.1 *Employer's* design

Employer will provide user requirement specification (URS) / performance specification to which the *Contractor* is to comply when he is required to design the works.

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

Please refer to technical specifications

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

All project documents are submitted to the *Project Manager* with a transmittal note according to Project / Plant Specific Technical Documents and Records Management Work Instruction (240-76992014). In order to portray a consistent image, it is important that all documents used within the project follow the same standards of layout, style and formatting as described in the Work Instruction. In addition, the *Contractor* adheres to the following:

- Project Handover Documentation Management Procedure (240-66920003).
- Project Documentation Deliverable Requirement Specification (240-65459834).
- Technical Documentation Classification and Designation Standard (240-54179170).

The *Contractor* shall submit all documentation to the Project Manager as follows:

- Electronic copies are submitted to NTCSA to the Project Manager.
- Hard copies are submitted to the Project Manager accompanied by a Transmittal Note.

The *Contractor* submits detailed design reports and associated drawings.

3.4 Other requirements of the *Contractor's* design

Any proposed design change by *Contractor* must be forwarded to the *Project Manager* for approval prior to the commencement. All Design change management are performed in accordance to the latest revision of the Eskom Project Engineering Change Management Procedure (240-53114026).

This should be done 14 days prior to the *Contractor's* planned start date. The *Project Manager* will liaise with the applicable engineering representative and manage the process of approval. The *Contractor* will be notified in writing by the *Project Manager* when the proposal has been approved and when work can commence.

3.5 Use of *Contractor's* design

Upon acceptance of the contractor's designs, copyright will pass to the Employer.

3.6 Design of Equipment

Contractor submits particulars of the design of an item of equipment for the Project Manager for acceptance if the Project Managers instructs them to.

3.7 Equipment required to be included in the works

There is no specific requirement for specialist equipment to be provided by the *Contractor* for the works. The *Contractor* must supply all equipment he deems necessary to complete the works.

3.8 As-built drawings, operating manuals and maintenance schedules

As-built drawings required, must be marked up by the *Contractor* in conjunction with the Project Manager. The final completion certificate for the works will not be issued by the Project Manager unless all as-built drawings have been received if required. The Contractor should take note that the 50% retention release is subject to the Employer having received the As-built drawings and maintenance manual.

4 Procurement

4.1 People

4.1.1 Minimum requirements of people employed on the Site

Police clearance is required for personnel that the *Contractor* utilises on the site as the site location is a National Key Point due to its proximity to the National Control Centre.

4.1.2 BBBEE and preferencing scheme – SDL&I Section

Supplier Development Localisation and Industrialisation

SDL&I mandate is to achieve maximum and sustainable local development impact through leveraging Eskom's procurement spend in a manner that allows flexibility within the business in order to accommodate government local development initiatives and policies

As a State-Owned Enterprise, ESKOM supports Government's socio-economic development initiatives that it addresses through Supplier Development and Localisation objectives, which include enterprise development, transfer of skills, job creation, incubation, localisation of procurement initiatives and industrialisation.

For the purposes of tendering, the *tenderer* must demonstrate the manner in which the SD&L requirements will be met in due course in an implementation program. If the *tender* is awarded all SD&L undertakings (the *Contractor's* SD&L Obligations) must be made by the *Contractor* at the time of contracting.

SDL&I Undertaking

- The SDL&I undertaking generally identifies the following areas for SDL&I evaluation. These are procurement from EMEs, QSEs, LMEs (Generic); local content of the tender as a whole; Job creation and Skills Development commitments of the *tenderer*.
- Targets and weighting are set for each individual project.
- Tenderers who complete and submit the undertaking as required, but who do not meet Eskom's targets, will not be disqualified. SDL&I undertakings do not form part of scoring but commitments will form part of contractual obligations.

SDL&I Strategy Setting

Designated Components

Commodity	Components	Local Content Threshold
Cables	Telecom cables	90%
Steel	Galvanized steel	100%
Batteries	VRLA batteries	50%
Cement	Concrete	100%

Local Procurement Content

Tenderers are required to submit their proposals in the table below

Local Procurement Content	NTCSA target	Tenderer Proposal
	100%	

Jobs. Tenderers are required to submit proposals for the type and number of jobs that will be created and retained in South Africa as a direct result of being awarded a contract.

Type of Jobs to be created	Number of Jobs to be created

Type of Jobs to be retained	Number of Jobs to be retained

Skills development

Category	Supplier 's proposal
Electrical Technicians(on Job Training)	3
Safety Officer(On Job Training)	1

SDL&I Penalty and Performance Security

NTCSA will apply a penalty of 2.5% of the Contract Value for failure to meet SDL&I obligations. For the duration of the contract, NTCSA will retain 2.5% of every invoice (excluding VAT) as security for the fulfilment of all SDL&I Obligations. The retained amounts shall only be released to the Contractor upon:

- NTCSA receives the SDL&I progress report/s from the contractor.
- Fulfilment of all SDL&I obligations by the contractor.
- Submission of an approved compliance report by SDL&I Department

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

If the ASGI-SA requirements are to be included in this contract specify constraints which *Contractor* must comply with after contract award in regard to any ASGI-SA requirements. The ASGI-SA Compliance Schedule completed in the returnable tender schedules is reproduced here. If ASGI-SA does not apply, delete this paragraph.

The *Contractor* complies with and fulfils the *Contractor's* obligations in respect of the Accelerated and Shared Growth Initiative - South Africa in accordance with and as provided for in the *Contractor's* ASGI-SA Compliance Schedule stated below

[Insert the agreed ASGI-SA Compliance Schedule here]

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

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

4.2 Subcontracting

4.2.1 Preferred subcontractors

The *Employer* does not have any preferred Sub-Contractors that the Contractor must use. The Contractor must source products that are to specification. The *Contractor* will have to notify NTCSA in the event of using any Sub-Contractor. A Sub-Contractor cannot sub-contract work to another sub-contractor.

4.2.2 Subcontract documentation, and assessment of subcontract tenders

The *Employer* expects the *Contractor* to manage his Sub-Contractors in the same way that the *Project Manager* manages the *Contractor*. Special attention must be given to the management of the Sub-Contractors SHEQ compliance in the same way that the Employer manages the *Contractor*.

It is recommended that the *Contractor* make use of the NEC ECS / NEC3 ECSS contracting system to ensure a contracting standard throughout.

The *Project Manager* must accept all Sub-Contractors and suppliers that the *Contractor* employs for this contract

4.2.3 Limitations on subcontracting

The contractor must not subcontract all the work, nor main management responsibilities, without the Project Managers acceptance

4.2.4 Attendance on subcontractors

Not Applicable

4.3 Plant and Materials

4.3.1 Quality

Quality of work shall comply to technical requirements and specifications – See attached technical specification and quality documentation on tender returnable

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

No equipment or materials are provided “free issue” to the *Contractor* for this contract. All equipment and material necessary for the works are to be provided by the *Contractor*.

4.3.3 *Contractor's* procurement of Plant and Materials

Material must be off loaded and stored separately in areas allocated for this purpose. The Contractor must manage such storage areas as to ensure safety compliance as well as security of any equipment and material.

All transportation to site of equipment and material required for this project will be by means of road transport. The Contractor must familiarise himself with the road conditions to Simmerpan Complex, Victoria Lake Inn and Hume.

4.3.4 Spares and consumables

Replacement components are to be readily available. The *Contractor* guarantees that all components are available in South Africa in the foreseeable future for at least 20 years.

4.4 Tests and inspections before delivery

N/A

4.5 Marking Plant and Materials outside the Working Areas

N/A

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

N/A

4.7 Cataloguing requirements by the *Contractor*

State whether cataloguing is applicable, if it is, reference the requirements for cataloguing that need to be satisfied by the <i>Contractor</i> (consult Procurement Instruction Number 1 of 2018 – Incorporating Cataloguing into the Procurement Environment, Unique Identifier 240-1289988974).

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 Employer will provide access control for the Site. All persons and vehicles entering or exiting Simmerpan complex, Victoria Lake Inn and HUE may be subjected to searches and the Employer reserves the right to refuse entrance to the site, to any person not meeting security and/or access requirements. From time to time, and as required, the Employer will issue policies and procedures regarding Site security and access control. These policies and procedures shall be strictly adhered to by the Contractor. The Employer shall be entitled, at his discretion, to amend or relax the Site security and/or access requirements to deal with emergencies or other circumstances justifying such amendment or relaxation. Any breach of security must be reported to the *Employer* immediately.

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

The *Contractor's* Personnel and any visitors on the Site must be in possession of a valid identification card supplied by the *Contractor*. The Employer furthermore may remove from the Site (or from any other places, if any, as may be specified under the Contract as forming part of the Site) any person who ceases, for any reason, to have legitimate business thereon.

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

The *Contractor* must clearly indicate any shift work or extended working hour work that is required in order to meet with the required completion and milestone completion dates of the contract. The *Project Manager* and SHEQ manager's permission must be obtained prior to working such hours. Permission will only be granted if the longer hours worked have been accepted in writing by the Department of Labour.

5.1.4 Health and safety facilities on Site

The *Contractor* must refer to: Safety, Health and Environmental Specification for the works

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

The *Contractor* must refer to: Safety, Health, and Environmental Specification for the works.

5.1.6 Title to materials from demolition and excavation

The removal and disposal of any old material and equipment from site will be the responsibility of the Contractor.

5.1.7 Cooperating with and obtaining acceptance of Others

Except as directed by the Project Manager, the Contractor shall in no way interfere with, remove, adjust or operate equipment and/or materials of or being supplied or operated by other Contractors, should third parties be in the same work environment. The Contractor shall, at all times, keep the work of other Project Contractors free from damage.

5.1.8 Publicity and progress photographs

This is not applicable.

5.1.9 Contractor's Equipment

The *Contractor* must keep a daily record of all equipment and machinery on site. The information must be captured in such a way that differentiation is made between hired and owned equipment. The record must also clearly indicate when equipment is working and who the operator of the said equipment was for the recorded shift.

These records must be verified and signed off by the Project Manager on a daily basis and this document must always be available on site.

5.1.10 Equipment provided by the Employer

No equipment will be provided by the Employer. The Contractor provides all equipment and tools required to complete the *works*.

5.1.11 Site services and facilities

The Employer will, at his expense, arrange for, develop and maintain the various facilities and services at or near the Site, as applicable. The services and facilities provided by the Employer are listed below:

- Electricity
- Water supply

5.1.12 Facilities provided by the Contractor

Contractor is responsible for site establishment and de-establishment at project completion. i.e Ablution facilities, change rooms, site office, etc

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

The *Contractor* surveys the existing equipment before any repairs, procurement, fabrication or installation.

5.1.14 Survey control and setting out of the works

The Project Manager will provide existing underground services layout. The contractor will be responsible for verification of given services layout. Should the contractor cause damage to any services, the contractor shall repair/fix at his own cost. The Project Manager will not be responsible/liable for any damages

5.1.15 Excavations and associated water control

The *Contractor* will be responsible for dewatering of excavations where necessary.

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

The Project Manager will provide existing underground services layout

5.1.17 Control of noise, dust, water and waste

The control of noise and waste is addressed in the Safety, Health and Environmental specification. The *Contractor* must familiarise himself with these requirements.

5.1.18 Sequences of construction or installation

Sequence of the project will be as per the accepted project programme submitted by *the Contractor*.

5.1.19 Giving notice of work to be covered up

The Contractor must refer to: Safety, Health, and Environmental Specification for the works

5.1.20 Hook ups to existing works

The Contractor must refer to: Safety, Health, and Environmental Specification for the works.

5.2 Completion, testing, commissioning and correction of Defects

5.2.1 Work to be done by the Completion Date

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

Item of work	To be completed by
As built drawings (Maintenance manuals, fibre cable route, etc)	Within one week (working day) after Completion

5.2.2 Use of the works before Completion has been certified

N/A

5.2.3 Materials facilities and samples for tests and inspections

Any samples that must be provided are to be provided by the Contractor once the contract has been awarded.

The Contractor must supply materials facilities and samples for tests as prescribed in the relevant SANS practice code.

The Contractor includes the following on his ITP to be witnessed by the Project Manager:

- Acceptance of all relevant documents and drawings.
- Inspection of modifications before the installation
- Final inspection before the handover to the Employer.
- Inspection to ensure that all required records are available.

5.2.4 Commissioning

Refer to detailed commissioning procedure.

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

There are no requirements or start-up procedures required from the Contractor to put the works into operation.

5.2.6 Take over procedures

Take over of the Works shall be in accordance with NEC3 ECC hand over certification and projects execution hand over document

The Contractor advises the Project Manager when the works will be available for final inspection and provide assistance where required.

By completion date in the contract data, the Contractor shall complete all work required. The Project Manager prior to release of retention money shall approve all the completed works. The contractor maintains any defects of the works until the defects date. (52 Weeks)

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

Clause 43.4 of the NEC will apply.

5.2.8 Performance tests after Completion

The *Contractor* to demonstrate that the *works* can operate as guaranteed. Contractor will provide all testing certificates

5.2.9 Training and technology transfer

Compliance to the SDL&I requirements. The *Employer* requires the *Contractor* to provide training in the use of maintenance and operating of the *works* or any associated transfer of technology from him to the *Employer*.

5.2.10 Operational maintenance after Completion

N/A

6 Plant and Materials standards and workmanship

6.1 Investigation, survey and Site clearance

Refer to technical specification. – To check the guideline on the template

6.2 Building works

Reference could be made to the latest Model Trade Preambles published by the Association of South African Quantity Surveyors. However, these have been developed for use with the JBCC series of contracts and an approach where description of the work is made part of the bill of quantities, which is not the case in other forms of contract. Only parts of the Model Trade Preambles could be referenced by an ECC contract, with a covering note dealing with the changes in terminology.

6.3 Civil engineering and structural works

If and where civil works is envisaged, such as speaker towers etc., the *Contractor* complies with the Eskom 240-56364545 Structural Design and Engineering Standard for civil Works.

6.4 Electrical & mechanical engineering works

Refer to technical specifications

6.5 Process control and IT works

Refer to technical specifications

6.6 Other

N/A

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

Drawing number	Revision	Title

C3.2 CONTRACTOR'S WORKS INFORMATION

7.2 Detailed Scope of work

7.2.1 General Requirements

- The Scope of "Works" is an extension of the drawings, specifications and bills of quantities listed.
- The *Contractor* shall notify the Employer's representative of any discrepancies before commencement of the Works.
- The *Contractor* supplies all material, labour, plant, equipment, loose tools, consumables and transport for the duration and completion of the project.
- The *Contractor* shall provide all costs for the execution of the Works of the complete project as indicated on the drawings, specifications and in the Bill of Quantities.
- The *Contractor* shall immediately notify the Employer's representative in writing of scope and site variations.
- The *Contractor* shall report all obstacles on site that could impact negatively on time and cost in writing to the Employer.
- The *Contractor* shall clear and de-establish total site on completion of proposed works.

7.2.2 Project Specification Requirements

- Provide for an EN54 compliant Public Address and Alarm Voice Evacuation system for the specified areas inclusive of all amplifiers, power management systems, audio management systems, broadcast input devices, audio recorder units, multi-media units, Ethernet switches, interfaces, modules/cards, operating software & licenses, and human-machine interfaces.
- Provide all terminal equipment (audio & visual) inclusive of associated cabling & hardware.
- The system shall be based on a 100V speaker line design as opposed to a 70V design.
- Provide management system and components for all areas specified by the *Employer*.

7.2.3 Location of the Works / Area to be covered.

This phase of the *Works* is limited to areas within the main Simmerpan Complex.

The entire Simmerpan Complex has been zones into 7 main zones with certain zones comprising of sub-zones within their respective zones. These zones are catered for via de-centralised equipment racks located in 7 different locations. The scope for this phase includes providing fully populated equipment racks for the following 3 of the 7 rack locations with the installation areas listed below each of the rack locations:

- Switchgear Building Rack
 - Simmer Centre
 - Metering Lab
 - Switchgear Building Ground Floor, 1st Floor and 2nd Floor and 3rd Floor
- Transmission Safety Risk
 - Safety Risk Building
 - Medical Centre Building
 - Transmission Old house
 - School of Technology
- Live Line Building
- Engineering Building PTM&C Server Room Rack
 - PTM&C Room
 - Psychometric Building
 - Transmission Stores
 - ET Stores
 - Telecoms
 - BIPM (Engineering 1st Floor)
 - Panel Workshop (Eng. Ground Floor)
 - Central Grid Maintenance Works
 - Transit Building
 - Risk Management
 - Gymnasium
 - Metering Lab

- Simmer Centre Rack
 - H Block
 - Flexi-Form
 - Simmer Centre EPMD
 - Simmer Centre HR
 - Simmer Centre Finance
 - Central Grid
 - HV Lab (Live work test facility)
 - DC Lab
 - Instrument Workshop
- Victoria Lake Inn Racks
 - Victoria Lakes Board Room
 - Victoria Lakes Dining and Kitchen Room
 - Victoria Lakes Accommodation Rooms
 - Victoria Lakes Office

The new equipment rack located in the Switchgear Power Distribution Equipment Room and Transmission Safety Risk Server Room shall also contain all components and capacity to cater for the speaker CCTs and speaker line loads (as provided) for the Switchgear Building (All floors) and the TOM Stores and adjoining building/s.

7.2.4 Drawings and Tables Applicable to the Project

The Contractor shall supply the PA system Zone As-built drawing clearly show the all the interfaces to Racks in their specific location zone.

- Tables are included into the *Works Information*
- Construction drawings will be issued to the successful contractor on contract award.

7.2.5 Key Personnel Requirements

7.2.5.1 Project Manager

- A *Project Manager* shall be allocated to the project for management of the project and providing regular feedback.
- The *Project Manager* shall also attend all required meetings and be responsible for all correspondence between the *Employer* and the *Contractor*.

7.2.5.2 Project Site Supervisor

- The *Project Manager* shall also attend all required meetings and be responsible for all correspondence between the *Employer* and the *Contractor*.
- This individual shall also serve as the on-site interface between the *Employer's* representative and the *Contractor*.

7.2.5.3 Accredited Access Equipment Personnel

- The *Contractor* shall indicate the method of accessing certain areas and the equipment to be used, especially for accessing work areas above ground level.
- Should scaffolding be used by the *Contractor*, the *Contractor* shall suitably qualified personnel for the erection, use, dismantling and inspection of access scaffolding.
- Use of all other access equipment shall be subject to approval from the *Employer* prior to such equipment being allowed on site.
- Personnel handling and inspecting all access equipment shall be in possession of the respective valid accredited training certificates for the respective equipment.

7.2.5.4 Electrical Works Personnel

- A qualified electrician shall be used for all electrical connections.
- The *Contractor* shall ensure that all electrical work is issued with Safety Clearance Certificates, Air-conditioning and Refrigeration Technician
- A qualified and SAQCC registered air conditioner technician shall be used for all air conditioning work.

7.2.5.5 Accredited Technology / Product Specific Technical Personnel

- The *Contractor* shall ensure that provision is made for OEM accredited installation and commissioning technicians for the duration of the project.
- All personnel shall be in possession of valid accreditation documents from the respective OEM in this regard.

7.2.5.6 Accredited Fibre Optic Technician

- The *Contractor* is required to provide an organogram of the crew that they intend deploying on the project.
- All fibre optic splicing and OTDR testing shall be done by an accredited fibre optic technician.
- Fibre Optic Technicians are required to be accredited with FOA.

7.2.5.7 Additional Personnel Requirements

- The *Contractor* is required to provide an organogram of the crew that they intend deploying on the project.
- All other scope requiring accredited personnel in that field shall be provided for the respective portion of work.
- All specialist personnel shall have the valid accreditation / training certificates for their respective fields of work.

7.2.6 Technical Requirements

The following technical specifications must be read in conjunction with the Standards and specification as documented under Section 3. The information below indicates the specific requirements for this scope of the project. All speakers shall comply with relevant international standards for safety and performance such as SANS/IEC 60268-5 for sound system equipment and SANS/IEC 60529 for Ingress Protection IP rating IP65.

7.2.6.1 Equipment Housing / Rack

- Equipment housing for all 3 rack locations shall be limited to a single rack not exceeding 47U.
- The equipment housing for the Psychometric (Transport Building) is required to be a wall-mount version due to the limited floor space in this location.
- All required components and equipment (excluding speakers and associated cabling & hardware) for Psychometric (Transport Building) shall therefore be in wall-mounted housing / racks.
- The equipment rack for the Switchgear Building shall require all cable entry from the top of the rack.
- The equipment rack for the PTM&C Room require all cable entry from the bottom of the rack as this room has a raised floor.
- Data sheets for all equipment housing (floor standing as well as wall-mounted) shall be supplied for technical evaluation purposes.

7.2.6.2 System Architecture

- The architecture of the system shall be a de-centralized system initially catering for 3 of the 7 zones of the system.
- Primary backbone of the system shall be a 24-core single mode HDD fibre optic cable configured in a STAR configuration for this phase.
- It is required for the system to have the capability of concurrently accommodating a Ethernet network to achieve backbone redundancy (this shall be implemented in future phases of the project).
- Management of the system will be from Switchgear Building hosting one rack.
- A Fireman's microphone shall be in Switchgear Building.
- The Voice Recorder and Multi-media functionality shall also be in the Switchgear Building equipment rack.

7.2.6.3 Zones, Zonal CCTs and CCT Loads

- The entire site has been zones into 7 main zones.

7.2.6.4 Back-Ground Music (BGM)

- BGM functionality for daily use of the system has been removed for this project.
- A multi-media unit shall however be supplied and installed in the management system equipment rack.
- The purpose of the multi-media unit will be broadcast selected audio into different areas of zone / zones for the purposes of testing audio outputs during maintenance exercises.

7.2.6.5 Tones – Pre-recorded Messages

- The *Supplier* shall provide samples of differentiated tones for Fire, Medical, Evacuation, for evaluation by the *Employer*.
- The supplier shall also provide samples of pre-recorded voice messages as shall be indicated by the *Employer*.

7.2.6.6 Microphones

The *Contractor* shall all VX-300 series Remote Microphone RM-300X are installed in the following locations:

- The Fireman's microphone together with a VX-300 series Remote Microphone RM-300X shall be in the Transmission Safety Risk building.
- A VX-300 series Remote Microphone RM-300X shall be placed in the Switchgear Room housed in the Switchgear Building.
- A VX-300 series Remote Microphone RM-300X shall be installed at Victoria Lake Inn at the security desk reception.
- A Remote VX-300 series Remote Microphone RM-300X shall be installed in the ground floor security reception at Simmer Centre EPMD Building.

- One shall be in System Operator Control Room and the other on the desk of the National Control Security Reception desk.
- A VX-300 series Remote Microphone RM-300X will be installed at PTM&C security reception room at Engineering Building.
- All VX-300 series Remote Microphone RM-300X shall include adequate surge & lightning protection.
- All VX-300 series Remote Microphone RM-300X shall be equipped with adequate keys to accommodate a minimum of 12 zones in addition to alert tone / pre-recorded message keys and other basis keys.
- The VX-300 series Remote Microphone RM-300X at Transmission Safety Risk shall be assigned the highest priority after the Fireman's microphone.
- All main VX-300 series microphones shall be equipped with Ethernet cables terminated into termination boxes.
- Ethernet fly leads shall serve as interfaces between these termination boxes and the microphones.



Figure 1: VX-300 RM-300X Desk Microphone

The Contractor shall comply with VX-300 series Remote Microphone RM-300X specification shall be followed:

Table 1: VX-300 Series RM-300X Remote Microphone Specification

Applicable Model	RM-300X
Power Sources	24V DC (operating range: 15-40 DC), supplied from the audio input until or DC input power supply connector
Current Consumption	Under 240mA
Audio Output	0 dBV, 600 Ω , balance
External Microphone Input	negative 40 dB, 2.2 k Ω , unbalanced, mini jack, phantom powering
Frequency Response	100Hz - 20kHz
Distortion	Under 1%
Signal-to-noise Ration	Over 60 dB
Volume Control	Microphone volume control, Monitor speaker volume control
Key Extension	Max. 7 RM-210F
Maximum Cable Distance	1200m
Finish	ABB resin, black
Dimension (W x H x D)	190 x 76.5 x 215mm (gooseneck microphone excluded)
Weight	850g

7.2.6.7 P

Supply Protection

- The Fireman's microphone together with a Remote microphone shall be in the Transmission Safety Risk building.
- A remote microphone shall be placed in the Live Line Building reception room housed in the Live Line Building

- One shall be in in the first floor Switchgear security reception room and the other on the desk of the Transmission Safety Risk Security desk.
- All microphones shall include adequate surge & lightning protection.
- All microphones shall be equipped with adequate keys to accommodate a minimum of 12 zones in addition to alert tone / pre-recorded message keys and other basis keys.
- The remote microphone at Switchgear Building Control shall be assigned the highest priority after the Fireman's microphone.
- All main microphones Ethernet cables are to be terminated into termination boxes.
- Ethernet fly leads shall serve as interfaces between these termination boxes and the microphones.

7.2.6.8 Component Power Supplies

The Contractor shall ensure comply with the VX-3000DS Power Supply Specification as follows:

- All components shall be powered by OEM specified power supplies capable of providing the recommended power to each component / module in the system.
- Supplies a VX-3000DS DC power supply to all system components with combination of two built-in power source units with a high-performance charger.
- Provides automatically switch to auxiliary battery power if the AC power supply is down.
- Supply VX-3000DS: EN 54-4 certified, Certificate No: 1143-CPR-137

Contractor shall design and supply the power supplies in accordance with the following specification:

Table 2: VX-3000DS Power Supply Specification

Applicable Model	RM-300X
Power Sources	220- 230V AC, 50Hz
Power Consumption	2800W max in total (at rated output with charging), 350 W max each (EN 60065)
DC Power Output (AC mode)	Rated output: 2300 W (31 V, 72.5 A, total DC outpower), Peak output: 2780W (29 V, 96 A, total DC power output)
DC Power Output	8 x 31V (19- 33V) 25A max each, M4 Screw termination, distance between barriers: 11mm
Charging Output Voltage	27.3V +/- 0.3 V (at 25 degree), temperature correction coefficient: -40mV/C
Charger Method	Temperature compensated trickle charging
Battery Connection	One each positive and negative terminal, applicable cable diameter: AWG 6 - AWG 0 (AWG 1/10) (16mm ² - 50mm ²) Line Resistance within 4m ohm/total
Control Connector (DS LINK IN/OUT)	RJ45 female connector for connecting the system and cascade connection, shielded Twisted-pair straight cable (TIA/EIA - 568A standard)
Panel Indicator	AC power IN 1, IN 2 (Green), Charging (Green), Battery power (Green), Battery connects (Green), Battery condition (Green)
Finish	Panel: Surface-treated steel plate, black, 30% glossa, paint
Dimension (W x H x D)	482 x 132.6 x 400.5mm (19 degree, 3U)
Weight	11.8 kg

7.2.6.9 Redundancy

- Although the system shall not provide for back-bone redundancy in a star-configured fibre optic reticulation, the system shall be capable of providing a redundant backbone path over an Eskom VLAN reticulation.
- Seamless power redundancy shall be provided for all equipment racks.
- Seamless amplifier redundancy shall be provided for all amplifiers in the system.
- In addition to amplifier redundancy, the rack design shall ensure that speaker line CCT redundancy has been considered.
- All redundancy provisions shall not require any human intervention.
- All system shall be capable of indicating as well as logging in real time when any redundant options have been engaged and when the situation has been normalised.

7.2.6.10 Critical Signal Path monitoring / Surveillance and Fault Detection / Indication

- The system shall be configured in a manner to accomplish complete real-time monitoring of all system components.
- The surveillance shall include monitoring of each component in the main equipment racks, Ethernet cabling, microphones, power supplies, speaker lines and amplifiers, and all other primary components.
- Any fault detected by the surveillance functionality shall result in all microphones indicating the existence of the fault by means of audible & visual indication.
- The fault shall also be immediately logged in the event log register.

7.2.6.11 Interfaces

- The Voice Evacuation system shall not be interfaced with any other system in this phase.
- The system shall however provide the functionality of being able to be interfaced when required to do so.

7.2.6.12 System Event Log

- The system shall be able to store adequate logs on the storage capacity provided with the system management.
- All event logs shall include time & date stamps.
- Training shall be provided on accessing and understanding the Event Log feature of the system.
- The system shall be able to store adequate logs on the storage capacity provided with the system management.

7.2.6.13 On-site Management Requirements

- On-site management requirements shall be located within the equipment rack located at ZERO Control.
- Management system shall include the latest version of MS® Windows as well as MS® Office package inclusive of MS® Outlook.
- Additional software to be included shall be Team Viewer.
- All loaded software shall be licensed for lifetime and should not require annual licensing.

7.2.6.14 Remote Management Requirements

- The system shall not be configured for remote access in this phase.
- The system shall however provide the functionality of being able to provide this functionality when required.

7.2.6.15 Factory Acceptance Testing (FAT)

- The *Contractor* shall fully rig the system and configure it at their premises for Factory Acceptance Testing by the *Employer*.
- The system must be rigged in a manner that would indicate how it appears once installed on site. Temporary power, speaker and microphone cables shall be acceptable during the FAT session.
- The *Contractor* shall submit the FAT criteria documents together with supporting drawings /schematics to the *Employer* 14 working days prior to the FAT exercise for review and acceptance.
- The *Employer* may request amendments to the criteria prior to it being approved.
- The *Contractor* shall use the pre-approved FAT criteria documentation and associated schematics / drawings to conduct the FAT exercise.
- All defects identified during the FAT exercise shall be corrected with 72 hours and feedback provided to the *Employer's* representative.
- The *Employer's* representative shall confirm whether the defects have been corrected before permission is granted to transport the system to site.
- FAT documents shall be signed by all relevant stakeholders and included in the Quality File of the project as part of the document records.
- The *Employer* may opt to engage with the *Contractor* in one or more pre-FAT sessions prior to the main FAT exercise to enable a smooth testing exercise.

- FAT documents are together with architectural schematics for all equipment racks are to be submitted to the *Employer's* representative within 21 working days of the contract being entered into.

7.2.6.16 Site Acceptance Testing

- SAT criteria documents together with supporting drawings / schematics documents are to be submitted to the *Employer* together with the FAT documents (14 days prior to FAT) for review and acceptance.
- The *Employer* may request amendments to the criteria prior to it being approved.
- The *Contractor* shall use the pre-approved SAT criteria documentation and associated schematics / drawings to conduct the SAT exercise.
- SAT shall involve permanent intended power supplies and permanent speaker lines.

- All defects identified during the SAT exercise shall be corrected with 72 hours and the system re- checked with the Employer's representative.
- SAT documents shall be signed by all relevant stakeholders and included in the Quality File of the project as part of the document records.

7.2.6.17 Warranty and Support

- The *Contractor* shall be the OEM or an accredited supplier of the OEM for the product being proposed.
- The *Contractor* shall be suitably accredited in all aspects for the product being proposed.
- A Letter of Accreditation is required to be submitted in this regard.
- The tenderer shall be able to offer all technical, spares, and firmware support for the product being proposed.
- The tenderer shall have a history of supplying products of this nature for a period of 3 years or have personnel experienced in this field for a period of no less than 5 years.
- The tenderer shall supply a minimum of 3 traceable reference sites with contact person details where the proposed product has been successfully installed by them.

7.2.6.18 Distribution of Terminal Equipment

Distribution of speakers is as per Table 1 below.

Table 1: Speaker Distribution

LINE	AREA	FLOOR	LOCATION	HORN SPEAKER	CEILING SPKR.	A-B CEILING SPKR.	BOX W/O ATT.	BI-DI PROJ. SPEAKER	15W WALL-MOUNT	SPEAKER COUNT
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SWITCHGEAR BUILDING										
1	Ground Floor	GND	IN		2				4	6
2	Ground Floor	GND	OUT	2						2
3	First Floor	FIRST	IN		3			2	2	7
4	Second Floor	SECOND	IN		3			2	4	9
5	Third Floor	3 rd Floor	IN	2				2		4

TOTALS	→	4	8					6	10	28
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Engineering Building New Rack										
1	PTMC – Transmission Stores	GND	OU	4						11
2	PTMC – Transmission Stores	First Floor	IN					4	3	11
3	Psychometric Building	GND	IN		4			2	2	8

PUBLIC ADDRESS SYSTEM INSTALLATION AT VICTORIA LAKE INN, SIMMERPAN, GERMISTON

4	ET Stores	FIRST	IN	4		1		3	8
5	Telecoms	GND	IN	5			2	2	9
6	BIPM (Engineering 1 st Floor)	FIRST	IN	5			1	2	8
7	Panel Workshop (Eng. Ground Floor)	GND	IN	3				2	5
8	Central Grid Maintenance Works	GND	IN	2	3		2	3	10
9	Transit Building	GND	IN	3			2	2	7
10	Risk Management	GND	IN	2	3		2	2	7
11	Gymnasium	GND	IN	8			3	2	13

		TOTALS	→	6	32	1	18	23	105
LINE	AREA	FLOOR	LOCATION	HORN SPEAKER	CEILING SPKR. A-B CEILING SPKR.	BOX W/O ATT.	BI-DI PROJ. SPEAKER	15W WALL-MOUNT	SPEAKER COUNT

Simmer Centre New Rack (ZONE)

1	Simmer Centre (Outside)	OUTSIDE	OUT	2					2
2	Simmer Centre EPMD	GND	IN	3			4	3	10
3	Simmer Centre HR	First Floor	IN	4			2		6
4	Simmer Centre Finance	GND	IN	4			2	2	8
5	Central Grid	FIRST	IN	4		3		3	10
6	HVLAB	OUTSIDE	OUT	1					1
7	HVLAB	GND	IN	5			2	2	9
8	Flexi-Form	FIRST	IN	2	5		1	2	10
9	Instrument Workshop	GND	IN	2	3			2	7
10	H Block	GND	IN	2	3		2	3	10

TOTALS	→	12	28	3	13	17	71
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Victoria Lake Inn New Rack (ZONE)									
1	Victoria Lake Outside	OUTSID	OU	5					5
2	Victoria Lake Board Room	FIRST	IN	6				3	9
3	Victoria Lakes Dinning and Kitchen Room	GND	IN	4			2	2	8
4	Victoria Lakes Accommodation Rooms	FIRST	IN	4		1		3	8
5	Victoria Lakes Offices	FIRST	IN	5			8	8	21
6	Victoria Lakes Toilets	GND	IN	12					12
7	Victoria Lake Kitchen	FIRST	IN	5			1	2	8
8	Victoria Lake Security Desk	GND	IN	3				2	5

TOTALS	→	5	39		1	11	20	76
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LINE	AREA	FLOOR	LOCATION	HORN SPEAKER	CEILING SPKR.	A-B CEILING SPKR.	BOX W/O ATT.	BI-DI PROJ. SPEAKER	15W WALL-MOUNT	SPEAKER COUNT
Transmission Safety Risk New Rack (ZONE)										
1	Transmission Safety Risk	GND	OUT	2						2
2	Transmission Safety Risk	GND	IN		2				2	4
3	Medical Centre Building	OUTSIDE	OUT	1						1
4	Medical Centre Building	GND	IN		5				2	7
5	Old houses Building	GND	IN		4				2	6
6	School of Technology Building	OUTSIDE	OUT	3						3
7	School of Technology Building	GND	IN		24			1	2	27
8	Live Line Building	GND	OUT	3						3
9	Live Line Building	GND	IN	3	4			3	3	13

Grand Total	TOTALS	→	12	39			4	11	63
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7.2.6.19 Specification Requirements for installation of Speakers and Associated Cabling and Hardware

The contractor shall be responsible for the complete installation of the PA system, including testing and commissioning and offer comprehensive training for the operating staff on system use and maintenance.

- All external horn & bi-directional projection speakers on brick / concrete walls shall be mounted on 41mm x 41mm galvanized steel strut channels together with the termination boxes.
- All internal horn & bi-directional projection speakers on brick / concrete walls and metal structures in the plant shall be mounted on 41mm x 41mm galvanized steel strut channels together with the junction boxes.
- All terminals shall be of the disconnect (knife-edge) variety for the entire scope.
- Ceiling speakers are to be mounted on ceiling tiles via cut-outs in the tiles.

- Where there are existing cable trays in the ceilings, these shall be used for the installation of the Fire/Alarm cable as far as possible.
- For all other cable installations inside ceilings, the cable should be installed in a manner that it does not rest on the ceiling tiles.
- For Transmission Safety Risk and Data & Engineering Building PTM&C all cable in ceilings not installed on cable trays shall be installed inside galvanized steel tubing secured to the ceiling.
- Cable installations on raised floors inside the Transmission Safety Risk and Engineering Building PTM&C buildings shall also be installed in galvanized steel tubing.
- All speakers in the System Operator Control Room area shall be coupled with attenuators.
- Adequate cable allowance shall be considered for all installations for the purposes of maintenance.
- All main cable lengths shall be recorded and shall form part of the Maintenance Fingerprint.
- Employer's estimated cable distances are as per Table 3 below.

Table 3: Estimated Cable Lengths

INSTALLATION AREA	FIBRE OPTIC SM 24-CORE HDD	Cat5e STP Ethernet Cable	Cat6A Ethernet Cable	PH30 SWA 4-CORE 1.5mm	PH30 4-CORE 1.0mm	PH30 2-CORE 1.5mm	PH30 2-CORE 1.0mm
ZERO Control – Switchgear Building	800m						
Switchgear Building – Simmer	250m						
Simmer Centre -Transmission	300m			150			
ZERO Control – Engineering	500m			250			
Transmission Safety & Risk – Live	500m		180	250			
Transmission Old House			200	200	500		350
Transmission Satey & Risk – School	350m	80			350	300	300
Live Line Building		75		230	800	450	200
Psychometric Building		320		280	200		250
Transmission Stores Building		100		150	300		300
ET Stores Building		50		170	100		
Telecom Building		60		200	130		300
BIPM (Engineering 1 st Floor)		80			300		300
Panel Workshop (Eng. Ground)		75			350		200
Central Grid Maintenance Works		320			100		350
Transit Building		100			200		200
Risk Management		50			300		200
Gymnasium		60			100		300
School of Technology – VLI	1000m	80			130		100
Flexi-Form		75			500		130
Simmer Centre EPMD			320		350	300	100
Simmer Centre Finance		100	150		200	450	350
Simmer Centre HR		50	150		200		400
Central Grid		100	400			400	200
HV Lab (Live work test facility)						250	300
DC Lab					130		100
Instrument Workshop		75			300		130
H Block		320			350		400
Victoria Lake In		100				400	350
Victoria Lake Board Room		50	230		200		400
Victoria Lake Accommodation		60			300		550

Victoria Lake Security Desk		100					300
Victoria Lake Dinning and Kitchen		200					150
Victoria Lake Office			100				330
Victoria Lake Toilets			100				300
Old Transport Building		150			300		250
PTMC Engineering Building – 1000m							
TOTALS	1200	2830	1130	1630	6790	2100	8140

7.2.6.20 Equipment Rack and Microphone Cabling

- All Ethernet cabling for microphones shall be of pure copper variety.
- Ethernet cabling inside the equipment racks as well as for the microphones in Transmission Safety Risk and Engineering Building PTM&C shall be minimum of Cat5e with cabling for all microphones being shielded.
- Ethernet cabling for all microphones in the Switchgear Building, Transmission Safety Risk and Live line Building shall be of the Cat6A shielded variety.
- Data / Specification sheets for all Ethernet cabling shall be supplied for the purposes of Technical Evaluation.
- The actual lengths of all installed cables shall be recorded.

7.2.6.21 Existing Standalone PA System in National Control

- There is an existing TOA VM-3360VA public address system with a TOA RM-200M microphone located in the vicinity of the Transmission Safety Risk reception which is not working and two existing small speakers at the boardroom.
- This unit is to be relocated and housed in the equipment rack of the new system which is to be located on the ground floor of the PTM&C Telecommunication server room.
- The microphone for this system shall remain in its current location with the Ethernet cable extended.
- All dual cone (A-B Ceiling speakers) shall be connected to this system.
- The existing bi-directional speakers and associated cabling for this system shall be removed.

7.2.6.22 Fibre Optic Cable, Terminations & Testing

- Fibre optic cables installed between the PA system equipment racks shall be a 24-CORE single mode heavy duty duct (HDD) fibre.
- Fibre cable length between Transmission Safety Risk and the Switchgear Building is approximated as being 500M in length and the length between the Transmission Safety Risk and Live line Building is approximated as 200M.
- The actual lengths of all installed cables shall be recorded.
- All fibre optic patch panels shall be fully populated and be terminated in SC-APC connectors.
- Data / Specification sheets for the fibre optic cable as well as the fibre optic patch panels shall be supplied for the purposes of Technical Evaluation.
- Fibre optic testing of all cores shall be performed on all 3 wavelengths in both directions.

7.2.6.23 Junction Boxes and Terminal Blocks

- Junction boxes accommodating audio cables shall be with the non-transparent lid.
- Junction boxes accommodating electrical cables for strobe lights shall be with the transparent lid.
- The above exercise is to differentiate between the junction boxes for audio & electrical.
- All junction boxes shall include an earthing point.
- All modular terminal blocks shall be of the knife-edge DIN rail mount variety with screw terminals and test points.
- Terminals shall be able to accommodate a minimum of 4 mm² cable cores.
- Separator plates and end stops shall be used together with terminal blocks to separate cable cores.
- Terminal blocks shall be able to accommodate terminal labels.
- All unused cable entry points shall be fitted with blanking plugs.
- A junction box will be installed to terminate any main incoming PH30 cables into any building and/or infrastructure.
- A junction box shall also be included at all levels of a multi-level building.
- There junction boxes shall serve as test points for the purposes of maintenance.

7.2.6.24 Additional Testing

- Apart from the required FAT & SAT Tests that are required, the *Contractor* shall also perform additional mandatory tests during the installation period.
- These tests as listed in the Inspection & Test Plan (ITP) shall follow the required Witness & Hold points.
- All check sheets and ITP documents shall be signed by all relevant stakeholders and included in the Quality File of the project as part of the document records.
- All material delivered to site shall also be subject to quality control procedures to ensure that the goods meet the required specifications.
- The *Employer* may request inspection of certain material at the *Contractor's* supplier premises for acceptance prior to it being delivered to site.

7.2.6.25 Training

Training on the use of microphones

- The *Contractor* shall provide for comprehensive training on the use of microphones.
- The operational and maintenance training shall cover the use of all types of microphones and any microphone augmentations that form part of the system.
- The training must include zonal and ALL-CALL broadcasts selection, alert tones & pre-recorded message broadcast selection, BGM control, reset, fault acknowledgement, etc. functionalities.
- A minimum of two *Employer's* representatives shall be provided with "Super-User" training to allow them to train new users on the use of the microphone.
- All training must be accompanied by training material notes.
- Training will include the use of the alert tone & pre-recorded messages functionality.

7.2.6.26 Human-Machine Interface (HMI) Training

- Training shall be provided on the use of the HMI.
- Training shall be specific to checking system status, accessing event logs, as well as resetting of the system.
- The training shall include the reading and acknowledgement of all statuses of the system via LCD screens / LEDs or whatever form in which such statuses or faults are displayed.

7.2.6.27 Training on Re-initialization of the System

- Training shall be provided on the re-initialization of the system to accept / acknowledge any changes made to the system.

7.2.6.28 Optimisation

- The *Contractor* shall conduct an optimization exercise to adjust all volume levels of all speakers as well as microphones.
- The optimization exercise shall be to achieve the most optimum speaker output setting.
- Optimization exercise may require the tap settings of certain speakers to be adjusted to a desired optimum level.
- All changes in speaker tap settings shall be recorded and filed and form part of the Maintenance Fingerprint of the system.

7.2.6.29 Commissioning

- All speaker line CCTs shall be commissioned post installation and optimization processes.
- The exact loads and impedance measurements shall be recorded and form part of the Maintenance Fingerprint.
- Final commissioning of the system equipment racks shall take place post the partial commissioning of all speaker line CCTs.

7.2.6.30 Partial Handover

- All speaker line CCTs and or areas / zones shall be handed over to the *Employer's* representative once they have been commissioned.
- All relevant Quality and handover documentation needs to be handed over together with this exercise.

7.2.6.31 Engineering and the Contractor's Design

7.2.6.31.1 Employer's Design

- The *Employer's* Subject Matter Expert (SME) has made recommendation on the architecture of the system inclusive of the distribution & placement of the audio equipment in the various areas where such equipment is to be installed for this phase of the project.
- The *Contractor* shall however make proposals in this regard that will be subject to the *Employer's*.

7.2.6.31.2 Part of the Works which the contractor is to design.

The *Contractor* is required to provide the following designs:

- Architecture of the system – if different from that of the *Employer's* SME recommendations.
- Equipment Rack layout designs.
- Speaker lines CCTs - if different from that of the *Employer's* SME recommendations.
- Power consumption calculations.
- Heat Dissipation calculations.
- Provide differentiated alert tones and pre-recorded messages for which the text dialogue shall be provided by the *Employer*.

7.2.6.32 Procedure for the substation and acceptance of the contractor's design

All designs from the *Contractor* are to be accompanied by the following as a minimum requirement:

- Data / specification sheets of all components / material as proposed in the designs.
- Test certificates (where applicable) shall be supplied by the *Contractor*.
- Any other supporting documentation that is deemed as necessary.

- The *Contractor* is required to submit all proposed designs to the *Employer* with all required supporting documentation for the *Employer's* perusal at least 14 days in advance. All *Contractor* designs shall be subject to the *Employer's* assessment & approval.

7.2.6.33 Equipment required to be included in the works

The *Contractor* shall include the supply of the following equipment as part of the *Works*:

- Analogue impedance meter (preferably one recommended by the OEM of the equipment being supplied).
- All items not itemized on the BoQ but forms part of the installation requirements shall be supplied and installed by the *Contractor*.
- This shall include, but is not limited to fasteners, adhesives, consumables, etc.

7.2.6.34 Configuration Management

- All KKS coding shall be supplied by the *Employer*.
- Labels shall be manufactured as per configured data by the *Contractor* and affixed.
- The *Employer* shall provide the *Contractor* with a Labelling Standard which provides a guideline on the manufacture of the labels.

7.2.6.35 As-built/ floor plan drawings

- As-built/Floor plan drawings shall be supplied to the successful *Contractor* for the areas in which installation is required.
- Terminal equipment locations and proposed cable routes shall be indicated on these drawings.
- The *Contractor* is to red-line these drawings depicted and clearly show the revision mark-up and latest revision as per Eskom convention depicting installed cable, junction boxes and terminal equipment.

7.2.6.36 Documentation

The following documents are to be supplied by the *Contractor* within the pre-determined schedule:

- Functional description of the system
- Electrical Schematic diagrams, including loop diagrams.
- General Arrangement drawings of the panels
- Component lists per panel and per section.
- Termination diagrams for each Enclosure, Junction box, Maintenance junction box.
- Operation and Maintenance Instruction manual.
- Original Manufacturers product documents
- FAT Procedure
- Commissioning procedure
- Handover certificates
- Inspection and Test Procedures

7.2.6.37 Re-measurable items

- Notwithstanding that practical care was exercised in preparing the BOQ, but all quantities given herein shall be deemed to be estimated quantities of the work to be done but they are not to be taken as actual and correct quantities of the work to be executed and they are not to absolve the *Contractor* of his obligations under the *Contract*.
- All work shall be re-measurable.

7.2.6.38 Air-conditioning requirements

The three rooms identified for the installation of the equipment racks are all three air-conditioned rooms and therefore there is no requirement from this contract to do any work on air-conditioners in these rooms.

7.2.6.39 Electrical requirements

Contractor shall modify the Existing Distribution Board and issue CoC in accordance with the SANS 10142-1 ensure supply to the speakers. All equipment shall be rated for operation on a 240/415V, 3-phase, 4 wire, 50 Hz system with solidly earthed neutral system. Conductors size shall not be specified must be determined in accordance with the SANS 10142-1. *Contractor* shall use identified Distribution Boards for this project. Distribution Boards Circuit modifications for all identified DB's with additional breakers for HVAC.

7.2.6.40 Tender returnable (technical)

The following documents shall from part of the required documents to be submitted with the tender.

7.2.6.40.1 Method Statements

The *Contractor* shall provide detailed method statements on how he intends to carry out the *Works*; this shall apply to all, and any part of the *Works* as provided in the conditions of contract. The *Contractor's* comprehensive Method Statements shall demonstrate the following:

- Sound understanding of the whole of the *Works*,

- Understanding of the required competencies in executing all activities of the whole of the *Works*,
- The logical sequencing in which the *Works* are to be executed and,
- The Safety, Health, Environmental and Quality considerations in execution of the *Works*.

7.2.6.40.2 Sample Inspection and Test Plans (ITPs) and Quality Acceptance Documents

The *Contractor* shall provide sample ITPs & QA documents for all activities of the scope. These documents shall demonstrate the following:

- *Contractor's* understanding of the key Witness, Hold, Inspection and Verification points of the exercise.
- *Contractor's* expectation in terms of an acceptable standard of workmanship.

7.2.6.40.3 Draft Schedule

The *Contractor* shall submit a draft schedule depicting all activities for the entire scope. The draft schedule shall indicate the different aspects of each area of installation and the duration per activity. The schedule shall be based on a 5-day work week excluding any public holidays and weekends.

7.2.6.40.4 Data / Specification sheets

- The *Contractor* shall provide data / specification sheets for all components of the system inclusive of terminal equipment and cabling.
- Where the data sheet includes several variants of a product or several products, the proposed product shall clearly be marked.
- System brochures shall also form part of this requirement.

7.2.6.40.5 Product Certification / Conformity Documents

- Where requested, all product conformity /certification documents shall be provided for all components, inclusive of terminal equipment, batteries back-up, and cabling.
- Where test certificates have been requested, these shall be submitted.

7.2.7 Architectural Schematics

- The requirement for the architectural schematic shall be limited to the scope of this work.
- Schematic shall indicate the composition of the components making up the system and their interconnectivity in each of the zonal equipment racks as well as the interconnectivity between the zonal racks.

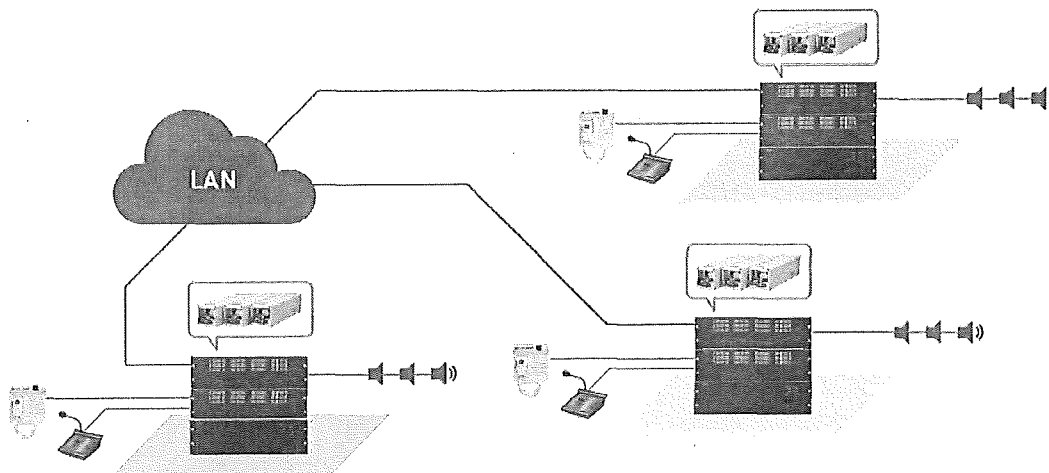


Figure 2: Ring Topology of Decentralised Audio Streaming over WAN

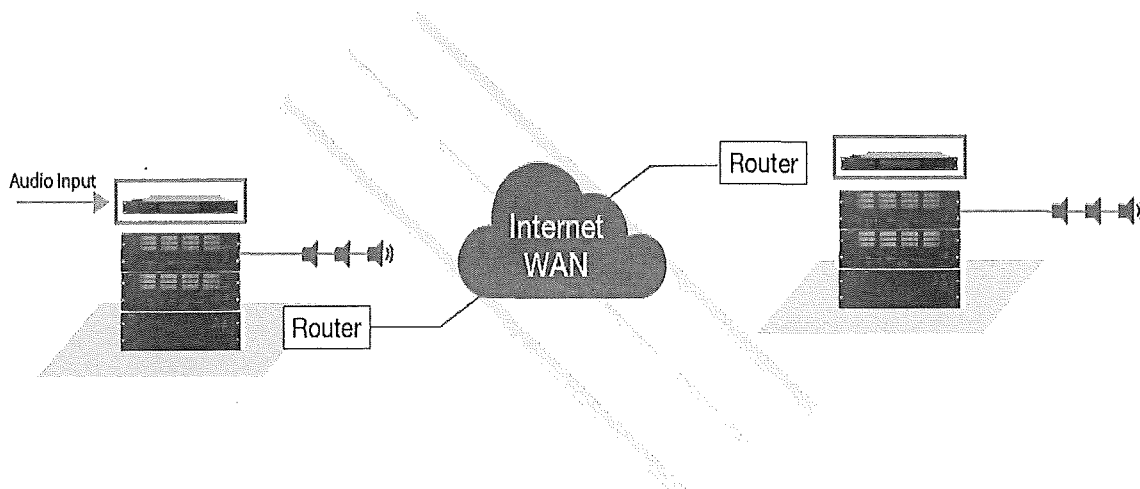


Figure 3: Audio Streaming over the Wide Area Network

7.2.7.1.1 Rack Layout

- Rack layouts depicting the layout of each of the components within each rack shall be submitted as part of the proposal.
- The layout shall indicate the height of each rack and the positioning of each of the components within each rack.

7.2.7.1.2 Left Over and Recovered Material

- All left over material that formed part of the BoQ shall remain the property of the *Employer* and be left on site.
- All de-installed bi-directional speakers and associated cabling shall also remain the property of the *Employer*.

7.2.7.1.3 Guarantees

- The *Contractor* shall guarantee the equipment to be supplied under this contract against faulty design, materials, and workmanship at the manufacturer's works within the defect liability period (DLP).

PART 4: SITE INFORMATION

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

PART 4: SITE INFORMATION

1. General description

Eskom NTCSA Simmerpan Complex, Germiston. It is a National Key Point and its falls under the National Key Point Act

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

The Simmerpan complex was originally South Africa's second power station, built to supply the energy-intensive mining industry, operated from 1909 to 1957. The Simmerpan Complex is a vital strategic operation centre for NTCSA. The facility houses a few different offices and support services critical to the operation of NTCSA. NTCSA Simmerpan have different contractors currently busy with maintenance, (e.g. wall painting, road markers, and garden etc).

3. Subsoil information

No records of geotechnical reports, no borehole and no earthworks are required by this contract.

4. Hidden services

Electrical and IT cables, plumbing pipes and mechanical equipment, not to be damaged by the Contractor during construction

5. Other reports and publicly available information

N/A.