NGWATHE LOCAL MUNICIPALITY

CONSTRUCTION OF KWAKWATSI 88/6.6 KV, 2x10MVA SUBSTATION

CIDB GRADING: 7 EP PE OR HIGHER

TENDER NO: NLM TEC 51/21/22

CLOSING DATE: 29 November 2022

CLOSING TIME: 12H00

ISSUED BY: LOCAL MUNICIPALITY	CONSULTING ENGINEERS
NGWATHE Local Municipality Supply Chain Management Private Bag X 530, Parys 9585 Tel: 056 816 2700 Fax: 056 817 7709 E: thabisos@ngwathe.co.za	**Muteo Consulting cc** Unit A3 Centurion Close 119 Gerhard Street 0157 T: +27 12 664 6577 M: +27 81 394 8793 E: samuelm@muteo.co.za

Tenderer ……..……..…..

CSD No. …… . ……..

CIDB Registration Number:…… **Grade:**……..……

Total price inclusive of Value added Tax: R ……..……

Amount in Words……

NGWATHE LOCAL MUNICIPALITY

CONSTRUCTION OF KWAKWATSI 88/6.6 kV, 2X10MVA SUBSTATION

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TENDERING PROCEDURES

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T1.1: TENDER NOTICE AND INVITATION TO TENDER

NGWATHE LOCAL MUNICIPALITY
Construction of KWAKWATSI 88/6.6 kV, 2X10 MVA Substation

TENDER NO. NLM TEC 51/21/22

Tenders are hereby invited from Electrical Engineering Contractors with a CIDB grading of **7EP PE or Higher** for the **CONSTRUCTION OF KWAKWATSI 88/6.6KV, 2x10MVA SUBSTATION UNDER NGWATHE LOCAL MUNICIPALITY.**

BID NUMBER	DESCRIPTION	CONTACT PERSON	CLOSING DATE & TIME	CIDB GRADING	EVALUATION CRITERIA	COMPULSORY BRIEFING SESSION/ SITE INSPECTION
NLM: TEC 51/21/22	Construction of Kwakwatsi 88/6.6KV ,2X10MVA Substation	Technical Enquires:Mr H.W Coetzer: 056 817 7611 henkcoetzer@lantic.net Procurement Enquires: T. Mathibedi: 056 816 2700 thabisos@ngwathe.co.za	29 November 2022 @ 12h00 pm	7 EP PE or Higher	90/10	Thursday, 10 November 2022 12:00 pm at the Koppies Municipality offices

Bid documents containing the Conditions of Bid and other requirements in terms of the Supply Chain Management Policy will be downloaded from e-tender Publication Portal at www.etenders.gov.za at no fee, and can also be downloaded from the municipal website at www.NGWATHE.gov.za

Bids will be evaluated under the provision of the following Acts and its Regulations: Municipal Finance Management Act, (Act 56 of 2003); PPPFA; Supply Chain Management Policy of the Municipality in accordance with the Specifications and in terms of **90/10 preferential points system**.

Sealed Bid Documents must be submitted in an envelope clearly indicating, "**BID NUMBER AND DESCRIPTION**" on the outside and must reach the undersigned by depositing it into the Municipal Tender Box, by no later than the date and time stipulated on the above table. All bids will be opened in public at the Municipal Chamber.

The Municipality is not bound to accept the lowest or any Bid and reserves the right to accept any part of a Bid. Bids must remain valid for a period of ninety (90) days after the closing date of the Submission thereof.

Tenderers must be registered with the CIDB in a class of construction works and have a grading designation equal to or higher than that determined in accordance with the sum Tendered or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations, 2004. Tenderers with a minimum grading designation of 7 EP PE or higher are eligible to submit bids.

Only tenderers who have CSD Summary report, Tax Clearance compliance status letter or Tax clearance compliance number, Company Registration Certificate, proof that the bidder municipal business account or any of the directors municipal account is not in arrears (N.B. Municipal Clearance not older than three month), Audited Financial Statement, CIDB Certificate (where required) and Certified BBBEE Verification certificate are eligible to submit tenders.

Bids which are late, incomplete, unsigned, completed by pencil, sent by telegraph, facsimile, electronically or E-mail and without compulsory required documents will be disqualified.

Acceptable tenders will be evaluated by using a two stage tender evaluation procedure. First stage is functionality (Previous projects, technical experience, available plant and financial resources). Tenderers are required to score a minimum of 70% in order to proceed to the second stage. Second stage will be evaluated using Method 2: Financial offer (90 points) and Preferences (10 points) for BBBEE certification

N.B: NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE [AS DEFINED IN REGULATION 1 OF THE LOCAL GOVERNMENT: MUNICIPAL SUPPLY CHAINS MANAGEMENT REGULATIONS

BW Kannemeer
Acting Municipal Manager
NGWATHE Local Municipality
Private Bag X 530
Parys
9585

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T1.2. TENDER DATA

1. GENERAL

The Conditions of Tender in the Standard Conditions of Tender as contained in Annex F of SANS 294 – *Construction Procurement Processes, Methods and Procedures* which contain references to the Tender Data for details that apply specifically to this tender.

The Tender Data shall be read with the Standard Conditions of Tender in order to expand on the Tenderer's obligations and the Employer's undertakings in administering the tender process in respect of the project under consideration.

The Tender Data hereafter shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender.

Each item of Tender Data given below is cross-referenced to the relevant clause in the standard Conditions of Tender.

2. TENDER DATA APPLICABLE TO THIS TENDER

F.1.1 The Employer for this Contract is: **NGWATHE LOCAL MUNICIPALITY**

F.1.2 Tender Documents

(a) **The Tender Document** consists of the following:

TENDER

T1: Tendering Procedures
- T1.1: Tender Notice and Invitation to Tender
- T1.2: Tender Data

T2: Returnable Documents
- T2.1: List of Returnable Documents
- T2.2: Returnable schedules and forms

CONTRACT

Part 1: Agreements and Contract Data
- C1.1: Form of Offer and Acceptance
- C1.2: Contract Data

Part 2: Pricing Data
- C2.1: Pricing Instructions
- C2.2: Bill of Quantities

Part 3: Scope of Work
- C3: Scope of Work

Part 4: Site Information
- C4: Site information

(b) **Drawings**,

The Tender Document and the drawings shall be obtained from the Employer or his authorized representative at the physical addresses stated in the Tender Notice, upon payment of the deposit stated in the Tender Notice.

F.1.4 The Employer's agent is:

Name	: MUTEO CONSULTING CC
Address	: Unit A3 Centurion Close 119 Gerhard Street Centurion, 0157
Telephone	012 664 6577
E-mail address	samuelm@muteo.co.za

F.1.5 The Employer's right to accept or reject any tender offer

The Employer is not obliged to accept the lowest or any tender offer.

F.2.1 Eligibility

A Tenderer will not be eligible to submit a tender if:

(a) the Contractor submitting the tender is under restrictions or has principals who are under restrictions to participate in the Employer's procurement due to corrupt or fraudulent practices;

(b) the Tenderer does not have the legal capacity to enter into contract;

(c) the Contractor submitting the tender is insolvent, in receivership, bankrupt or being wound up, has his affairs administered by a court or a judicial officer, has suspended his business activities, or is subject to legal proceedings in respect of the foregoing;

(d) The Tenderer does not comply with the legal requirements stated in the Employer's procurement policy;

(e) The Tenderer cannot demonstrate that he possesses the necessary professional and technical qualifications and competent, financial resources, equipment and other physical facilities, managerial capability, personnel, experience and reputation to perform the contract;

(f) The Tenderer cannot provide proof that he is in good standing with respect to duties, taxes, levies and contributions required in terms of legislation applicable to the work in the contract.

Only those Tenderers who are registered with the Construction Industry Development Board (CIDB) in a contractor-grading equal to or higher than a contractor grading designation **7EP PE or Higher** as defined in the Regulations (09 June 2004 and 22 July 2005), in terms of the CIDB Act No 38 of 2000, are eligible to submit tenders for this contract.

F.2.7 Site visit and clarification meeting

Compulsory Briefing Session shall be held as per details below.

Location: Koppies Municipality Offices (KWAKWATSI AREA: 24°46'42.74"S ; 27°16'30.19"E)

Date: 10 November 2022 at 12:00 pm

F.2.10 pricing the tender offer

(a) Value Added Tax

The Valued Added Tax (VAT) rate shall be 15% or as otherwise provided for by legislation.

(b) The successful Tenderer shall be required to produce a VAT invoice that shall only be prepared once measurements and valuations for work done in terms of the contract offer have been agreed with the Employers agent and a certificate of payment issued.

(c) Payment of VAT to non-Vat vendors shall be processed from the month in which the Tenderers liability with the South African Revenue Services is effective.

F.2.11 A Tender offer shall not be considered if alterations have been made to the forms of tender data or contract data (unless such alterations have been duly authenticated by the Tenderer) orif any particulars required therein have not been completed in all respects.

F.2.12 Alternative tenders

F.2.12.1 Alternative Tender Offers

If a tenderer wishes to submit an alternative tender offer, the only criteria permitted for such an alternative tender offer are:

(a) Individual items

Individual items offered as alternatives to items in the Bill of Quantities will only be considered if listed and priced in Form I: *Amendments, Qualifications and Alternatives* in Part 2 of the Contract Document, accompanied by a detailed statement as necessary.

(b) Alternative designs

Where a Tenderer desires to submit alternative tender involving modifications to the design or method of construction that would alter the character of the tender, the following procedure must be observed:

(i) The alternative offer must be accompanied by supporting information, drawings, calculations and a priced alternative Bill of Quantities to enable its technical acceptability, construction time and price to be fully assessed. Such information, drawings and Bill of Quantities must be sufficient for proper evaluation of the tendered alternative, otherwise the offer will not be considered;

(ii) Any alternative tender involving modifications to design will be assessed on its merits and may be accepted. An accepted alternative design will become the design for the purpose of the contract.

(iii) If an alternative design with its priced Bill of Quantities has been accepted, the sum thus tendered for the alternative will not be subject to re-measurement and will be the final amount payable to the Contractor, except only for variations arising from:

- Changes in design parameters ordered by the Engineer;
- Changes not arising from any failure or fault of the Contractor, but from modifications requested by the

Engineer.

(iv) A decision whether or not to adopt a technically acceptable modified design will be governed by the amount of the overall saving and the advantages to the Employer which the modified design can be reliably expected to achieve. Matters to be considered in arriving at the overall saving will include the effect of any deferment in starting date arising from extra time needed for the preparation of an amended contract for signature.

(v) The Tenderer will be liable for all costs necessary for the Engineer to check the alternative design offered

F2.13 Submitting a Tender Offer

F.2.13.3 Tender offers shall be submitted as an original only.

Under no circumstances whatsoever may the tender forms be retyped or redrafted.

Photocopies of the original tender documentation may be used, but an original signature must appear on such photocopies.

F.2.15 Closing Time

The closing time for submission of Tender Offers is: **12H00 PM** on **29th November 2022.**
Telephonic, telegraphic, telex, electronic or e-mailed tenders will not be accepted.

F.2.16 Tender validity

The Tender Offer validity period is **90 days** from the closing time for submission of tenders.

F.2.19 Access

Access shall be provided for inspections and testing by personnel acting on behalf of the Employer.

F.2.23 Certificates

The following certificates must be provided with the tender:

- **See F.3.11**

F.3.4 Opening of Tender Submissions

The time and location for opening of the tender offers are:

Time: **12H00 PM.** Date: **29th November 2022**

Location / Venue: Ngwathe Local Municipality, Procurement Department,
Liebenbergstrek Singel Street, Parys, 9585

F.3.5 The two-envelope system will **not** apply to this tender.

F.3.11 Evaluation of Tender Offers

F.3.11.1 The Tenders will be evaluated using a two-stage system as per Preferential Procurement Regulations 2011 pertaining to the Preferential Procurement Policy Framework Act, Act No 5 of 2000 as follows;

Option 1:
The employer shall:

a) Determine and test each tender offer for responsiveness in accordance with the conditions of tender and tender data.
b) Check the responsive tenders for arithmetical errors, omissions, and discrepancies in accordance with the conditions of tender and tender data.
c) Obtain clarification from the Tenderer in accordance with the conditions of tender and tender data.
d) Evaluate responsive tenders in accordance with the conditions of tender and tender data.

Responsive tenders will be evaluated according to the MFMA, Circular No.53 of the Municipal Act No.56 of 2003.

First stage – Compliance to administrative requirements
The following critical criteria have been identified for this bid and any non-compliant thereto will lead to the bid regarded as non-responsive and disqualified from further evaluation:

- **Power of attorney / authority for signatory of JV**
- **Valid Tax Clearance attached (If JV, for Both) and SARS PIN**
- **CIDB Grading of 7EP PE or Higher certificates relevant for the bid (if JV, for Both)**
- **Form of offer completed in figures and words**
- **Document filled in with a black pen**
- **All pages signed or initialled**
- **Schedule of construction plant included (Proof of ownership to be attached or other arrangement)**
- **Programme of Works**
- **Schedule of Company Experience: Active and completed projects should be supported by Appointment letters and completion certificates (attachment)**
- **Certified copy of B-BBEE Certificate (If JV, certified copy of consolidated B-BBEE Certificates)**
- **Certified copies of Cipro Documents (If JV, for both)**
- **Certified ID Copies of all directors/members/shareholders of company/business/ (If JV, for Both)**
- **Proof of maintaining a business bank accounts or original cancelled cheque or originally Stamped bank confirmation (If JV, a joint venture business account should be provided)**
- **Signed and initialized JV Agreement**
- **Proof of bank rating for determining Bidders Financial capability to successfully deliver the Project (original letter from the bank and should be less than three (3) months old)**
- **Letter of intent for Providing Guarantee must be from a Reputable Bank**
- **Original Letter of Good Standing with Compensation Commission (Compensation for Injuries and Disease Act)**
- **Occupational Health and Safety Plan**
- **Organogram, curriculum vitae and certified qualifications of key personnel**
- **Tax invoice or statement as proof of updated municipal rates and taxes for the Company/business as well as directors/members/shareholders (SAPS affidavit for non-rated municipal areas & or copy of lease agreement with signed letter or confirmation From landlord to certify such arrangement)**
- **Proof of purchased bid receipt**
- **No Price amendment without signature in the bills of quantity**
- **Certificate of non-collusion**
- **Completed and signed all MBD documents (MBD 1; MBD 2; MBD 3; MBD 4; MBD 5; MBD 6.1; MBD 8; MBD 7 and MBD 9)**
- **Completed MBD 5 and submit audited statements (AFS)-Only where the tender amount**

exceeds R10 Million including vat)

- **Alteration to the bid document or submission of a copy of the original bid document will amount to disqualification**

NB: BIDDERS WHO FAIL TO COMPLY WITH EITHER OR ALL OF THE ABOVE-MENTIONED REQUIREMENTS SHALL BE AUTOMATICALLY DISQUALIFIED.

Second stage – Evaluation of functionality:

Responsive tenders will then be evaluated on functionality. The minimum score for functionality is 70%, and a bidder who scores below this minimum shall not be considered for further evaluation in terms of the preference point system.

FUNCTIONALITY COMPETENCE ACHIEVEMENT SCHEDULES

TABLE A1: PREVIOUS 132kV or 88kV or 66kV BULK SUBSTATION CONSTRUCTION PROJECTS COMPLETED

Completed projects with appointment letter and corresponding final completion certificates will be assessed as follows:

	TARGETED GOAL **Previous projects involving 132kV or 88kV or 66kV Bulk Substation Construction projects**	**POINT ALLOCATION**	**MAXIMUM POINT**
1	No information provided or information is not relevant to project objectives	0	**40**
2	1 similar bulk substation projects each with an amount of R 60 000 000 or higher	5	
3	2 similar bulk substation projects each with an amount of R 60 000 000 or higher	10	
4	3 similar bulk substation projects each with an amount of R 60 000 000 or higher	15	
5	4 similar bulk substation projects each with an amount of R 60 000 000 or higher	20	
6	5 similar bulk substation projects each with an amount of R 60 000 000 or higher	30	
7	more than 5 similar bulk substation projects each with an amount of R 60 000 000 or higher	40	
	Method Statement		**10**
1	Clear and Method in accordance to the Scope	10	
2	Not clear and not provided	0	
	Quality Control Plan		**10**
1	Clear and Compliance with relevant required quality standard = 10 (ISO and SANS)	10	
2	Non-Compliance with quality standards and not provided = 0	0	

N.B: Proof of verifiable references of previous completed projects (appointment letters and completion certificates on Client Letterhead) with contact details in the form of certified copies must be attached. Completion certificates must be signed by all parties namely: the employer, Engineer and the contractor (certificates that are not signed by ALL relevant parties will result in the bidder forfeiting points). PREVIOUS COMPLETED SUBSTATION PROJECTS FOR ESKOM ARE A MUST. Failure to submit required COMPLETION CERTIFICATES, METHOD STATEMENT AND QUALITY CONTROL PLAN will result in the bidder getting zero points.

TABLE A2: BANKING RATING

	TARGETED GOAL Previous projects involving 132kV or 88kV or 66kV Bulk Substation Construction projects	POINT ALLOCATION	MAXIMUM POINT
1	No information provided or information is not relevant to project objectives	0	**10**
2	Rating E or Lower		
3	Rating of C or D	5	
4	Rating of B	8	
5	Rating of A	10	

N.B: Proof of original bank rating letter must be provided, it must be specific to this bid and not older than three (3) months. (Failure to submit proof of the bank rating from the relevant bank will result in the bidder getting zero points)

TABLE A3: KNOWLEDGE AND EXPERIENCE OF KEY STAFF

Bidders must complete T2.1 Form G (Knowledge and Experience of Key Personnel) on page T33 of T2.1 and must be attached to this bid document and must clearly indicate Electrical construction experience, project description, duration and contactable reference. **NB:** (Failure to complete T2.1 Form G and submitting certified copies will result in the getting zero points). Key personnel must be unencumbered, available full timeand unique to this project

	TARGETED GOAL Previous projects involving 132kV or 88kV or 66kV Bulk Substation Construction projects	POINT ALLOCATION	MAXIMUM POINT
1	No information provided or information is not relevant to project objectives	0	**20**
2	Construction Manager	10	
3	Site Agent	7	
4	Safety Officer	3	

FUNCTINALITY SCORING ASSESSMENT CRITERIA

COMPANY EXPERIENCE	KEY PERSONNEL EXPERIENCE	PLANT & EQUIPMENT	BANK RATING
(MAX 60 POINTS)	**(MAX 20 POINTS)**	**(MAX 10 POINTS)**	**(MAX 10 POINTS)**
Failure to submit required CERTIFICATE OF COMPLETION, METHOD STAEMENT AND QUALITY CONTROL PLAN will result in the bidder getting zero points. **NB:** Completion certificates must be signed by all parties namely: the employer, Engineer<and the contractor (certificates that is not signed by ALL relevant parties will result in the bidder forfeiting points)	Bidders must complete **T2.3 (Form B1 AND B2)** attached in the bid document for key personnel and must clearly indicate Electrical construction experience, project description, duration and contactable reference. NB: (Failure to complete T2.3 Form and submit certified copies will result in the getting zero points) Key personnel must be unencumbered, available full time and unique to this project	BIDDERS must complete form T2.1D. 1E: Schedule of (Plant & Equipment) (failure to submit proof of ownership OR Letter of intent for Plant and Equipment hire is signed by both the lessee and the lessor will result in the bidder getting zero Points) NB: All valid certificate are required including load test certificate for the Crane and Cherry Picker	(Failure to submit proof of the bank rating from the relevant bank will result in the bidder getting zero points)

Completed projects with final completion certificates will be assessed as follows:

(Max 40 points)

- **More than 5 similar bulk substation projects each with an amount of R 40 000 000 or higher = 40 points**
- **5 similar bulk substation projects each with an amount of R 40 000 000 or higher = 30 points**
- **4 similar bulk substation projects each with an amount of R 40 000 000 or higher = 20 points**
- **3 similar bulk substation projects each with an amount of R 40 000 000 or higher = 15 points**
- **2 similar bulk substation projects each with an amount of R 40 000 000 or higher = 10 points**
- **1 similar bulk substation projects each with an amount of R 40 000 000 or higher = 5 points**
- **No information provided or information provided not relevant to project objectives.**

(Max 10 points)

METHOD STATEMENT :

- **According to the scope and clear = 10**
- **Not provided = 0**

(Max 10 points)

QUALITY CONTROL PLAN :

- **Compliance with relevant required quality standard and clear = 10 (ISO and SANS)**
- **Non-Compliance with quality standards = 0**

CONSTRUCTION MANAGER: must be permanently based on site for the duration of a project. A Construction Manager with Electrical Engineering Experience, before and after professional registration, will be assessed as follows:

(MAX 10 Points)

EXPERIENCE:

- 05 Years or More Experience in Electrical Engineering with a minimum of Diploma in Electrical Engineer AND Registered as a Pr CPM (SACPCMP)/ PMP (**10 points).**
- 05 years' experience in Electrical Engineering with a minimum of Diploma but no registration as Pr CPM (SACPCMP /PMP or D**iploma 5 points)**
- Less than 03 years' experience in Electrical Engineering with a Diploma but no registration as Pr CPM (SACPCMP /PMP or D**iploma 3 points)**

SITE AGENT: with at least an undergraduate degree OR diploma qualification in Electrical Engineering must be permanently based on the site for the duration of the project. The Site Agent with Electrical Engineering experience must, before or after qualification will be assessed as follows: (Attach certified copies of academic qualifications.

(MAX 7 POINTS)

EXPERIENCE:

- 05 Years or more experience in construction field **(7 Points Degree/Diploma in Electrical Engineering)**
- 03 – 4 years experience in construction field **(4 Points Degree/Diploma in Electrical Engineering)**
- Less than 3 years' experience in construction field **(2 Points Degree/Diploma in Electrical Engineering)**
- No documentation submitted or documentation not relevant to project objectives. **(0 points)**

SAFETY OFFICER: registered as a construction health and safety officer with SACPMP/SAIOSH with a minimum diploma qualification must be permanently based on the site for the duration of a project. The safety office with road construction experience before and after professional registration, will be assessed base on the following:

(MAX 3 Points)

EXPERIENCE:

- Diploma/Degree AND Registered with council SACPCMP / SAIOSH as CHSO **(3 points)**
- Diploma/Degree but not Registered with council SACPCMP / SAIOSH as CHSO

(Max 10 points)

- **1 x 6 Ton Crane Truck points= 3**
- **1 x Excavator points = 3**
- **1 x 6 Ton Cherry points = 2**
- **1 x TLB points = 2**
- **No information submitted or information do not specification requirement = 0 points**

MAX 10 POINTS

- Rating A =10 Points
- Rating B =8 Points
- Rating C or D= 5 Points
- Rating E/lower: 0 Points

	(1 points) ➢ No Diploma/Degree and not registered with SACPCMP or SAIOSH **(0 Points)**		

N.B:

- **Contracts Manager**

  Must be permanently based on site for the duration of a project. A Construction Manager with Electrical Engineering Experience, before and after professional registration, will be assessed as follows:

➢ ...Must have a minimum of NQF level 6 qualification in Electrical Engineering
➢ ...Must have more than 3 years working experience in Electrical Field.
➢ ...The Contracts Manager point scoring will be as follows:

  - 05 Years or More Experience in Electrical Engineering (10 points degree)
  - 03 years' experience in Electrical Engineering (diploma 5 points)
  - Less than 3 years after obtaining certificate or equivalent in Electrical Engineering

- **Site Agent**

  Should possess at least an undergraduate degree OR diploma qualification in Electrical Engineering and must be permanently based on the site for the duration of the project. The site Agent with Electrical Engineering experience before or after qualification, will be assessed as follows:

➢ Must have a minimum of NQF level 4 qualification in Electrical Engineering
➢ Must have more than 3 years working experience in Electrical Field
➢ The Site Agent point scoring will be as follows:
➢ 05 Years or more experience in electrical construction (7 Points diploma in civil engineering)

- 03 Years or more experience in Electrical Engineering certificate in civil engineering (5 points)
- Less than 3 Year experience in Electrical Engineering (2 Points)

- **Safety Officer**

  Should be registered as a construction health and safety officer with SACPMP with a minimum diploma qualification must be permanently based on the site for the duration of a project. The safety office with road construction experience before and after professional registration, will be assessed based on the following:

- Must have a minimum of NQF level 5 qualification in Electrical Engineering
- Must have more than 3 years working experience in Electrical Field
- The Safety Officer point scoring will be as follows:
- Registered with council SACPCMP or/and SAMPRAC (2 Points)
- 3 Years or above experience (1 Point)

Submit a three-page CV for all above-mentioned personnel with contactable references. Also submit certified copies of I.D. document and qualifications. Failure to provide these shall warrant claiming zero points.

TABLE A4: PLANT AND EQUIPMENT

BIDDERS must complete T2.1 Form K: Schedule of Plant & Equipment on. **(Failure to submit proof of ownership OR Letter of intent for Plant and Equipment hire is signed by both the lessee and the lessor will result in the bidder getting zero Points)**.

	TARGETED GOAL Previous projects involving 132kV or 88kV or 66kV Bulk Substation Construction projects	**POINT ALLOCATION**	**MAXIMUN POINTS**
1	1 x 6 Ton Truck with crane	3	**10**
2	1 x Excavator	3	
3	1 x 6 Ton Cherry Picker	2	
4	1xTLB	2	

N.B: Proof of plant and equipment ownership in the form of copies must be attached and must be owned by the bidding company or owned by one of Directors. Proof of plant and equipment commitment letter from the leasing or hiring company that commits the availability for the execution of the project. All valid certificates are required including load test certificate for the Crane and Cherry Picker. Failure to provide this shall warrant claiming zero points.

The minimum score required for functionality is **70%**, and a bidder who scores below this minimum shall be disqualified and shall not be considered for further evaluation in terms of the 90/10 preference point system

The procedure for evaluation of responsive Tender Offers will be Method 2: Financial Offer and Preferences.

F.3.11.2 The financial offer will be scored in terms of Formula 2, Option 2 of Table F.1 of SANS 294: 2004, which reads as follows: 90 maximum points

Nfo = W1 x Pm/P

Where:

Nfo = number of tender evaluation points awarded for the financial offer;

W1 = 90/10 preference point system above R50 million
Pm = the rand value of the lowest comparative offer;
P = the rand value of the Tender Offer under consideration.
Points will be rounded off to the nearest 2 decimal places.

F.3.11.3 (b) The preferences points (B-BBEE), maximum 10 points will be allocated as follows:

Tenderers are required to submit original and valid B-BBEE status level Verification Certificates or certified copies thereof together with their bids, to substantiate their B-BBEE rating claims.

Tenderers who do not submit B-BBEE status level Verification certificate or are non-compliant contributors to B-BBEE do not qualify for preference points for B-BBEE but will not be disqualified from the bidding process. They will score points out of 90 for price only and zero (0) points out of 10 for B-BBEE.

A trust, consortium or joint venture must submit a consolidated B-BBEE status level verification certificate for every separate bid.

B-BBEE Status Level of Contributor	**Number of Points (90/10 System)**
1	**10**
2	**9**
3	**8**
4	**5**
5	**4**
6	**3**
7	**2**
8	**1**
Non-Compliant Contributor	**0**

F.3.13 Acceptance of Tender Offer

F.3.13.1 Tender Offers will only be accepted on condition that:

(a) the tender offer is signed by a person authorized to sign on behalf of the Tenderer and authority of Signatory is attached;

(b) a valid Tax Clearance Certificate is included with his tender;

(c) The Tenderer has signed and initialized all pages of tender document

(d) Tenderer's declaration of compliance with the Occupational Health and Safety Act No. 85 of 1993 and the Construction Regulations 2003 as well as the Tenderer's health and safety plan, is included with his tender submission;

(e) a Tenderer who submitted a tender as a Joint Venture has included an acceptable Joint Venture Agreement with his tender;

(f) Tender document has not been unbundled or tempered with,

(g) the Tenderer or a competent authorized representative of the Contractor who submitted the tender has attended the compulsory clarification meeting or site inspection;

(h) The Contractor who submits the tender has been registered with the Construction Industry Development Board in accordance with the Construction Industry Development Board Act No. 38 of 2000 and the CIDB Regulations 2003 promulgated in terms of the Act.

(i) The Tenderer or any of its principals is not listed on the register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector;

(j) The Tenderer has not abused the Employer's Supply Chain Management System or has failed to perform on any previous contract and has been given a written notice to this effect;

(k) The Tenderer or any of its principals, directors or managers is not employed in the service of the State or any municipality. In the event that such principals are involved, official approval from the Executing Authority regarding carrying out remunerative work outside of the public service must be included in the tender submission.

(l) The Employer is satisfied that the Tenderer or any of his principals have not influenced the tender offer and acceptance by the following criteria:

a. having offered, promised or given a bribe or other gift or remuneration to any person in connection with the obtaining or execution of this Contract;

b. having acted in a fraudulent or corrupt manner in obtaining or executing this Contract;

c. having approached an officer or employee of the Employer or the Employer's Agent with the objective of influencing the award of a Contract in the Tenderer's favour;

d. having entered into any agreement or arrangement, whether legally binding or not, with any other person, firm or company to refrain from Tendering for this Contract or as to the amount of the Tender to be submitted by either party;

e. having disclosed to any other person, firm or company other than the Employer, the exact or approximate amount of his proposed Tender;

f. The Employer may, in addition to using any other legal remedies, repudiate the Tender offer and acceptance and declare the Contract invalid should it have been concluded already.

F.3.18 Copies of Contract

The number of paper copies of the signed contract to be provided by the Employer is ONE.

Annex F: Standard Conditions of Tender

(As contained in Annexure F of the CIDB Standard for Uniformity in Construction Procurement)

F.1 General

F.1.1 Actions

The employer and each tenderer submitting a tender offer shall comply with these conditions of tender. In their dealings with each other, they shall discharge their duties and obligations as set out in F.2 and F.3, timeously and with integrity, and behave equitably, honestly and transparently.

F.1.2 Tender Documents

The documents issued by the employer for the purpose of a tender offer are listed in the tender data.

F.1.3 Interpretation

F.1.3.1 The tender data and additional requirements contained in the tender schedules that are included in the returnable documents are deemed to be part of these conditions of tender.

F.1.3.2 These conditions of tender, the tender data and tender schedules which are only required for tender evaluation purposes, shall not form part of any contract arising from the invitation to tender.

F.1.3.3 For the purposes of these conditions for the calling for expressions of interest, the following definitions apply:

a) **comparative offer** means the tenderer's financial offer after the factors of non-firm prices, all unconditional discounts and any other tendered parameters that will affect the value of the financial offer have been taken into consideration

b) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process; and

c) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels

d) **quality (functionality)** means the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs

F.1.4 Communication and employer's agent

Each communication between the employer and a tenderer shall be to or from the employer's agent only, and in a form that can be read, copied and recorded. Writing shall be in the English language. The employer shall not take any responsibility for non-receipt of communications from or by a tenderer. The name and contact details of the employer's agent are stated in the tender data.

F.1.5 The employer's right to accept or reject any tender offer

F.1.5.1 The employer may accept or reject any variation, deviation, tender offer, or alternative tender offer, and may cancel the tender process and reject all tender offers at any time before the formation of a contract. The employer shall not accept or incur any liability to a tenderer for such cancellation and rejection, but will give written reasons for such action upon written request to do so.

F.1.5.2 The employer may not, subsequent to the cancellation or abandonment of a tender process or the rejection of all responsive tender offers re-issue a tender covering substantially the same scope of work within a period of six months unless only one tender was received and such tender was returned unopened to the tenderer.

F.2 Tenderer's obligations

F.2.1 Eligibility

Submit a tender offer only if the tenderer complies with the criteria stated in the tender data and the tenderer, or any of his principals, is not under any restriction to do business with employer.

F.2.2 Cost of tendering

Accept that the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer satisfy requirements.

F.2.3 Check documents

Check the tender documents on receipt for completeness and notify the employer of any discrepancy oromission.

F.2.4 Confidentiality and copyright of documents

Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a tender offer in response to the invitation.

F.2.5 Reference documents

Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are not attached but which are incorporated into the tender documents by reference.

F.2.6 Acknowledge addenda

Acknowledge receipt of addenda to the tender documents, which the employer may issue, and, if necessary, apply for an extension to the closing time stated in the tender data, in order to take the addenda into account.

F.2.7 Clarification meeting

Attend, where required, a clarification meeting at which tenderers may familiarize themselves with aspects of the proposed work, services or supply and raise questions. Details of the meeting(s) are stated in the tender data.

F.2.8 Seek clarification

Request clarification of the tender documents, if necessary, by notifying the employer at least five working days before the closing time stated in the tender data.

F.2.9 Insurance

Be aware that the extent of insurance to be provided by the employer (if any) may not be for the full cover required in terms of the conditions of contract identified in the contract data. The tenderer is advised to seek qualified advice regarding insurance.

F.2.10 Pricing the tender offer

F.2.10.1 Include in the rates, prices, and the tendered total of the prices (if any) all duties, taxes (except Value Added Tax (VAT), and other levies payable by the successful tenderer, such duties, taxes and levies being those applicable 14 days before the closing time stated in the tender data.

F2.10.2 Show VAT payable by the employer separately as an addition to the tendered total of the prices.

F.2.10.3 Provide rates and prices that are fixed for the duration of the contract and not subject to adjustment except as provided for in the conditions of contract identified in the contract data.

F.2.10.4 State the rates and prices in Rand unless instructed otherwise in the tender data. The conditions of contract identified in the contract data may provide for part payment in other currencies.

F.2.11 Alterations to documents

Not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations. Erasures and the use of masking fluid are prohibited.

F.2.12 Alternative tender offers

F.2.12.1 Submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted. The alternative tender offer is to be submitted with the main tender offer together with a schedule that compares the requirements of the tender documents with the alternative requirements the tenderer proposes.

F.2.12.2 Accept that an alternative tender offer may be based only on the criteria stated in the tender data or criteria otherwise acceptable to the employer.

F.2.13 Submitting a tender offer

F.2.13.1 Submit a tender offer to provide the whole of the works, services or supply identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.

F.2.13.2 Return all returnable documents to the employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing in black ink.

F.2.13.3 Submit the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the employer.

F.2.13.4 Sign the original and all copies of the tender offer where required in terms of the tender data. The employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.

F.2.13.5 Seal the original and each copy of the tender offer as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.

F.2.13.6 Where a two-envelope system is required in terms of the tender data, place and seal the returnable documents listed in the tender data in an envelope marked “financial proposal” and place the remaining returnable documents in an envelope marked “technical proposal”. Each envelope shall state on the outside the employer’s address and identification details stated in the tender data, as well as the tenderer's name and contact address.

F.2.13.7 Seal the original tender offer and copy packages together in an outer package that states on the outside only the employer's address and identification details as stated in the tender data.

F.2.13.8 Accept that the employer shall not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.

F.2.14 Information and data to be completed in all respects
Accept that tender offers, which do not provide all the data or information requested completely and, in the form required, may be regarded by the employer as non-responsive.

F.2.15 Closing time

F.2.15.1 Ensure that the employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Proof of posting shall not be accepted as proof of delivery. The employer shall not accept tender offers submitted by telegraph, telex, facsimile or e-mail, unless stated otherwise

F.2.15.2 Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.

F.2.16 Tender offer validity

F.2.16.1 Hold the tender offer(s) valid for acceptance by the employer at any time during the validity period stated in the tender data after the closing time stated in the tender data.

F.2.16.2 If requested by the employer, consider extending the validity period stated in the tender data for an agreed additional period.

F.2.17 Clarification of tender offer after submission

Provide clarification of a tender offer in response to a request to do so from the employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the total of the prices or substance of the tender offer is sought, offered, or permitted. The total of the prices stated by the tenderer shall be binding upon the tenderer.

Note: Sub-clause F.2.17 does not preclude the negotiation of the final terms of the contract with a preferred tenderer following a competitive selection process, should the Employer elect to do so.

F.2.18 Provide other material

F.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment. Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employer's request, the employer may regard the tender offer as non- responsive.

F.2.18.2 Dispose of samples of materials provided for evaluation by the employer, where required.

F.2.19 Inspections, tests and analysis

Provide access during working hours to premises for inspections, tests and analysis as provided for in the tender data.

F.2.20 Submit securities, bonds, policies, etc.

If requested, submit for the employer's acceptance before formation of the contract, all securities, bonds, guarantees, policies, and certificates of insurance required in terms of the conditions of contract identified in the contract data.

F.2.21 Check final draft

Check the final draft of the contract provided by the employer within the time available for the employer to issue the contract.

F.2.22 Return of other tender documents

If so instructed by the employer, return all retained tender documents within 28 days after the expiry of the validity period stated in the tender data.

F.2.23 Certificates

Include in the tender submission or provide the employer with any certificates as stated in the tender data.

F.3 The employer's undertakings

F.3.1 Respond to clarification

Respond to a request for clarification received up to five working days prior to the tender closing time stated in the Tender Data and notify all tenderers who drew procurement documents.

F.3.2 Issue Addenda

If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date of the Tender Notice until seven days before the tender closing time stated in the Tender Data. If, as a result a tenderer applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, will then notify it to all tenderers who drew documents.

F.3.3 Return late tender offers

Return tender offers received after the closing time stated in the Tender Data, unopened, (unless it is necessary to open a tender submission to obtain a forwarding address), to the tenderer concerned.

F.3.4 Opening of tender submissions

F.3.4.1 Unless the two-envelope system is to be followed, open valid tender submissions in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data. Tender submissions for which acceptable reasons for withdrawal have been submitted will not be opened.

F.3.4.2 Announce at the opening held immediately after the opening of tender submissions, at a venue indicated in the tender data, the name of each tenderer whose tender offer is opened, the total of his prices, preferences claimed and time for completion, if any, for the main tender offer only.

F.3.4.3 Make available the record outlined in F.3.4.2 to all interested persons upon request.

F.3.5 Two-envelope system

F.3.5.1 Where stated in the tender data that a two-envelope system is to be followed, open only the technical proposal of valid tenders in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data and announce the name of each tenderer whose technical proposal is opened.

F.3.5.2 Evaluate the quality of the technical proposals offered by tenderers, then advice tenderers who remain in contention for the award of the contract of the time and place when the financial proposals will be opened. Open only the financial proposals of tenderers, who score in the quality evaluation above the minimum number of points for quality stated in the tender data, and announce the score obtained for the technical proposals and the total price and any preferences claimed. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for quality.

F.3.6 Non-disclosure

Do not disclose to tenderers, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of tender offers, the final evaluation price and recommendations for the award of a contract, until after the award of the contract to the successful tenderer.

F.3.7 Grounds for rejection and disqualification

Determine whether there has been any effort by a tenderer to influence the processing of tender offers and instantly disqualify a tenderer (and his tender offer) if it is established that he engaged in corrupt or fraudulent practices.

F.3.8 Test for responsiveness

Determine, on opening and before detailed evaluation, whether each tender offer properly received:

a) meets the requirements of these Conditions of Tender,
b) has been properly and fully completed and signed, and
c) is responsive to the other requirements of the tender documents.

A responsive tender is one that conforms to all the terms, conditions, and specifications of the tender documents without material deviation or qualification. A material deviation or qualification is one which, in the Employer's opinion, would:

- detrimentally affect the scope, quality, or performance of the works, services or supply identified inthe Scope of Work,
- change the Employer's or the tenderer's risks and responsibilities under the contract, or
- affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

Reject a non-responsive tender offer, and not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.

F.3.9 Arithmetical errors

Check responsive tender offers for arithmetical errors, correcting them in the following manner:

- Where there is a discrepancy between the amounts in figures and in words, the amount in words shallgovern.

- If a bill of quantities (or schedule of rates) applies and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected.Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate will be corrected.

- Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tendererwill be asked to revise selected item prices (and their rates if a bills of quantities applies) to achieve the tendered total of the prices.

Consider the rejection of a tender offer if the tenderer does not correct or accept the correction of his arithmetical errors in the manner described above.

F.3.10 Clarification of a tender offer

Obtain clarification from a tenderer on any matter that could give rise to ambiguity in a contract arising from the tender offer.

F.3.11 Evaluation of tender offers

F3.11.1 General

Appoint an evaluation panel of not less than three persons. Reduce each responsive tender offer to a comparative offer and evaluate it using the tender evaluation method that is indicated in the Tender Data and described below:

Method 1: Financial offer	1) Rank tender offers from the most favourable to the least favourable comparative offer. 2) Recommend highest ranked tenderer for the award of the contract unless there are compelling and justifiable reasons not to do so.
Method 2: Financial offer and preferences	1) Score tender evaluation points for financial offer. 2) Confirm that tenderers are eligible for the preferences claimed and if so, score tender evaluation points for preferencing. 3) Calculate total tender evaluation points. 4) Rank tender offers from the highest number of tender evaluation points to the lowest. 5) Recommend tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.
Method 3: Financial offer and quality	1) Score quality, rejecting all tender offers that fail to score the minimum number of points for quality stated in the Tender data. 2) Score tender evaluation points for financial offer. 3) Calculate total tender evaluation points. 4) Rank tender offers from the highest number of tender evaluation points to the lowest. 5) Recommend tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.
Method 4: Financial offer, quality and preferences	1) Score quality, rejecting all tender offers that fail to score the minimum number of points for quality stated in the Tender data. 2) Score tender evaluation points for financial offer. 3) Confirm that tenderers are eligible for the preferences claimed, and if so, score tender evaluation points for preferencing. 4) Calculate total tender evaluation points. 5) Rank tender offers from the highest number of tender evaluation points to the lowest. 6) Recommend tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so. .

Score financial offers, preferences and quality, as relevant, to two decimal places.

F.3.11.2 Scoring Financial Offers

Score the financial offers of remaining responsive tender offers using the following formula:

N_{FO} = W_1 x A, where:
N_{FO} = the number of tender evaluation points awarded for the financial offer.
W_1 = the maximum possible number of tender evaluation points awarded for the financial offer as stated in the Tender Data.
A = a number calculated using either formulas 1 or 2 below as stated in the Tender Data.

Formula	Basis for comparison	Option 1	Option 2
1	Highest price or discount	$(1 + \frac{(P - P_m)}{P_m})$	P/P_m

2	Lowest price or percentage commission/fee	$(1 - \frac{(P - Pm)}{Pm})$	P_m/P

where:

Pm = the comparative offer of the most favourable tender offer.
P = the comparative offer of tender offer under consideration.

F.3.11.3 Scoring quality (functionality)

Score quality in each of the categories stated in the Tender Data and calculate total score for quality.

F.3.12 Insurance provided by the employer

If requested by the proposed successful tenderer, submit for the tenderer's information the policies and / or certificates of insurance which the conditions of contract identified in the contract data, require the employer to provide.

F.3.13 Acceptance of tender offer

F.3.13.1 Accept tender offer only if the tenderer satisfies the legal requirements stated in the Tender Data.

F.3.13.2 Notify the successful tenderer of the employer's acceptance of his tender offer by completing and returning one copy of the form of offer and acceptance before the expiry of the validity period stated in the tender data or agreed additional period. Providing the form of offer and acceptance does not contain any qualifying statements, it will constitute the formation of a contract between the employer and the successful tenderer as described in the form of offer and acceptance.

F.3.14 Notice to unsuccessful tenderers

After the successful tenderer has acknowledged the employer's notice of acceptance, notify other tenderers that their tender offers have not been accepted.

F.3.15. Prepare contract documents

If necessary, revise documents that shall form part of the contract and that were issued by the employer as part of the tender documents to take account of:

a. addenda issued during the tender period,
b. inclusion of some of the returnable documents,
c. other revisions agreed between the employer and the successful tenderer, and
d. the schedule of deviations attached to the form of offer and acceptance, if any.

F.3.16 Issue final contract

Prepare and issue the final draft of contract documents to the successful tenderer for acceptance as soon as possible after the date of the employer's signing of the form of offer and acceptance (including the schedule of deviations, if any). Only those documents that the conditions of tender require the tenderer to submit, after acceptance by the employer, shall be included.

F.3.17 Complete adjudicator's contract

Unless alternative arrangements have been agreed or otherwise provided for in the contract, arrange for both parties to complete formalities for appointing the selected adjudicator at the same time as the main contract is signed.

F.3.18 Provide copies of the contracts

Provide to the successful tenderer the number of copies stated in the Tender Data of the signed copy of the contract as soon as possible after completion and signing of the form of offer and acceptance.

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NGWATHE LOCAL MUNICIPALITY

Construction of Kwakwatsi 88/6.6 kV, 2x10MVA Substation

T2.1 List of Returnable Documents ...

The tenderer must complete the following returnable documents:

1 Returnable Schedules required only for tender evaluation purposes

a. Certificate of Attendance at a Tender Site Meeting
b. Record of Addenda to Tender Documents
c. Certificate of Authority for Joint Ventures / Close Corporation/ Partnership/ Company/ Sole Proprietor(Certified copies of Identity Documents in the case of Sole Proprietor)
d. Registration Certificates of entities – Joint Ventures / Close Corporation/ Partnership/ Company/ SoleProprietor
e. Compulsory Enterprise Questionnaire
f. Schedule of the Tenderer's Experience
g. Schedule of Key Personnel
h. Format of Curriculum Vitae
i. Proposed Amendments, Qualifications and Alternatives
j. Schedule of Subcontractors
k. Schedule of Plant and Equipment
l. Copy of the Workmen's Compensation Registration Certificate (or proof of payment of contributions in termsof the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993)
m. Bank rating letter

2 Other documents required only for tender evaluation purposes

n. An original valid Tax Clearance Certificate issued by the South African Revenue Services.
o. Form of intent to provide a performance guarantee
p. CIDB 7 EP PE or Higher
q. B-BBBE Status Level Verification Certificate

3 Other documents that will be incorporated into the contract

r. Execution Programme
s. Contractor's Health and Safety Declaration
t. T: Contractor's Safety Plan
u. Pro forma Notification form in terms of the Occupational Health and Safety Act 1993, Construction Regulations, 2003
v. MBD Forms (4, 8 and 9)
w. Risk Assessment and Mitigation Measures

4 The offer portion of the C1.1 Offer and Acceptance
5 C1.2 Contract Data (Part 2)
6 C2.2 Bills of quantities

A. CERTIFICATE OF ATTENDANCE AT A TENDER SITE MEETING

This is to certify that *(Tenderer)* ……..…

of (*address)*.....

.....……..... was represented by the person(s) named below at the compulsory meeting held for all tenderers

I / We acknowledge that the purpose of the meeting was to acquaint myself / ourselves with the site of the works and / or matters incidental to doing the work specified in the tender documents in order for me / us to take account of everything necessary when compiling our rates and prices included in the tender.

Particulars of person(s) attending the meeting:

Name: .....……..... Signature: .....….....

Capacity: .....

Name: ….....……. Signature: .....….....

Capacity: .....

Attendance of the above person(s) at the meeting is confirmed by the Employer's representative, namely:

Name: .....……..……..... Signature: .....

Capacity: .....…… Date and Time: .....…….....

B. RECORD OF ADDENDUM TO TENDER DOCUMENTS

I / We confirm that the following communications received from the Employer or his representative before the date of submission of this tender offer, amending the tender documents, have been taken into account in this tender offer.

ADD. No.	DATE	TITLE OR DETAILS
1		
2		
3		
4		
5		

SIGNATURE: .....…….. DATE: ….....
(of person authorised to sign on behalf of the Tenderer)

C- CERTIFICATE OF AUTHORITY OF AN ENTITY

Indicate the status of the tenderer by ticking the appropriate box hereunder. The tenderer must complete the certificate set out below for the relevant category.

(I) Company	(II) Close Corporation	(III) Partnership	(IV) Joint Venture	(V) Sole Proprietor

(I) CERTIFICATE FOR COMPANY

I....., chairperson of the Board of Directors of ....., hereby confirm that by resolution of the Board (copy attached) taken on ..... 20 ,

Mr/Ms ....., acting in the capacity of ....., was authorised to sign all documents in connection with this tender and any contract resulting from it on behalf of the company.

Signature of Chairman: .....

Signature of Signatory: .....

As Witnesses:

1..... Name in Block Letters.....

2..... Name in Block Letters.....

Date: .....

(II) CERTIFICATE FOR CLOSE CORPORATION

We, the undersigned, being the key members in the business trading as.....

..... hereby authorise Mr/Ms ..... ,

acting in the capacity of ....., to sign all documents

in connection with the tender for Contract No .....and any contract resulting from it on our behalf.

Signature of Signatory: .....

As Witnesses:

1..... Name in Block Letters.....

2..... Name in Block Letters.....

Date: .....

NAME	ADDRESS	SIGNATURE	DATE

Note: This certificate is to be completed and signed by all of the key members upon whom rests the direction of the affairs of the Close Corporation as a whole.

(III). CERTIFICATE FOR PARTNERSHIP

We, the undersigned, being the key partners in the business trading as,

.....hereby authorise Mr/Ms….....

acting in the capacity of ....., to sign all documents in connection

with the tender for Contract No..... and any contract resulting from it on our behalf.

Signature of Signatory: .....

As Witnesses:

1..... Name in Block Letters.....

2..... Name in Block Letters.....

Date: .....

NAME	ADDRESS	SIGNATURE	DATE

Note: This certificate is to be completed and signed by all of the key partners upon who rests the direction of the affairs of the Partnership as a whole.

(IV) CERTIFICATE FOR JOINT VENTURE

We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorize Mr/Ms ....., authorized signatory of the company, ……..…… ……..acting in the capacity of lead partner, to sign all documents in connection with the tender offer for Contract No ..... and any contract resulting from it on our behalf.

This authorization is evidenced by the attached power of attorney signed by legally authorized signatories of all the partners to the Joint Venture.

Signature of Signatory: .....

As Witnesses:

1..... Name in Block Letters.....

2..... Name in Block Letters.....

Date: .....

NAME OF FIRM	ADDRESS	AUTHORISING SIGNATURE, NAME AND CAPACITY
Lead partner		

Note: This certificate is to be completed and signed by all of the key partners upon who rests the direction of the affairs of the Partnership as a whole.

V) CERTIFICATE FOR SOLE PROPRIETOR

I....., hereby confirm that I am the sole owner of the

business trading as: ……...

Signature of Sole owner: .....

As Witnesses:

1..... Name in Block Letters.....

2..... Name in Block Letters.....

Date: .....

D. REGISTRATION CERTIFICATE OF AN ENTITY

[Important note to Tenderer: Certified Registration Certificates for Companies, Close Corporations and Partnerships, ID documents for Sole Proprietors, must be inserted here. In the case of a Joint Venture, a copy of a duly signed Joint Venture Agreement must be included]

E. COMPULSORY ENTERPRISE QUESTIONNAIRE

The following particulars must be furnished. In the case of a joint venture, **separate** enterprise questionnaires in respect of each partner must be completed and submitted.

Section 1: Name of enterprise: . . . . . .

Section 2: VAT registration number, if any: . . . . . .

Section 3: CIDB registration number, if any: . . . . . .

Section 4: Particulars of sole proprietors and partners in partnerships

Name*	Identity number*	Personal income tax number*

***** Complete only if sole proprietor or partnership and attach separate page if more than 3 partners

Section 5: Particulars of companies and close corporations

Company registration number . . . . . .

Close corporation number . . . . . .

Tax reference number . . . . . .

Section 6: Record of service of the state

Indicate by marking the relevant boxes with a cross, if any sole proprietor, partner in a partnership or director, manager, principal shareholder or stakeholder in a company or close corporation is currently or has been within the last 12 months in the service of any of the following:

- a member of any municipal council
- a member of any provincial legislature
- a member of the National Assembly or the National Council of Province
- a member of the board of directors of any municipal entity
- an official of any municipality or municipal entity
- Δ an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999)
- Δ a member of an accounting authority of any national or provincial public entity
- Δ an employee of Parliament or a provincial legislature

If any of the above boxes are marked, disclose the following:

Name of sole proprietor, partner, director, manager, principal shareholder or stakeholder	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		current	Within last 12 months

*insert separate page if necessary

Section 7: Record of spouses, children and parents in the service of the state

Indicate by marking the relevant boxes with a cross, if any spouse, child or parent of a sole proprietor, partner in a partnership or director, manager, principal shareholder or stakeholder in a company or close corporation is currently or has been within the last 12 months been in the service of any of the following:

- a member of any municipal council
- a member of any provincial legislature
- a member of the National Assembly or the National Council of Province
- a member of the board of directors of any municipal entity
- an official of any municipality or municipal entity
- an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999)
- a member of an accounting authority of any national or provincial public entity
- an employee of Parliament or a provincial legislature

Name of spouse, child or parent	**Name of institution, public office, board or organ of state and position held**	**Status of service (tick appropriate column)**	
		current	**Within last 12 months**

*insert separate page if necessary

The undersigned, who warrants that he/she is duly authorised to do so on behalf of the enterprise:

i) authorizes the Employer to obtain a tax clearance certificate from the South African Revenue Services that my / our tax matters are in order;
ii) confirms that the neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004;
iii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption;
iv) confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest;
iv) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

Signed _____ Date .....

Name _____ Position .....

Enterprise name _____

F. SCHEDULE OF THE TENDERER'S EXPERIENCE

The following is a statement of work of similar nature recently successfully executed by myself / ourselves. Tenderer must attach certified copies of appointment letters and completion certificates in order to claim 5 points per project completed, maximum 20 points (4 projects)

Employer: Contact Person and Telephone Number	Consulting Engineer: Contact Person and Telephone Number	Nature of Work	Value of Work (inclusive of VAT)	Date Completed or Expected to be Completed

SIGNATURE: .....…….. DATE: .....
(of person authorised to sign on behalf of the Tenderer)

G. KEY PERSONNEL

In terms of the Project Specification and the Conditions of Tender, unskilled workers may only be brought in from outside the local community if such personnel are not available locally.

The Tenderer shall list below the personnel which he intends to utilize on the Works, including key personnel which may have to be brought in from outside if not available locally.

Category of Employee	Number of Persons					
	Key Personnel, Part of the Contractor's Organisation		Key Personnel to be imported if not available locally		Unskilled Personnel to be recruited from local community	
	HDI	NON-HDI	HDI	NON-HDI	HDI	NON-HDI
Site Agent, Project Managers						
Foremen, Quality Control and Safety Personnel						
Technicians, Surveyors, etc						
Artisans and other Skilled workers						
Plant Operators						
Unskilled Workers						
Others:						
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....

SIGNATURE: .....….. DATE: ….....
(of person authorized to sign on behalf of the Tenderer)

H. CURRICULUM VITAE FORMAT OF KEY PERSONNEL

CV of key personnel to follow this format.
CV of Construction Manager, Site Manager and Safety Officer are required for full points, see T.9 of T.59 for full breakdown of requirements

Name:	**Date of birth:**
Profession:	**Nationality:**
Qualifications:	
Professional Registration Number:	
Name of Employer (firm):	
Current position:	**Years with firm:**
Employment Record:	

Experience Record Pertinent to Required service: last 4 major bulk substation construction projects managed:

Certification:

I, the undersigned, certify that, to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience.

....
Signature of person named in the schedule *Date*

I. AMENDMENTS, QUALIFICATIONS AND ALTERNATIVES

(***This is not an invitation for amendments, deviations or alternatives*** *but should the Tenderer desire to make any departures from the provisions of this contract he shall set out his proposals clearly hereunder. The Employer will not consider any amendment, alternative offers or discounts unless forms (a), (b) and (c) have been completed to the satisfaction of the Employer*).

I / We herewith propose the amendments, alternatives and discounts. as set out in the tables below:

(a) **AMENDMENTS**

PAGE, CLAUSE OR ITEM NO	PROPOSED AMENDMENT

[**Notes**: (1) Amendments to the General and Special Conditions of Contract are not acceptable;

(2) The Tenderer must give full details of all the financial implications of the amendments and qualifications in a covering letter attached to his tender.]

(b) ALTERNATIVES

PROPOSED ALTERNATIVE	DESCRIPTION OF ALTERNATIVE

[Notes: (1) Individual alternative items that do not justify an alternative tender, and an alternative offer for time for completion should be listed here.

(2) In the case of a major alternative to any part of the work, a separate Bill of Quantities, programme, etc., and a detailed statement setting out the salient features of the proposed alternatives must accompany the tender.

(3) Alternative tenders involving technical modifications to the design of the works and methods of construction shall be treated separately from the main tender offer.]

(c) DISCOUNTS

ITEM ON WHICH DISCOUNT IS OFFERED	DESCRIPTION OF DISCOUNT OFFERED

[Note: The tenderer must give full details of the discounts offered in a covering letter attached to his tender, failing which, the offer will be prejudiced]

SIGNATURE: .....……..……..... DATE: …….....
(of person authorised to sign on behalf of the Tenderer)

J. SCHEDULE OF PROPOSED SUB-CONTRACTORS

We notify you that it is our intention to employ the following Subcontractors for work in this contract.

If we are awarded the contract, we agree that this notification does not change the requirement for us to submit the names of proposed Subcontractors in accordance with requirements in the contract for such appointments. If there are no such requirements in the contract, then your written acceptance of this list shall be binding between us.

	Name and address of proposed Subcontractor	**Nature and extent of work**	**Previous experience with Subcontractor.**
1.			
2.			
3.			
4.			
5.			

Signed ..... Date .....

Name ..... Position .....

Tenderer .....

K. SCHEDULE OF PLANT AND EQUIPMENT

The following are lists of major items of relevant equipment that I/we presently own or lease and will have available for this contract or will acquire or hire for this contract if my/our tender is accepted.

(a) Details of major equipment that is owned by and immediately available for this contract.

Quantity	Description, size, capacity, etc.

Attach additional pages if more space is required.

(b) Details of major equipment that will be hired or acquired for this contract if my/our tender is acceptable.
Submit original letter from Plant hire confirming that plant will be hired out to tenderer

Quantity	Description, size, capacity, etc.

Attach additional pages if more space is required.

Signed ..... Date .....

Name ..... Position .....

Tenderer .....

L. COPY OF WORKMENS' COMPENSATION REGISTRATION CERTIFICATE (OR PROOF OF PAYMENT OF CONTRIBUTIONS IN TERMS OF THE COMPENSATION FOR OCCUPATIONAL INJURIES AND DISEASES ACT NO. 130 OF 1993)

[Certified Copy of the Certificate or Proof of Payment thereof obtained from the Workmen's Compensation Commissioner to be inserted here]

M. BANK RATING

Tenderers should submit an original bank rating letter from their banker that indicates their bank rating.

TABLE A2: BANKING RATING

	TARGETED GOAL **Previous projects involving 132kV or 88kV or 66kV Bulk Substation Construction projects**	**POINT ALLOCATION**	**MAXIMUM POINT**
1	No information provided or information is not relevant to project objectives	0	**10**
2	Rating of E or Lower	0	
3	Rating of C or D	5	
4	Rating of B	8	
5	Rating of A	10	

N.B: Proof of original bank rating letter must be provided, it must be specific to this bid and not older than 30 days. Failure to provide this shall warrant claiming zero points.

N. TAX CLEARANCE CERTIFICATE

IMPORTANT NOTES:

1. The following is an abstract from the Preferential Procurement Regulations 2001 promulgated with the Preferential Policy Framework Act No 5 of 2000:

   "**Tax clearance certificate**

   16. No contract may be awarded to a person who has failed to submit an original Tax Clearance Certificate from the South African Revenue Service ("SARS") certifying the taxes of that person to be in order or that suitable arrangement have been made with SARS."

2. The ST 5.1 form, Application for Tax Clearance Certificate (in respect of tenders), must be **completed by the tenderer in every detail and submitted to the Receiver of Revenue** where the tenderer is registered for income tax purposes. The Receiver of Revenue will then furnish the tenderer with a Tax Clearance Certificate that will be valid for 6 months from date of issue. **This Tax Clearance Certificate must be submitted in the original with the tender that is before the closing time and date of the tender.**

   Each party to a Consortium/Joint or Venture/Sub-contractors must complete a separate Tax Clearance Certificate.

   Failure to submit an original and valid Tax Clearance Certificate, or certified copy thereof, will invalidate the tender.

3. An **example** of the Application for Tax Clearance Certificate, which Tenderers may use to apply for the Tax Clearance Certificate is included hereafter and is available at any Receiver's Office.

APPLICATION FORM FOR TAX CLEARANCE CERTIFICATE/

(IN RESPECT OF TENDER)

1. NAME OF TAXPAYER/TENDERER: ……..……..

2. TRADE NAME: …….....……

3. IDENTIFICATION No. (if applicable) | | | | | | | | | | | | | |

4. COMPANY/CLOSE CORPORATION REG No. : | | | | | | | | | | |

5. INCOME TAX REFERENCE No. : | | | | | | | | | | |

6. VAT REGISTRATION No. : | | | | | | | | | | |

7. PAYE EMPLOYERS REG No. (if applicable) : | | | | | | | | | | |

NB: Copy of the tender request must be attached to this application.

CONTACT PERSON REQUIRING TAX CLEARANCE CERTIFICATE:

SIGNATURE: .....

NAME : .....

TELEPHONE NUMBER : CODE: ..... NUMBER: .....

ADDRESS : .....

.....

DATE : 2018/ /

Please note that the Commissioner for the South African Revenue Service (SARS) will not exercise his discretionary powers in favour of any person with regard to any interest, penalties and/or additional tax leviable due to the late or underpayment of taxes, duties or levies or the rendition of returns by any person.

NAME OF PERSON RESPONSIBLE FOR CONTRACT : .....

(ST 5.1) March 1999

NB: This is a pro forma application form that has to be submitted to SARS to enable them to issue the required Tax Clearance Certificate. The original and valid Tax Clearance Certificate furnished by the Receiver of Revenue must be submitted with the tender (to be attached to the next page).

TAX CLEARANCE CERTIFICATE

[Tax Clearance Certificate obtained from SARS to be inserted here]

O. FORM OF INTENT TO PROVIDE A PERFORMANCE GUARATEE

[The Tenderer must attach hereto a letter from the bank or institution with whom he has made the necessary arrangements, to the effect that the said bank or institution will be prepared to provide the required performance guarantee when asked to do so]. A Proforma is attached for the tenderers to use.

PRO-FORMA FOR A PERFORMANCE GUARANTEE

PERFORMANCE GUARANTEE

Employer: (N*ame and Address*) _____

_____

Contract No: _____

(*Contract title*) _____

WHEREAS_____
(hereinafter referred to as " the Employer") entered into, a Contract with

_____

(hereinafter called "the Contactor") on the_____day of_____20_____
for the construction of (*Contract Title*)

_____

at_____

AND WHEREAS it is provided by such Contract that the Contractor shall provide the Employer with security by way of a guarantee for the due and faithful fulfilment of such Contract by the Contractor;

AND WHEREAS_____(hereinafter referred to as "the Guarantor") Has/have at the request of the Contractor, agreed to give such guarantee;

NOW THEREFORE WE, _____
Do hereby guarantee and bind ourselves jointly and severally as Guarantor and Co-principal Debtors to the Employer under renunciation of the benefits of division and exclusion for the due and faithful performance by the Contractor of all the terms and conditions of the said Contract, subject to the following conditions:

1. The Employer shall, without reference and/or notice to us, have complete liberty of action to act in any manner authorized and/or contemplated by the terms of the said Contract, and/or to agree to any modifications, variations, alterations, directions or extensions of the Completion Data of the Works under the said Contract, and that its rights under this guarantee shall in no way be prejudiced nor our liability hereunder be affected by reason of any steps which the Employer may take under such Contract, or of any modification, variation, alterations of the Completion Date which the Employer may make, give, concede or agree to under the said Contract.

2. This guarantee shall be limited to the payment of a sum of money

3. The Employer shall be entitled, without reference to us, to release any guarantee held by it, and to give time to or compound or make any other arrangement with the Contractor.

However, upon receipt by us of an authenticated copy of the Certificate of Completion in terms of the Contract, the amount of liability shall be reduced by 50%, which shall be in force until the issue of the

Final Approval Certificate at expiry of the Defects Liability Period

4. This guarantee shall remain in full force and effect until the issue of the Certificate of Completion in terms of the Contract, unless we are advised in writing by the Employer before the issue of the said Certificate of his intention to institute claims, and the particulars thereof, in which event this guarantee shall remain in full force and effect until all such claims have been paid of liquidated.

5. Our total liability hereunder shall not exceed the sum of

_____

_____(in words)

R_____(in figures)
(10 % of the tender sum) that amount I/we agree to hold at your disposal.

6. The Guarantor reserves the right to withdraw from this guarantee by depositing the Guaranteed Sum with the beneficiary, whereupon the Guarantor's liability hereunder shall cease.

I/We declare that I/we, on behalf of the Guarantor, waive the legal exceptions available to a guarantor and undertake to pay the said amount or such portion thereof as may be demanded, immediately on receipt of a written demand from you.

A certificate under your hand shall be sufficient and satisfactory evidence as to the amount of the Guarantor's liability for the purpose of enabling provisional sentence or anysimilar relief to be obtained against the Guarantor.

This guarantee is neither negotiable nor transferable, and must be surrendered to the Guarantor in the event of the full amount of the Guarantee being paid to the Employer.

7. I/We hereby choose our address for the serving of all notices for all purposes arising here from as

_____

_____

IN WITNESS WHEREOF this guarantee has been executed by us at _____

on this_____day of_____20 _____

As witnesses:

1. _____ Signature _____

1._____ Signature _____

Duly authorized to sign on behalf of (*Guarantor*) _____

Address_____

_____

P. CIDB REGISTRATION CERTIFICATE

Tenderers must be registered with the CIDB in Electrical Engineering class of construction works. Tenderers should have a CIDB contractor grading designation of 7 EP or higher

Q. B-BBEE STATUS LEVEL

A maximum 10 points will be allocated as follows:

Tenderers are required to submit original and valid B-BBEE status level Verification Certificates or certified copies thereof together with their bids, to substantiate their B-BBEE rating claims.

Tenderers who do not submit B-BBEE status level Verification certificate or are non-compliant contributors to B-BBEE do not qualify for preference points for B-BBEE but will not be disqualified from the bidding process. They will score points out of 90 for price only and zero (0) points out of 10 for B-BBEE.

A trust, consortium or joint venture must submit a consolidated B-BBEE status level verification certificate for every separate bid.

B-BBEE Status Level of Contributor	**Number of Points**
1	**10**
2	**9**
3	**8**
4	**5**
5	**4**
6	**3**
7	**2**
8	**1**
Non-Compliant Contributor	**0**

R. EXECUTION PROGRAMME

The Tenderer shall detail below or attach a preliminary programme reflecting the proposed sequence and tempo of execution of the various activities comprising the work for this Contract. The programme shall be in accordance with the information supplied in the Contract, requirements of the Project Specifications and with all other aspects of his Tender.

The Execution Programme must be based on the completion time as specified in the Contract Data.

PLEASE NOTE: the cashflow projections from the contractor (to be submitted before commencement of the execution of the contract) must be in accordance with this execution plan in order to ensure proper cashflow management by the Municipality and to minimise delayed payments.

PROGRAMME

ACTIVITY	WEEKS / MONTHS													

SIGNATURE: .....…… DATE: …….....
(of person authorised to sign on behalf of the Tenderer)

S. CONTRACTOR'S HEALTH AND SAFETY DECLARATION

In terms of Clause 4(4) of the OHSA 1993 Construction Regulations 2003 (referred to as "the Regulations" hereafter), a Contractor may only be appointed to perform construction work if the Employer is satisfied that the Contractor has the necessary competencies and resources to carry out the work safely in accordance with the Occupational Health and Safety Act No 85 of 1993 and the OHSA 1993 Construction Regulations 2003.

To that effect a person duly authorised by the tenderer must complete and sign the declaration hereafter in detail.

Declaration by Tenderer

1. I the undersigned hereby declare and confirm that I am fully conversant with the Occupational Health and Safety Act No 85 of 1993 (as amended by the Occupational Health and Safety Amendment Act No 181 of 1993), and the OHSA 1993 Construction Regulations 2003.

2. I hereby declare that my company has the competence and the necessary resources to safely carry out the construction work under this contract in compliance with the Construction Regulations and the Employer's Health and Safety Specifications.

3. I propose to achieve compliance with the Regulations by one of the following:

   (a) From my own competent resources as detailed in 4(a) hereafter: ..... ***Yes / No**

   (b) From my own resources still to be appointed or trained until competency is achieved, as detailed in 4(b) hereafter: ..... ***Yes / No**

   (c) From outside sources by appointment of competent specialist subcontractors as detailed in 4(c) hereafter..... ***Yes / No**

   (***** = *delete whatever is not applicable*)

4. Details of resources I propose:

   (Note: Competent resources shall include safety personnel such as a construction supervisor and construction safety officer as defined in Regulation 6, and competent persons as defined in Regulations 7, 8, 10, 11, 12, 14, 15, 18, 21(1), 22, 26 and 27, as applicable to this contract)

   (a) Details of the competent and qualified key persons from my company's own resources, who will form part of the contract team:

NAMES OF COMPETENT PERSONS	POSITIONS TO BE FILLED BY COMPETENT PERSONS

(a) Details of training of persons from my company's own resources (or to be hired) who still have to be trained to achieve the necessary competency:

(i) By whom will training be provided? .....

(ii) When will training be undertaken? .....

(iii) List the positions to be filled by persons to be trained or hired: .....

.....

.....

.....

(b) Details of competent resources to be appointed as subcontractors if competent persons cannot be supplied from own company:

Name of proposed subcontractor: .....

Qualifications or details of competency of the subcontractor: .....

.....

.....

.....

5. I hereby undertake, if my tender is accepted, to provide, before commencement of the works under the contract, a suitable and sufficiently documented Health and Safety Plan in accordance with Regulation 5(1) of the Construction Regulations, which plan shall be subject toapproval by the Employer.

6. I confirm that copies of my company's approved Health and Safety Plan, the Employer's Safety Specifications as well as the OHSA 1993 Construction Regulations 2003 will be provided on site and will at all times be available for inspection by the Contractor's personnel, the Employer's personnel, the Engineer, visitors, and officials and inspectors of the Department of Labour.

7. I hereby confirm that adequate provision has been made in my tendered rates and prices in the schedule of quantities to cover the cost of all resources, actions, training and all health and safety measures envisaged in the OHSA 1993 Construction Regulations 2003, and that I will beliable for any penalties that may be applied by the Employer in terms of the said Regulations (Regulation 30) for failure on the Contractor's part to comply with the provisions of the Act and the Regulations.

8. I agree that my failure to complete and execute this declaration to the satisfaction of the Employer will mean that I am unable to comply with the requirements of the OHSA 1993 Construction Regulations 2003, and accept that my tender will be prejudiced and may be rejected at the discretion of the Employer.

SIGNATURE: ..... DATE: .....….....

(of person authorised to sign on behalf of the Tenderer)

T. CONTRACTOR'S SAFETY PLAN

[The Tenderer shall attach to this page the Contractor's Health and Safety Plan as required in terms of Regulation 5 of the Occupational Health and Safety Act 1993 Construction Regulations 2003 and referred to in T2.1]

U. PRO FORMA NOTIFICATION FORM IN TERMS OF THE OCCUPATIONAL HEALTHAND SAFETY ACT 1993, CONSTRUCTION REGULATIONS 2003

[This form must be completed and forwarded, prior to commencement of work on site, by all Contractors that qualify in terms of Regulation 3 of the Construction Regulations 2003, to the office of the Department of Labour]

1. (a) Name and postal address of Contractor: ……..
   .....
   (b) Name of Contractor's contact person: .....
   Telephone number: .....
2. Contractor's workman's compensation registration number: .....
3. (a) Name and postal address of client: .....
   .....
   .....
   (b) Name of client's contact person or agent: .....
   Telephone number.....
4. (a) Name and postal address of designer(s) for the project: .....
   .....
   (b) Name of designer's contact person: .....
   Telephone number.....
5. Name of Contractor's construction supervisor on site appointed in terms of Regulation 6(1): ..... Telephone number: .....
6. Name/s of Contractor's sub-ordinate supervisors on site appointed in terms of regulation 6(2).
   …… .....
7. Exact physical address of the construction site or site office: .....
   .....
8. Nature of the construction work: .....
   …….....
9. Expected commencement date: .....
10. Expected completion date: .....
11. Estimated maximum number of persons on the construction site: .....
12. Planned number of subcontractors on the construction site accountable to Contractor: .....
13. Name(s) of subcontractors already chosen: .....
    .....
    .....
    …….
    ……..

SIGNED BY:

CONTRACTOR: .....…… DATE: .....

CLIENT: ..... DATE: .....

W. IDENTIFIED PROJECT RISKS AND CONTRACTOR'S MITIGATION

The contactor is expected to provide mitigation measures for the following identified risks on the project:

- Eskom Switching Station Scope delays
- Reduced multi-year budget from project funder
- Long lead items procurement delays

PART A
INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE (*NGWATHE LOCAL MUNICIPALITY*)					
BID NUMBER:		CLOSING DATE:		CLOSING TIME:	
DESCRIPTION					
THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (MBD7).					

BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID
BOX SITUATED AT *(STREET ADDRESS*

SUPPLIER INFORMATION					
NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE		NUMBER		
CELLPHONE NUMBER					
FACSIMILE NUMBER	CODE		NUMBER		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
TAX COMPLIANCE STATUS	TCS PIN:		**OR**	CSD No:	
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE [TICK APPLICABLE BOX]	☐ Yes ☐ No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT	☐ Yes ☐ No	

[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]

ARE YOU THE ACCREDITED REPRESENTATIVE **IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?**	☐ Yes ☐ No [IF YES ENCLOSE PROOF]	ARE YOU A FOREIGN BASED SUPPLIER FOR **THE GOODS /SERVICES /WORKS OFFERED?**	☐ Yes ☐ No [IF YES, ANSWER PART B:3]
TOTAL NUMBER OF ITEMS OFFERED		**TOTAL BID PRICE**	**R**
SIGNATURE OF BIDDER	……	**DATE**	
CAPACITY UNDER WHICH THIS BID IS SIGNED			

BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO:		**TECHNICAL INFORMATION MAY BE DIRECTED TO:**	
DEPARTMENT		CONTACT PERSON	
CONTACT PERSON		TELEPHONE NUMBER	
TELEPHONE NUMBER		FACSIMILE NUMBER	
FACSIMILE NUMBER		E-MAIL ADDRESS	
E-MAIL ADDRESS			

PART B
TERMS AND CONDITIONS FOR BIDDING

1. BID SUBMISSION:

1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.

1.2. **ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED–(NOT TO BE RE-TYPED) OR ONLINE**

1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.

2. TAX COMPLIANCE REQUIREMENTS

2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.

2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VIEW THE TAXPAYER'S PROFILE AND TAX STATUS.

2.3 APPLICATION FOR THE TAX COMPLIANCE STATUS (TCS) CERTIFICATE OR PIN MAY ALSO BE MADE VIA E-FILING. IN ORDER TO USE THIS PROVISION, TAXPAYERS WILL NEED TO REGISTER WITH SARS AS E-FILERS THROUGH THE WEBSITE WWW.SARS.GOV.ZA.

2.4 FOREIGN SUPPLIERS MUST COMPLETE THE PRE-AWARD QUESTIONNAIRE IN PART B:3.

2.5 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.

2.6 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.

2.7 WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.

3. QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS

3.1.	IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?	☐ YES ☐ NO
3.2.	DOES THE ENTITY HAVE A BRANCH IN THE RSA?	☐ YES ☐ NO
3.3.	DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?	☐ YES ☐ NO
3.4.	DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?	☐ YES ☐ NO
3.5.	IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?	☐ YES ☐ NO

IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 ABOVE.

NB: FAILURE TO PROVIDE ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.
NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE.

SIGNATURE OF BIDDER: .....

CAPACITY UNDER WHICH THIS BID IS SIGNED: .....

DATE:.....

TAX CLEARANCE CERTIFICATE REQUIREMENTS

It is a condition of a bid that the taxes of the successful bidder must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the bidder's tax obligations.

1 In order to meet this requirement bidders are required to complete in full the attached form TCC 001 "Application for a Tax Clearance Certificate" and submit it to any SARS branch office nationally. The Tax Clearance Certificate Requirements are also applicable to foreign bidders / individuals who wish to submit bids.

2 SARS will then furnish the bidder with a Tax Clearance Certificate that will be valid for a period of 1 (one) year from the date of approval.

3 The original Tax Clearance Certificate must be submitted together with the bid. Failure to submit the original and valid Tax Clearance Certificate will result in the invalidation of the bid. Certified copies of the Tax Clearance Certificate will not be acceptable.

4 In bids where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Clearance Certificate.

5 Copies of the TCC 001 "Application for a Tax Clearance Certificate" form are available from any SARS branch office nationally or on the website www.sars.gov.za.

6 Applications for the Tax Clearance Certificates may also be made via eFiling. In order a to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za.

PRICING SCHEDULE – FIRM PRICES (PURCHASES)

NOTE: **ONLY FIRM PRICES WILL BE ACCEPTED. NON-FIRM PRICES (INCLUDING PRICES SUBJECT TO RATES OF EXCHANGE VARIATIONS) WILL NOT BE CONSIDERED**

IN CASES WHERE DIFFERENT DELIVERY POINTS INFLUENCE THE PRICING, A SEPARATE PRICING SCHEDULE MUST BE SUBMITTED FOR EACH DELIVERY POINT

Name of Bidder……	Bid Number……...
Closing Time ……. …..	Closing Date ……..

OFFER TO BE VALID FOR……DAYS FROM THE CLOSING DATE OF BID.

ITEM NO.	QUANTITY	DESCRIPTION	BID PRICE IN RSA CURRENCY **(ALL APPLICABLE TAXES INCLUDED)

- Required by: …….
- At: …….
  ……
- Brand and Model …….
- Country of Origin
  …….
- Does the offer comply with the specification(s)? *YES/NO
- If not to specification, indicate deviation(s) …….
- Period required for delivery …….
  *Delivery: Firm/Not firm
- Delivery basis …….

Note: All delivery costs must be included in the bid price, for delivery at the prescribed destination.

** “all applicable taxes” includes value- added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies.

*Delete if not applicable

PRICING SCHEDULE – NON-FIRM PRICES (PURCHASES)

NOTE: PRICE ADJUSTMENTS WILL BE ALLOWED AT THE PERIODS AND TIMES SPECIFIED IN THE BIDDING DOCUMENTS.

IN CASES WHERE DIFFERENT DELIVERY POINTS INFLUENCE THE PRICING, A SEPARATE PRICING SCHEDULE MUST BE SUBMITTED FOR EACH DELIVERY POINT

Name of Bidder……	Bid number……
Closing Time ……	Closing Date ……

OFFER TO BE VALID FOR……DAYS FROM THE CLOSING DATE OF BID.

ITEM NO.	QUANTITY	DESCRIPTION	BID PRICE IN RSA CURRENCY **(ALL APPLICABLE TAXES INCUDED)

- Required by: ……
- At: ……..……

- Brand and model ……..……
-
- Country of origin ……..……

- Does the offer comply with the specification(s)? *YES/NO
- If not to specification, indicate deviation(s) ……
- Period required for delivery ……
- Delivery: *Firm/Not firm

** ”all applicable taxes” includes value- added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies.

*Delete if not applicable

MBD 3.2

PRICE ADJUSTMENTS

A NON-FIRM PRICES SUBJECT TO ESCALATION

1. IN CASES OF PERIOD CONTRACTS, NON FIRM PRICES WILL BE ADJUSTED (LOADED) WITH THE ASSESSED CONTRACT PRICE ADJUSTMENTS IMPLICIT IN NON FIRM PRICES WHEN CALCULATING THE COMPARATIVE PRICES

2. IN THIS CATEGORY PRICE ESCALATIONS WILL ONLY BE CONSIDERED IN TERMS OF THE FOLLOWING FORMULA:

$$Pa = \left(1 - \right) \left(\frac{R1t}{R1o} + D2 \frac{R2t}{R2o} + D3 \frac{R3t}{R3o} + D4 \frac{R4t}{R4o} \right) + VPt$$
$$V\,Pt \qquad D1$$

Where:

Pa	=	The new escalated price to be calculated.
(1-V) Pt	=	85% of the original bid price. **Note that Pt must always be the original bid price and not an escalated price.**
D1, D2..	=	Each factor of the bid price eg. labour, transport, clothing, footwear, etc. The total of the various factors D1,D2…etc. must add up to 100%.
R1t, R2t……	=	Index figure obtained from new index (depends on the number of factors used).
R1o, R2o	=	Index figure at time of bidding.
VPt	=	15% of the original bid price. This portion of the bid price remains firm i.e. it is not subject to any price escalations.

3. The following index/indices must be used to calculate your bid price:

Index……. Dated……. Index……. Dated……. Index……. Dated…….

Index……. Dated……. Index……. Dated……. Index……. Dated…….

4. FURNISH A BREAKDOWN OF YOUR PRICE IN TERMS OF ABOVE-MENTIONED FORMULA. THE TOTAL OF THE VARIOUS FACTORS MUST ADD UP TO 100%.

FACTOR (D1, D2 etc. eg. Labour, transport etc.)	PERCENTAGE OF BID PRICE

MBD 3.2

B PRICES SUBJECT TO RATE OF EXCHANGE VARIATIONS

1. Please furnish full particulars of your financial institution, state the currencies used in the conversion of the prices of the items to South African currency, which portion of the price is subject to rate of exchange variations and the amounts remitted abroad.

PARTICULARS OF FINANCIAL INSTITUTION	ITEM NO	PRICE	CURRENCY	RATE	PORTION OF PRICE SUBJECT TO ROE	AMOUNT FOREIGN CURRENC REMITTE ABROAD
				ZAR=		
				ZAR=		
				ZAR=		
				ZAR=		
				ZAR=		
				ZAR=		

2. Adjustments for rate of exchange variations during the contract period will be calculated by using the average monthly exchange rates as issued by your commercial bank for the periods indicated hereunder: (Proof from bank required)

AVERAGE MONTHLY EXCHANGE RATES FOR THE PERIOD:	DATE DOCUMENTATION MUST BE SUBMITTED TO THIS OFFICE	DATE FROM WHICH NEW CALCULATED PRICES WILL BECOME EFFECTIVE	DATE UNTIL WHICH NE CALCULATED PRICE WILL BE EFFECTIVE

PRICING SCHEDULE
(Professional Services)

Name of Bidder:…… Bid Number: ……

Closing Time: ……. Closing Date ……

OFFER TO BE VALID FOR..... DAYS FROM THE CLOSING DATE OF BID.

ITEM NO	DESCRIPTION	BID PRICE IN RSA CURRENCY **(ALL APPLICABLE TAXES INCLUDED)

1. The accompanying information must be used for the formulation of proposals.

2. Bidders are required to indicate a ceiling price based on the total estimated time for completion of all phases and including all expenses inclusive of all applicable taxes for the project. R……

3. PERSONS WHO WILL BE INVOLVED IN THE PROJECT AND RATES APPLICABLE (CERTIFIED INVOICES MUST BE RENDERED IN TERMS HEREOF)

4. PERSON AND POSITION	HOURLY RATE	DAILY RATE
----------	R----------	----------
----------	R----------	----------
----------	R----------	----------
----------	R----------	----------
----------	R----------	----------

5. PHASES ACCORDING TO WHICH THE PROJECT WILL BE COMPLETED, COST PER PHASE AND MAN-DAYS TO BE SPENT

----------	R----------	---------- days
----------	R----------	---------- days
----------	R----------	---------- days
----------	R----------	---------- days

5.1 Travel expenses (specify, for example rate/km and total km, class of airtravel, etc). Only actual costs are recoverable. Proof of the expenses incurred must accompany certified invoices.

DESCRIPTION OF EXPENSE TO BE INCURRED	RATE	QUANTITY	AMOUNT
----------	……	……..	R……..
----------	……	……..	R……..
----------	……	……..	R……..
----------	……	……..	R……..

**"all applicable taxes" includes value-added taxes, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies.

5.2 Other expenses, for example accommodation (specify, eg. Three star hotel, bed and breakfast, telephone cost, reproduction cost, etc.). On basis of these particulars, certified invoices will be checked for correctness. Proof of the expenses must accompany invoices.

DESCRIPTION OF EXPENSE TO BE INCURRED	RATE	QUANTITY	AMOUNT
----------	.....	.....	R.....
----------	.....	.....	R.....
----------	.....	.....	R.....
----------	.....	.....	R.....

TOTAL: R……

6. Period required for commencement with project after acceptance of bid .....

7. Estimated man-days for completion of project .....

8. Are the rates quoted firm for the full period of contract? ..... *YES/ NO.

9. If not firm for the full period, provide details of the basis on which adjustments will be applied for, for example consumer price index.....

.....

.....

.....

*Delete if not applicable

MBD 4

DECLARATION OF INTEREST

1. No bid will be accepted from persons in the service of the state[1].

2. Any person, having a kinship with persons in the service of the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to persons in service of the state, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority.

3 In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

3.1 Full Name of bidder or his or her representative: …….

3.2 Identity Number: …….

3.3 Position occupied in the Company (director, trustee, hareholder[2]): …….

3.4 Company Registration Number: ……..

3.5 Tax Reference Number: ..……

3.6 VAT Registration Number: ..……

3.7 The names of all directors / trustees / shareholders members, their individual identity numbers and state employee numbers must be indicated in paragraph 4 below.

3.8 Are you presently in the service of the state?

YES / NO

3.8.1 If yes, furnish particulars.……

…..……..

[1]MSCM Regulations: "in the service of the state" means to be –

(a) a member of –
  (i) any municipal council;
  (ii) any provincial legislature; or
  (iii) the national Assembly or the national Council of provinces;

(b) a member of the board of directors of any municipal entity;
(c) an official of any municipality or municipal entity;
(d) an employee of any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No.1 of 1999);
(e) a member of the accounting authority of any national or provincial public entity; or
(f) An employee of Parliament or a provincial legislature.

[2] Shareholder" means a person who owns shares in the company and is actively involved in the management of the company or business and exercises control over the company.

3.9 Have you been in the service of the state for the past twelve months? …**YES / NO**

3.9.1 If yes, furnish particulars……..……..

…….

3.10 Do you have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and or adjudication of this bid?..... **YES / NO**

3.10.1 If yes, furnish particulars.

……
……

3.11 Are you, aware of any relationship (family, friend, other) between any other bidder and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid?..... **YES / NO**

3.11.1 If yes, furnish particulars

……
……

3.12 Are any of the company's directors, trustees, managers, Principle shareholders or stakeholders in service of the state? .....**YES / NO**

3.12.1 If yes, furnish particulars.

……
……

3.13 Are any spouse, child or parent of the company's director's trustees, managers, Principle shareholders or stakeholders in service of the state?

YES / NO

3.13.1 If yes, furnish particulars.

……
……

3.14 Do you or any of the directors, trustees, managers, Principle shareholders or stakeholders of this company Have any interest in any other related companies or Business whether or not they are bidding for this contract.

YES / NO

3.14.1 If yes, furnish particulars:

……..
……..

4. Full details of directors / trustees / members / shareholders.

Full Name	Identity Number	State Employee Number

…….. ……

Signature **Date**

…… ……

Capacity **Name of Bidders**

DECLARATION FOR PROCUREMENT ABOVE R10 MILLION (VAT INCLUDED)

For all procurement expected to exceed R10 million (VAT included), bidders must complete the following questionnaire:

1 Are you by law required to prepare annual financial statements for auditing?

1.1 If yes, submit audited annual financial statements for the past three years or since the date of establishment if established during the past three years.

……

……

YES / NO

2 Do you have any outstanding undisputed commitments for municipal services towards a municipality or any other service provider in respect of which payment is overdue for more than 30 days?

2.1 If no, this serves to certify that the bidder has no undisputed commitments for municipal services towards a municipality or other service provider in respect of which payment is overdue for more than 30 days.

2.2 If yes, provide particulars.

……

……

……

……..

3 Has any contract been awarded to you by an organ of state during the past five years, including particulars

YES / NO

of any material non-compliance or dispute concerning the execution of such contract?

3.1 If yes, furnish particulars

……

……

YES / NO

4. Will any portion of goods or services be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality / municipal entity is expected to be transferred out of the Republic? **YES / NO**

4.1 If yes, furnish particulars

……

……

CERTIFICATION

I, THE UNDERSIGNED (NAME) ……

CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS CORRECT.

I ACCEPT THAT THE STATE MAY ACT AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

…….. ……..

Signature Date

…… …….

Position Name of Bidder

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2017

This preference form must form part of all bids invited. It contains general information and serves as a claim form for preference points for Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution

NB: BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017.

---

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to all bids:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2 1.2

a) The value of this bid is estimated to exceed/not exceed R50 000 000 (all applicable taxes included) and therefore the …….. preference point system shall be applicable; or

b) Either the 80/20 or 90/10 preference point system will be applicable to this tender

1.3 Points for this bid shall be awarded for:

(a) Price; and

(b) B-BBEE Status Level of Contributor.

1.4 The maximum points for this bid are allocated as follows:

	POINTS
PRICE	
B-BBEE STATUS LEVEL OF CONTRIBUTOR	
Total points for Price and B-BBEE must not exceed	**100**

1.5 Failure on the part of a bidder to submit proof of B-BBEE Status level of contributor together with the bid, will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

1.6 The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

2. DEFINITIONS

(a) **"B-BBEE"** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;

(b) "**B-BBEE status level of contributor"** means the B-BBEE status of an entity in terms of a code of good practice on black economic empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;

(c) **"bid"** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the provision of goods or services, through price quotations, advertised competitive bidding processes or proposals;

(d) **"Broad-Based Black Economic Empowerment Act"** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);

(e) "EME" means an Exempted Micro Enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

(f) **"functionality"** means the ability of a tenderer to provide goods or services in accordance with specifications as set out in the tender documents.

(g) **"prices"** includes all applicable taxes less all unconditional discounts;

(h) **"proof of B-BBEE status level of contributor"** means:

1) B-BBEE Status level certificate issued by an authorized body or person;

2) A sworn affidavit as prescribed by the B-BBEE Codes of Good Practice;

3) Any other requirement prescribed in terms of the B-BBEE Act;

(i) **"QSE"** means a qualifying small business enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

(j) **"rand value"** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;

3. POINTS AWARDED FOR PRICE

3.1 THE 80/20 OR 90/10 PREFERENCE POINT SYSTEMS

A maximum of 80 or 90 points is allocated for price on the following basis:

80/20 **or** **90/10**

$$Ps = 80\left(1 - \frac{Pt - P\min}{P\min}\right) \quad \text{or} \quad Ps = 90\left(1 - \frac{Pt - P\min}{P\min}\right)$$

Where

Ps = Points scored for price of bid under consideration

Pt = Price of bid under consideration

Pmin = Price of lowest acceptable bid

4. POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTOR

4.1 In terms of Regulation 6 (2) and 7 (2) of the Preferential Procurement Regulations, preference points must be awarded to a bidder for attaining the B-BBEE status level

of contribution in accordance with the table below:

B-BBEE Status Level of Contributor	Number of points (90/10 system)	Number of points (80/20 system)
1	10	20
2	9	18
3	6	14
4	5	12
5	4	8
6	3	6
7	2	4
8	1	2
Non-compliant contributor	0	0

5. BID DECLARATION

5.1 Bidders who claim points in respect of B-BBEE Status Level of Contribution must complete the following:

6. B-BBEE STATUS LEVEL OF CONTRIBUTOR CLAIMED IN TERMS OF PARAGRAPHS 1.4 AND 4.1

6.1 B-BBEE Status Level of Contributor: . = ……(maximum of 10 or 20 points)

(Points claimed in respect of paragraph 7.1 must be in accordance with the table reflected in paragraph 4.1 and must be substantiated by relevant proof of B-BBEE status level of contributor.

7. SUB-CONTRACTING

7.1 Will any portion of the contract be sub-contracted?

(***Tick applicable box***)

YES		NO	

7.1.1 If yes, indicate:

i) What percentage of the contract will be subcontracted.....%
ii) The name of the sub-contractor……..
iii) The B-BBEE status level of the sub-contractor.....……..
iv) Whether the sub-contractor is an EME or QSE
(Tick applicable box)

YES		NO	

v) **Specify, by ticking the appropriate box, if subcontracting with an enterprise in terms of Preferential Procurement Regulations,2017:**

Designated Group: An EME or QSE which is at last 51% owned by:	EME √	QSE √
Black people		
Black people who are youth		
Black people who are women		
Black people with disabilities		
Black people living in rural or underdeveloped areas or townships		
Cooperative owned by black people		
Black people who are military veterans		
OR		
Any EME		
Any QSE		

8. **DECLARATION WITH REGARD TO COMPANY/FIRM**

8.1 Name of company/firm:……..

8.2 VAT registration number:……

8.3 Company registration number:……

8.4 TYPE OF COMPANY/ FIRM

- □ Partnership/Joint Venture / Consortium
- □ One person business/sole propriety
- □ Close corporation
- □ Company
- □ (Pty) Limited

[TICK APPLICABLE BOX]

8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

……
……
……
……

8.6 COMPANY CLASSIFICATION

- □ Manufacturer
- □ Supplier
- □ Professional service provider
- □ Other service providers, e.g. transporter, etc.

[*TICK APPLICABLE BOX*]

8.7 MUNICIPAL INFORMATION

Municipality where business is situated: …….

Registered Account Number: …….

Stand Number:…….

8.8 Total number of years the company/firm has been in business:……

8.9 I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBE status level of contributor indicated in paragraphs 1.4 and 6.1 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we acknowledge that:

i) The information furnished is true and correct;

ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;

iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;

iv) If the B-BBEE status level of contributor has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have –

(a) disqualify the person from the bidding process;

(b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;

(c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;

(d) recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and

(e) forward the matter for criminal prosecution.

WITNESSES 1. …….. 2. ……	…… SIGNATURE(S) OF BIDDERS(S) DATE: …… ADDRESS …….. …….. ……..

DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT

This Municipal Bidding Document (MBD) must form part of all bids invited. It contains general information and serves as a declaration form for local content (local production and local content are used interchangeably).

Before completing this declaration, bidders must study the General Conditions, Definitions, Directives applicable in respect of Local Content as prescribed in the Preferential Procurement Regulations, 2011 and the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:201x.

1. General Conditions

1.1. Preferential Procurement Regulations, 2011 (Regulation 9.(1) and 9.(3) make provision for the promotion of local production and content.

1.2. Regulation 9.(1) prescribes that in the case of designated sectors, where in the award of bids local production and content is of critical importance, such bids must be advertised with the specific bidding condition that only locally produced goods, services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.

1.3. Regulation 9.(3) prescribes that where there is no designated sector, a specific bidding condition may be included, that only locally produced services, works or goods or locally manufactured goods with a stipulated minimum threshold for local production and content, will be considered.

1.4. Where necessary, for bids referred to in paragraphs 1.2 and 1.3 above, a two stage bidding process may be followed, where the first stage involves a minimum threshold for local production and content and the second stage price and B-BBEE.

1.5. A person awarded a contract in relation to a designated sector, may not sub- contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.

1.6. The local content (LC) as a percentage of the bid price must be calculated in accordance with the SABS approved technical specification number SATS 1286: 201x as follows:

$$LC = 1 - \left(\frac{x}{y}\right) \times 100$$

Where
x imported content
y bid price excluding value added tax (VAT)

Prices referred to in the determination of x must be converted to Rand (ZAR) by using the exchange rate published by the South African Reserve Bank (SARB) at 12:00 on the date, one week (7 calendar days) prior to the closing date of the bid as required in paragraph 4.1 below.

1.7. A bid will be disqualified if:

- the bidder fails to achieve the stipulated minimum threshold for local production and content indicated in paragraph 3 below; and.

- this declaration certificate is not submitted as part of the bid documentation.

2. Definitions

2.1. **"bid"** includes advertised competitive bids, written price quotations or proposals;

2.2. **"bid price"** price offered by the bidder, excluding value added tax (VAT);

2.3. **"contract"** means the agreement that results from the acceptance of a bid by an organ of state;

2.4. **"designated sector"** means a sector, sub-sector or industry that has been designated by the Department of Trade and Industry in line with national development and industrial policies for local production, where only locally produced services, works or goods or locally manufactured goods meet the stipulated minimum threshold for local production and content;

2.5. **"duly sign"**means a Declaration Certificate for Local Content that has been signed by the Chief Financial Officer or other legally responsible person nominated in writing by the Chief Executive, or senior member / person with management responsibility(close corporation, partnership or individual).

2.6. **"imported content"** means that portion of the bid price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or its subcontractors) and which costs are inclusive of the costs abroad, plus freight and other direct importation costs, such as landing costs, dock duties, import duty, sales duty or other similar tax or duty at the South African port of entry;

2.7. **"local content"** means that portion of the bid price which is not included in the imported content, provided that local manufacture does take place;

2.8. **"stipulated minimum threshold"** means that portion of local production and content as determined by the Department of Trade and Industry; and

2.9. **"sub-contract"** means the primary contractor's assigning, leasing, making out work to, or employing another person to support such primary contractor in the execution of part of a project in terms of the contract.

3. The stipulated minimum threshold(s) for local production and content for this bid is/are as follows:

Description of services, works or goods	Stipulated minimum threshold
_____	_____%
_____	_____%
_____	_____%

4. Does any portion of the services, works or goods offered have any imported content? YES / NO

4.1 If yes, the rate(s) of exchange to be used in this bid to calculate the local content as prescribed in paragraph 1.6 of the general conditions must be the rate(s) published by the SARB for the specific currency at 12:00 on the date, one week (7 calendar days) prior to the closing date of the bid.

The relevant rates of exchange information is accessible on www.reservebank.co.za.

Indicate the rate(s)of exchange against the appropriate currency in the table below:

Currency	**Rates of exchange**
US Dollar	
Pound Sterling	
Euro	
Yen	
Other	

NB: Bidders must submit proof of the SARB rate (s) of exchange used.

LOCAL CONTENT DECLARATION BY CHIEF FINANCIAL OFFICER OR OTHER LEGALLY RESPONSIBLE PERSON NOMINATED IN WRITING BY THE CHIEF EXECUTIVE OR SENIOR MEMBER/PERSON WITH MANAGEMENT RESPONSIBILITY (CLOSE CORPORATION, PARTNERSHIP OR INDIVIDUAL)

IN RESPECT OF BID No. .....
ISSUED BY: (Procurement Authority / Name of Municipality / Municipal Entity):
.....

NB The obligation to complete, duly sign and submit this declaration cannot be transferred to an external authorized representative, auditor or any other third party actingon behalf of the bidder.

I, the undersigned, ... (full names), do hereby declare, in my capacity as …… ……..
of .....(name of bidder entity), the following:

(a) The facts contained herein are within my own personal knowledge.

(b) I have satisfied myself that the goods/services/works to be delivered in terms of the above-specified bid comply with the minimum local content requirements as specified in the bid, and as measured in terms of SATS 1286.

(c) The local content has been calculated using the formula given in clause 3 of SATS 1286, the rates of exchange indicated in paragraph 4.1 above and the following figures:

Bid price, excluding VAT (y)	R
Imported content (x)	R
Stipulated minimum threshold for Local content (paragraph 3 above)	
Local content % as calculated in terms of SATS 1286	

If the bid is for more than one product, a schedule of the local content by product shall be attached.

(d) I accept that the Procurement Authority / Municipality /Municipal Entity has the right to request that the local content be verified in terms of the requirements of SATS 1286.

(e) I understand that the awarding of the bid is dependent on the accuracy of the information furnished in this application. I also understand that the submission of incorrect data, or data that are not verifiable as described in SATS 1286, may result in the Procurement Authority / Municipal / Municipal Entity imposing any or all of the remedies as provided for in Regulation 13 of the Preferential Procurement Regulations, 2011 promulgated under the Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

SIGNATURE: _____ **DATE:** _____

WITNESS No. 1 _____ **DATE:** _____

WITNESS No. 2 _____ **DATE:** _____

CONTRACT FORM - PURCHASE OF GOODS/WORKS

THIS FORM MUST BE FILLED IN DUPLICATE BY BOTH THE SUCCESSFUL BIDDER (PART 1) AND THE PURCHASER (PART 2). BOTH FORMS MUST BE SIGNED IN THE ORIGINAL SO THAT THE SUCCESSFUL BIDDER AND THE PURCHASER WOULD BE IN POSSESSION OF ORIGINALLY SIGNED CONTRACTS FOR THEIR RESPECTIVE RECORDS.

PART 1 (TO BE FILLED IN BY THE BIDDER)

1. I hereby undertake to supply all or any of the goods and/or works described in the attached bidding documents to (name of institution)…….…… in accordance with the requirements and specifications stipulated in bid number……..…….. at the price/s quoted. My offer/s remain binding upon me and open for acceptance by the purchaser during the validity period indicated and calculated from the closing time of bid.

2. The following documents shall be deemed to form and be read and construed as part of this agreement:

   (i) Bidding documents, *viz*
   - Invitation to bid;
   - Tax clearance certificate;
   - Pricing schedule(s);
   - Technical Specification(s);
   - Preference claims for Broad Based Black Economic Empowerment Status Level of Contribution in terms of the Preferential Procurement Regulations 2011;
   - Declaration of interest;
   - Declaration of bidder's past SCM practices;
   - Certificate of Independent Bid Determination;
   - Special Conditions of Contract;

   (ii) General Conditions of Contract; and

   (iii) Other (specify)

3. I confirm that I have satisfied myself as to the correctness and validity of my bid; that the price(s) and rate(s) quoted cover all the goods and/or works specified in the bidding documents; that the price(s) and rate(s) cover all my obligations and I accept that any mistakes regarding price(s) and rate(s) and calculations will be at my own risk.

4. I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this agreement as the principal liable for the due fulfillment of this contract.

5. I declare that I have no participation in any collusive practices with any bidder or any other person regarding this or any other bid.

6. I confirm that I am duly authorised to sign this contract.

NAME (PRINT) …….

CAPACITY …….

SIGNATURE …….

NAME OF FIRM ……

DATE …….

WITNESSES

1 ……..……

2. ……

DATE: …….

MBD 7.1

CONTRACT FORM - PURCHASE OF GOODS/WORKS

PART 2 (TO BE FILLED IN BY THE PURCHASER)

1. I…… in my capacity as……..….. accept your bid under reference number ……dated……for the supply of goods/works indicated hereunder and/or further specified in the annexure(s).

2. An official order indicating delivery instructions is forthcoming.

3. I undertake to make payment for the goods/works delivered in accordance with the terms and conditions of the contract, within 30 (thirty) days after receipt of an invoice accompanied by the delivery note.

ITEM NO.	**PRICE (ALL APPLICABLE TAXES INCLUDED)**	**BRAND**	**DELIVERY PERIOD**	**B-BBEE STATUS LEVEL OF CONTRIBUTION**	**MINIMUM THRESHOLD FOR LOCAL PRODUCTION AND CONTENT (if applicable)**

4. I confirm that I am duly authorized to sign this contract.

SIGNED AT ……ON……..

NAME (PRINT) …….

SIGNATURE …….

OFFICIAL STAMP

WITNESSES

1. …….

2. …….

DATE …….

CONTRACT FORM - RENDERING OF SERVICES

THIS FORM MUST BE FILLED IN DUPLICATE BY BOTH THE SERVICE PROVIDER (PART 1) AND THE PURCHASER (PART 2). BOTH FORMS MUST BE SIGNED IN THE ORIGINAL SO THAT THE SERVICE PROVIDER AND THE PURCHASER WOULD BE IN POSSESSION OF ORIGINALLY SIGNED CONTRACTS FOR THEIR RESPECTIVE RECORDS.

PART 1 (TO BE FILLED IN BY THE SERVICE PROVIDER)

1. I hereby undertake to render services described in the attached bidding documents to (name of the institution)…… in accordance with the requirements and task directives / proposals specifications stipulated in Bid Number…….. at the price/s quoted. My offer/s remain binding upon me and open for acceptance by the Purchaser during the validity period indicated and calculated from the closing date of the bid.

2. The following documents shall be deemed to form and be read and construed as part of this agreement:

   (i) Bidding documents, *viz*
   - Invitation to bid;
   - Tax clearance certificate;
   - Pricing schedule(s);
   - Filled in task directive/proposal;
   - Preference claims for Broad Based Black Economic Empowerment Status Level of Contribution in terms of the Preferential Procurement Regulations 2011;
   - Declaration of interest;
   - Declaration of Bidder's past SCM practices;
   - Certificate of Independent Bid Determination;
   - Special Conditions of Contract;

   (ii) General Conditions of Contract; and

   (iii) Other (specify)

3. I confirm that I have satisfied myself as to the correctness and validity of my bid; that the price(s) and rate(s) quoted cover all the services specified in the bidding documents; that the price(s) and rate(s) cover all my obligations and I accept that any mistakes regarding price(s) and rate(s) and calculationswill be at my own risk.

4. I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this agreement as the principal liable for the due fulfillment of this contract.

5. I declare that I have no participation in any collusive practices with any bidder or any other person regarding this or any other bid.

6. I confirm that I am duly authorised to sign this contract.

NAME (PRINT) …….

CAPACITY …….

SIGNATURE …….

NAME OF FIRM ……

DATE …….

WITNESSES

1 …….

2 …….

DATE: ……..

CONTRACT FORM - RENDERING OF SERVICES

PART 2 (TO BE FILLED IN BY THE PURCHASER)

1. I……. in my capacity as……..…… accept your bid under reference number ……dated……for the rendering of services indicated hereunder and/or further specified in the annexure(s).

2. An official order indicating service delivery instructions is forthcoming.

3. I undertake to make payment for the services rendered in accordance with the terms and conditions of the contract, within 30 (thirty) days after receipt of an invoice.

DESCRIPTION OF SERVICE	PRICE (ALL APPLICABLE TAXES INCLUDED)	COMPLETION DATE	B-BBEE STATUS LEVEL OF CONTRIBUTION	MINIMUM THRESHOLD FOR LOCAL PRODUCTION AND CONTENT (if applicable)

4. I confirm that I am duly authorised to sign this contract.

SIGNED AT …… ON ……..

NAME (PRINT) ……..

SIGNATURE ……

OFFICIAL STAMP

WITNESSES

1 ……

2 ……

DATE: ……..

CONTRACT FORM - SALE OF GOODS/WORKS

THIS FORM MUST BE FILLED IN DUPLICATE BY BOTH THE SUCCESSFUL BIDDER (PART 1) AND THE SELLER (PART 2). BOTH FORMS MUST BE SIGNED IN THE ORIGINAL SO THAT THE SUCCESSFUL BIDDER AND THE SELLER WOULD BE IN POSSESSION OF ORIGINALLY SIGNED CONTRACTS FOR THEIR RESPECTIVE RECORDS.

PART 1 (TO BE FILLED IN BY THE BIDDER)

1. I hereby undertake to purchase all or any of the goods and/or works described in the attached bidding documents from (name of institution) ..... in accordance with the requirements stipulated in (bid number)…….…….. at the price/s quoted. My offer/s remain binding upon me and open for acceptance by the seller during the validity period indicated and calculated from the closing time of bid.

2. The following documents shall be deemed to form and be read and construed as part of this agreement:

   (i) Bidding documents, *viz*
   - Invitation to bid;
   - Tax clearance certificate;
   - Pricing schedule(s);
   - Declaration of interest;
   - Declaration of Bidder's past SCM practices;
   - Special Conditions of Contract;

   (ii) General Conditions of Contract; and
   (iii) Other (specify)

3. I confirm that I have satisfied myself as to the correctness and validity of my bid; that the price(s) quoted cover all the goods and/or works specified in the bidding documents; that the price(s) cover all my obligations and I accept that any mistakes regarding price(s) and calculations will be at my own risk.

4. I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this agreement as the principal liable for the due fulfillment of this contract.

5. I undertake to make payment for the goods/works as specified in the bidding documents.

6. I declare that I have no participation in any collusive practices with any bidder or any other person regarding this or any other bid.

7. I confirm that I am duly authorised to sign this contract.

NAME (PRINT) …….

CAPACITY …….

SIGNATURE …….

NAME OF FIRM …….

DATE …….

WITNESSES

1 …….

2. ……..

DATE: ……..

MBD 7.3

CONTRACT FORM - SALE OF GOODS/WORKS

PART 2 (TO BE FILLED IN BY THE SELLER)

1. I…… in my capacity as……..….. accept your bid under reference number ……dated .....for the purchase of goods/works indicated hereunder and/or further specified in the annexure(s).

2. I undertake to make the goods/works available in accordance with the terms and conditions of the contract.

ITEM NO.	DESCRIPTION	PRICE (ALL APPLICABLE TAXES INCLUDED)		

4. I confirm that I am duly authorized to sign this contract.

SIGNED AT ……ON……..

NAME (PRINT) …….

SIGNATURE …….

OFFICIAL STAMP

WITNESSES

1. …….

2. …….

DATE ……..

DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

1 This Municipal Bidding Document must form part of all bids invited.

2 It serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.

3 The bid of any bidder may be rejected if that bidder, or any of its directors have:

a. abused the municipality's / municipal entity's supply chain management system or committed any improper conduct in relation to such system;
b. been convicted for fraud or corruption during the past five years;
c. willfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or
d. Been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).

4 In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

Item	Question	Yes	No
4.1	Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? (Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/Authority of the institution that imposed the restriction after the *audi alteram partem* rule was applied). **The Database of Restricted Suppliers now resides on the National Treasury's website (**www.treasury.gov.za**) and can be accessed by clicking on its link at the bottom of the home page.**	Yes ☐	No ☐
4.1.1	If so, furnish particulars:		
4.2	Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? **The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.**	Yes ☐	No ☐
4.2.1	If so, furnish particulars:		

4.3	Was the bidder or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	Yes ☐	No ☐
4.3.1	If so, furnish particulars:		

Item	Question	Yes	No
4.4	Does the bidder or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?	Yes ☐	No ☐
4.4.1	If so, furnish particulars:		
4.5	Was any contract between the bidder and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes ☐	No ☐
4.7.1	If so, furnish particulars:		

CERTIFICATION

I, THE UNDERSIGNED (FULL NAME) ……..……..…… CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM TRUE AND CORRECT.

I ACCEPT THAT, IN addition TO CANCELLATION OF A CONTRACT, ACTION MAY BE TAKEN AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

……... **……..**
Signature **Date**

……. **……..**
Position **Name of Bidder**

MBD 9

CERTIFICATE OF INDEPENDENT BID DETERMINATION

1 This Municipal Bidding Document (MBD) must form part of all bids[1] invited.

2 Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or bid rigging).[2] Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.

3 Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:

a. takes all reasonable steps to prevent such abuse;

b. reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and

c. cancels a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.

4 This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.

5 In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid:

[1] Includes price quotations, advertised competitive bids, limited bids and proposals.

[2] Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

_____

(Bid Number and Description)

in response to the invitation for the bid made by:

_____

(Name of Municipality / Municipal Entity)

do hereby make the following statements that I certify to be true and complete in every respect:

I certify, on behalf of:_____ that:

(Name of Bidder)

1. I have read and I understand the contents of this Certificate;
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:

    (a) Has been requested to submit a bid in response to this bid invitation;
    (b) Could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
    (c) Provides the same goods and services as the bidder and/or is in the same line of business as the bidder
6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium[3] will not be construed as collusive bidding.

7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
    (a) prices;
    (b) geographical area where product or service will be rendered (market allocation)
    (c) Methods, factors or formulas used to calculate prices;
    (d) The intention or decision to submit or not to submit, a bid;
    (e) The submission of a bid which does not meet the specifications and conditions of the bid; or
    (f) Bidding with the intention not to win the bid.
8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.
9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.

[3] Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

…… ……

Signature Date

…… ……

Position Name of Bidder

NGWATHE LOCAL MUNICIPALITY

Construction of KWAKWATSI 88/6.6 kV, 2 X10 MVA Substation

C1.2: CONTRACT DATA

C1.2.1: CONDITIONS OF CONTRACT

C1.2.2 PART A: CONTRACT DATA PROVIDED BY THE EMPLOYER

C1.2.2 PART B: CONTRACT DATA PROVIDED BY THE CONTRACTOR

C1.2.3 FORM OF GUARANTEE

C1.2.4 AGREEMENT IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL HEALTH AND SAFETY ACT No 85 OF 1983

C1.2.1 CONDITIONS OF CONTRACT

GENERAL CONDITIONS OF CONTRACT

This Contract will be based on the "General Conditions of Contract for Construction Works –2015 Edition", issued by the South African Institution of Civil Engineering. (Short title: **"General Conditions of Contract 2015**") and can be obtained from:

SAICE
Waterfall Park
Howick Gardens
Vorna Valley Half way House
Becker Street
MIDRAND
1685
Gauteng Province
Tel: (011) 805-5947/8
Fax: (011) 805-5971.

It is agreed that the only variations from the General Conditions of Contract 2015 are those set out hereafter under "Special Conditions of Contract".

SPECIAL CONDITIONS OF CONTRACT

1. GENERAL

These Special Conditions of Contract (SCC) form an integral part of the Contract. The Special Conditions shall amplify, modify or supersede, as the case may be, the General Conditions of Contract 2015 to the extent specified below, and shall take precedence and shall govern.

The clauses of the Special Conditions hereafter are numbered "SCC" followed in each case by the number of the applicable clause or sub clause in the General Conditions of Conditions 2015, and the applicable heading, or (where a new special condition that has no relation to the existing clauses is introduced) by a number that follows after the last clause number in the General Conditions, and an appropriate heading.

2. AMENDMENTS TO THE GENERAL CONDITIONS OF CONTRACT

No amendments.

C1.2.2: CONTRACT DATA (Applicable to this contract)

PART A: DATA PROVIDED BY THE EMPLOYER

The following contract specific data are applicable to this contract.

REFERENCE	CONTRACT SPECIFIC DATA BY THE EMPLOYER
Clause 1.1.1.13:	The Defects Liability Period to this contract is 12 months measured from the date of the Certificate of Completion.
Clause 1.1.1.14:	The time for achieving Practical Completion of the whole of the Works is within Eighteen (18) Months including special non-working days and the year-end breaking.
Clause 1.1.1.15:	**Name of Employer: NGWATHE LOCAL MUNICIPALITY**
Clause 1.1.1.15:	The Pricing strategy is Re-measurement Contract
Clause 1.2.1.2:	**Address of Employer:**

Physical:

Liebenberg trek Singel Street
Parys
9585

Postal:

Private Bag X359
Parys
9585

E-Mail: mbangxa2000@gmail.com
Telephone No: (056) 816 2700

Clause 1.1.1.16:	**Name of Engineer: MUTEO CONSULTING cc**
Clause 1.2.1.2:	**Address of Engineer:** Unit A3 Centurion Close 119 Gerhard Street 0157 **E-Mail: samuelm@muteo.co.za** **Telephone No: 012 664 6577**
	Clause 3.1.3 The Engineer is required to obtain the specific approval of the Employer for the following: The Engineer requires the Municipality approval in order to authorise any expenditure in excess of the tender Sum plus 10% Contingencies.
Clause 5.3.1	Health and Safety Plan (refer to Clause 4.3) Initial Programme (Refer to Clause 5.6) Security (Refer to Clause 6.2) Insurance (Refer to Clause 8.6)
Clause 5.3.2	The time to submit the documentation required before commencement with the Works execution is 28 days

REFERENCE	CONTRACT SPECIFIC DATA BY THE EMPLOYER
Clause 5.8.1	(1) Special non-working days are Sundays and the following statutory public holidays as declared by National or Regional Government: New Year‟s Day, Human Rights Day, Good Friday, Family Day, Freedom Day, Workers day, Youth Day, National Women‟s Day, Heritage Day, Day of Reconciliation, Christmas Day and the Day of Goodwill including the construction industry year end break. (2) The year end break commences on the first working day after 15 December and ends on the first working day after 6 January of the next year.
Clause 5.12.2.3	An extension of time due to abnormal rainfall shall be determined by means of the critical path method The rainfall gauge shall be suitably located and accurate rainfall readings shall be taken on the Site daily at 08:00, unless otherwise agreed to by the Engineer and the records entered in a book. The Contractor shall, at his own expense, take all necessary precautions to ensure that unauthorized persons cannot interfere with the rainfall gauge. The record book shall be handed to the Engineer for his signature no later than ten (10) days after rain has fallen and that is considered to justify an extension of time.
Clause 5.13.1:	The penalty for failing to complete the whole of the Works is **R1500** per calendar day
Clause 5.14.5.2	The Defects Liability Period to this contract is 12 months measured from the date of the Certificate of Completion.
Clause 5.16.3	The latent defect period is 10 years
Clause 6.5.1.2.3	The maximum percentage allowance to cover overhead charges is **15%**
Clause 6.10.1.5	The percentage advance on materials not yet built into Permanent Works is Eighty (80).
Clause 6.10.3	Retention money guarantee is not allowed.
Clause 8.6.1.1.2	The value of materials supplied by the Employer to be included in the insurance sum is **R1 000 000.00.**
Clause 8.6.1.1.3	The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is 2.5% of Contract Amount.
Clause 8.6.1.3	The limit of indemnity for liability insurance is **R 1 000 000.00** for any single liability claim.
Clause 8.6.1.2:	Special risk insurance issued by SASRIA is required.
Clause 8.6.1.3	The number of Adjudication Board Members to be appointed is one.

C1.2.2: CONTRACT DATA (Applicable to this contract)

PART B: DATA PROVIDED BY THE CONTRACTOR

The following contract specific data are applicable to this contract.

REFERENCE **CONTRACT SPECIFIC DATA BY THE CONTRACTOR**

Clause 1.1.1.9: **Name of Contractor**: ……..

Clause 1.2.1.2: **Address of the Contractor**:

Physical: Postal:

..... ….....

....

E-Mail: ..... Telephone No: …….....
Fax No: ……

Clause 6.2.1 The Security to be provided by the Contractor (incl Vat) shall be one of the Following

Type of Security	Contractor"s choice Indicate "Yes" or "No"
Cash deposit of 10% of the Contract Sum	
Performance guarantee of 10% of the Contract Sum	
Retention of 10% of the value of the Works	Not available
Cash deposit of 5% of the Contract Sum plus retention of 5% of the value of the Works	
Performance guarantee of 5% of the Contract Sum plus retention of 10% of the value of the works	

Clause 6.8.3: The variation in cost of all special materials is to be provided in the table SM 1 for special materials.

The rates and prices for the special materials shall be furnished by the Tenderer, which rates and prices shall not include VAT but shall include all other obligatory taxes and levies. The quoted price is the ruling price on the 1st of Month prior to close of tender.

TABLE: SM1

Special Materials	Unit*	Rate or Price for the base month
.....	.....	……
……	.....	……

* Indicate whether the material shall be delivered in bulk or in containers. When called upon to do so, the Contractor shall substantiate the above rates or prices with acceptable documentary evidence.

Signed on behalf of Tenderer: …….

REFERENCE **CONTRACT SPECIFIC DATA BY THE CONTRACTOR**

Clause 4.4.3: **Selection of Sub-Contractors**

The Tenderer shall list below the Subcontractors and Suppliers whom he intends to appoint in respect of the various specialist items of work to be done or goods supplied on this contract. Alternatives may be mentioned.

The Tenderer shall state whether he intends to carry out any specialised work or supply of goods himself.

Acceptance of this tender shall not be construed as approval of all or any of the listed specialist Subcontractors or Suppliers. Should any of or all of the specialist Subcontractors or Suppliers not be approved subsequent to the acceptance of the tender, it shall in no way invalidate this tender, and the tendered unit rates for the various items of work shall remain final and binding, even in the event of a Subcontractor or Supplier not listed below being approved by the Employer.

SCHEDULE OF SPECIALIST SUB-CONTRACTORS AND SUPPLIERS

Specialised Item	Name and Details of Specialist Sub-Contractors

Signed on behalf of Tenderer: ……

PRO FORMA

C1.2.3 PERFORMANCE GUARANTEE

For use with the General Conditions of Contract for Construction Works, 3rd Edition, 2015.

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" Means:.....
Physical address:.....
"Employer" means: NGWATHE LOCAL MUNICIPALITY
"Contractor" means:.....
"Engineer" means: MUTEO CONSULTING
"Works" means: Whole works involved in the Construction of KWAKWATSI 88/6.6 kV, 2 x10 MVA Substation "Site" means: the area of the Works including site office and camps
"Contract" means: The Agreement made in terms of the Form of Offer and Acceptance and such amendments or additions to the Contract as may be agreed in writing between the parties.

"Contract Sum" means: The accepted amount inclusive of tax of R.....
Amount in words.....
"Guaranteed Sum" means: The maximum aggregate amount of R.....
Amount in words:.....
"Expiry Date" Means:.....

CONTRACT DETAILS

Engineer issues: Interim Payment Certificates, Final Payment Certificate and the Certificate Completion of the Works as defined in the Contract.

PERFORMANCE GUARANTEE

1. The Guarantor"s liability shall be limited to the amount of the Guaranteed Sum.
2. The Guarantor"s period of liability shall be from and including the date of issue of this Performance Guarantee and up to and including the Expiry Date or the date of issue by the Engineer of the Certificate of Completion of the Works or the date of payment in full of the Guaranteed Sum, whichever occurs first. The Engineer and or the Employer shall advise the Guarantor in writing of the date on which the Certificate of Completion of the Works has been issued.
3. The Guarantor hereby acknowledges that:

3.1 any reference in this Performance Guarantee to the Contract is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship.

3.2 Its obligation under this Performance Guarantee is restricted to the payment of Money.

4. Subject to the Guarantor"s maximum liability referred to in 1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 4.1 to 4.3:

4.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Engineer in an Interim or Final Payment Certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 4.2;

4.2 A first written demand issued by the Employer to the Guarantor at the Guarantor"s physical address with a copy to the Contractor stating that a period of seven (7) days has elapsed since

the first written demand in terms of 4.1 and the sum certified has still not been paid;

4.3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum certified in 4.

5. Subject to the Guarantor"s maximum liability referred to in 1, the Guarantor undertakes to pay the Employer the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand from the Employer to the Guarantor at the Guarantor"s physical address calling up this Performance Guarantee, such demand stating that:

5.1 the Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 5; or

5.2 a provisional or final sequestration or liquidation court order has been granted against the Contractor and that the Performance Guarantee is called up in terms of 5; and

5.3 the aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/ final sequestration and /or the provisional liquidation court order.

6. It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4 and 5 shall not exceed the Guarantor"s maximum liability in terms of 1.

7. Where the Guarantor has made payments in terms of 5, the Employer shall upon the date of issue of the Final Payment Certificate submit an expense account to the Guarantor showing how all monies received in terms of this Performance Guarantee have been expended and shall refund the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Performance Guarantee shall bear interest at the prime overdraft rate of the Employer's bank compounded monthly and calculated from the date payment was made by the Guarantor to the Employer until the date of refund.

8. Payment by the Guarantor in terms of 4 and 5 shall be made within seven (7) calendar days upon receipt of the first written demand to the Guarantor.

9. Payment by the Guarantor in terms of 5 will only be made against the return of the original Performance Guarantee by the Employer.

10. The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from the Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.

11. The Guarantor chooses the physical address as stated above for the services of all notices for all purposes in connection with.

12. This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.

13. This Performance Guarantee, with the required demand notices in terms of 4 and 5, shall be regarded as a liquid document for the purposes of obtaining a court order.

14. Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate's Courts Act No 32 of 1944, as amended, to the jurisdiction of the Magistrate's Court of any district having jurisdiction in terms ofSection 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's Court.

Signed at.....
Date:.....
Guarantor"s signatory (1) .....
Capacity.....
Guarantor"s signatory (2) .....
Capacity.....
Witness signatory (1) .....
Witness signatory (2) .....

C1.2.4: AGREEMENT IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL HEALTH AND SAFETY ACT No 85 OF 1993

THIS AGREEMENT is made between NGWATHE LOCAL MUNICIPALITY represented by the Municipal Manager. (hereinafter called the EMPLOYER of the one part, herein represented by:

....

in his capacity as .....;

AND: ....

(hereinafter called the CONTRACTOR) of the other part, herein represented by .....

....

in his capacity as: .....

duly authorised to sign on behalf of the Contractor.

WHEREAS the CONTRACTOR is the Mandatory of the EMPLOYER in consequence of an agreement between the CONTRACTOR and the EMPLOYER in respect of

CONTRACT No: ..... for the……

.....

AND WHEREAS the EMPLOYER and the CONTRACTOR have agreed to enter into an agreement in terms of the provisions of Section 37(2) of the Occupational Health and Safety Act No 85 of 1993, as amended by OHSA Amendment Act No 181/1993 (hereinafter referred to as the ACT);

NOW THEREFORE the parties agree as follows:

1. The CONTRACTOR undertakes to acquaint the appropriate officials and employees of the CONTRACTOR with all relevant provisions of the ACT and the regulations promulgated in terms thereof.

2. The CONTRACTOR undertakes to fully comply with all relevant duties, obligations and prohibitions imposed in terms of the ACT and Regulations: Provided that should the EMPLOYER have prescribed certain arrangements and procedures that same shall be observed and adhered to by the CONTRACTOR, his officials and employees. The CONTRACTOR shall bear the onus of acquainting himself/herself/itself with such arrangements and procedures.

3. The CONTRACTOR hereby accepts sole liability for such due compliance with the relevant duties, obligations, prohibitions, arrangements and procedures, if any, imposed by the ACT and Regulations, and the CONTRACTOR expressly absolves the EMPLOYER and the Employer's CONSULTING ENGINEERS from being obliged to comply with any of the aforesaid duties, obligations, prohibitions, arrangements and procedures in respect of the work included in the contract.

4. The CONTRACTOR agrees that any duly authorised officials of the EMPLOYER shall be entitled, although not obliged, to take such steps as may be necessary to ensure that the CONTRACTOR has complied with his undertakings as more fully set out in paragraphs 1 and 2 above, which steps may include, but shall not be limited to, the right to inspect anyappropriate site or premises occupied by the CONTRACTOR, or to take such steps it may deem necessary to remedy the default of the CONTRACTOR at the cost of the CONTRACTOR.

5. The CONTRACTOR shall be obliged to report forthwith to the EMPLOYER any investigation, complaint or criminal charge which may arise as a consequence of the provisions of the ACT and Regulations, pursuant to work performed in terms of this agreement, and shall, on written demand, provide full details in writing of such investigation, complaint or criminal charge.

Thus signed at .....for and on behalf of the **CONTRACTOR**

on this the …… day of ……..……..…… 20……

SIGNATURE: .....

NAME AND SURNAME: .....

CAPACITY: .....

WITNESSES: 1. .....

2. .....

Thus signed at ..... for and on behalf of the **EMPLOYER** on this

the ……... day of ……..…… 20……

SIGNATURE: .....

NAME AND SURNAME: .....

CAPACITY: .....

WITNESSES: 1. .....

2. .....

NGWATHE LOCAL MUNICIPALITY

Construction of KWAKWATSI 88/6.6 kV,2x1 0 MVA Substation

C2.1 Pricing Instructions

1. Measurement and payment shall be in accordance with the relevant provisions of the ESKOM Standard Specification for Electrification Works as in the Bill of Quantities of the Scope of Works.

2. The units of measurement described in these Bills of Quantities are metric units. Abbreviations used in the Bills of Quantities are as follows:

%	=	percent
h	=	hour
ha	=	hectare
kg	=	kilogram
kl	=	kilolitre
km	=	kilometre
km-pass	=	kilometre-pass
kPa	=	kilopascal
kW	=	kilowatt
l	=	litre
m	=	metre
mm	=	millimetre
m^2	=	square metre
m^2-pass	=	square metre-pass
m^3	=	cubic metre
m^3-km	=	cubic metre-kilometre
MN	=	meganewton
MN.m	=	meganewton-metre
MPa	=	megapascal
No.	=	number
Prov sum	=	Provisional sum
PC sum	=	Prime Cost sum
R/only	=	Rate only
sum	=	lump sum
t	=	ton (1000 kg)
W/day	=	Work day

3. For the purpose of these Bills of Quantities, the following words shall have the meanings hereby assigned to them:

Unit:	The unit of measurement for each item of work as stated in the Bill of Quantities/Schedule of prices
Quantity:	The number of units of work for each item.
Rate:	The agreed payment per unit of measurement.
Amount:	The product of the quantity and the agreed rate for an item.
Lump sum:	An agreed amount for an item, the extent of which is described in the Bills of Quantities but the quantity of work of which is not measured in any units.

4. Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance is made for waste.

5. It will be assumed that prices included in the bills of quantities are based on Acts, Ordinances, Regulations, By-laws, International Standards and National Standards that were published 28 days before the closing date for tenders. (Refer to www.stanza.org.za or www.iso.org for information on standards)

6. The prices and rates in these Bills of Quantities are fully inclusive prices for the work described under the items. Such prices and rates cover all costs and expenses that may be required in and for the execution of the work described in accordance with the provisions of the Scope of Work, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the Contract Data, as well as overhead charges and profit. These prices will be used as a basis for assessment of payment for additional work that may have to be carried out.

7 Where the Scope of Work requires detailed drawings and designs or other information to be provided, all costs associated therewith are deemed to have been provided for and included in the unit rates and sum amount tendered such items

8. An item against which no price is entered will be considered to be covered by the other prices or rates in the Bills of Quantities. A single lump sum will apply should a number of items be grouped together for pricing purposes.

9. The quantities set out in these Bills of Quantities are approximate and do not necessarily represent the actual amount of work to be done. The quantities of work accepted and certified for payment will be used for determining payments due and not the quantities given in these Bills of Quantities.

10. Reasonable compensation will be received where no pay item appears in the Bills of Quantities in respect of work required in terms of the Contract and which is not covered in any other pay item.

11. The short descriptions of the items of payment given in these Bills of Quantities are only for the purposes of identifying the items. More details regarding the extent of the work entailed under each item appear in the Scope of Work.

12. PRELIMINARY, GENERAL AND SITE ESTABLISHMENT

11.1 Provision

Provision is made in the Bill of Quantities for lump sums to cover the Contractor's cost to supply, erect commission, maintain and eventually demolish and remove site facilities, plant, tools and equipment, and for the Contractor to comply with any other obligations of a preliminary and general nature in terms of the contract. The sum tendered in the Bill of Quantities for any preliminary and general item shall cover the Contractor's direct and overhead costs, profit andall other costs for the provision of the item and/or compliance with the obligations, liabilities, risksand requirements associated with the item.

11.2 Payment for Fixed Cost Items

The sum tendered for these items will be paid in equal instalments over the contract period, the amount remaining after every instalment being re-calculated to arrive at equal instalments per month for the contractual period remaining.

11.3 Payment for Time-related Items

The sum tendered for these items will be paid in equal instalments over the contract period, the amount remaining after every instalment being re-calculated to arrive at equal instalments per month for the contractual period remaining. The total sum subject to recalculation will be adjusted according to the Adjusted Contract Period at the time when Certification of Payment is due.

11.4 Payment for Value-related Items

The sum tendered for these items will be paid in equal instalments over the contract period, the amount remaining after every instalment being re-calculated to arrive at equal instalments per

month for the contractual period remaining. The total sum subject to recalculation will be adjustedaccording to the Adjusted Contract Sum at the time when Certification of Payment is due.

12 DAY LABOUR, PLANT HIRE AND HAULAGE

Tenderers must state their rates, in the relevant section of the Bill of Quantities, for day labour, plant hire and haulage. Plant hire and Day labour rates are to be shown as hourly rates for the various categories of labour set out in the Schedule. Separate rates shall be quoted for work outside normal working hours, "normal working hours" being taken as all weekdays from 07h00 to 17h00.

No work is to be carried out as a charge to day labour, plant hire or haulage without prior writtenauthorization of the Engineer and claims for such activities will not be paid without suchauthorization.

Rates must include for the use of Contractor's small tools and equipment and must be inclusive of Contractor's overheads and profit.

NGWATHE LOCAL MUNICIPALITY

Construction of KWAKWATSI 88/6.6 kV, 2x10MVA Substation

C2.2 Bills of Quantities

ELECTRICAL WORKS		
ITEM	**DESCRIPTION**	**AMOUNT**
1	Preliminary and General	
2	Site Clearance	
3	Earth Works	
4	Excavation & Control Trenches	
5	Concrete Works	
6	Structural Steel Works	
7	Cable Ducts	
8	Storm Water & Drains	
9	Facilities	
11	Earth Mat Grid	
12	MV Switch Gear	
13	General Electrical	
14	Out Door Equipments	
15	HV-MV Cabling	
16	Conductor Stringing	
17	Clamp Installation	
18	Commissioning	
	Subtotal	
	Contingencies @ 5%	
	Subtotal Incl Contingencies	
	15% VAT	
	Total for Electrical Work:	

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
		SCHEDULE 1					
1	**SANS 1200A**	**PRELIMINARIES**					
1.1		**NLM's specific requirements**					
1.1.1		Contractual requirements i.e insurances, statutory contributions etc	Months	18			
1.1.2		**Establishment of facilities on site such as plant, sheds, water, electricity, lighting, sanitary facilities, stores, communication, concrete batching and mixing, setting out, contractors sign board**					
1.1.2.1		Offices	Months	18			
1.1.2.2		Staff Accommodation	Months	18			
1.1.2.3		Security(24 hours), Armed Response	Months	18			
1.1.2.4		Stores (Materials & Equipment)	Months	18			
1.1.2.5		Water, Sanitation & Electricity	Months	18			
1.1.2.6		Communication	Months	18			
1.1.2.7		Community Liason Officer for the duration of Contract	Months	18			
1.1.2.8		Training for Student	Months	18			
1.1.2.9		Amount for PSC	Months	18			
1.1.2.10		Generic Training	Months	18			
1.1.3		**Specialist Engineering Detailed Design, Information and Drawings**					
1.1.3.1		Contractor to conduct Earth Resistivity Testing after completion of S/S platform for Detailed Earthmat and Earthing Design	Item	1	R 50 000.00		
1.1.3.2		Contractor to compile Earthmat and Earthing Detail Design for approval by Engineer	Item	1	R 150 000.00		
1.1.3.3		Contractor to compile Protection, Metering, AC/DC & Telecontrol -Detail Design Document including all relevant application drawings and diagrams as per Functional Designs and Specifications for approval by Engineer	Item	1	R 150 000.00		
1.1.3.4		Contractor to produce Protection Settings, including all relevant calculations for approval by Engineer	Item	1	R 100 000.00		
Carried Forward							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
Brought Forward							
1.1.4		Make provisions for several factory visits & acceptance tests as required and applicable for (1) Transformers (2) HV Equipment (3) MV Switchgear & Control Plant Equipment (To be witnessed by Engineer and Employer representatives: Total 4 x Persons, All Costs and Expenses included)	Item	1	R 300 000.00		
1.1.5		**Pre-Commissioning, Final Commissioning, Testing and Handing Over Documentation, Testing Certificates, Test Results, As built Drawings etc complete with sets of all relevant Equipment and Maintenance Manuals**					
1.1.5.1		Earth Mat and all Earthing (Complete)	Item	1			
1.1.5.2		Trfs, HV, MV Equipment & Switchgear (Complete)	Item	1			
1.1.5.3		Primary Plant (Complete)	Item	1			
1.1.5.4		Control Plant (Complete)	Item	1			
1.1.5.5		MV & LV & Control Cables (Complete)	Item	1			
1.1.6		Removal of site establishment on completion of contract as per EMP	Item	1			
1.1.7		Special Safety (OHS Act) requirement by Client	Item	1			
1.1.8		Establishment of Plant & Equipment	Item	1			
1.1.9		Inspections by Client	Item	1			
1.1.10		Environmental requirements by Client	Item	1			
1.1.11		Establish fencing team	Item	1			
1.1.12		Transport to approved stores in Ngwathe for all surplus or redundant material or equiment all	Item	1			
1.2		**Contractor's Monthly related items:**					
1.2.1		Contractual requirements-EPWP-Report	Months	18			
1.2.2		Operation & maintenance of facilities	Months	18			
1.2.3		**Management & Supervision**					
1.2.3.1		Management & Supervision of the works: Appointment of an Authorised Person (HV Regulation Qualified, Full Time Supervisor) Compulsory to provide & list the name(s) of Authorised Person and his credentials for the durarion of the contract	Months	18			
Carried Forward							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
Brought Forward							
1.2.4		Company & head office overhead costs	Months	18			
1.2.5		Programme and Planning	Months	18			
1.2.6		Transport and offloading of all materials and equipment forming part of this contract which the contractor shall be responsible for to this site	Item	1	R 300 000.00		
1.2.7		Construction Plants-Hire	Months	18			
1.2.8		Receiving taking control and administering material.Store Man	Months	18			
1.2.9		Arrangement with NLM control, obtaining permits, arranging outages etc and to energise sub.	Item	3			
1.2.10		For the services of an external Professional COW for use During Construction	Months	18			
1.2.11		Specialist for the Environmental Management services for use During Construction	Months	18			
1.3		**Prime Cost Items:**					
1.3.1		Provide temporary access to works to allow for construction and delivery of materials incl transformers to site, reinstate to original or desired condition	item	1	R 55 000.00		
1.3.2		For Compaction testing of earthworks by a commercial laboratory	item	1			
1.3.3		**Cost for compliance to Construction Regulations requirements as well as Cost for Compliance to Health and Safety Specification, Special Safety (OHS Act) requirements by Client, compiling a Health and Safety Plan, Establishment of Plant and Equipment, Inspections by Eskom and Client**					
1.3.3.1		Personal Protective Equipment	3 Years	3			
1.3.3.2		Compliance with Safety Plan & Safety File	Months	18			
1.3.3.3		Statutory Health and Safety Appointments	Months	18			
1.3.3.4		Health and Safety Training	Months	18			
1.3.3.5		First Aid	Months	18			
1.3.4		**Environmental Management Requirements**					
1.3.4.1		Compliance with Environmental Legislation as well as environmental specifications included and or referred to in this document and Waste Disposal	Months	18			
Subtotal carried to Item 1 of Summary							

Item No	Reference/ Drawing No	Description of the Item	Unit	Qty	Rate	Price (R)
2		**SCHEDULE 2**				
2.2	**SABS 1200C**	**SITE CLEARANCE**				
		Note: *All Steel, Copper and Aluminium to be set aside for controlled NLM disposal via specified scrap merchant. The scrap value to be offset against project* All building rubble and spoil to be removed and disposed at a site/pit of the contractors own choice. Transport and dumping costs for the disposal of rubble and spoil to be included in the clearance rates				
2.2.1	**SABS 1200C**	**Site Preparation**				
2.2.2.1		Clear and Grub site terrace for entire substation, Note: This Activity will be done in 3 phases, Within Project Phase of 36Months (150m x 150m)	m²	22500		
2.2.2.2		Application of Herbicides and Pesticides over the complete terrace(150m x 150m)	m²	22500		
2.2.2.3		Demolish and remove structures/ concrete foundations, cables and dismantle steelwork				
2.2.2.4		Remove topsoil to nominal depth of (150mm x150m x150m) and stockpile and maintain	m³	3375		
Subtotal carried to Item 2 of Summary						

Item No	Reference/ Drawing No	Description of the Item	Unit	Qty	Rate	Price (R)
		SCHEDULE 3				
3	**SABS 1200C**	**SITE WORKS**				
3.1	**SABS**	**Site Preparation**				
3.1.1		Conduct Geotech Studies.	item	1		
3.2	SABS 1200D	**Earthworks (Excavations)**				
3.2.1		Bulk Earthworks (Formation of Platform) (100m X 120m x 1.5)	m^3	18000		
3.2.2		Excavate Earth Mat Trial Holes to Verify Earthmat Positions 20 Holes of (1m x1m x 1.2m)	each	20		
3.2.3		Excavate Earth Mat Trenches, Area of 100m x 100m for Earthmat	m^2	1000		
3.3		**External and Station Site Access Road**				
3.3.1		Prepare Access road for TRF Delivery 640m x 5m from Main Entrance Gate to Sub Embarkment	m2	3200		
3.4		**Disposal of Burden Specify**				
3.4.1		Limited Haul 6m^3	km	4000		
3.4.2		Long Haul 6m^3	km	2500		
Subtotal carried to Item 3 of Summary						

Item No	Reference/ Drawing No	Description of the Item	Unit	Qty	Rate	Price (R)
		SCHEDULE 4				
4	**SABS 1200BD**	**Earthworks (Trenches)**				
4.1		**Excavate in all materials for trenches, backfill, compact and dispose of surplus material**				
4.1.1		88kV High Voltage Cable Trench 270m x 1m x 2.25m for 2 x 88kV FDRS	m³	607.5		
4.1.2		6.6kV Medium Voltage Cable Trench for 6.6kV 2 x FDR on new Switch Room (4.8m W x 1m D x 65m L)	m³	312		
4.1.3		Excavate Control Cable Trenches and Dispose Of Material (393m L x 820mm W X 415mm D)	m³	134		
4.1.5		Excavate 6.6kV Cable Trenches for the MV B/B Coupling Cables Between TRF 1 and TRF2&3 and Dispose Of Material (85m L x 1m W X 1.2m D)	m³	102		
4.2		**Make-up deficiency in backfill material by importation from borrow pit /commercial sources designated by contractor (provisional)**				
4.2.1		Sift Backfil Soil Selected granular material to12mm grade for all excavated back fill soils.	m³	1021		
4.2.2		Import / Selected fill material with thermal resistivity of ≤ 1.2 for all Control Cable 30mm as Per D-DT5245 Control Cable Trenches.(393m L x 820mm W X 30mm D)	m³	97		
4.2.3		Reinstate Road Surfaces complete with all courses .. G5 Material from Security Gate to Sub Entrance gate roadway (5m x 100mm x 110m)	Item	1		
4.2.4		Compaction in Road reserves	m	40		
Subtotal carried to Item 4 of Summary						

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
		SCHEDULE 5					
5		**CONCRETE**					
5.1		**Foundations** Foundations and concrete structures to be supplied complete with Formwork, reinforcing, concrete to specified strength using aggregates as per drawings, price inclusive of holding down bolts, frame and grouting					
5.1.1		132kV Isolator support fdn	each	30			
5.1.2		6.6kV Isolator support fdn	each	6			
5.1.3		132kV Circuit Breaker support fdn	each	12			
5.1.4		132kV CT support fdn	each	18			
5.1.5		6.6kV NER fdn	each	2			
5.1.6		Transformer Plinth Slipway, Catchment pit, Sump including brickwork (bundwall) suitable for 10MVA transformer complete as per Dwg D-DT-5232	each	2			
5.1.7		132kV HV Cable termination fdn CES	each	6			
5.1.8		6.6kV MV cable end support fdn	each	6			
5.1.9		Fire wall support fdn	each	2			
5.1.10		Lightning/Lighting mast fdn	each	4			
5.1.11		Ner Terminal Supt fdn	each	2			
5.1.12		88kV VT support fdn	each	12			
5.1.13		132kV busbar Tubular fdn	each	8			
5.1.14		132kV Terminal Support fdn	each	10			
Subtotal carried to Item 5 of Summary							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
		SCHEDULE 6					
6	**SANS 1200H**	**ERECTION OF STEELWORK**					
		Supply and fabrication					
6.1		Preparation of shop detail drawings	item	1			
6.2		**Supply, fabrication, delivery and erection of steelwork, complete with all the necessary cleats, brackets, gussets packs, etc. using steel to SABS 1431 Grade 300 WA for electrical equipment support**					
6.2.1		All steelwork to be hot dipped galvanized to SABS spec 763 - in accordance with SABS 1200HC					
6.2.2		Price to include erection, bolts, nuts and rivets					
6.2.3		132kV Circuit Breaker support	each	8			
6.2.4		132kV Isolator support	each	14			
6.2.5		132kV CT – 2.5m ME support	each	18			
6.2.6		132kV CT support cap	each	6			
6.2.7		132kV HV Cable termination support	each	6			
6.2.8		132kV HV SA support Cap	each	6			
6.2.9		MV cable end support	each	4			
6.2.10		Fire wall support	each	2			
6.2.11		21m Lightning/Lighting mast support	each	6			
6.2.12		88kV VT – 2.5m ME support	each	26			
6.2.13		88kV busbar Tubular Support	each	10			
6.2.14		88kV Tubular 26 (12mL X 120mm x 4mm)	each	8			
6.2.15		88kV VT support cap	each	6			
6.2.16		ISOLATOR 6.6kV 2500A 31kA Support	each	2			
6.2.17		Insul, Line Post132kV 10kN 31mm/kV		38			
6.2.18		6m line Terminals	each	12			
Carried Forward							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
Brought Forward							
6.2.19		Column - 132/C Lattice Steel, Steelwork Manufaturing Details & Assembly - (10,668 Stringer Height)	each	4			
6.2.20		Beam - 132/C40/1 Lattice Steel, Steelwork Manufaturing Details & Assembly	each	2			
6.2.21		Earthwire support - 132/EW Lattice Steel, Steelwork Manufaturing Details & Assembly	each	4			
Subtotal carried to Item 6 of Summary							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
		SCHEDULE 7					
7		**CABLE CUCT**					
7.1		**Supply and lay rectangular portal culverts and slab as cable trench or cable tunnel,**					
		Alternatively brick built trenches can be provided					
7.1.1		**Supply of Trench covers measured elsewhere**					
7.1.1.1		Construct 3000mm x 250mm (765mm L x 230mm W x20mm B) Trench Covers-Control Cables	each	1706			
7.1.1.2		Construct 3000mm x 250mm 1 x(1.2m L x 230mm W x 35mm B with 8mm Steel Reinforce- 88kV FDRs	each	165			
7.2		**Cable Protection Slabs**					
7.2.1		Supply and Lay cable protection slabs 300mm above cable					
7.2.2		Cable Protection Slabs 900mmx230mmx 20m on Both 88kV Southern FDRs and 6.6kV B/B Coupling Cables-Within Sub.	each	20			
7.3		**Supply Lay and Prove Duct**					
7.3.1		160mm x 12m PVC Sleeves duct for Cable installation for Switch Room	each	10			
7.4		**Cable Markers**					
7.4.1		Route Marker for all 88kV FDRs Joints Bays and 6.6kV MV FDR Joint Bays	each	10			
Subtotal carried to Item 7 of Summary							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
		SCHEDULE 8					
8		**Storm Water Drainage**					
8.1		**Yard Stoning**					
8.1.1	SCSASAB K2 Rev.0	Supply and spread 150mm thick layer of 25mm Yard stones(150m x70m x.15m)	m^3	1575			
8.2		**Concrete Slipway (Transformers) Excavate in all material, supply, construct and remove burden**					
8.2.1		Construct 3 x3m x6m x 250mm thick reinforced concrete slip way to the transformers. Reinforcing to be mesh ref. 245 top and bottom. Connect reinforcement to earth grid as per D-DT-5240s10	m	18			
8.3		**300mm Concrete Pipes** Excavate in all material, supply and construct and remove burden:					
8.3.1		Dia 300mm pipes to oil holding dam	m	100			
8.4		**Oil Holding Dam** Excavate in all material, supply and construct and remove burden:					
8.4.1		An oil holding dam complete with lid	item	1			
8.4.2		An oil trap/filter in series with the oil dam	item	1			
8.5		**Run-way** Excavate in all material, supply and construct and remove burden:					
8.5.1		5000mmx250mmthick x 22m long reinforced concrete runway as detailed on drawing (excludes transformer slip ways) Reinforce concrete at cable trench crossings. Connect reinforcement to earth grid	m	66			
8.6		**Manholes** Excavate in all material, supply and construct					
8.6.1		Manholes (Inside and outside bund wall)	ea	3			
8.6.2		Excavate & Install Soak Pit Hard Rock	ea	1			
Carried Forward							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
Brought Forward							
8.6.3		Supply Oil Holding Dam Pump , Cables, Switching Control Valves and install Dia 50mm PVC pipes for control cables from transformers and oil pump to cable trenches outside the bund wall	each	1			
8.6.4		**Apply herbicides and insecticides** Assistance of applying herbicides and insecticides can be obtained from EMM, Environmental Sciences	m²	10500			
Subtotal carried to Item 8 of Summary							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
		SCHEDULE 9					
9		**Facilities**					
9.1		**Control Room**					
9.1.1		Build a 5.7m W x16.7m L Eskom STD. (APEX ROOF) COMBO CONTROL BUILDING TYPE B Roof shall be a normal Apex roof. (The contractor shall allow for the supply and installation of an outdoor type water proof switch for the yard lighting which will be positioned next to the one 5m gate at the entrance to the control room. This will be wired to a contactor in the yard box via a 4mm-4core cable.)	item	1			
9.1.2		Build a 6.7m W x23.7m L Eskom STD. (APEX ROOF) COMBO CONTROL BUILDING TYPE A Roof shall be a normal Apex roof. (The contractor shall allow for the supply and installation of an outdoor type water proof switch for the yard lighting which will be positioned next to the one 5m gate at the entrance to the control room. This will be wired to a contactor in the yard box via a 4mm-4core cable.)	item	1			
9.1.3		Supply and attach cable trays in the control room	m	38			
9.1.4		Supply and attach substation name board	each	1			
9.1.5		Supply and attach signs to fence and gates	Item	1			
9.1.6		Supply and attach procedure in case of fire/first aid to control room	each	1			
Subtotal carried to Item 9 of Summary							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
		SCHEDULE 10					
10		**SUBSTATION FENCING**					
10.1		**Stone Verge Kerbing**,					
10.1.1		Setting out of kerbing (Pre-cast to SABS 927),around Substation Platform Perimeter Supply and install kerbing - Complete as specified (Type Figure 3)	m	500			
10.1.2		Removal of excavated material	m^3	13			
10.2		**Cable Trenching**					
10.2.1		Setting out of cable trench	Sum	1			
10.2.2		Excavation, Supply and install cable trench - 600mm wide	m	450			
10.2.3		Excavation, Supply and install cable trench - 820mm wide	m	200			
10.2.4		Excavation, Supply and install reinforced concrete	each	95			
10.2.5		Supply and install cable trench cover supports	each	2			
10.2.6		Supply and install PVC Sleeve (100mm Dia)	m	35			
10.3		**Yard Stone & Weed Control**					
10.3.1		neutralise site,spread weed killer & herbicides	m^2	2000			
10.3.2		Second application of weed killer	m^2	2000			
10.3.3		Supply and spread of yard stone - 100mm thick and spread (30mm minimum size)	m^3	200			
10.4		**Fencing - Security (2.4m, Clear-Vu Fence, supply,excavate, installation, Complete with Electric Fence, Energisers, Indicators, Labels, Etc.)**					
10.4.1		Supply and install fence corner posts	each	10			
10.4.2		Supply and Install Clear-Vu Fence & Intermediate	each	70			
10.4.3		Supply and install 6m Clear-Vu Double Leaf Gate	each	1			
10.4.4		Supply and install 6m Clear-Vu - Removable Panelsv (bolted)	each	3			
10.4.5		Supply and install 6m Clear-Vu gate posts	each	3			
Carried Forward							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
Brought Forward							
10.4.6		Supply and install - 1,8m Diamond Mesh Temporary Construction Fence, Complete with Safety Baricading Netting & Signage	m	600			
10.4.7		Supply and install - 2.4m Clear-Vu Fence, complete	m	400			
10.4.8		Removal of excavated material	m^3				
10.4.9		Supply and Install an Electric Fence on top of Clear-Vu fencing, complete with Energiser, Indicators,labels and Control	m	400			
10.5		**Warning signs**					
10.5.1		Supply and Install unauthorized entry sign	each	16			
10.5.2		Supply and Install first aid sign	each	5			
10.5.3		Supply and Install prohibitive (various)	each	5			
10.5.4		Supply and Install hard hat sign	each	4			
10.5.5		Supply and Install safety shoe sign	each	4			
10.5.6		Supply and Instal CCTV Access Control and Access Control (Provisional Amount of R 400 000)	Sum	1	400 000.00		
Subtotal carried to Item 10 of Summary							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
		SCHEDULE 11					
11		**INSTALLATION OF EARTH GRID**					
11.1		**Complete earth grid Supply, Transport to site and Install as per earth grid drawing including all excavations, backfilling and compaction**					
11.1.1		10 mm round copper main earth grid	m	1500			
11.1.2		10 mm round copper for earth tails connected from reinforcement of trfr plinths, slipways and runway to main earth grid	m	40			
11.1.3		50 mm x 3 mm flat copper for earth tails for building earthing of panels. This earthing should run on cable rack.	m	125			
11.1.4		50 mm x 3 mm flat copper for earth tails connected to the main earth grid from equipment foundations, transformer kerbing reinforcement and fence (to the fence and fence corner gate post CGP)	m	500			
11.1.5		Run 50 mm x 3 mm flat copper for battery room	m	250			
11.1.7		**Joints/Bonding**					
11.1.8		Bond all foundation copper to main earth grid of the substation as per earthing standard and foundation drawings.					
11.1.9		Main earth grid brazing; 10 mm round to 10 mm round	each	240			
11.1.10		Main earth grid brazing to earth tails (all foundations, control room, fence, etc.) ; 10 mm round to 50 mm x 3 mm flat	each	336			
11.1.11		Main earth grid brazing to earth tails (reinforcing of trfr plinths, slipways and runway,	each	90			
11.1.12		50 mm x 3 mm flat copper bolted to corner gate ,posts and intermediate posts and fence	each	124			
11.1.13		80 x 6 mm x 1.2 m long galvanised steel strap bolted to transformer tank and connected to transformer holding down bolts for earthing of transformers. (2 connections per strap)	each	12			
11.1.14		Provisional amount for the specialist to design the entire earth grid, R 250 000	Item	1	R 250 000.00		
11.1.15		It is the responsibility of the substation Contractor to test the earth-grid resistance on completion of the project. Tests to be done by an approved person. The results shall be compared to the design results, as submitted by the Eskom Project Eng.	Item	1	R 45 000.00		
Subtotal carried to Item 13 of Summary							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
		SCHEDULE 12					
12		**INSTALLATION OF HV & MV SWITCH GEAR & CONTROL, BATTERY CHARGERS & AUXILLIARIES**					
12.1		**For the supply, delivery , off loading of MV switchgear (Actom or equivalent) , control panels, battery chargers, RTU, Auxilliaries (Switching /Control Room) complete with all SEL or equivalent protection devices & relays as per the Detailed Control Plant design and drawings provided by the Contractor and submitted to the Engineer for approval.**					
12.1.1		6.6kV 1250A , Incomer BKRs 25kA Metal Clad Switchgear	each	2			
12.1.2		6.6kV 1250A , B/C BKRs 25kA Metal Clad Switchgear	each	1			
12.1.3		6.6kV B/B VTs, Metal Clad Switch Gear	each	2			
12.1.4		1 X 110V DC 15 A 65AH Battery Terminal Unit	each	3			
12.1.5		85 x 110V DC Batteries complete with cabinet	each	3			
12.1.3		6.6kV/400V Auxilary Supply 200kVA	each	1			
12.1.4		Transformer SEL Protection Scheme as specified in the Detailed Design provided by the Contractor	Item	1			
12.1.5		Tap change Control Schemes as specified in the Detailed Design provided by the Contractor	Item	1			
12.1.6		Current Differential Protection Schemes as specified in the Detailed Design provided by the Contractor	Item	1			
12.1.7		88kV Bus Section Protection Schemes as specified in the Detailed Design provided by the Contractor	Item	1			
12.1.8		Tariff Metering Panel	Each	2			
12.1.9		Meters(Cl 0.2)	Each	6			
Carried Forward							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
Brought Forward							
12.1.10		Vectographs	each	4			
12.1.11		Statistical Metering Panel	each	2			
12.1.12		Metters (Cl 0.5)	each	4			
12.1.13		AC/DC Distribution Swing Frame panel (Top and Bottom Entry) 2400mm X 880mm x 600mm cabinet complete with earthing bars, trunking , prepunched gland plates, blue passivation lifting lugs.	each	2			
12.1.14		Yard Control AC Distribution Board (with distribution and termination modules aper Detailed Design	each	1			
12.1.15		Yard Control AC Distribution Board (with distribution and termination modules aper Detailed Design	each	1			
12.1.16		Main AC incoming module (to be mounted in a 19 inch floor standing cabinet)	each	1			
12.1.17		Main AC incoming module (to be mounted in a 19 inch floor standing cabinet)	each	1			
12.1.18		400V 3 Phase AC Distribution Module	each	2			
12.1.19		230V 1 Phase AC Distribution Module	each	2			
12.1.20		AC supply module	each	2			
12.1.21		CT Junction Box	each	6			
12.1.22		VT Junction Box	each	6			
12.1.23		Isolator Junction Boxes (ISJB)	each	14			
12.1.24		D20 RTU Config 5 or similar and IDF Frame to interface with primary and secondary plant equipmemt to be approved by Engineer and Eskom. This should come complete with all accessories to enable full system installation which included power supply unit, IDF rack, Cabling between IDF and Primary and secondart plant, communication interface kit and cables	each	2			
Carried Forward							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
Brought Forward							
12.1.24		D20 RTU Config 5 or similar and IDF Frame to interface with primary and secondary plant equipmemt to be approved by Engineer and Eskom. This should come complete with all accessories to enable full system installation which included power supply unit, IDF rack, Cabling between IDF and Primary and secondart plant, communication interface kit and cables	Each	2			
12.1.25		Telecommunication Equipment (SDH Multiplexer					
12.1.25.1		Allow for IEC619850 compliant SDH multipler to establish communication Link to Master Station to be approved by Engineer, Employer and Eskom complete with required cabling, gatewateys , interface units to make the syatem fully functional	Item	1	R 100 000.00		
12.1.26		Allow for full life time software licensing for RTU and SDH multipler	Item	1	R 20 000.00		
12.1.27		Maintenance Tools	each	1			
12.1.28		First Aid box Complete with Labelling	each	2			
12.1.28		Provide an amount of R 200000 to extend the 6.6kV 1250A busbar on the existing Kwawatsi switching station and incorporate 2 X 1250A incomer breaker panels and 1x 1250A feeder breaker panels. The breakers are a free issue from Municipality.	Item	1	R 200 000.00		
12.1.29		6.6kV 800A, Bus FDR BKRs, 25kA Metal Clad Switch Gear	each	8			
Subtotal carried to Item 12 of Summary							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
		SCHEDULE 13					
13	**SANS 1200A**	**GENERAL ELECTRICAL**					
13.1		**Signs and Notices**					
13.1.1		Allow for all the signs as per the Detail Technical Specification					
13.1.2		Signs and notices on Buildings	item	5			
13.1.3		Signs and Notice on Perimeter Fences and Substation Entrances	item	3			
13.1.4		Combined Emergency Notices	item	1			
13.1.5		Perimeter Fence	item	50			
13.1.6		First Aid kit to NOSA requirements	item	1			
13.1.7		**Fire Extinguishers**					
13.1.8		Supply and Install fire Extinguisers in positions directed by engineer / fire chief	item	3			
13.1.9		**Lightning/Lighting Masts/ Area Lighting**					
13.1.10		Lightning Masts complete with fittings and electrical control compartment and 4 x 110W LED per /21m Mast	each	6			
13.1.11		Supply Cabling , Conduts and Wire Control Room and Switch Room and Provide Earth leakages.	item	1			
13.1.12		6mm^2 x 4 core cable inclusive of terminations for the general area and substation lighting	m	200			
13.2		**Lightning Protection of Switchyard**					
13.2.1		Provisional amount for the specialist evaluation of the LPS in terms of SANS 10313 and necessary modifications to proposed LPS	item	2			
13.3		Povide a provisional sum of R100000.oo for Firec Detection System to be executed by the a Specialist Fires services sub contractor approved by the Engineer.	Item	1	R 100 000.00		

13.4		Provide a Provisional sum for Mechanical Service Systems R100000.00 to be executed by the specialist sub contractor approved by the Engineer	Item	1	R 100 000.00		
Carried Forward							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
Brought Forward							
13.5		Provide a Provisional sum for decommission the existing Koppies munic substation	Item	1	R 400 000.00		
13.6		**Lightning Protection of Building**					
13.6.1		Co-ordinate and provide Lightning protection system for buildings see SANS 10313 including equipotential bonding and electonic earthing requirements (cross bond to earthmat) inclusive of certification by specialist.	item	1			
Subtotal carried to Item 13 of Summary							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
		SCHEDULE 14					
14		**INSTALLATION OF EQUIPMENT**					
14.1		**New Equipment:** Price shall include all sundries, tools, mounting accessories for the correct operation of the equipment price shall further include for fixing and alignment, on and off-site testing as per specification and equipment manufacturers requirements for a complete installation. Price shall include for all transport, off-loading, rigging insurance, etc. Steelworks, excavations and foundations measured under civil works:					
14.1.1		88kV(132kV) Line Isolator w S/ARR	each	4			
14.1.2		88kV(132kV) Line Isolator	each	4			
14.1.3		132kV B/B Isolator	each	2			
14.1.4		88kV S/ARR (Trfr mounted) set	each	2			
14.1.5		6.6kV S/ARR (Trfr mounted) set	each	2			
14.1.6		6.6kV S/ARR MCOV (Terminal Incomer) set	each	2			
14.1.7		132kV Circuit Breaker	each	6			
14.1.8		132kV Current Transformer (BZ 1600/1) set	each	6			
14.1.9		88/6.6kV 10MVA OLTC Transformer DYN11 Open Bushings, including FAT, loading and transportation of transformers(low bed truck from supplier to site(Koppies Substation, NLM), on and off loading and rigging of transformer(Contractor to allow for Heavy duty Mobile Crane), dressing and assembling of transformers (complete) on site, filling oil, testing of oil complete with certificates.	each	2			
14.1.10		Supply Install 6.6kV NEC/NEE/AUX complete with 6.6kV Termination boxes(Ground mounted)	each	2			
14.1.11		Supply Install 88kV B/B VT's Sets	each	4			
14.1.12		Supply Install 88kV P/VT's Sets	each	2			
14.1.13		Supply Install 88kV Line VT's Sets	each	2			
14.1.14		132kV Post Insulators (HV Conductor/MV cables Supp)	each	68			
14.1.15		6.6kV Post Insulators Cable End Support	each	9			
Carried Forward							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
Brought Forward							
14.1.16		88 kV Isolator Rotating Centre, 2500A; 31,5kA/3sec; H/O	each	4			
14.1.17		88 kV Isolator Rotating Centre with one Earth Switch, 2500A; 31,5kA/3sec; Man	each	4			
14.1.18		6.6 kV Circuit Breaker	each	2			
14.1.19		6.6 kV Isolator Rotating Centre with one Earth Switch, 800A; 25kA/3sec; Man	each	2			
Subtotal carried to Item 14 of Summary							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
		SCHEDULE 15					
15		**MV and LV Cable Work**					
15.1		**New Equipment:** **Transport to site from Contractor's stores and install the following equipment supplied by Contractor:**					
15.1.1		**Incomers**					
15.1.2		Provide route layout design drawing by specialist indicating joint box locations cross bonding requirements etc	item	1			
15.1.3		Joint 630mm² PILC Cu single Core 6.6kV cable	each	45			
15.1.4		Supply and Lay 630mm² PILC Cu single Core 6.6kV cable	m	800			
15.1.5		Make off 630mm² 1c Cu PILC 6.6kV cable outdoor termination	each	20			
15.1.6		Earth cable armouring (braded tail) onto HV Terminal structures	each	20			
15.1.7	DDT-7615	Provide an amount of R300 000 for supply and installation of 2 X stayed angle strain structure (0 -90*) complete and string 1000m of Chicadee conductor up to Terminal Stucture of Koppies Substation	Item	1	R 300 000.00		
15.2.		**Clamps Cable**					
15.2.1		Support 6.6kV cables with Polyprop clamp	each	50			
15.3		**6.6kV Cable Work**					
15.3.1		Provisional amount for the jointing relocation and protection of 6.6kV cables during construction, R15000.00	item	1			
15.3.2		Provisional an amount o R 300 000 for the relocation of Hop Hons feeder, 6.6kV MV line consisting of 4 spans @100m, R300000.00	item	1	R 300 000.00		
15.3.3		Provisional amount for the upgrade power supply to the water treatment works, R300 000.00	item	1	R 300 000.00		
15.3.4		Provisional amount for the jointing relocation and protection of 6.6kV cables during construction	item	1			
15.3.5		Supply and lay 6.6kV , 240mm2 PILC single core Cu cable	m	0			
15.3.6		Supply and Install 6.6kV, 240mm2 PILC single core Outdoor (TRF) terminations	each	Rate Only			Rate Only
15.3.7		Supply and Install 6.6kV, 630mm^2 PILC single core Indoor (TRF & 6.6kV B/B Coupling Cables) terminations	each	100			
15.3.8		New connections 95mm2 PILC single core Outdoor terminations between transformers and NER's	each	Rate Only			Rate Only
15.3.9		Support 6.6kV cables with Polyprop clamp	each	30			
Carried Forward							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
Brought Forward							
15.3.10		Earth cable armouring (braded tail) onto MV switchgear Cu earth bar	each	20			
15.4		**New connections of 6.6kV switchboards' feeders**					
15.4.1		Supply and lay 6.6kV , 95mm2 PILC three core Cu cable	m	100			
15.4.2		Supply and lay 6.6kV , 120mm2 PILC three core Cu cable	m	0			
15.4.3		Supply and lay 6.6kV , 150mm2 PILC three core Cu cable	m	0			
15.4.4		Supply and lay 6.6kV , 185mm2 PILC three core Cu cable	m	600			
15.4.5		Earth cable armouring (braded tail) onto MV switchgear Cu earth bar	each	16			
15.4.6		**New connections between local transformer and AC/DC Panel**					
15.4.7		Supply and Install 6.6kV, 95mm² PILC three core Outdoor terminations	each	1			
15.4.8		Supply a 95mm2 cable gland	each	1			
15.5		**Joint Cable Include for the removal of old termination**					
15.5.1		Supply joints for 6.6kV , 95mm2 PILC three core Cu cable	each	2			
15.5.2		Supply joints for 6.6kV , 120mm2 PILC three core Cu cable	each	0			
15.5.3		Supply joints for 6.6kV , 150mm2 PILC three core Cu cable	each	0			
15.5.4		Supply joints for 6.6kV , 185mm2 PILC three core Cu cable	each	20			
15.6		**Terminate Cable**					
15.6.1		Supply Termination for 6.6kV , 95mm2 PILC three core Cu cable	each	2			
15.6.2		Supply Termination for 6.6kV , 120mm2 PILC three core Cu cable	each	2			
15.6.3		Supply Termination for 6.6kV , 150mm2 PILC three core Cu cable	each	4			
15.6.4		Supply Terminationfor 6.6kV , 240mm2 PILC three core Cu cable	each	10			
15.6.5		Pressure Test all Cables	item	1			
15.6.6		**Control Cables**					
15.6.6.1		**Transformer control cables**					
15.6.6.1.1		2.5mm^2 30 core	m	200			
15.6.6.1.2		2.5mm^2 4C core	m	200			
15.6.6.1.3		4.0mm^2 4C core	m	200			
15.6.6.2		**132kV Switchgear**					
15.6.6.2.2		4.0mm^2 4C core	m	200			
Carried Forward							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
Brought Forward							
15.6.6.3		**88kV(132kV) CTs**					
15.6.6.3.1		2.5mm^2 30 core	m	300			
15.6.6.3.2		2.5mm^2 4C core	m	300			
15.6.6.3.3		4.0mm^2 4C core	m	300			
15.6.6.4		**88kV VTs**					
15.6.6.4.3		2.5mm^2 4C core	m	350			
15.6.6.5		**132kV Isolators**					
15.6.6.5.1		2.5mm^2 4C core	m	370			
15.6.6.7		**132kV Isolators**					
15.6.6.7.1		10mm^2 4 core	m	200			
Subtotal carried to Item 15 of Summary							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
		SCHEDULE 16					
16		**INSTALLATION OF EQUIPMENT-CONDUCTOR**					
16.1		**Stringing and Conductor** Stringers and droppers – Non Insulated Bull	m	1500			
16.1.1		Stringers and droppers – Non Insulated Centipede	m	1470			
16.1.2		Stringers and droppers – Insulated Bull	m	648			
16.1.3		Stringers and droppers – Hornet Insulated	m	121			
16.2		**Joint Ball Portable Earth**					
16.2.1		Supply and install earth ball joints	each	204			
16.3		**Switching grid**					
16.3.1		Supply and install switching grids	each	1			
16.4		**Equipment Labelling**					
16.4.1		Equipment Labelling	each	132			
Subtotal carried to Item 16 of Summary							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
		SCHEDULE 17					
17		**INSTALLATION OF EQUIPMENT CONT.**					
17.1		**Clamp Assemblies**					
17.1.1		Clamp Fix /Supp 38.3mm KCP 38/127	ea	18			
17.1.2		Clamp B/COMP 38.3mm PALM 0DG-SPC14	**ea**	9			
17.1.3		Clamp B/COMP 38.3mm-38mm 0DG-KC3	ea	36			
17.1.4		Clamp Cross 26.5mm-38mm K4	ea	24			
17.1.5		Clamp B/Comp 38.3mmPalm 0Dg SPC4	ea	78			
17.1.6		Clamp B/Comp 38.3mmPalm 45DgSPC5	ea	78			
17.1.7		Clamp B/Comp 26.5mm-38mm 0Dg KC2	ea	18			
17.1.8		Clamp Bus StudTBST120/26/C	ea	9			
17.1.9		Clamp F/Bus SuppType TBFS120-127	ea	240			
17.1.10		Clam EXPT120-127PCDTBFX 120-127SS	ea	48			
17.1.11		End CapTBEC 120 Cond with F / Clamp	ea	220			
17.1.12		End CapTBEC 120 No F / Clamp	ea	66			
17.1.13		Clamp T S CompTBCT 120/ 2x38mm	ea	46			
17.1.14		Clamp Y Comp 2x 38.3mm-PALM 0DG YC16	ea	6			
17.1.15		Clamp Y Comp 2 x38.3mm-PALM 45DG YC17	ea	6			
17.1.16		Clamp Y Comp 2 x38.3mm-38mm-045DG YC4	ea	18			
17.1.17		Clamp Y Comp 2 x38.3mm-38mm-045DG YC2	ea	36			
17.1.18		Clamp PEG Al Bull 38.3mm EPC-38mm	ea	24			
17.1.19		Clamp Y / Comp 2 x 38.3mm-38mm 45Dg YC4	ea	12			
17.1.20		Clamp , Tub Tap off TBCT120/C1-38	ea	75			
17.1.21		Clamp PEG Al Bull 26.5mm EPC-26	ea	75			
17.1.22		Clamp B/ Comp 38.3mm-38mm 0Dg KC3	ea	210			
17.1.23		Clamp B/Comp 38.3mm-38mm 45DG-KC4	ea	276			
17.1.24		Clamp T/Comp TBCT-120/38/C2 0Dg	ea	66			
17.1.25		Clamp Tub Bus/Palm T/Off TBPT120	ea	195			
Carried Forward							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
Brought Forward							
17.1.26		Clamp F/Bus Coupler TBSC120-127	ea	66			
17.1.27		Clamp Cross 26.5mm-38mm K2	ea	15			
17.1.28		Clamp B/ Comp 38.3mm-38mm 0Dg KC1	ea	9			
17.1.29		Clamp Cross16.3mm-38mm K3	ea	9			
17.1.30		Lug all Hornet 1B M12	ea	3			
17.1.31		Clamp T/Comp 38.3mm-38mm 0Dg TC10	ea	9			
Subtotal carried to Item 17 of Summary							

Item No.	Refer	Description of the item	Unit	Qty	Rate		Price (R)
					Supply	Install	
		SCHEDULE 18					
18.1		**COMMISSIONING EQUIPMENT**					
18.1.1		**General**					
18.1.1.1		FAT and SAT attendance by a certified Protection Engineer and witnessed by Engineer	Item	1			
18.1.2		**Functional Testing**					
18.1.2.1		Protection settings and grading of MV feeder relays by specialist protection engineer as per spec that will be proposed by the contractor, presented and approved by Employer after the awardimg of Tender. This will include the software (DigSilent/Etap)modelling and simulation of the protection philosophy of the network	Item	1			
18.1.2.2		Testing and commissioning of MV installation by Certified Engineer as per SANS 10142-2. Test shall include VLF tests by a certified or qualified specialist. Testing to be witnessed by Employer and Eskom. Included is the testing of HV and MV switchgear by a specialist commissioning engineer	Item	1			
18.1.4		**SUBSTATION SCADA**					
18.1.5		Substation SCADA - FAT	item	1			
18.1.6		Substation SCADA - SAT	item	1			
18.1.7		**MASTER STATION SCADA**					
18.1.8		Master Station SCADA - SAT	item	1			
Carried Forward							

NGWATHE LOCAL MUNICIPALITY

Construction of KWAKWATSI 88/6.6 kV, 2x10MVA Substation

C3: SCOPE OF WORK

C3.1 STANDARD SPECIFICATIONS

C3.2 PROJECT SPECIFICATIONS

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PART C3 SCOPE OF WORKS

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STATUS

In the event of any discrepancy between the Scope of Works, the Bill of Quantities or the Drawings, the Project Specifications shall take precedence and prevail in the Contract.

C3.1 DESCRIPTION OF THE WORKS

C3.1.1 EMPLOYER'S OBJECTIVES

The Employer‟s objectives are to **Construct Kwakwatsi 88/6.6 kV, 2 x10 MVA Substation**. The electricalscope of works covered by this TOR for Kwakwatsi substation shall include:

- The supply, installation and commissioning of cabling as per the standards and requirements specified in the relevant specifications and the cable schedules.
- The supply, installation, testing and commissioning of 2 x 10 MVA, 88/6.6 kV Power Transformers as per the standards and requirements specified in the relevant specifications
- Supply, installation, testing and commissioning of transformer power cabling including the 6.6 kV power cables and transformer earthing leads according to specifications
- Supply, installation, testing and commissioning of the AC and DC control cables for the 10 MVA transformers according to specifications.
- Supply, installation, testing and commissioning of the AVR System for the transformers according to specifications
- The supply, installation and commissioning of kV switchgear at KWAKWATSI substation as per the standards and requirements in the relevant specifications. The following 6.6 kV bays in indoor IP55 rated cubicles shall be provided with the associated relays, meters, protection CTs and VTs, tariff class accuracy CTs for measurement, and SCADA RTU:
  - 8x6.6 kV feeder bay – Outgoing Feeders
  - 2x6.6 kV feeder bay – Transformer (Incomer) feeders
  - 2x6.6 kV feeder bay – Bus Section
- The installation and commissioning of 132kV outdoor breakers at KWAKWATSI substation as per the standards and requirements specified in the relevant specifications.
- The supply, installation, testing and commissioning of 1 x 315 kVA 6.6kV / 415 V auxiliary transformers on the NECRT‟s as per the standards and requirements specified in the relevant specifications. The auxiliary transformers supplied shall be suitable for ground mounting on a plinth adjacent to the power transformer plinths.
- The supply, installation, testing and commissioning of the M&E services as required in the relevant specifications:
  - LVAC distribution system
  - DC system
  - Lighting
  - Cable containment
  - Equipment and cable labelling

- Ventilation system
- Pipe, ducting and supporting steelwork
- Earthing system (verification of the conceptual design)
- Lightning protection system
- Water supply
- Fire alarm system
- Fire suppression system
- Site security and access control
- Closed circuit television monitoring
- M&E service interfaces with SCADA system

- Supply and delivery of all other materials required for the electrical works according to specifications. These shall include LV cables and all consumable materials.
- Supply, installation, testing and commissioning of energy meters according to specifications
- Supply, delivery, installation, testing and commissioning of an RTU and SCADA system for the substation according to specifications
- Supply, delivery, installation, testing and commissioning of a 415 V AC distribution system, 110 V DC battery charger and battery bank system as well and a 50V DC distribution system according to specifications
- Supply, delivery and installation of a substation yard lighting system according to specifications
- Supply, delivery and installation of items required to meet safety requirements according to specifications. These shall include: fire extinguishers, equipment labels for the transformer, outgoing and incoming lines, safety warning signage and a system single line diagram
- Preparation of as-built drawings for the completed substation electrical works.

Where possible, local workers may be temporarily employed to perform non-specialized parts of the works.

C3.1.2 OVERVIEW OF THE WORKS

The scope of works includes all works necessary to establish KWAKWATSI 88/6.6 kV substation.

The Contractor has taken full accountability for the design and engineering, overall co-ordination with internal and external agencies, project management, loading, unloading, storage at site, inventory management including Municipality"s supplied materials at site during construction, installations as per Project Manager"s advice, handling, moving to final destination, obtaining statutory clearances for successful erection, testing and commissioning of the substation.

In this regard the Contractor has to carry out the geotechnical investigations and soil resistivity tests and provided a basis for the civil designs and the substation earthing design.

The Contractor shall develop concept design documents as required and submitted them to the Employer for approval of the changes. The Contractor shall use the concept design documents as a basis for the detailed design. The following detailed design documents shall be submitted by the Contractor for approval by the Employer prior to commencement of Works:

- Inception Report (Including detailed Work Methodology and Schedule)
- Geotechnical Assessment Report
- Soil Resistivity Survey
- Earthing Design
- Substation aerial earthing Design
- Electrical Drawings
- General Arrangement Working Drawings
- Equipment Layout Drawings
- Substation plant house
- Interceptor tank
- Inspection chambers, septic tank and Soakaway pit.
- Fire wall
- Transformer Plinth Design
- Transformer Oil Sump Designs
- Transformer Steel Grating Designs
- General Foundation Drawings
- Toilet and Water Closet
- Substation aggregate surfacing
- Cable trenches
- Cable gantries
- Access road
- Site drainage
- Bar bending Schedules
- Cable gantries design
- Fencing Details and Drawings
- Verification of Power Requirements for Auxiliary Supply
- Cubical Layout Drawings clearly indicating the dimensions of the cubicles supplied in relation to the dimensions of the equipment housed in the cubicles
- Substation SLD
- LV AC Distribution
- Substation lighting
- Test and Commissioning Procedures

The sub-contractor shall submit a preliminary project schedule with the bid documentation. The methodology submitted shall include all assumptions made.

C3.1.3 Extent of Works

The civil scope of works for KWAKWATSI substation shall include the following:

- Geotechnical investigations and soil resistivity tests.

- Detailed design of civil works including:
- Earth works
- Transformer plinth
- Oil sump
- Substation plant house
- Interception tank
- Inspection chamber, Septic tank and Soakaway pit
- Fire wall
- Guard house
- Toilet and Water Closet.
- Substation aggregate surfacing
- Substation earthing
- Substation lighting
- Cable trenches
- Cable gantries
- Substation aerial earthing
- Fencing
- Walling
- Access road

- Site drainage.
- Supply and delivery of all materials required for all the civil works
- Site clearance, site preparation works.

Preparation of design drawings, construction drawings for approval by the Local Government Authorities and as-built drawings for the completed substation electrical and civil works.

Approval of construction drawings by Local Government Authorities.

The Contractor shall under his own responsibility and expense, inspect and examine the proposed construction site, its surroundings, and existing infrastructure and facilities relevant to the execution of the Works and obtain all the information necessary for the proper execution of the Works covered under this TOR. The Contractor shall ensure compliance with the requirements specified within this TOR.

C3.1.3 LOCATION OF THE WORKS

KWAKWATSI Substation is located within the NGWATHE Local Municipality in the Freestate province.

C3.2 ENGINEERING

C3.2.1 DESIGN

The Engineer is responsible for the basic engineering design, up to the bid stage, of the permanent Works as reflected in the Contract Documents unless otherwise stated. O&M manuals shall be compiled by the Contractor and shall include all drawings and information. The manuals shall be comprehensive and shall enable the Employer"s personnel, to do the necessary maintenance and repairs to the installation. Once the Engineer has approved the compiled documentation, the documents shall be duplicated as required by the specifications.

C3.2.2 EMPLOYER'S DESIGN

Nil.

C3.2.3 CONTRACTOR'S DESIGN

The Contractor is responsible for the detail engineering design of the permanent Works as reflected in the Contract Documents unless otherwise stated.

Where contractor is to supply the design of designated parts of the permanent Works or temporary Works he shall supply full working drawings supported by a professional engineer's design certificate.

C3.2.4 DRAWINGS

The Contractor shall ensure that accurate as-built records are kept of all infrastructure installed or relocated during the contract. The position of pipe bends, junction boxes, duct ends and all other underground infrastructure shall be given by either co-ordinates, or stake value and offset. Where necessary, levels shall also be given. A marked-up set of drawings shall also be kept and updated by the Contractor. This information shall be supplied to the Engineer's Representative on a regular basis.

All information in possession of the Contractor, required by the Engineer and/or the Engineer"s Representative to complete the as-built/record drawings, must be submitted to the Engineer's Representative before a Certificate of Completion will be issued.

The following drawings are included in this tender at this stage, and are deemed sufficient for the contractor to see the scope of the work, the difficulties that would arise during construction, as well as the proposed protection and control requirements, based on the single line diagrammed:

Drawing no.	Description

C3.2.5 DESIGN PROCEDURES

The Contractor shall submit the designs, which he is responsible for in terms of the contract, to the Engineer for approval, before any fabrication and/or installation may take place.

No design changes shall be implemented unless approval is received in writing from the Engineer. Amended drawings, showing the design changes, shall be issued to all concerned, immediately after approval of such amendments.

All documentation, drawings and instructions shall be accompanied by a transmittal sheet, indicating whether it is for approval/construction/information etc.

C3.3 PROCUREMENT

C3.3.1 PREFERENTIAL PROCUREMENT

C3.3.1.1 Requirements

As per standard Municipal tender procedures included elsewhere in this tender.

C3.3.1.2 Resource standard pertaining to targeted procurement

As per standard Municipal tender procedures included elsewhere in this tender.

C3.3.2 SUBCONTRACTING

C3.3.2.1 Scope of mandatory subcontract works

Due to the specialized nature of certain sections of the works, it is anticipated that the principal contractors that would be appointed, will make use of sub-contractors. Bidders shall indicate in their tenders where they make use of subcontractors, and also indicate the details of the proposed subcontractors. These subcontractors will be deemed to be domestic sub-contractors.

C3.3.2.2 Preferred subcontractors/suppliers

The Bidders shall note that the Employer reserves the right to appoint more than one contractor for the Works. Contractors shall also be acceptable to the Insurers, who will pay for a large portion of the Works. Where more than one contractor is appointed, the Employer reserves the right to appoint specific Contractors as principal contractors and others as nominated or selected contractors under the principal contractors. It is, however, preferred, that the Contractors offer a full turnkey solution.

C3.3.2.3 Subcontracting procedures

Before any subcontractors are appointed, full details of the qualifications and experience shall be

submitted to the Engineer for approval. No appointment shall be made without the written approval of the Engineer.

C3.3.2.4 Attendance on subcontractors

Attendance on subcontractors is deemed to be included in the rates, and no separate allowance shall be made for attendance on subcontractors. Attendance due to the work executed by contractors under separate contracts are listed separately.

C3.4 CONSTRUCTION

C3.4.1 WORKS SPECIFICATIONS

C3.4.1.1 Applicable SABS 1200 Standardized Specifications

SABS 1200 is applicable to all civil works.

C3.4.1.2 Particular Specifications

See Part II of this document.

C3.4.1.3 National and International Standards

See Part II of this document.

C3.4.1.4 Variations and Additions to the SABS 1200 Standardized Specifications

Variations and additions to the following SABS 1200 Standardized Specifications listed in C3.4.1 are given in section C3.4.6.

C3.4.2 SITE ESTABLISHMENT

C3.4.2.1 Services and facilities provided by the Employer

(a) Water sources

The contractor should make his own arrangements for onsite water supply.

(b) Electricity supply

There is no electricity supply contractor should make his own arrangements for electricity supply.

(c) Excrement disposal

The contractor shall be responsible for waste disposal onsite

(d) Area for Contractor's site establishment

The Site of the Works is restricted and the Employer has no suitable areas available where the Contractor may erect offices, workshops, stores and other facilities that he requires for the purposes of the Contract. The Contractor shall, at his own cost, be responsible for locating and making all arrangements necessary for securing an area suitable to meet his needs in respect of the erection of the Contractor"s offices, stores and other facilities, including the facilities to be provided for the Engineer in accordance with theContract.

Any potential area proposed by the Contractor shall be within reasonable proximity to the Site of the Works and its location shall be subject to the approval of the Engineer, which approval shall not be unreasonably withheld.

C3.4.2.2 Facilities provided by the Contractor

(a) Facilities for the Engineer

The Contractor shall provide on the Site, for the duration of the Contract and for the exclusive use of the Engineer and/or his Representative (as applicable), the various facilities described hereunder. All such facilities shall be provided promptly on the commencement of the Contract and failure on the partof the Contractor to provide any facility required in terms of this specification shall constitute grounds for the Engineer to withhold payment of the Contractor"s tendered Preliminary and General items until the facility has been provided or restored as the case may be.

(i) Office accommodation

Nil.

(ii) Carports

Nil.

(iii) Site meeting venue

Nil.

(iv) Contract name boards

The Contractor shall provide, erect and maintain contract name boards at such positions and locations directed by the Engineer (and quantities as listed in the bills of quantities), which name boards shall, unless otherwise specified elsewhere in the Contract, comply with the recommendations for the standard board of the South African Association of Consulting Engineers, with regard to size, painting, decorating and detail, and the requirements described hereunder.

Each name board shall be made of tempered hardboard with a thickness of at least 12 mm, so braced on the reverse side as to prevent warping and shall be mounted on two or more, as necessary, firmly planted poles. The painting of the boards shall comply with the relevant requirements of CKS 193 and the colours of the paints shall be an acceptable match to the applicable colours given in SABS 1091.

The Contractor shall keep the contract name boards in good state of repair for the duration of the Contract and shall remove them on completion of the Contract.

(v) Survey equipment and assistants

Nil.

(vi) Telephone facilities

Yes. A Cellphone and airtime, the cost of which is provided as provisional sum in the Bill of Quantities.

(vii) Computer facilities

Nil.

(viii) Fax facilities

Nil.

(ix) Electricity supply for the Engineer

Nil.

(x) Site instruction book

The Contractor shall keep a triplicate book for site instructions on the Site at all times. This book shall be for the exclusive use of the Engineer. The book shall also be used as a site diary to note inspections.

(xi) Housing for Engineer's Representative

Nil.

(b) Water

The Contractor shall, at his own expense, be responsible for obtaining and distributing all water as may be required for the purposes of executing the Contract, including water for both construction purposes and domestic use, as well as for making all arrangements in connection therewith. The Contractor shall further, at his own expense, be responsible for providing all necessaries for procuring, storing, transporting and applying water required for the execution of the Contract, including but not limited to all piping, valves, tanks, pumps, meters and other plant and equipment, as well as for all work and superintendence associated therewith.

The sources of all water utilised for the purposes of the Contract shall be subject to the prior approval of the Engineer, which approval shall not be unreasonably withheld.

The Contractor shall comply with all prevailing legislation in respect of drawing water from natural and other sources and shall, when required by the Engineer, produce proof of such compliance. The distribution of water shall be carried out by the Contractor strictly in accordance with the applicable laws and regulations.
All water provided by the Contractor for construction purposes shall be clean, free from undesirable concentrations of deleterious salts and other materials and shall comply with any further relevant specifications of the Contract. The Contractor shall, whenever reasonably required by the Engineer, produce test results demonstrating such compliance. Water provided by the Contractor for human consumption shall be healthy and potable to the satisfaction of the health authorities in the area of the Site.

No separate payment will be made to the Contractor for the obtainment, distribution and consumption of water, the costs of which will be deemed to be included in the Contractor"s tendered rates.

(c) Electricity

The Contractor shall, at his own expense, be responsible for obtaining and distributing all electricity as he may require for the purposes of executing the Contract, including electricity for both construction purposes and domestic use, as well as for making all arrangements in connection therewith.

The distribution of electricity shall be carried out by the Contractor strictly in accordance with the applicable laws and regulations.

No separate payment will be made to the Contractor for the obtainment, distribution and consumption of electricity, the costs of which will be deemed to be in the Contractor"s tendered rates and prices.

(d) Excrement disposal

The Contractor shall, at his own expense, be responsible for safely and hygienically dealing with and disposing of all human excrement and similar matter generated on the Site during the course of the Contract, to the satisfaction of the responsible health authorities in the area of the Site and the Engineer. All such excrement shall be removed from the Site and shall not be disposed of by the Contractor on the Site.
The Contractor shall further comply with any other requirements in this regard as may be stated in the Contract.

No separate payment will be made to the Contractor in respect of discharging his obligations in terms of this subclause and the costs thereof shall be deemed to be included within the Contractor"s tendered Preliminary and General items.

C3.4.2.3 Site usage

Not Applicable

C3.4.2.4 Permits and Wayleaves

The Contractor shall be responsible to obtain all permits required under this Contract.

C3.4.2.5 Features requiring special attention

(a) Site maintenance

During progress of the work and upon completion thereof, the Site of the Works shall be kept and left in a clean and orderly condition. The Contractor shall store materials and equipment for which he is responsible in an orderly manner, and shall keep the Site free from debris and obstructions.

(b) Subcontractors

All matters pertaining to subcontractors (including Nominated Subcontractors) and the work executed by them shall be dealt with directly between the Engineer and the Contractor in the context of all subcontract work being an integral part of the Works for which the Contractor is responsible.
The Engineer will not liaise directly with any subcontractors nor will he issue instructions concerning the subcontract works directly to any subcontractor.

All matters arising from the subcontract agreements shall be dealt with directly between the Contractor and the subcontractors and the Engineer will not become involved.

(c) Access to properties

The Contractor shall organise the work to cause the least possible inconvenience to the public and to the property owners adjacent to or affected by the work, and except as hereunder provided, shall at all times provide and allow pedestrian and vehicular access to properties within or adjoining or affected by the area in which he is working. In this respect the Contractor's attention is drawn to Clause 17.1 of the Conditions of Contract.

If, as a result of restricted road reserve widths and the nature of the work, the construction of bypasses is not feasible, construction shall be carried out under traffic conditions to provide access to erven and properties.

Notwithstanding the aforegoing, the Contractor may, with the prior approval of the Engineer (which approval shall not be unreasonably withheld), make arrangements with and obtain the acceptance of the occupiers of erven and properties to close off part of a street, road, footpath or entrance temporarily, provided that the Contractor duly notifies the occupiers of the intended closure and its probable duration, and reopens the route as punctually as possible. Where possible, such streets, roads, footpaths and entrances shall be made safe and reopened to traffic overnight. Such closure shall not absolve the Contractor from his obligations under the Contract to provide access at all times. Barricades, traffic signs, drums and other safety measures appropriate to the circumstances shall be provided by the Contractor to suit the specific conditions.

(d) Existing residential areas

Electricity and water supply interruptions in existing residential areas shall be kept to a minimum. The Engineer's approval shall be obtained prior to such interruptions and residents shall be notified in writing at least 24 hours but not more than 48 hours in advance. Supplies shall be normalised by 16:00 on the same day.

(e) Monthly statements and payment certificates

The statement to be submitted by the Contractor in terms of Clause 49 of the Conditions of Contract shall be prepared by the Contractor at his own cost, strictly in accordance with the standard payment certificate prescribed by the Engineer, in digital electronic computer format. The Contractor shall, together with a copy of the digital electronic computer file of the statement, submit two (2) A4 size paper copies of the statement.

For the purposes of the Engineer"s payment certificate, the Contractor shall subsequently be responsible,

at his own cost, for making such adjustments to his statement as may be required by the Engineer for the purposes of accurately reflecting the actual quantities and amounts which the Engineer deems to be due and payable to the Contractor in the payment certificate.

The Contractor shall, at his own cost, make the said adjustments to the statement and return it to the Engineer within three (3) normal workings days from the date on which the Engineer communicated to the Contractor the adjustments required. The Contractor shall submit to the Engineer five (5) sets of A4 size paper copies of such adjusted statement, together with a copy of the electronic digital computer file thereof.

Any delay by the Contractor in making the said adjustments and submitting to the Engineer the requisite copies of the adjusted statement for the purposes of the Engineer"s payment certificate will be added to the times allowed to the Engineer in terms of Subclause 49.4 of the Conditions of Contract to submit the signed payment certificate to the Employer and the Contractor. Any such delay will also be added to the period in which the Employer is required to make payment to the Contractor.

(f) Construction in restricted areas

Working space is sometimes restricted. The rates and prices tendered will be deemed to include full compensation for any difficulties encountered by the Contractor while working in restricted areas. No extra payment nor any claim for payment due to these difficulties will be considered.

(g) Notices, signs, barricades and advertisements

All notices, signs and barricades, as well as advertisements, may be used only if approved by the Engineer. The Contractor shall be responsible for their supply, erection, maintenance and ultimate removal and shall make provision for this in his tendered rates.

The Engineer shall have the right to instruct the Contractor to move any sign, notice or advertisement to another position, or to remove it from the Site of the Works if in his opinion it is unsatisfactory, inconvenient or dangerous.

(h) Workmanship and quality control

The onus to produce work that conforms in quality and accuracy of detail to the requirements of the Specifications and Drawings rests with the Contractor, and the Contractor shall, at his own expense, institute a quality control system and provide suitably qualified and experienced engineers, foremen, surveyors, materials technicians, other technicians and technical staff, together with all transport, instruments and equipment to ensure adequate supervision and positive control of the Works at all times.

The cost of supervision and process control, including testing carried out by the Contractor, will be deemed to be included in the rates tendered for the related items of work.

The Contractor's attention is drawn to the provisions of the various Standardized Specifications regarding the minimum frequency of testing required. The Contractor shall, at his own discretion, increase this frequency where necessary to ensure adequate control.

On completion and submission of every part of the work to the Engineer for examination and measurement, the Contractor shall furnish the Engineer with the results of the relevant tests, measurements and levels to demonstrate the achievement of compliance with the Specifications.

C3.4.2.6 Extension of time due to abnormal rainfall

The contractor shall not be permitted to work on the site during lightning activity.

(a) Extension of time in respect of delays resulting from wet climatic conditions on the Site will only be considered in respect of abnormally wet climatic conditions and shall be determined for each calendar month or part thereof, in accordance with the formula given below:

$$V = (Nw - Nn) + (Rw - Rn)/X$$

in which formula the symbols shall have the following meanings:

V = Potential extension of time in calendar days for the calendar month under consideration:
If V is negative and its absolute value exceeds Nn, then V shall be taken as equal to minus Nn.
When the value of V for any month exceeds the number of days in the particular month, V will be the number of days in the month.

Nw = Actual number of days in the calendar month under consideration on which a rainfall of Y mm or more was recorded on the Site

Nn = Average number of days, derived from existing records of rainfall in the region of the Site, on which a rainfall of Y mm or more was recorded for the calendar month

Rw = Actual rainfall in mm recorded on the Site in an approved rain gauge forthe calendar month under consideration

Rn = Average rainfall in mm for the calendar month, derived from existing records of rainfall in the region of the Site

The factor (Nw - Nn) shall be deemed to be a fair allowance for variations from the average number of days during which the rainfall exceeds Y mm.

The factor (Rw - Rn)/X shall be deemed to be a fair allowance for variations from the average number of days during which the rainfall did not exceed Y mm but wet conditions prevented or disrupted work.

(b) The rainfall records at the rainfall station as stated in the Rainfall Table following and the monthly averages (Rn and Nn) for this period shall, for the purposes of this Contract be taken as normal and as the values to be substituted for Rn and Nn in the formula above. The values of X and Y shall be 20 and 10 respectively.

The potential extension of time V has been calculated for each month and year of the period concerned to indicate the possible effect of the rainfall formula. The values of V were obtained by applying the rainfall formula and using the actual rainfall figures and the calculated values of Rn and Nn indicated in the table.

(c) The Contractor shall, at his own cost, provide and erect on the Site at a location approved by the Engineer, an approved rain gauge, which shall be fenced off in a manner which will prevent any undue interference by workmen and others. The Contractor shall, at his own cost, arrange for the reading of the rain gauge on a daily basis for the duration of the Contract. The gauge readings, as well as the date and time at which the reading was taken shall be recorded in a separate record book provided by the Contractor for this purpose. All entries in the rainfall
record books shall be signed by the person taking the reading and the gauge shall be properly emptied immediately after each reading has been taken. If required by the Engineer, the Engineer shall be entitled to witness the reading of the gauge.

(d) The Contractor"s claims in terms of Sub clause 10.3 of the Conditions of Contract for extension of time in respect of delays resulting from wet climatic conditions on the Site during each month, shall be submitted in writing to the Employer monthly;

provided always that the period allowed to the Contractor in terms of Clause 10.3 of the Conditions of Contract in which to submit his claim for each month shall be seven (7) days, calculated from the last day of the month to which the claim applies.

The Contractor's monthly claim shall be accompanied by a copy of the signed daily rainfall readings for the applicable month.

(e) The extent of any extension of time which may be granted to the Contractor in respect of wet climatic conditions (whether normal or abnormal) shall be determined as the algebraic sum of the "V" values for each month between the Commencement Date and the Due Completion Date of the Contract provided always that
(i) rainfall occurring within the period of the Contractor"s Christmas shut-down shall not be taken into account in the calculation of the monthly "V" values;

(ii) rainfall occurring during any period during which the Contractor was delayed due to reasons other than wet climatic conditions on the Site, and for which delay an extension of time is granted by the Employer, shall not be taken into account in the calculation of the monthly "V" values;

(iii) if the algebraic sum of the "V" values for each month is negative, the time for completion will not be reduced on account of subnormal rainfall, and

(iv) where rainfall is recorded only for part of a month, the "V" value shall be calculated for that part of the month using pro rata values for Nn and Rn.

(f) The Employer shall, simultaneous with granting any extension of time in terms of this clause, revise the Due Completion Date of the Contract to reflect an extension of time having been granted in respect of wet climatic conditions, to the extent of the algebraic sum of all the "V" values for all the preceding months of the Contract, less the aggregate of the "Nn" values for the remaining (unexpired) months of the Contract (viz less aggregate of the potential maximum negative "V" values for the remaining Contract Period). Thus, provided that where such period is negative, the Due Completion Date shall not be revised.

(g) Any extension of time in respect of wet climatic conditions granted in terms of this clause shall not be deemed to take into account delays experienced by the Contractor in repairing or reinstating damage to or physical loss of the Works arising from the occurrence of abnormal climatic conditions. Extension of time in respect of any such repairs or reinstatement regarding damage shall be the subject of a separate application for extension of time in accordance with the provisions of the Conditions of Contract.

(h) The Contractor shall make due allowance within his programme submitted for a total anticipated delay to items on the critical path resulting from wet climatic conditions, of 21 (twenty-one) normal working days during the Contract.

(i) Extension of time, if granted by the Employer, will be determined as the aggregate number of normal working hours for which all progress on the item or items on the critical path was brought to a halt as a result of wet climatic conditions, less the number of normal working days specified in subclause (d) above.

(j) In determining the revised Due Completion Date of the Contract, the Employer shall add the equivalent number of normal working days delay determined in accordance with subclause (e) and all intervening normal non-working days to the prevailing Due Completion Date.

C3.4.3 PLANT AND MATERIALS

C3.4.3.1 Plant and materials supplied by the Employer

None

C3.4.3.2 Materials, samples and shop drawings

(a) Samples

Materials or work which does not conform to the approved samples submitted in terms of Subclause 23.4 of the Conditions of Contract, will be rejected. The Engineer reserves the right to submit samples to tests to ensure that the material represented by the sample meets the specification requirements.

The costs of any such tests conducted by or on behalf of the Engineer, the results of which indicate that the samples provided by the Contractor do not conform to the requirements of the Contract, shall, in accordance with the provisions of Subclause 23.7 of the Conditions of Contract, be for the Contractor"s account.

C3.4.4 CONSTRUCTION EQUIPMENT

C3.4.4.1 Requirements for equipment

The Contractor shall provide proof that he has the required equipment and plant, which will be required for the successful completion of this project.

C3.4.4.2 Equipment provided by the employer

Nil.

C3.4.5 EXISTING SERVICES

C3.4.5.1 Known services

Existing cable routes are not available on drawings, and the contractor will have to take all reasonable care to find the existing services, and to protect or re-route the services, prior to any construction activities.

C3.4.5.2 Treatment of existing services

Not Applicable

C3.4.5.3 Use of detection equipment for the location of underground services

The contractor shall make his own arrangements at his own expense to locate existing services.

C3.4.5.4 Damage to services

The Contractor will be held liable for damage to any existing services.

C3.4.5.5 Reinstatement of services and structures damaged during construction

The Contractor will be responsible for the reinstatement of any services damaged during construction. Any reinstatement will be to the subject to the approval of the Engineer. The Contractor will be held liable for all costs for the reinstatement of services damaged during construction.

C3.4.6 PARTICULAR SPECIFICATIONS

See Part II of this document

C3.5 MANAGEMENT OF THE WORKS

C3.5.1 GENERIC SPECIFICATIONS

See Part II of this document.

C3.5.2 SUPERVISION

The contractor shall have the necessary supervision on site to ensure that all work is supervised by a competent and authorized person always. The works will be executed in a restricted area and will be executed under a permit system.

C3.6 HEALTH AND SAFETY

C3.6.1 HEALTH AND SAFETY REQUIREMENTS AND PROCEDURES

(a) Construction Regulations, 2003

The Contractor shall be required to comply with the Occupational Health and Safety Act, 1993: Construction Regulations, 2003 (the regulations) as promulgated in Government Gazette No 25207 and Regulation Gazette No 7721 of 18 July 2003. Non-compliance with these regulations, in any way whatsoever, will be adequate reason for suspending the Works.

The proposed type of work, materials to be used and potential hazards likely to be encountered on this Contract are detailed in the Project Specifications, Schedule of Quantity and Drawings, as well as in the Employers' health and safety specifications (regulation 4(1)) of the Construction Regulations 2003,which are bound in the Contract document/will be issued separately by the Employer.

The Contractor shall in terms of regulation 5(1) provide a comprehensive health and safety plan detailing his proposed compliance with the regulations, for approval by the Employer.

The Contractor shall at all times be responsible for full compliance with the approved plan as well as the Construction Regulations and no extension of time will be considered for delays due to non- compliance with the abovementioned plan or regulations.

A payment item is included in the Schedule of Quantities to cover the Contractor's cost for compliance with the OHS Act and the abovementioned regulations.

C3.6.2 PROTECTION OF THE PUBLIC

The Site is within a restricted area and the Contractor will take all measures required not to allow members of the public access to the Site.

C3.6.3 BARRICADES AND LIGHTING

The Contractor is required to implement the relevant regulations in terms of the OHS Act. The contractor is advised to barricade his work areas from such live parts of the network to ensure the safety of his employees.

C3.6.4 TRAFFIC CONTROL ON ROADS

Not Applicable

C3.6.5 MEASURES AGAINST DISEASE AND EPIDEMICS

The Contractor shall, in his Health and Safety Plan, make provision for measures against the spread of disease and epidemics.

C3.6.6 AIDS AWARENESS

The Contractor shall, in his Health and Safety Plan, make provision for the education of his personnel in the dangers and complications related to the transfer of AIDS. Regular informative sessions shall be held, preferably at the same time as the Safety Meetings, where the methods for the prevention of Aids are explained and discussed.

The Contractor"s personnel shall be fully informed about the Aids awareness campaigns, counselling clinics and medical aid available to suspected sufferers of the disease.

Part C4 Site Information

C4.1 LOCALITY PLAN

C4.2 GPS COORDINATES

KWAKWATSI AREA: 24°46'42.74"S ; 27°16'30.19"E

C5: GENERAL & DETAIL SPECIFICATION STANDARD TECHNICAL REQUIREMENTS

5.0 GENERAL

Bids shall be evaluated based on the completeness of the Technical Schedules and Supporting Materials & Equipment Specifications submitted in-line with the specifications herein. However, additional proposals for alternative specifications and designs in-line with best international practices and technological developments are welcome.

All technical schedules shall be completed and submitted as part of the technical bid. The full manufacturer specification documentation of all the equipment supplied shall be submitted as part of the technical bid. Bids that lack completed technical schedules, or manufacturer specification documentation shall be considered non-compliant.

The Contractor shall provide a detailed work plan that shall include the starting date for mobilizing adequate resources and the time schedule for all works up to the completion and commissioning of the substation. The effective start date of the work schedule submitted as part of the bid documentation shall be taken to be 60 days from the close of bids.

The Contractor shall furnish all tools, plant, instruments, qualified supervisory personnel, labour, materials, any temporary works, consumables etc. whether or not such items are specifically stated herein, for completion and commissioning of the substation in accordance with specification requirements.

This Specification covers the supply of all materials, the execution of all works, including all design and investigative work and all commissioning, necessary for the satisfactory completion and operation of the Project. However, should there be any details of construction or materials which have not been referred to in the Specification, but the necessity for which are usual or essential to the completion of all works in all trades, the same shall be deemed to be included in the Contract Price.

The bidder shall supply as part of the bid documentation the completed Technical Schedules with supportive documentation for all the specifications included in this Terms of Reference. The supportive documentation shall include the manufacturer"s equipment specifications, operating and maintenance manuals, data sheets etc. that verify the information submitted by the bidder in the Technical Schedules.

The bidders shall include as part of the bid documentation the Type Test Reports for the following:

- HV and MV Cables
- Substation RTU
- The DC System and Battery Banks
- The Surge Arrestors and Counters
- Power Transformers
- Switchgear
- Auxiliary Transformers

Type test reports from an independent and recognized testing authority shall be submitted. The submitted Type test reports shall not be older than five (5) years from the date of bid opening.

5.1 Design and Standardization

All Equipment shall be designed to ensure satisfactory operation in all atmospheric conditions specified in section 6.1.2 and during such sudden variation of load and voltage as may be met with under working conditions on the system, including those due to faulty synchronising and short circuit.

The designs shall incorporate all reasonable precautions and provisions for the safety of thoseconcerned in the operation and maintenance of the substation equipment and of associated works supplied under other contracts.

Where the Specification does not contain characteristics with reference to workmanship, equipment, materials and components of the covered equipment, it is understood that the same must be new, of highest grade of the best quality of their kind, conforming to best engineering practice and suitable for the purpose for which they are intended.

The design of the Works shall be such that installation, future expansions, replacements and general maintenance may be undertaken with a minimum of time and expense. Each component shall be designed to be consistent with its duty and suitable factors of safety, subject to mutual agreements and shall be used throughout the design.

5.2 Quality Assurance

The Contractor shall submit as part of the bid documentation, a quality management plan, for the assurance of quality of construction and installation of the works. The contractor shall also submit as part of the bid documentation, quality management plans for each of the different suppliers of equipment to be used in the substation.

The quality assurance arrangements shall conform to the relevant requirements of ISO 9001 or ISO 9002 as appropriate.

The systems and procedures which the Contractor will use to ensure that the Works comply with the ToR requirements shall be defined in the quality management plan for the works.

The quality management plan for the works shall set out the activities in a logical sequence and, unless advised otherwise, shall include the following:

a) An outline of the proposed work and program sequence

b) The duties and responsibilities assigned to staff ensuring quality of work for project

c) The inspection of materials and components on receipt

d) Reference to the Contractor‟s work procedures appropriate to each activity

e) Inspection during fabrication/construction

f) Final inspection and test

The Contractor shall retain responsibility for the disposition of non-conforming items.

During the course of the project, the Employer will monitor the implementation of the Quality Assurance arrangements. Monitoring will be by surveillance of the activities on site and/or by formal audits of the

adherence of the Contractor to the systems and procedures which constitute his Quality Assurance arrangements.

Corrective actions shall be agreed and implemented in respect of any deficiencies

The Contractor shall provide any facilities, including access, which may be required by the Employer for monitoring activities.

5.3 Health Safety and Environment (HSE)

The Contractor shall at all times adhere to the Safety Policy when carrying out these works. Within one month of award of contract the Contractor shall submit an HSE Plan for the project, for the approval by the Employer

The primary objective of the HSE Plan is for the contractor to demonstrate that he has the capability to carry out the project works in a cost-effective manner, giving due consideration to the Health, Safety and Environmental management of both his own employees, those of the Employer and anyone who may be affected by his activities.

The HSE Plan shall conform to the following general structure:

a) Contractors Policy Statement

b) Health

c) First Aid

d) Occupational health

e) Safety

f) Motivation and communication

g) Emergency response

h) Safety function

i) Accident investigating and reporting

j) Personal protective equipment

k) Environment

l) Waste management

The Contractor shall avail personnel to be present for NGWATHE Local Municipality Safety Training / Induction. The Contractor shall at all times ensure the following:

- All personnel on site shall at all times have the required personal safety equipment
- The Contractor shall at all times limit access to the site to only the Contractor‟s personnel and the Employer representatives
- The Contractor shall ensure adequate access control measures are in place

- The Contractor shall have a safety representative present on site at all times. The safety representative shall be a trained Safety, Health, Risk, Environment and Quality (SHREQ) Officer, with experience in enforcing SHREQ requirements on construction sites.

- The Contractor shall provide all equipment required for the safe execution of the works. The Contractor shall ensure that all such equipment supplied is in good working order.

Should there be any details regarding safety which have not been referred to in the Specification, but the necessity for which are usual or essential to the completion of all works in all trades, the same shall be deemed to be included in the Contract Price. Failure to adhere to the safety requirements shall result in the stoppage of works. All additional costs incurred as a result of such delays, to ensure timely completion of the milestones, shall be borne by the Contractor.

The Contractor shall ensure the security of all equipment and personnel on site at all times until the station is formally handed over to the Employer.

5.4 Progress Reporting

The Contractor shall submit a weekly progress report detailing the progress of all works during the execution of the works. The reports shall show clearly and accurately the position of all activities associated with engineering, material procurement, works tests, shipping, site erection, testing and commissioning with regard to the agreed project schedule. The progress reports shall contain photographic documentation.

The site works shall be segregated into civil and electrical works for reporting purposes and each section of the site works shall be monitored giving the percentage completion and the estimated completion date in accordance with the project schedule. The number of men working on site, both labour and supervisory staff, shall be reported together with any incidents or events that may affect theprogress of site works.

Any delays which may affect any milestone or final completion dates shall be detailed by the Contractor who shall state the action taken to effect project completion in accordance with the project schedule.

5.4.1 Standards

Except otherwise specified or implied, the Project Works shall comply with the latest edition of the relevant International Electrotechnical Commission (IEC) standards, British Standards (BS), and any other standards mentioned in this Terms of Reference. In case of conflict the order of precedence shall be (1) IEC, (2) BS.

Reference to a particular standard or recommendation in this Terms of Reference does not relieve the Contractor of the necessity of providing the Project Works complying with other relevant standards or recommendations.

5.4.2 Language and system of units

The English language shall be used in all written communications between the Employer and the Contractor with respect to the services to be rendered and with respect to all documents and drawings

procured or prepared by the Contractor pertaining to the work, unless otherwise agreed by the Employer.

The design features of all equipment shall be based on the SI system of units.

5.4.3 Drawings

Within 14 days of project commencement, the Contractor shall submit, for approval by the Employer the detailed design drawings. The detailed design drawings shall include drawings for all electrical andcivil works and these shall be submitted to the Project Manager for approval before construction.

The Contractor shall submit all drawings for approval in sufficient time to permit modifications to be made if such are deemed necessary, and the drawings to be re-submitted without delaying the initial deliveries or completion of the Project works. The Employer reserves the right to request any additional information that may be considered necessary in order to fully review the drawings.

Drawings submitted by the Contractor and approved by the Employer shall not be departed from without the instruction in writing of the Employer.

The Contractor shall be responsible for any discrepancies or errors in any omissions from the drawings, whether such drawings have been approved or not by the Employer. Approval given by the Employer to any drawing shall neither relieve the Contractor from his liability to complete the Project works in accordance with Specifications nor exonerate him from any of his guarantees.

Upon approval, the Contractor shall then prepare construction drawings for submission to the Local Government authorities for approval. The Contractor shall be responsible for the construction drawing approval process. Approval/acceptance by the Employer shall in no way relieve the Contractor of his sole accountability for the adequacy of all designs used on the substation.

5.4.4 CIVIL WORKS

5.4.4.1 Geotechnical Investigations

The geotechnical investigation for assessing suitable type and size of foundations for structures and equipment included bore holes, plate load tests and trial pits. Laboratory tests on soil and water samples were carried out to establish type of cement to be used in the works and suitability of water for construction.

The geotechnical investigations were carried out under the direction, control and supervision of a qualified and experienced geotechnical specialist. The report from the geotechnical specialist formed the basis for the detailed civil designs of the substation. A copy of the report is appended to this report and details the following:

- Geological information of the region
- Past observations and historical data, if available, for the area or for other areas with similar profile or for similar structures in the nearby area.
- Procedure of investigations employed, field test results and laboratory test results.
- Net safe bearing capacity and settlement computation for different types of foundations for various widths and depths.
- Shallow foundations for transformers, sub-station structures and other buildings etc.
- Recommendation regarding roads.
- Recommendations regarding stability of slopes, during excavations, etc.
- Selection of foundation types for transformer, buildings etc.
- Borehole and trial pit logs on standard proforma showing the depths, extent of various soil strata etc.
- Depth of ground water table and its effect on foundation design parameters.
- Recommendations for the type of cement to be used and any treatment to the underground concrete structures based on chemical composition of soil and subsoil water.

Further to the geotechnical investigations, soil resistivity tests were carried out. The results of the soil resistivity tests shall form the basis of the earth mat design of the substation and are appended to this report.

5.4.4.2 Earth Works

This section covers the general requirements of earthwork in excavation in different soils and strata including rock, site grading, filling in areas, including importing excavated approved material from borrow pits, filling back around foundations and in plinths including consolidation, conveyance and disposal of surplus unwanted spoils.

The Contractor shall carry out the survey of the site before excavation and set properly all lines and establish levels for various works such as earthworks in excavation for grading, foundations, plinth filling, access roads, drains, cable trenches, etc. Such survey shall be carried out by taking accurate cross sections of the area perpendicular to established reference/ grid lines at 5m intervals or nearer based on ground profile. The excavation shall be done to correct lines and levels in all types of strata such as soil, soft murrum, hard murrum, soft rock, hard rock etc. This shall also include, where required, proper shoring to maintain excavations and also the furnishing, erecting and maintaining of adequate barricades around excavated areas and warning lamps at night for ensuring safety.

The following earth works/ clearance activities shall be carried out as per the Civil and Structural Specifications.

- Site clearance
- Excavation
- Removal of small trees, shrubs, hedges and roots
- Stripping/handling topsoil
- Trench fill foundations
- Unstable ground.

5.4.4.3 Concrete and Allied Works

All concrete works shall be done in accordance with the Civil and Structural Specifications. If any deviations are required from this, this must be discussed with the Employer or the approved Employer"s representative.

5.4.4.4 Formwork

All concrete works shall be done in accordance with the Civil and Structural Specifications. If any deviations are required from this, this must be discussed with the Employer or the approved Employer representative.

5.4.5 Yard Surfacing

The yard surface is defined, as any area of the site not occupied by buildings, foundations, cable ducts, or by other structures or equipment. The site is to be connected to the local road with asphalt surfacing.

The yard area within the site and around the buildings and transformer bays is to be a reinforced concrete ground bearing slab topped with 20mm thick hot rolled asphalt surface course.

The slab is to be integral with a low concrete wall where necessary to prevent surface water entering the site. The slab is generally to be laid to falls so that it drains to the east to the site entrance.

The rest of the yard area shall be covered with aggregate surfacing. The entire switchyard area shall be levelled before placing the site surfacing/gravel fill material. After all the aggregate materials have been put on site, the surface shall be rolled or compacted with suitable water sprinkling to form a

smooth and compact surface condition ready to receive the aggregate. Perforated polythene membrane of a minimum thickness of 1200 (300mμ) shall be laid under a layer of murrum. Crushed broken aggregate of 20 mm nominal size shall then be spread, rolled and compacted to a thickness of 100 mm.

The design and layout of the site entrance must be coordinated with equipment suppliers to take into account the delivery and replacement of equipment, especially the transformers by Abnormal Vehicles. The design and layout for the site access and the proximity of the site boundary to the local roads shall adhere to the South Africa National Roads Agency (UNRA) requirements.

5.4.6 Fencing Works

The substation shall be fenced off from the general public. The substation boundary fence and entrance gates shall be made of galvanised Clearview fencing and shall comply with the Civil Specification. The palisade boundary fencing shall traverse the substation yard including the guard house and the WC toilet.

The gate shall be a sliding gate approximately 6.0 m wide x 2.4m high made of 100 x 50 x 3.0 mm bottom rail, 75 x 50 x 3.0 mm side, and top rail. Filled with 40 x 40 x 3 mm hot dip galvanised mild steel angle iron welded to SHS vertical bars at 150mm centres with spear shaped top; including end posts; mild steel guides, galvanized MS wheels with dust proof steel roller bearings; including galvanized mild steel angle track and all associated accessories complete with all necessary locking accessories. All gates shall be fitted with lock mechanisms able to accommodate pad locks with a shackle diameter of at least 15 mm. The guard house shall be fenced off from the rest of the substation area with a palisade fence with mild steel angle posts and shall also have a man gate fitted of 900mm wide.

All fences and gates shall be aligned upright with all parts appropriately aligned vertically and horizontally.

5.4.7 Cable Trenches

5.4.7.1 MV / Control Cable Trenches

Cable trenches shall be as specified in the Civil and Structural specification document. The trench dimensions shall be designed to support a transformer of 50 tonnes and the loads associated with jacking and installation or removal of the transformer. All cable trenches within the plant house and within the substation yard shall be 800mm in width and 1.5m in depth whereas the trenches within the substation yard shall be 800mm in width and 1.5m in depth. All concrete below ground shall be designedand detailed as water resisting.

All cable trenches shall be provided with approved cable support system capable of preventing cable contact with the invert of the trenches. Provisions shall be made with the transformer bunds and cable trenches for support of the 88 kV and 6.6 kV transformer cables and also to support cable trays for the transformer control cabling.

Trenches shall be provided with removable, suitably sized precast concrete covers where indicated in the specification. Galvanized steel angle irons shall be welded onto the precast covers along the edges of the cable trenches and shall have 2 No. lifting holes fitted with collapsible lifting handles. Cable trenches and pre-cast removable RCC covers shall be as per the specification. Cable trenches shall not be used as storm water drains, the top of cable trench shall be such that the surface rainwater does not enter the trench.

The cable trenches shall be able to drain out any storm water that gains entry into the trenches.

5.4.7.2 Earthing and Lightning

The Contractor is responsible for the installation of the substation earthing mat in accordance with the Earthing and Lightning Specification. The earthing mat shall be designed such that the substation meets the requirements of IEEE Std. 80 Guide for Safety in AC Substation Grounding. The contractor shall supply detailed calculations as part of the detailed design submissions, proving that the requirements of the IEEE Std. 80 have been met in the design of the substation earthing.

All fences shall be bonded to the substation earth electrode as follows:

- For normal fences, at intervals not exceeding 20 m
- On both side posts of all gates and removable panels

The connection between the fence and the substation earth electrode shall comprise of the following parts:

- Copper earth conductor connected to the fence post at a nominal depth of 100 mm below terrace top level and to the below ground earth electrode
- The earth conductor shall be bonded to the fence posts by means of a 16mm diameter clamp and the contact surfaces shall be treated with non-oxidizing grease prior to clamping.
- The earth conductor shall be bonded to the below ground earth electrode by means of oxy-acetylene brazing.

An aerial lightning conductor shall be installed above the substation as described in the Earthing and Lightning Specification.

5.4.7.3 Steelwork

All steelwork is to be designed, fabricated and erected in accordance with the Civil and Structural specification clause G10. All Steelwork shall be bonded to the substation earth mat, and be provided with portable earth ball connections on the steelwork.

5.4.7.4 Access Road and Storm Water Drains

The Contractor shall be responsible for constructing approach roads, sub-station roads and service roads within the substation area. Access roads into the substation yard shall be constructed to permit transportation of the required equipment under all weather Conditions.

The forecourt area in front of the switch house and transformer bays is to comprise a ground bearing reinforced concrete slab on well compacted granular fill, designed to support the loads from equipment delivery vehicles and associated loads.

The design and layout of the site entrance must be coordinated with equipment suppliers to take into account the delivery and replacement of equipment, especially the transformers by Abnormal Vehicles. The design and layout for the site access and the proximity of the site boundary to the local roads shall

adhere to the South Africa National Roads Agency (SANRAL) or Roads Agency Limpopo (RAL) requirements

The Contractor shall construct the storm water drainage system, (culverts, ditches, drains etc.) to as per the specifications. The drainage system shall accommodate general surface water and water from roofs, roads, transformer bunds and foul drainage. The surfaces of the site shall be sloped to prevent the ponding of water. The Contractor shall ensure that water drains are away from the site area and open storm water drains shall be provided on both sides of the roads designed to drain the road surface.

The Contractor shall obtain rainfall data and ensure that the design of the storm water drainage system, (culverts, ditches, drains etc.) can accommodate the most intense rainfall that is likely to occurover the catchments area in one hour period on an average of once per ten years.

5.4.7.5 Transformer Plinth, Oil Sump and Interceptor

The transformer plinth and bunds were designed to support a transformer of 50 tonnes and the loads associated with jacking and installation or removal of the transformer. All concrete below ground was designed and detailed as water resisting. The depth of foundation was determined based on the recommendations of the geotechnical investigations conducted by the Specialist Consultant. All foundations are reinforced with steel and where not required on the basis of the calculations, nominal reinforcement is provided. Transformer foundation allows for oil collection pit and an oil interceptor.

The transformer plinth concrete is as per the Civil and Structural specification.

The bund wall allows for rainfall and oil to be drained to the oil interceptor tank and then on to a soak away. The transformer bund is filled with single size (40 to 100 mm particle size) stone to provide sufficient porosity such that each bund can retain the oil from one transformer. The transformer oil sump is covered by a hot-dip galvanised steel grating. The steel grating is covered by a layer of stone chipping. The design of the steel grating including the size and depth of layers of the stone chippings is submitted as part of the Detailed Design.

The oil interceptor shall be capable of retaining the oil from the transformers. An oil recovery system shall be provided for the transformer in order to avoid spread of fire by the oil and for environmental protection by providing suitable sump pits which can accommodate 125% oil of the transformer. The transformer oil sump shall be covered by a hot-dip galvanised steel grating. The steel grating shall be covered by a layer of stone chipping. The design of the steel grating including the size and depth of layers of the stone chippings shall be submitted as part of the Detailed Design. The required drawing shall be approved by appointed authorized authority before taking up the foundation work.

Provisions shall be made with the transformer bunds for support of the 88 kV and 6.6 kV transformer cables and also to support cable trays for the transformer control cabling.

A steel firewall shall be included in the design, to be erected between the two transformers.

5.4.7.6 Substation Switch room Building

The Substation Switchroom Building shall house separate 6.6 kV switch room, a control room and a battery room. The structure shall comprise in-situ concrete foundations, cable trenches, basement and ground floor slab with load bearing masonry walls and external walls, a suspended reinforced slab to bear the loads of cable racking and piping and a pitched roof topped with profiled metal sheets. The internal finish to the switch house will be painting, applied to a pointed and jointed face of concrete block work and subject to Employer approval. The building is to be constructed in accordance with the

Civil and Structural Specification. Reinforced concrete detailing and reinforcement scheduling is to be carried out by the Contractor.

The switch rooms have been sized to accommodate the necessary switchgear and allow for future expansion of both switchboards by one panel on either side. Necessary safety clearances between the switchboard and the walls and ceiling have been considered and adhered to during design.

Earthing bars within the switch room building and cable trenches must be installed and connected to the earthing mat.

5.4.7.7 Labelling

All equipment and operating labels shall be black lettering on an orange background except otherwise specified. Labels shall be finished in vitreous enamel having a minimum guarantee of 25 years. The vitreous enamel labels shall be manufactured from mild steel plates at least 0.5 mm thick.

The following combined notices shall be displayed in a conspicuous position, such as on the wall of the building facing the normal direction of approach, so that they may be referred to when required:

- A notice of procedure in case of fire
- A notice on how to resuscitate persons suffering from the effects of electric shock
- A complete labelling schedule must be provided to the contractor

5.4.7.8 Requirements for Signs and Notices on Buildings

The switch house shall have the following notices and signs displayed at each entrance:

- A notice prohibiting unauthorized persons from entering
- A notice prohibiting unauthorized persons from handling or interfering with electrical machinery
- A warning of electric shock hazard sign
- Any other mandatory signs only when they are applicable

5.4.7.9 Requirements for Signs and Notices on Perimeter Fences

All entrances (locked gates) in the perimeter fence shall have the following notices and signs exhibited:

- A notice prohibiting unauthorized persons from entering;
- A notice prohibiting unauthorized persons from handling or interfering with electrical machinery;
- A warning of electric shock „Hazard" sign.

On the perimeter fences between the entrances, all that is required is a single combination of the notices described above.

Where there is only one entrance to the yard, a single combination sign per side is required.

5.4.7.10 Fire Detection and Suppression

Fire detection/ suppression for electrical fires and CO_2 fire extinguishers in and around the control room are be supplied and installed as detailed in the Mechanical and Electrical Services Specification The Contractor shall supply at least three (3) fire extinguishers filled with carbon dioxide gas and shall be rated for putting out fires whose fuel is flammable or combustible liquid and electrical fires involving potentially energized electrical equipment.

The other fire extinguishers shall be suited for outdoor storage and shall be installed on outdoor cubicles and pole structures within the substation switchyard.

5.4.7.11 Furniture and Accessories

- A working Steel Table with minimum one drawer and two chairs should be supplied. Table should be adequately sized to handle A0 Drawings.
- A key cabinet with a breakable window should be installed against the wall to house operating keys.
- A two to three step ladder is to be provided for use inside the control room when working on panels.
- A Steel Cabinet shall be supplied and installed to house operating Manuals drawings and tools as well as appropriate tool racks.
- A lockable transparent cabinet to house the single line diagram of the substation shall be supplied.
- Insulating mats, conforming to IEC 62222:2009, to be placed in front of the 6.6 kV.

6.0 ELECTRICAL EQUIPMENT SPECIFICATION AND INSTALLATION REQUIREMENTS

This section gives the specifications of all equipment that shall be supplied by the contractor. All technical schedules shall be completed and submitted as part of the technical bid. The full manufacturer specification documentation of all the equipment supplied shall be submitted as part of the technical bid. Bids that lack completed technical schedules, or manufacturer specification documentation shall be considered non-compliant.

6.1 Service Conditions

6.1.1 Power System Characteristics

All equipment supplied shall be suitable for the connection to the NGWATHE network where applicable:

Table 4: Power Systems Characteristic Requirements

System	Units	88 kV	6.6 kV	415 V
Frequency	Hz	50 ± 1 %	50 ± 1 %	50 ± 1 %
Number of Phases		3	3	3 & Neutral
Phase Rotation		ABC	ABC	ABC
System Nominal Voltage	kV	132 ± 10 %	22 ± 10 %	0.415 ± 10%
System Maximum Voltages	kV	145	24	0.4565
3 Phase Short Circuit Current	kA	31.5	25	30
Earth Fault Current	kA	31.5	25	30
Short Time Current Duration	Seconds	3	3	3
System Earth Connection		Unearthed	Solid Earth	Solid Earth
Power Frequency Withstand	kV	275	50	3
Lightning Impulse Withstand with 1.2 µs rise time	kV	650	145	70

6.1.2 Environmental Conditions

All equipment supplied shall be suitable for operation in the following conditions:

Table 5: Environmental Conditions

Details	Units	Value
Maximum altitude above sea level	M	1500
Maximum ambient temperature	°C	50
Maximum daily average ambient air temperature	°C	35
Maximum temperature attainable by an object exposed to the sun	°C	60
Maximum yearly weighted average ambient temperature	°C	32
Maximum relative humidity	%	100
Average number of thunderstorm days per annum (isokeraunic level)	number	70
Average number of rainy days per annum	number	120
Average annual rainfall	Cm	150
Maximum wind pressure	kg/m2	94.3
Class of pollution (IEC 60815-1:2009)		Medium „C"
Condensation		Yes

6.1.3 Protection

6.1.3.1 General

Multifunction protective relays shall be installed on the low voltage compartment door. These shall be the latest generation numerical, microprocessor based, three phase relays and shall be UL-Listed or UL-recognised, one of which shall be a bay controller, and shall be capable of performing a wide range of integrated protection functions as follows:

The equipment is intended for installation in remote, unattended substations. The protection equipment shall therefore be designed for minimum attention and maintenance.

6.1.3.2 Relay Functional Requirements

Every part of the system shall have continuous self-supervision and user-friendly diagnostic functions with clear alarm outputs to indicate malfunctions in the protection and control system.

The devices must be designed to operate in an electrically hostile environment, with stringent requirements on electromagnetic interference immunity. Restrictions on radiated emissivity shall be adhered to.

The relays shall provide monitoring of the CT and VT circuits and alarm on circuit failure.

The relays shall provide a graphic mimic display visually indicating:

- The position (open/closed) of the circuit breaker
- The position (open/closed) of the Disconnector / Isolator Switch
- The position (open/closed) of the Earth Switch
- Protection function trip and metering data

Unlimited user-configurable Human Machine Interface (HMI) screens shall allow the user to create unique single line displays with a simple tool or from an existing library.

In the case of interruption of power supply to the protection relays, the entire software, all saved data and the counters must be preserved in a non-volatile manner without batteries. Technology used must be capable of monitoring both itself and the release circuits.

The relays shall provide key locking to prevent unauthorized switching either local or remote. Unauthorized Local Switching, except for Emergency Tripping, shall be prevented by use of passwords.

The relays shall be capable of internally performing main-tie-main auto-transfer and auto-restore functions.

The relays shall have nine programmable function keys to replace control switches.

The relays shall have programmable logic capabilities to permit use in protection and control systems. Programming software must be compliant with IEC 62231 standard for PLC programming.

The relays shall have a modular communications processor to permit field change between Modbus RTU, Profibus-DP, Profibus-FMS, DNP3.0-Serial, DNP3.0-TCP/IP, IEC 60870-5-103 and IEC 61850 protocols. The relays shall be able to support point to point and ring modes of communications and also have RJ45 and fibre optic communication physical interfaces. The required communicationmedium for the relays is fibre optic cabling.

The relays binary inputs shall be provided with chatter blocking and filter time. The chatter blocking shall block a binary input indication and prevent the generation of indications when the signal cannot be interpreted. The filter time indicates how long a signal must be present before it shall be interpreted as an indication. This shall serve to suppress short, intermittent changes. These two features shall be available and settable separately for each binary input indication.

The relays shall provide four protection settings groups. Setting group changes shall be available locally through front function key and binary input, remotely through operator or service communicationinterface using a personal computer and via system interface (IEC 61850, DNP3, IEC 60850-101, IEC 60850-104, Profibus, Modbus, etc.).

The relays must provide 20 flexible functions that shall be used to create additional protection functions to maximize application flexibility.

The relay software shall allow relay configuration through Windows based software current up to Windows 7.

The relays shall provide complete sequence-of-events recording, time stamped in milliseconds under all conditions. The relays shall provide oscillography (waveform) capture, with configurable pre- and post-fault data capture times. All internally and externally generated binary values shall be configurable to appear in the custom generated fault. Information containing time, date, interrupted current amperesper phase, time in pickup, trip open, close or user programmed status points, etc., shall be displayed.

Logging of system and protective events, last 200 events (accessible via front RS-232 communications port and rear service communications port used to connect to a personal computer having an RS-232 port or USB).

Log of last eight faults (maximum five second record time) containing date and time stamps, pickup and tripping signals, interrupted current amperes, voltage, etc. The analogue quantities displayed in the oscillography shall have the option for viewing in either primary or secondary quantities.

Fault records shall be in the industry standard COMTRADE® format that shall be imported or exported.

All logging settings, annunciations, fault records, Binary I/O and LED assignments must have easy to print options and easy file transfer capabilities.

Relay software shall have feature for archiving or retrieving an entire project that includes all subfolders and relay files in one simple to use feature.

A measurement supervision feature shall be provided for monitoring external current and voltage transformers connected to the relay.

The software shall have the capability of entering the settings in both primary and secondary quantities.

The current transformer polarities shall be reversible using a setting in the software when it becomes necessary.

The software shall include a commissioning tool for all hardware (BI/BO/LEDs) and SCADA mapped points.

The software shall be compatible with earlier version relay firmware releases.

The software shall have a capability to assign an IP address to the relay allowing for a web browser commissioning tool feature to view relay information online.

6.1.3.3 Transformer Protection

The 88 kV transformer feeders shall have the following protection scheme and functionality implemented:

- Differential (87), protection zone consisting of the transformer and the 88 kV feeder and 6.6 kV cables
- LV Restricted Earth Fault (64REF)
- Balanced Earth Fault (64BEF)
- Over current and Earth Fault (50/50N)
- Time delayed Overcurrent and Earth Fault (51/51N)
- Lockout (86)

The 6.6 kV transformer feeders shall have the following protection scheme and functionality implemented:

- Overcurrent and Earth Fault (50/50N)
- Time Delayed Overcurrent and Earth Fault (51/51N)
- Time Delayed Overcurrent and Earth Fault (51/51N)
- Standby Earth Fault (SBEF) (64N)
- Lockout (86)

The transformer shall also have the following protective devices to alarm and/ or trip the 88 kV transformer feeder:

- Main tank Buchholz relay (Alarm and Trip)
- OLTC Buchholz relay (Trip)
- Oil temperature (Alarm and Trip)
- Winding temperature (Alarm and Trip)
- Pressure Relief Device Main Tank (Trip)
- Pressure Relief Device Tap Changer (Trip)

6.1.3.4 Line Feeder Protection – 88 kV

The 88kV line feeders shall have the following protection schemes and functionality implemented:

- Distance (21)
- Overcurrent and Earth Fault (50/50N)
- Time delayed Overcurrent and Earth fault (51/51N)
- Sensitive Earth Fault (50Ns)
- Auto-reclose(79)
- Lockout (86)
- Phase imbalance (46)

- **6.1.3.5 Line Feeder Protection – 6.6 kV**

The 6.6 kV line feeders shall have the following protection schemes and functionality implemented:

- Overcurrent and Earth fault (50/50N)
- Time delayed Overcurrent and Earth fault (51/51N)
- Sensitive Earth Fault (50Ns)
- Phase Imbalance (46)
- Phase Sequence (47)
- Auto-reclose (79)
- Lockout (86)

- **6.1.3.6 Inter-Tripping**

Inter-tripping shall be implemented from the 88 kV transformer circuit breaker to the 6.6 kV transformer circuit breaker such that a trip on the 88 kV transformer breaker will cause the 6.6 kV transformer breaker to trip and not close while the 88 kV transformer circuit breaker remains open. Similarly, a trip on fault of the 6.6 kV transformer breaker will cause the 88 kV transformer breaker to trip. Where circuit breakers are of the racking type, any racking out action on the 6.6 kV transformer circuit breaker will cause the 88 kV transformer circuit breaker to trip to avoid exposure of personnel to a live chamber.

6.1.3.7 Inter-Locking

The interlocking shall be implemented to:

- Prevent the closing of the 6.6 kV transformer breaker when the 88 kV circuit breaker is open
- Prevent the earthing of the 6.6 kV transformer breaker when the 88 kV transformer feeder isolator is closed
- Prevent the earthing of the 88 kV transformer breaker when the 6.6 kV transformer feeder isolator is closed
- Prevent the closing of the 6.6 kV bus coupler while the transformer OLTCs of the transformers feeding the two bus sections are in different tap positions.
- Prevent the closing of the 88 kV line feeder earth switches while the associated 132kV feeder is energised
- Prevent the earthing of a bus section while the isolators of the feeders associated with that particular bus section are closed

The interlocking shall be implemented using physical wiring.

6.1.4 Installation

Type MMLG01 test blocks or similar quality shall be provided for each relay to allow the secondary injection and circuit breaker timing tests to be carried out. Test plugs shall be provided and shall provide facility to short the current transformers at the test block.

Each protection relay shall be supplied with one test socket.

The test socket should be wired such that:

1. Connection of the test socket isolates and shorts out the CTs
2. Connection of the test socket isolates trips from the IED to the CB
3. Connection of the test socket isolates the IED such that it powers down

All relays shall be supplied at 110 V DC and shall operate satisfactorily to 85% supply voltage.

The housing shall be a sealed dust proof environment for the relay internal electronics. Heat build-up must be dissipated through the surface area of the steel enclosure. Protection relays shall operate reliably for the given climate conditions.

6.1.5 Control Wiring

All control wiring shall be factory installed, complete with bundling, lacing and protection where necessary and complying with the following:

1) Flexible conductors of No. 14 AWG for wires across hinges, control and CT and VT circuits and for interconnections between shipping units.
2) Conductors sized according to the duty required.

6.1.6 Labelling

The Contractor shall supply equipment labels made of steel plates of 1200 mm x 300 mm and a thickness of at least 1.8 mm with engraved writing.

All equipment and operating labels shall be black lettering on an orange background except otherwise specified. Labels shall be finished in vitreous enamel having a minimum guarantee of 25 years. The vitreous enamel labels shall be manufactured from mild steel plates at least 0.5 mm thick.

The following combined notices shall be displayed in a conspicuous position, such as on the wall of the building facing the normal direction of approach, so that they may be referred to when required:

1. A notice of procedure in case of fire
2. A notice on how to resuscitate persons suffering from the effects of electric shock
3. A complete labelling schedule must be provided to the contractor.

The transformer label shall be installed on a frame made from steel angle bars that shall be planted in the ground such that the label is 700 mm above the ground. The angle bars shall be of 25 mm x 25 mm and have a thickness of 1.8 mm.

The labels for the incoming and outgoing lines, bus bar and other pole-mounted equipment shall be installed on an angle bar that shall be installed on the H-pole structures. The angle bar shall be 25 mm x 25 mm and have a thickness of 1.8 mm.

The switch house shall have the following notices and signs displayed at each entrance:

4. A notice prohibiting unauthorized persons from entering
5. A notice prohibiting unauthorized persons from handling or interfering with electrical machinery
6. A warning of electric shock hazard sign
7. Any other mandatory signs only when they are applicable.

Four safety-warning signs shall be installed with one on each of the four faces of the substation fence.

The Contractor shall also supply a single line diagram of the station, which shall be installed in a galvanised steel cabinet with a glass window. The cabinet shall be 700 mm x 1200 mm, with a soft board on which the diagram shall be pinned. The cabinet shall be raised 2m off the ground level with galvanised steel angle bars of appropriate size. The cabinet shall be an outdoor naturally ventilated cubicle with a minimum IP rating of IP54. The Contractor may propose alternative specifications for thecabinet to ensure the protection of its contents.

The signage in shall be supplied.

Table 6: Substation signage to be supplied

	Equipment	Label
1.	Power Transformer	Transformer 1 10 MVA, 88/ 6.6 kV
2	Power Transformer	Transformer 2 10 MVA, 88/ 6.6 kV
3.	Incoming Lines	Note: To be confirmed
4.	Outgoing Lines	Note: To be confirmed
5.	Bus Bar	Note: To be confirmed
6.	RTU	RTU
7.	Battery Bank	110 V Battery Bank, 50V battery bank
8.	Auxiliary Transformer	Auxiliary Transformer/NEC/NCR 100kVA, 6.6kV/0.415 kV
9.	Safety Warning Signage	Four (4) signages and the following safety messages (two signages per message): "Unauthorised Access Not Allowed" and "Danger: High Voltage" Three (3) signages with the message "Work in Progress" to be attached to feeders on which work is being carried out.
10.	Switch house Signage	Authorised personnel only
		Danger Electric Shock Risk

Specific labelling requirements for the different equipment to be installed at the substation can be found in the appropriate equipment specification documents.

6.2 Power / Auxiliary Transformer

The Contractor is responsible for the supply and installation of the two (2) 10 MVA, 88/6.6 kV power transformers as per the Transformer Specification entailed in section 7.1.

The Contractor shall also be responsible for the supply and installation of one (1) 315 kVA, 6.6/0.415 kV auxiliary transformers as per the Transformer Specification in section 7.2. The auxiliary transformer shall be suitably located near the main transformers.

Power transformer installation shall include the following works:

- Placement of the transformer centrally on the plinth
- Cleaning of the transformer to remove any past oil spillage stains and any other stains
- Assembly of the accessories of the transformer including the transformer breathers, neutral CTs and all other components disassembled from the transformer in preparation for transportation.
- Installation and connection of the open conductors or MV cables carrying the 88 kV supply onto the 88 kV bushings of the transformer
- Installation and connection of the MV cables onto the 6.6 kV bushings of the transformer to carry away power at 6.6 kV
- Connection of the transformer earthing leads onto the earth terminals on the transformer body
- Heat running of the transformer oil

The installation of the AC and DC control cables for the transformer shall include the following:

- Laying, installation, termination and connection of cables from the 415V AC distribution board to the transformer MK for power supply to the OLTC motor drive
- Laying, installation, termination and connection of cables from the 240V AC distribution board to the transformer MK for the tap changer control signals
- Laying, installation, termination and connection of cables from the transformer MK to the 88 kV and 6.6 kV transformer switchgear bays or auto reclosers for alarm and trip signals for transformer protection devices namely, Buchholz relay, oil and winding temperatures and Oil gauges for the transformer main tank and OLTC tank

6.3 Transformer Automatic Voltage Regulator

The transformer AVR shall be mounted in a weather and rust proof sheet steel indoor cubicle of IP 65 ingress protection rating. The cubicle shall have a hinged front door with locking facilities, giving full access to the cubicle"s contents. The minimum sheet steel thickness shall be 2.5 mm.

The cubicle shall be adequately ventilated for continuous operation in the ambient temperature specified. All ventilation openings provided shall be fitted with drip proof louvers and fine mesh wire or perforated screens to exclude small insects and vermin.

The AVR shall be interfaced with the transformer by means of a 9 core 2.5 mm^2 cable for a minimum of the following alarms, signals and controls:

- Remote and automatic tap changer raising and lowering signals from the AVR to the transformer
- Tap changer position signal from the transformer OLTC to the AVR
- Tap changer in operation signal
- OLTC motor drive supply voltage status

The AVR relay shall be connected to the VT output of the 6.6 kV transformer outgoing metering unit with a 7 core 2.5 mm^2 cable for the power supply to the AVR and the transformer voltage signal to the AVR for regulation.

6.4 Overhead Lines and Structures

All overhead line structure poles shall be buried to a depth of at least 1/6 of the length of the pole.

The pole pits shall be back filled and compacted sufficiently to maintain the pole structures upright. The Contractor shall ensure the area around the pole structures is well levelled.

Stays shall be applied on pole structures where necessary to counter any resultant forces exerted on the pole structures by the weight and tension of conductors.

6.5 Surge Arrestors

Surge arrestors shall be supplied and installed as per Surge Arrestors and Counters Specification in section 7.9 and 7.10.

6.6 Metering

Meters shall be supplied and installed as per Metering Specification.

6.7 Substation Communications and SCADA

Substation Communication and SCADA systems shall be supplied and installed as per Substation Communication and SCADA specification.

6.8 Cables

Indicative sizes and orientation of MV, LV and control cables have been provided in the Cable Schedule. The contractor shall carry out a detailed study of the different loads at the substation (MV, LVAC and DC) and confirm the adequacy of cable sizing.

6.8.1 88 kV and 6.6 kV Cables

88 kV and 6.6 kV cables shall be supplied and installed as per the HV/MV cables specification.

6.8.2 LV and Multi-core Cables

Single and multi-core cables specified in the LV and Multi-core Cable Specification shall be installed as specified by the specifications.

6.8.3 Control Cabling

Control cabling shall include the following cabling:

- All low voltage AC and DC supply cables
- All transformer alarm, trip and indication cables
- All OLTC control, indication and alarm cables
- All interface cabling between metering units and energy meters

All control cabling installations shall conform to the following:

- Control cable terminations shall be made using cable lugs matching the relevant cable size and firmly crimped onto the cable with a crimping tool
- Control cables shall be labelled clearly at both ends according to a pre-approved labelling schedule using cable labelling ferrules. All optic fibre cabling shall also be labelled according to a pre-approved labelling schedule.
- Transformer control cables shall be neatly bundled together with cable ties and run in cable trenches.

6.9 AC and DC Distribution

The AC and DC systems shall be supplied and installed in compliance with the M&E services specification and DC system specification.

6.10 Yard Lighting

Substation yard lighting shall be installed to provide light over the entire substation area as specified.

6.11 Mechanical and Electrical Services

The substation shall have the relevant Mechanical and Electrical (M&E) services installed in line with the M&E services specification. For Kwakwatsi substation this includes:

- LVAC distribution system
- DC system
- Lighting
- Cable containment
- Equipment and cable labelling
- Ventilation system
- Pipe, ducting and supporting steelwork
- Earthing system
- Lightning protection system
- Water supply

- Fire alarm system
- Fire suppression system
- Site security and access control
- Closed circuit television monitoring
- M&E service interfaces with SCADA system.

6.12 Testing & Commissioning

Testing, inspections and commissioning shall be completed in accordance with the relevant standards and specifications. If required, a representative of the Employer shall attend to witness the testing and commissioning of the substation services and a test certificate shall be provided on completion of each testing and commissioning activity. The bidder shall provide for factory acceptance testing (FAT) for the following equipment:

- Power Transformers
- Switchgear
- SCADA

The tests are to be executed by Manufacturer in the presence of five (5) appointed Ngwathe Municipality"s representatives. All costs required to cover such arrangements are to be included as part of the Bidder"s Financial Bid.

Any costs incurred by the contractor as a result of abortive or protracted visits by the purchaser's representatives, due to poor organisation on the part of the manufacturer or test failures, shall be for borne by the contractor.

6.12.1 Instruments Required for Commissioning

The cost of providing all instruments and associated equipment, attendance of the specialists that will be required for the commissioning and testing shall be included in the Offer. A recent calibration certificate for each instrument shall be available for inspection.

A schedule of the instruments to be used shall be submitted with the bid documentation and to the Employer"s representative for approval prior to the commencement of commissioning and testing.

6.13 Inspections Tests

The Employer reserves the right to require that all items supplied are tested and all test reports shall be incorporated into the Instruction, Operations and Maintenance Manuals (Section 0).

The Contractor in consultation with the Employer"s representative shall arrange the testing programme to suit the construction programme at the earliest opportunity. Prior to commencing of testing and

commissioning the Contractor shall supply the NGWATHE representative with a detailed test programme such that they can arrange to witness the testing. This must not be less than 4 weeks before the start of the test programme for tests carried out locally and 8 weeks before the start of the test programme for tests that are executed outside the country. The contractor shall ensure that the testing and commissioning engineer responsible for overseeing testing is able to fluently communicate in the English Language and is able to address all queries raised during the testing period.

The electrical equipment, relays and control equipment shall be certified by means of test certificates to have been tested successfully and in accordance with the specified requirements and standards. It shall also be certified that they have passed the following tests successfully:

- Temperature rise test
- Ability to withstand overload test
- Durability test
- Contact Test
- Insulation test
- High frequency disturbance test
- Any other type tests recommended by the manufacturer and those laid down by the relevant standards and specifications.

The Contractor shall prepare a test certificate for each service in each section to be tested and these certificates will be signed by the Employer"s representative and form part of the hand-over documentation.

If type testing is to be done, testing shall be carried out in accordance with the specified requirements by an independent recognized testing institute. Results for routine tests carried out as part of the manufacturing process shall be included in the operation and maintenance manuals.

6.14 Sub-contracting

The Contractor may sub-let the commissioning activities to a firm specialising in this work and shall be identified in the Contractors offer or by the subsequent approval of the Employer"s representative.

6.15 Test Reports

A comprehensive report shall be prepared which shall record all the parameters which affect the performance of the system at the time of commissioning. A similar report shall be prepared for any specified tests. The report shall be submitted to the Employer"s representative for approval and such approval must be gained before the Services are handed over.

6.16 Requirements for All Contractors

- A risk assessment is carried out by a competent person prior to any work commencing
- All employees shall participate in the Risk Assessment process.
- Hierarchy of controls must be considered and utilised wherever possible.
- The provision of PPE (as required) to all employees based on the Hierarchy of Risk identified during the risk assessment process. A minimum requirement has been determined by Ngwathe:

- Hard hat
- High visibility vest/standardized Class 2 work overall
- Steel toecap safety boots for ankle support
- Other risk-based PPE to be confirmed by the activity or task being performed (e.g. eye)

6.17 Guarantees

The Contractor shall guarantee all equipment and material components against any and all defects in the design, material, manufacturing and damage incurred during transportation and handling of the equipment and material components for the period ending at the end of the Defects liability period. The guarantee in respect of defects in the design, material and manufacturing of equipment and material components shall be underwritten by the manufacturer.

The Contractor shall be responsible to cover the costs should equipment and materials have to be returned to the manufacturer's facilities and thereafter to the Site to effect repairs in terms of the guarantee.

6.18 Design Life

- The structures, buildings and primary electrical equipment shall have a design life of up to 40 years.
- Secondary systems such as protection and control equipment shall have a minimum design life of 15 years.

6.19 Defects Liability Period

- The Contractor shall offer a defects liability period as detailed in the schedules.

6.20 Spares

- The Contractor shall provide the mandatory spares detailed in the relevant specification documents with their price. Mandatory spares shall be supplied as part of the Works under this Terms of reference.
- The spares shall include consumable items sufficient for an operational period of 5 (five) years after commissioning, as well as essential replacement parts to cover the event of a break-down which would affect the availability or safety of the equipment. Spares shall be available during the life of the equipment and the Contractor shall give 12 months" notice of his, or any sub-contractors", intention to cease manufacture of any component used in the equipment.
- The Contractor shall ensure that sufficient spare parts and consumable items are available for his own use during commissioning of the plant. Spares ordered by the Employer shall not be used by the Contractor without the written consent of Employer and any spares so used by

the Contractor during the commissioning of equipment shall be replaced by the Contractor at the Contractor‟s expense.

- Any spare Equipment, parts and tools shall be subject to the same specification, tests and conditions as similar material supplied under the Scope of Works of the Project.

- They shall be interchangeable and suitable for use in place of the corresponding parts supplied with the plant and must be suitably marked and numbered for identification and prepared for storage by greasing or painting to prevent deterioration.

- All spare Equipment or materials containing electrical insulation shall be packed and delivered in cases suitable for storing such parts or material over a period of years without deterioration. Such cases shall have affixed to both the underside and topside of the lid a list detailing its contents. The case will remain the property of the Employer.

6.21 Training

- Where required the Contractor shall provide sufficient training for the Employer‟s staff to operate the services installed by the Contractor. The specification documents associated with the substation works provide detail of exact training requirements.

- Three categories of training shall be imparted.

  a) Major equipment maintenance

  b) Operator familiarization

  c) Installation and commissioning techniques

6.21.1 Major equipment maintenance

- Training to be imparted on operation and maintenance of transformers, switchgear, battery charger, protection relays, Substation RTU, cable termination and jointing etc.

6.21.2 Operator familiarization

This course is intended to familiarize the Engineers/operators with the systems and their use in operating and controlling. The course shall ensure that the operating staff is completely familiar with alloperational aspects of the substation equipment including software management. The means of obtaining special data, report logs and all other facilities which would enable the operators to be fully conversant with the system, shall also be incorporated.

6.21.3 Installation and commissioning techniques

The Employer's staff or its authorized representative will be present during the installation and commissioning period and it is essential that they be fully involved in any on-site corrections or modifications to hardware and software equipment.

6.21.4 Proposals for training

For each course recommended the following information shall be provided:

a) Course name and identification

b) Short description of the curriculum

c) Level of competency required for each course, this can be mutually decided between the contractor and the Employer.

d) Date and duration

e) Maximum number of staff that can attend

f) Location

g) Other important information

The times at which the various training courses will take place shall be stated, and fully documented notes shall be available to the Employer not later than two months before the commencement of the course. All training course notes and documentation shall be in the English language.

6.22 Documentation Submittals

The Tenderer shall carefully review the designs and specifications for the substation. The tables of technical schedules attached to each of the specifications shall be completed and any other material provided in support of the quotation.

6.22.1 General

- All manufacturing, layout, construction and detail drawings shall be to scale and fully detailed. Drawing sheet sizes shall comply with the ISO A series for sizes A4 to A0.
- All drawings, diagrams or plans shall use S.I. metric units and be in English.
- Schematic and other electrical drawings shall preferably be A3 in size and suitable for reduction to A4 for inclusion in instruction books. All drawings and graphical symbols shall be in accordance with IEC 60617.
- Drawings for approval shall bear contract references and shall be submitted in PDF / DWG format after approval, and display both the NGWATHE and the consulting Engineers title block.
- All drawings, diagrams, sketches and plans shall be clear, well laid out and of high quality and standard in all respects. Legends, notes and descriptions shall be incorporated on all drawings, diagrams and plans.
- As-built drawings shall be prepared to show the position and arrangement of all equipment, all details of interface wiring between equipment, and all internal wiring of equipment. The contractor shall also submit, where possible, digitally stored copies of all as-built drawings on disc or CD-ROM in PDF / DWG format.

- A drawing register should be supplied with the design and it should be updated with revisions during construction and on completion of the project.

6.22.2 Instruction, Operating and Maintenance Manuals

- Instruction, operating and maintenance manuals shall be provided for all equipment and devices.

- All manuals shall be submitted to the Employer at least 10 working days before the commencement of any testing. No tests will be accepted prior to the submission of these manuals.

- The manuals shall include the sections detailed in the technical Specifications where applicable.

- During commissioning, the commissioning engineer shall mark up two copies of the drawings before leaving site. One copy shall be left at the site and the other copy shall be used for compilation of the final as built drawings, manuals and commissioning reports.

7.0 BIDDERS TO FILL IN GUARANTEED EQUIPMENT SPECIFICATIONS

7.1 10 MVA Transformer

7.1.1 Tests

Testing shall be in accordance with SANS 60076. The FAT and SAT tests shall include, but not be limited to, the tests described in this section.

7.1.2 Factory Acceptance Tests

The transformer shall be completely assembled at the factory, utilising materials and equipment that will be a part of the final assembled unit, and shall be subjected to all routine tests specified in SANS 60076 and additional tests as specified herein. All tests shall be performed at the expense of the Contractor/OEM.

7.1.3 Routine Tests

- Pressure test on the main tank.
- Visual inspection of tank welding.
- Dye-penetration test of load bearing members to detect weld defects.
- Leakage test on gaskets and bolted covers.
- Tests to prove tank vacuum capability.
- Check of galvanising thickness.
- Check of paint thickness.
- Check of all bushings.
- Routine tests on tap changer.
- Ratio test.
- Impedance test.

7.1.4 Tests on Completion

- Measurement of the winding resistance for all windings and on all taps.
- Voltage-ratio measurement and check of vector group.
- Applied overvoltage test.
- Induced overvoltage test.
- Measurement of impedance voltages.
- Impulse Test (3 x full wave and chopped wave).
- Measurement of No-load losses.
- Measurement of load losses (including calculation to adjust for 75°C).
- Measurement of harmonics.
- Sound level measurements.
- Partial discharge test with limits as shown in Table 14, where Ur is the rated voltage

7.1.5 Oil Tests during Factory Tests

The oil in the transformer shall be sampled and tested before and after transformer testing. A dissolved gas analysis shall be performed for each sample. A copy of the oil test report shall be included with the certified transformer test report.

7.1.6 Site Acceptance Testing

The results of all the Site tests done during commissioning shall be documented and a copy of the results included in the transformer manual. These tests shall include the verification of:

- Voltage ratios on all three phases for each tap position.
- The vector group.
- Measure insulation, HV to tank MV to tank HV to MV (5 kV).
- A functional test for all alarm and trip contacts.
- CT insulation, HV to tank at 5 kV, secondary to tank at 1 kV, maximum magnetising curve for the cores to be used, ratio tests for all taps and polarity.
- The control/power cabling insulation (min 1 kV).
- The correct operation and indication of tap-changers and timing checks.
- The correct position of all valves in the oil circuits.
- Nameplate impedance to be verified.
- Wiring to the marshalling interface box terminals and to the tap change mechanism box terminals.
- Verify winding and oil thermometer accuracies.
- Tan delta tests to be done on all bushings with test taps.
- Disconnect the transformer core earth and megger to tank to ensure that the core is not bonded to the tank, 1 kV max. Ensure reconnecting of the core earth on completion of testing.
- Main tank and tap change oil levels to be checked.
- Check to see if the main tank to conservator valve is open.
- Frequency response analysis.
- Check silica gel.

7.1.7 Tap Changers

Each transformer shall be provided with equipment for tap changing to enable variation of the effective transformation ratio whilst the transformers are on-load, without producing phase displacement.

The tap changer shall incorporate an electrical driver tap changing mechanism and shall be of the high-speed resistor transition type, in compliance with the requirements of IEC 60214, IEC 60512 andother applicable standardized specifications.

Table 7: 10 MVA 88/6.6 kV Power Transformer Specifications

Item	Description	Engineer's Specs	Bidder's Specs
1	**Nominal System Voltage**		
1.1	Rated Nominal Primary Ratio Voltage	88 kV	
1.2	Rated Nominal Secondary Voltage	6.6 kV	
2	**Continuous Rated Power for All Tapping's**		
2.1	ONAN Rated Apparent Power Output	7 MVA	
2.2	ONAF Rated Apparent Power Output	10 MVA	
3	**Overload Withstand Capability**		
3.1	Short-time overload withstand capability	STATE	
3.2	Long-time overload withstand capability	STATE	
4	**Minimum Insulation for windings**		
4.1	Primary Impulse withstand test voltage for line terminal	650 / 350 kV peak	
4.2	Secondary Impulse withstand test voltage for line terminal	150 / 95kV peak	
4.3	60 second Primary Power Frequency Withstand Test, Separate Source	95 kV	
4.4	60 second Secondary Power Frequency Withstand Test, Separate Source	50 / 28 kV	
4.5	Primary-to-Earth 60 s, Induced-Overvoltage Withstand Test Voltages	230 / 140 kV	
4.6	Secondary 60s, Induced-Overvoltage Withstand Test Voltages	44 / 6.6 kV	
5	**Transformer Type**		
5.1	Vector Group	YNd1	
5.2	Type of Transformer	Core	
5.3	Number of Limbs	3	
5.4	Type of Cooling	ONAN/F	

6	**Core Design**		
6.1	Maximum Flux Density (at U_n)	< 1.72	
7	Auxiliary power voltage		
7.1	DC	110 V	
7.2	AC	220 V	
8	Fittings and Accessories		
8.1	Rating and diagram plate	Yes	
8.2	Two safety earthing terminals for transformer tank and radiator banks	Yes	
8.3	Lifting lugs	Yes	
8.4	Jacking pads	Yes	
8.5	Terminal marking plate	Yes	
8.6	Conservator (main chamber and OLTC chamber) with filling cap. Drain valve, vent pipe and equaliser connection.	Yes	
8.7	Pressure relief device	Yes	
8.8	RTCC Panel	Yes	
8.9	Magnetic type oil level indicator with 150mm diameter dial and alarm initiating contacts for low and high oil levels.	Yes	
8.10	Explosion vent with double diaphragm	Yes	
8.11	Inspection cover	Yes	
8.12	De-hydrating breather complete with 1st fill of activated alumina or silica gel	Yes	
8.13	150 mm dial type oil temperature indicator with alarm and trip contacts and maximum reading pointer.	Yes	
8.14	150 mm dial type winding temperature indicator with alarm & trip contacts and maximum reading pointer.	Yes	
8.15	Double float Buchholz relay with alarm and trip contacts, tests, cocks and window to view the trapped gas.	Yes	
8.16	Oil drain valve at bottom.	Yes	
8.17	Oil sampling valves at top, middle and bottom.	Yes	
8.18	Shut-off valve each, on either side of Buchholz relay.	Yes	
8.19	Bank of radiators with isolating valves at top and bottom for connections between the transformer tank and radiator banks.	Yes	
8.20	Weather proof marshalling box for housing dial type temperature indicators, terminal blocks etc. and complete with toughened glass window, space heater, internal illumination etc.	Yes	

	The wiring from various accessories / fittings to marshalling box will be by 1.1 kV grade PVC insulated, sheathed and armoured copper conductor cable of size 2.5mm² Marshalling box shall be mounted on the transformer tank and not on radiator banks.		
8.21	Climbing rungs or ladder.	Yes	

7.2 6.6/0.4 kV NECRT Transformer

This specification covers the combined, oil-immersed, three-phase neutral electromagnetic couplers with neutral - earthing resistors and auxiliary transformers (NECRTs). NECRTs shall be installed to provide earthing points for the 6.6 kV system and to limit the current during line-to-earth faults on these systems.

The purpose of the neutral earthing resistor is to limit the current flow to earth under fault conditions. The purpose of the auxiliary transformer is to provide the secondary voltage to supply local auxiliary loads at the new Main Intake Substation.

The NECRT shall comply with all the requirements of SANS 60076-6, with amendments and additional requirements as described below. All units shall be designed for both overhead and cable connection.

The units shall have a life expectancy of 40 years.

The 6.6 kV outdoor NECRTs shall be in accordance with the Technical Schedule shown in the Table below.

Table 8: 22/0.4 kV NECRT Transformer Specifications

Item	**Description**	**Specified**	
1	**Electrical conditions**		
1.1	Nominal system voltage	6.6 kV	
1.2	Maximum system voltage	24 kV	
1.3	Frequency	50 Hz	
2	**Minimum Insulation Requirements**		
2.1	Impulse withstand voltage for line terminal (primary)	145 kV	
2.2	Sixty second, power frequency withstand voltage	50 kV	
3	**Rated Requirements**		
3.1	Nominal short time (10s) current of NEC and NER	360 A r.m.s	
3.2	Nominal continuous current of NEC and NER	10 A r.m.s	
3.3	Zero sequence reactance (Xo)	23,7 to 28,4 Ω/phase	
3.4	Zero sequence resistance (Ro) at 100°C	47,3 to 56,8 Ω/phase	
4	**Auxiliary Transformers**		

4.1	Nominal Rating	315 kVA	
4.2	Primary nominal voltage	6.6 kV	
4.3	No load secondary voltage	400 V	
4.4	Vector Group	Dyn11	
4.5	Percentage impedance	5%	
4.6	Tapping Range	+5% -5%, 2.5% per tap	
5	**Material**		
5.1	NEC winding	Cu	
5.2	Aux HV Winding	Cu	
5.3	Aux LV Winding	Cu	
6	**Housing and corrosion protection**		
6.1	Tank Colour	Light Grey (SANS 1091 „G29")	
7	**Inter-Turn Winding Insulation**		
7.1	Enamel Grade	Grade 3 or better	
8	**HV Bushings**		
8.1	Minimum creepage	31 kV/mm	
8.2	Type	Outdoor	
8.3	Stem Size (diameter and length)	26mm x 125 mm	
9	**Neutral Bushing**		
9.1	Minimum creepage	31 kV/mm	
9.2	Type	Outdoor	
9.3	Stem Size (diameter and length)	26mm x 125 mm	
10	**Cable Connection**		
10.1	400 V side	As per drawings	
11	**Indicating and Protective Devices**		
11.1	Buchholz relay	Yes	
11.2	Oil temperature thermometer	Yes	
11.3	Winding temperature thermometer	Yes	
11.4	Dehydrating Breather	Yes	

11.5	Oil Level Indicator	Yes	

7.3 132kV Outdoor Circuit Breaker

7.3.1 Design and Construction

The circuit breaker design and construction shall comply with the requirements of SANS 62271-100. The circuit breakers are required to perform as follows:

- The circuit breaker shall provide for three-pole operation.
- The circuit breaker shall be fully pre-fabricated.
- The unit shall undergo complete routine factory pre-testing, to comprehensively test the electrical and mechanical functionality.
- The circuit breaker shall be transportable without dismantling any major parts of the unit, to prevent the necessity for any HV testing on Site.
- The circuit breakers shall be fully transportable inside purpose made ISO containers or wooden crates, for transportation on a standard trailer on normal road surfaces.
- Once installed, repetition of the electric tests on the circuit-breaker will not be required, apart from commissioning tests and tests of the wire connections between circuit-breakers, centipede overhead conductors and other components, such as voltage transformer, power transformer and the like.
- The circuit breaker shall be designed to minimize the scope of civil works for the foundations. The unit shall be designed to fit on a single, purpose-designed concrete platform, unless otherwise specified or required by the OEM.
- The circuit breaker shall be designed to minimize erection time.
- Replacement of one phase of the circuit breaker shall be possible with a minimum down time of the substation, provided that a spare pole is readily available.

The circuit-breakers shall be equipped with a minimum number of flanges and an optimized number of gas segregations, in order to prevent and reduce the risk of gas leakages during the lifespan of the circuit-breakers. Circuit breakers with a double O-ring fitted on all the flanges will be preferred.

A lock-out and tripping feature shall be incorporated, to prevent operation of the circuit breaker whenever the gas pressure falls below a level at which the circuit breaker would be incapable of performing in accordance with its rated duty. Gas monitors shall be temperature compensated.

An alarm feature shall also be incorporated, to indicate falling gas pressures prior to lockout of the circuit breaker. The rate of gas leakage per annum shall be guaranteed and shall not be greater than 1% for any compartment. The system of gas monitoring shall be temperature compensated and shall be subject to approval by the Employer.

7.3.2 Type Tests

The circuit breakers shall be subject to type tests at the manufacturer‟s factory as per clause 6 of SANS 62271-100. A detailed test report, certifying compliance of such tests, shall be provided. The following mandatory type test shall be performed before shipment:

- Dielectric tests.
- RIV tests.
- Measurement of the resistance of main circuit.
- Temperature rise test.
- Short-time current tests, line charging current breaking tests.
- Tightness test.
- EMC test.
- Mechanical tests.
- Short circuit making and breaking tests.
- Capacitive current switching.
- Critical current tests.
- Out-of-phase switching tests.
- Small inductive current breaking tests.

7.3.3 Routine Tests

Individual circuit breakers shall be subjected to the following routine tests, as per Clause 7 of SANS 62271-100:

- Power frequency dry tests on the main circuits.
- Dielectric test on control and auxiliary circuits.
- Measurements of the ohmic resistance of main circuits.
- Tightness test.
- Design and visual check.
- Mechanical operating test.
- Test on components.
- Test of painted and galvanised surfaces.

The type tests shall be made on one circuit breaker to be supplied before beginning of routine tests. The *Employer* may waive the type test certificates if tests performed on identical circuit breakers are available and acceptable to the *Employer*.

7.3.4 Factory Acceptance Testing

The *Employer* reserves the right to inspect and evaluate all manufacturing and testing facilities relating to the 88 kV and 6.6 kV circuit breakers offered, both before and at any time during manufacturing.

The *Employer* reserves the right to inspect any ordered 88 kV and 6.6 kV circuit breakers before shipment, or at any stage of manufacture. This inspection will entail a thorough check to ensure

complete compliance with this standard, technical schedule and the approved manufacturer's drawings.

The *Contractor* shall submit the quality control plans to the *Employer*, indicating all inspection hold points. The *Employer* may add further inspection hold and/or witness points. The *Contractor* shall make due allowance for these activities in the manufacturing programme and, to avoid delays, shall give sufficient, agreed upon, advanced notice of the date of inspection. The *Employer* will not accept late delivery on the basis of inspection delays.

The *Contractor* shall obtain a written clearance from the *Employer* prior to dispatch of the equipment from the OEM/manufacturer"s premises to Site. This clearance shall be confirmed on the routine test certificates. No clearance shall be given where there are any outstanding defects resulting from Factory Acceptance Testing (FAT).

7.3.5 Site Acceptance Tests

Commissioning checks and a test programme (as determined by the manufacturer) shall be carried out in accordance with SANS 62271 for all circuit breakers. The test programme shall be incorporatedinto the circuit breaker inspection and test plan. This shall include checks after installation, mechanical tests and measurements, checks of certain specific operations and electrical tests and measurements.

Electrical tests shall include, but are not limited to, the following:

- Measurement of the steady-state contact resistance of the main circuit.
- Measurement of the dynamic contact resistance of the main circuit.
- Insulation resistance.
- Timing tests

The measurement of the time quantities shall be done at nominal and minimum coil control voltages.

For each measurement of the operating time, a recording shall be made of each individual operating coil current - namely Close, Trip I and Trip II. The resolution of the function times shall be clearly indicated in the test reports.

During the measurement of the re-charging time of the closing spring, the peak motor current in the spring charging process shall be measured as well as the continuous motor current. Measurements shall be made both at the nominal and minimum control voltage.

The results of pre-commissioning tests after installation on Site shall be documented, signed off and a copy of the results included with the switchgear documentation for hand-over as part of the quality process. All tests shall be witnessed by the *Employer.*

Table 10: 88 kV Outdoor Circuit Breaker Specifications

Item	Description	Engineer's Specs	Bidder's Specs
1	**Normal Service Conditions**		
1.1	Operation	3 pole	
1.2	Installation	Outdoor	
1.3	Altitude	≤ 1 800 amsl	
1.4	Maximum ambient temperature	45 °C	
1.5	Minimum ambient temperature	-10 °C	
1.6	Relative humidity	100 %	
1.7	Degree of protection	IP44	
1.8	Pollution level	Severe (31 mm/kV specific creepage)	
1.9	Rated nominal system voltage	88 kV	
1.10	Rated maximum system voltage	145 kV	
1.11	Rated system frequency	50 Hz	
2	**Rated Insulation Levels**	3 pole	
2.1	Rated power frequency withstand voltage (1 min)		
2.1.1	common value	275 kV	
2.1.2	across the isolating distance	315 kV	
2.1.3	across open CB	315 kV	
2.2	**Rated lightning impulse withstand voltage (1s)**		
2.2.1	common value	650 kV	
2.2.2	across the isolating distance	750 kV	
2.2.3	across open CB	750 kV	
3	**Composite and/or RIP Bushings**		
3.1	Rated voltage	145kV	
3.2	Rated Current	2500	
3.3	Rated power frequency withstand voltage	275 kV	

3.4	Rated lightning impulse withstand voltage	650 kV	
3.5	Partial discharge level, □ 5 pC	92 kV	
3.6	Creepage distance	≥ 31 mm/kV	
4	**Current Ratings**		
4.1	Rated continuous current	2500 A	
4.2	Rated short-time withstand current	31.5 kA	
4.3	Rated short circuit duration	3 s	
4.4	Rated peak withstand current	104 kA	
4.5	Temperature rise of active parts at rated continuous current	≤ 65 °C	
4.6	Temperature rise of terminals at rated continuous current	≤ 50 °C	
4.7	Temperature rise of enclosure at rated continuous current	≤ 15 °C	
5	**SF_6 Gas System**		
5.1	Annual SF6 leakage	< 1 % per year	
6	**Circuit Breaker Mechanism**		
6.1	Type	SF6 Auto-puffer	
6.2	Operating mechanism	Spring type, three-pole	
6.3	Circuit-breaker mechanical endurance class	Class M2	
6.4	Maximum number of mechanical operation for drive mechanism	10 000	
6.5	Rated operating sequence according to IEC	O - 0.3 s - CO -1 min – CO	
6.6	Stored switching sequence	O – CO	
6.7	Classification of circuit-breaker according to its restrike performance (line- and cable charging breaking current)	Class C2	
6.8	Maximum number of operations at rated current	5000	
6.9	Short circuit breaking current	40 kA	
6.10	First reference voltage	208 kV	
6.11	Point of time t1	104 µs	
6.12	Peak value	291 kV	
6.13	Point of time t2 and t3	312 µs	
6.14	Starting point td	2 µs	

	Rate of rise	2 µs	
6.15	Characteristic For Short Line Fault		
6.16	Short line fault current	36 kA	
6.16.1	Wave impedance	450 Ω	
6.16.2	Peak value	194 kV	
6.16.3			
6.16.4	Rated peak factor	1.6	
6.16.5	Time delay tdL	<0.1 µs	
6.16.6	Time tL to peak uL	3.08 µs	
6.16.7	Rate of rise of transient recovery voltage	7.84 kV/µs	
6.16.8	Opening time	23 ± 4 ms	
6.16.9	Arcing time	11.5 – 21.5 ms	
6.16.10	Break time	<50 ms	
6.16.11	Closing time	30 ± 5ms	
6.16.12	Contact speed:	To be provided by OEM	
6.16.12.1	Opening	4.6 ± 0.5ms	
6.16.12.	Closing	4.6 ± 0.5ms	
6.17	**Circuit-breaker operating mechanism enclosure requirements**		
6.17.1	Operating mechanisms, local control facilities and allparts requiring lubrication protected by weatherproof enclosures	Yes	
6.17.2	Degree of protection for enclosures containing exposed bearings, auxiliary switches, motors and other electrical devices	IP 55	
6.17.3	Degree of protection for all open areas in the circuit-breaker common base frame as well as externally mounted indicating devices (where applicable)	IP 2X	
6.17.4	Degree of protection for all other enclosures	IP 54	
6.17.5	Operating mechanism enclosure, handles and fixings material	316L stainless steel/ Painted Aluminium	
6.17.6	Maximum height to top of mechanism allows servicing from ground (*Un* ≤ 132kV)	2000 mm	

6.17.7	Front access door secured with a heavyduty locking mechanism	Yes	
6.17.8	Padlocking facility shackle diameter	6 mm	
6.17.9	Front access door equipped with travel stop	Yes	
6.17.10	Rigid, corrosion resistant documentation pocket provided on inside of front access door, securely attached no protrusion through door	Yes	
6.17.11	Enclosure colour	Light grey („G29")	
6.18	**Auxiliaries**		
6.18.1	Rated voltage	110V dc	
6.18.2	Rated current	5A dc	
6.18.3	**Operating Coils**		
6.18.3.1	Rated voltage	110V dc	
6.18.3.2	Rated power	200W	

7.4 6.6 kV Indoor Switchgear

7.4.1 General

The Ingress protection degree shall be in compliance with IEC 60529 standards shall be the following:

- IP65 for the MV housing.
- IP44 for the LV compartment.

The switchboards shall be equipped with fixed vacuum circuit breakers that comply with SANS 62271-100. The circuit breakers shall be for triple pole operation and shall have primary contacts that operate within a vacuum. The stationary mounted circuit breakers shall be fully type-tested. Copies of test certificates, as evidence of successful completion of type tests, shall be submitted with the switchgear acceptance certification.

The circuit breakers shall be designed for electrical spring charging, but shall also make allowance for manual charging of the spring. All circuit breakers shall be routine tested in accordance with SANS 62271-100. The circuit breakers shall be equipped as follows:

- With stored energy spring mechanism for motor charging and emergency manual operation, or by means of a magnetic actuated mechanism.
- With mechanical push buttons for closing and opening.
- With mechanical indicators for switch position and mechanism position.
- With mechanical counter.
- With shunt release OFF.
- With shunt release ON.
- With auxiliary signaling contacts.

The circuit breakers shall be suitable for the following switching duty, in accordance with the latest IEC 62271-100 standard.

- For mechanical endurance, class M2.
- For electrical endurance, class E2.
- Capacitor switching class C2.

7.4.2 Signal Lamps

Indication lights shall be required to indicate whether the circuit breaker is in the open or closed position and whether the circuit is earthed. Signal lamps are of the multi-LED bayonet coupling type and easily replaceable from the front of the panel, without the use of tools. The signal lamp lenses shall be coloured as follows:

- Circuit-breaker closed: Red.
- Circuit-breaker open: Green.
- Circuit earthed: Yellow.
- Springs charged:
- Springs discharged:

7.4.3 Testing

MV Switchgear shall be tested in accordance with SANS 62271. The FAT and SAT tests shall include, but not be limited to, the tests described in this section.

7.4.4 Type Tests

The metal enclosed switchgear shall be type tested at a recognized and certified test laboratory. The *Contractor* shall provide the relevant certificates and test reports to prove compliance with SANS 62271. The tests include, but are not limited to, the following:

- Internal arc type test.
- Making and breaking capacity tests.
- Short time current test.
- Temperature rise test.
- Impulse voltage and power frequency voltage test.
- Mechanical endurance type test.

The *Contractor* shall provide MV Switchgear that is identical to the type of switchgear tested. If any functional component of the MV Switchgear differs from the one described in the type test certificates/ reports, the components will be subject to retesting before approval by the *Employer*. The conditions under which the type tests are performed, i.e. panel configuration, number of tests to be done and the like, shall be agreed between the test authority, *Employer* and *Contractor.*

Manufacturing of the first switchboard shall not commence without the prior approval of the type testing by the *Employer*.

7.4.5 Routine Tests

Routine tests shall be carried out on the new switchgear in accordance with the requirements provided in SANS 62271-100 and shall include, but not be limited to, the following:

- Wiring and function tests.
- Equipment verification tests.
- Low voltage circuit insulation test.
- High voltage power frequency test.
- Partial discharge tests.
- Circuit breaker operation timing tests.
- Contact resistance
- Insulation resistance

7.4.6 Factory Acceptance Testing

The *Employer* reserves the right to inspect and evaluate all manufacturing and testing facilities relating to the indoor medium voltage switchgear, both before and at any time during manufacturing.

The *Employer* reserves the right to inspect any ordered indoor medium voltage switchgear before shipment, or at any stage of manufacture. This inspection will entail a thorough check to ensure complete compliance with this standard, technical schedule and the approved manufacturer's drawings.

The *Contractor* shall submit the quality control plans to the *Employer*, indicating all inspection hold points. The *Employer* may add the necessary inspection hold and/or witness points. The *Contractor* shall make due allowance for these activities in the manufacturing programme and, to avoid delays, shall give sufficient, agreed upon, advanced notice of the date of inspection. The *Employer* will not accept late delivery on the basis of inspection delays.

The *Contractor* shall obtain a written clearance from the *Employer* prior to dispatch of the equipment from the OEM/manufacturer"s premises to Site. This clearance shall be confirmed on the routine test certificates. No clearance shall be given where there are any outstanding defects resulting from Factory Acceptance Testing (FAT).

7.4.7 Site Acceptance Testing

Commissioning checks and a test programme, as determined by the manufacturer, shall be carried out in accordance with SANS 62271. This shall include checks after installation, circuit-breaker mechanical tests and measurements, checks of certain specific circuit breaker operations and electrical tests and measurements.

Tests shall include, but are not limited to, the following:

- 80% power-frequency voltage tests of the main circuits in accordance with SANS 62271-200 7.105.
- Tightness tests for vacuum switchgear in accordance with SANS 62271-200 7.105 (dielectric test across the open contacts at a voltage stated by the manufacturer).
- Verification of remote control operation using the hand-held remote control unit for circuit-breaker.

- Testing of all interlocking.

Mechanical tests and measurements on the circuit-breakers may include, but are not limited to, the following:

- Verification of the rated operating sequence.
- Measurement of time quantities.

Checks of certain specific operations for the circuit-breakers may include, but are not limited to, the following:

- Simulation of fault-making operation and check of anti-pumping device.
- Behaviour of the circuit-breaker on a closing command while an opening command is already present.
- Application of an opening command on both releases simultaneously.

Electrical tests shall include, but are not limited to, the following:

- Measurement of resistance of the main circuits of the assembly in accordance with SANS 62271200.
- Dielectric tests on auxiliary and control circuits in accordance with SANS 62271-200.

For each measurement of the operating time, a recording shall be made of each individual operating coil current, namely Close, Trip I and Trip II. The resolution of the function times shall be clearly indicated in the test reports.

For measurement of the steady-state contact resistance of the main circuit, a DC current of at least 50 A shall be used. The results shall be given in μΩ and the resolution shall be at least 1 μΩ.

Reasons for differences between the results of the tests made on Site and the results of the tests as they were carried out at the OEM"s premises shall be clearly stated and corrections shall be made.

The results of pre-commissioning tests after installation on Site shall be documented, signed off and a copy of the results included with the switchgear documentation for hand-over as part of the quality process. All tests shall be witnessed by the *Employer.*

Table 11a: 6.6 kV Indoor Feeder Circuit Breaker Specifications

Item	Description	Engineer's Specs	Bidder's Specs
1	**Ratings**		
1.1	Rated voltage (U_r)	6.6 kV	
1.2	Highest voltage for equipment (Um)	12 kV	
1.3	Number of phases	3	
1.4	Rated short-duration power-frequency withstand voltage (U_d)	50 kV	

1.5	Rated peak lightning impulse withstand voltage (U_p)	145 kV	
1.6	Rated frequency (f_r)	50 Hz	
1.7	Rated normal current (I_r) - busbar	800 A	
1.8	Rated short-time withstand current (I_k)	25 kA	
1.9	Rated peak withstand current (I_p and I_{pe})	63 kA	
1.10	Rated duration of short circuit (t_k) – main circuit and earthing switch	3 s	
1.11	Rated duration of short circuit (t_{ke}) - earthing circuit	3 s	
1.12	Rated DC supply voltage of closing and opening devices and of auxiliary and control circuits (U_a)	110 V DC	
1.13	Rated short-circuit breaking current (I_{SC}) of circuit-breaker	25 kA	
2	**Circuit Breaker**		
2.1	Vacuum circuit breaker type	SBV 4	
2.2	Number of mechanical operations	M2 (10 000)	

Table 11b: 6.6 kV Bus Coupler Circuit Breaker Specifications

Item	Description	Engineer's Specs	Bidder's Specs
1	**Ratings**		
1.1	Rated voltage (U_r)	6.6 kV	
1.2	Highest voltage for equipment (Um)	12 kV	
1.3	Number of phases	3	
1.4	Rated short-duration power-frequency withstand voltage (U_d)	50 kV	
1.5	Rated peak lightning impulse withstand voltage (U_p)	145 kV	
1.6	Rated frequency (f_r)	50 Hz	
1.7	Rated normal current (I_r) - busbar	1250 A	
1.8	Rated short-time withstand current (I_k)	25 kA	
1.9	Rated peak withstand current (I_p and I_{pe})	63 kA	

1.10	Rated duration of short circuit (t_k) – main circuit and earthing switch	3 s	
1.11	Rated duration of short circuit (t_{ke}) - earthing circuit	3 s	
1.12	Rated DC supply voltage of closing and opening devices and of auxiliary and control circuits (U_a)	110 V DC	
1.13	Rated short-circuit breaking current (I_{SC}) of circuit-breaker	25 kA	
2	**Circuit Breaker**		
2.1	Vacuum circuit breaker type	SBV 4	
2.2	Number of mechanical operations	M2 (10 000)	

Table 11c: 6.6 kV Transformer Incomer Circuit Breaker Specifications

Item	Description	Engineer's Specs	Bidder's Specs
1	**Ratings**		
1.1	Rated voltage (U_r)	6.6 kV	
1.2	Highest voltage for equipment (Um)	12 kV	
1.3	Number of phases	3	
1.4	Rated short-duration power-frequency withstand voltage (U_d)	50 kV	
1.5	Rated peak lightning impulse withstand voltage (U_p)	145 kV	
1.6	Rated frequency (f_r)	50 Hz	
1.7	Rated normal current (I_r) - busbar	1250 A	
1.8	Rated short-time withstand current (I_k)	25 kA	
1.9	Rated peak withstand current (I_p and I_{pe})	63 kA	
1.10	Rated duration of short circuit (t_k) – main circuit and earthing switch	3 s	
1.11	Rated duration of short circuit (t_{ke}) - earthing circuit	3 s	
1.12	Rated DC supply voltage of closing and opening devices and of auxiliary and control circuits (U_a)	110 V DC	
1.13	Rated short-circuit breaking current (I_{SC}) of circuit-breaker	25 kA	
2	**Circuit Breaker**		
2.1	Vacuum circuit breaker type	SBV 4	

2.2	Number of mechanical operations	M2 (10 000)	

7.5 Isolators (With and Without Earth Switch)

7.5.1 General

This specification covers the technical requirements for high-voltage outdoor disconnectors and earth switches, including the design, manufacture, testing, supply, delivery, erection and maintenance training for the outdoor type disconnectors, earth switches and associated equipment as specified herein.

The 88 kV outdoor isolators shall be in accordance with the Technical Schedule shown in Table 12.

7.5.2 Ratings

Double side-break, centre rotate disconnectors shall be used, which shall be rated at 2500 A continuous current and short-time current of 40 kA, unless otherwise specified.

Insulation shall be for severe pollution conditions with insulators designed for creepage at 31 mm/kV. When current switching duty is foreseen (i.e. for current values higher than 50 mA the equipment shall be rated for busbar transfer and induced current switching, whichever is applicable, according to the requirements of SANS 62271-102.

7.5.3 Tests

Manufacture, factory inspection, shipping, off-loading, erection and Site tests shall be done in accordance with an approved quality assurance plan. Copies of typical type-test reports/certificates and a typical routine test report/certificate shall be submitted at tender stage.

The Contractor shall submit the necessary quality control plans, indicating all inspection hold points to which the Employer may add their witness, and hold points for inspection by the Employer or appointed representative. The Contractor shall make due allowance for these hold points.

The Employer will not accept responsibility for late delivery in respect of delays caused by issues arising from these hold points.

Type tests

Equipment shall be type tested in accordance with the requirements of SANS 62271-102. These tests shall include, but may not be limited to, the following:

- Power frequency withstand voltage test.
- Lightning impulse withstand voltage test.
- Radio interference voltage test.
- Temperature rise test.
- Measurement of the resistance of the main circuit.
- Short-time and peak withstand current test.
- Mechanical endurance test.

- Bus transfer current switching.

Type tests carried out more than seven (7) years ago are not deemed to be valid.

The disconnector shall have been type tested in accordance with the KIPTS natural ageing and pollution performance test procedure for outdoor insulator products.

7.5.4 Routine tests

Routine test reports and results shall be submitted for each disconnector in MS Excel or MS Word format, and shall be in English.

- Routine testing shall be carried out at the Contractor"s/OEM"s premises prior to shipment to Site.
- The secondary wiring shall be verified in accordance with the approved wiring diagram. The resistance of heater circuits, coils of contactors, resistors and the like shall be checked and verified.
- Voltage tests shall be in accordance with SANS 60694 shall be performed on the secondary circuits.
- Resistance of Main Circuit: The main circuit resistance shall be measured in accordance with IEC 60694 and recorded in the routine test report.

The following tests/inspections shall be done on completion of erection and prior to handing over of the equipment:

- Current path resistance measurement.
- Contact travel, end position and alignment.
- Complete operational check, including auxiliary switch function. (5 open and 5 close operations).
- Operating force measurement for manual type drives.
- Operating forces measurements of motor drives (in electrical and mechanical units).

The above shall be recorded on a test record sheet and signed off by the Contractor"s representative.

7.5.5 Factory Acceptance Testing

The Employer reserves the right to inspect and evaluate all manufacturing and testing facilities relating to the outdoor isolators offered, both before and at any time during manufacturing.

The Employer reserves the right to inspect any ordered outdoor isolators before shipment, or at any stage of manufacture. This inspection will entail a thorough check to ensure complete compliance with this standard, technical schedule and the approved manufacturer's drawings.

Table 12: Technical Schedule for 88 kV Outdoor Isolators

Item	Description	Engineer's Specifications	Contractor's Specifications
1	**System Conditions**		
1.1	System voltage	88 kV	

1.2	Number of phases	3	
1.3	Nominal system frequency	50 Hz	
1.4	System earthing	Effectively earthed	
1.5	Rated supply voltage of auxiliary and control circuits	110 Vdc	
1.6	Expected life	40 years	
2	**Disconnector ratings (SANS 62271-102)**		
2.1	Rated voltage (Ur)	145 kV	
2.2	Rated normal current (Ir)	2500 A	
2.3	Rated short-time withstand current (Ik)	40 kA	
2.4	Short-time withstand current duration (tk)	3 s	
2.5	Rated peak withstand current (Ip)	100 kA	
2.6	Rated short-duration power frequency withstand voltage	275 kV	
2.7	Rated lightning impulse withstand voltage	≥ 550 kV	
2.8	Mechanical endurance class	M2	
2.9	Rated value of bus transfer current for DS	1600 / 300 A or 80 % of rated current	
2.10	Across the isolating distance (LIWL)	630 kV	
3	**Detail and type of disconnector**		
3.1	Type of disconnector required	Centre Rotate Double Break (CRDB)	
4	**Mounting of disconnector**		
4.1	Mounting height (lowest part of insulation above ground level)	2500 mm	
4.2	Electrical clearances - Between live portions at system voltage and earth	≥ 3700 mm	
5	**Type of operation mechanism**		
5.1	Disconnector	Either motor or hand operated type	
6	**Operating movement**		
6.1	Disconnector	Vertical	
7	**Motor driven mechanism - voltage**	110 Vdc	
8	**Main Terminals**		
8.1	Type	Pad	
8.2	Material	Aluminium	

8.3	Orientation: vertical or horizontal	Horizontal	
9	**Insulation and Clearances**		
9.1	Insulator type designation	C6-550	
9.2	Cantilever strength class	6 kN	
9.3	Creepage distance	31 mm/kV	
9.4	Insulator material	Porcelain	
10	**Insulator Test Voltage**		
10.1	Lightning impulse withstand voltage (1,2/50 µs) referred to sea level - To earth and between phases in the open position	550 kV	
10.2	Power frequency withstand voltage (60 second) referred to sea level - To earth and between phases in the open position	275 kV	
11	**Insulator Dimensions**		
11.1	Top flange PCD with 4 x 14mm (Plain) holes	127 mm	
11.2	Bottom flange PCD with 8 X 14mm (Plain) holes	127 mm	
12	**Auxiliary Switches**		
12.1	Number of Poles	16 Pole	
12.1.1	Type F	1	
12.1.2			
12.1.3	Type M	5	
12.1.4	Type G	8	
12.1.5	Type N	2	
13	Type GS	2 (if required)[1]	
13.1			
13.2			
13.3			
13.4	**Ratings for auxiliary switches**		
13.5	Breaking capacity (110 V ≤ Ua ≤ 250 V)	440 W	
14	Class type		
	Breaking current for 110 V DC	2 A	
	Continuous current	10 A	
	Short-time current for 30 second	100 A	
	Miscellaneous		
14.1	Protection of housing, mechanism enclosures and nameplates		

14.1.1	IP rating	IP55	
14.1.2	Material type	316 Stainless steel	
14.1.3	Nameplates and their fixings shall be weather and corrosion proof	Yes	
14.1.4	Nameplate material	Aluminum or stainless steel	
14.2	Cubicle heating and ventilation		
14.2.1	Electrical heating - Supply voltage, 50 Hz	110 V	
14.3	Secondary terminals, gland plate and cable connections		
14.3.1	Terminal type	Spring loaded	

7.6 88 kV Outdoor Current Transformers

The CTs shall comply with the requirements of IEC 61869, IEC 60044 and any other associated standards. Insulators fitted to the CTs shall comply with SANS 60815 for application in polluted conditions.

The main and back-up IEDs shall provide protective functions based on values measured from analogue current signals supplied from cores dedicated to protection functions.
Where a dedicated measurement transducer is connected, this shall use a separate current transformer circuit, designed to provide the analogue current signal at the prescribed accuracy and burden.
The neutral of each CT circuit shall be earthed at one place only, i.e. on the incoming neutral terminal inside the protection panel. A sliding link terminal shall be provided on the earth connection for isolation proposes in order to facilitate insulation resistance testing.
All CTs shall be connected to the respective circuits through 4-way PK2 test blocks that ensures short circuiting of the CT incoming terminals circuit upon withdrawal of the test block cover.
88 kV CTs shall be installed on the HV side of the transformer. These CTs shall have a continuous current rating of 2500 A and shall be equipped with six secondary cores, which provide for 2 x protection, 2 x buszone and 2 x metering cores. The protection and metering cores shall make provision for multiple tapping positions.

7.6.1 Tests

The 88 kV current transformer tests shall be carried out in accordance with SANS 60044-1 and SANS 61869.

7.6.2 Type Tests

The *Contractor*/OEM shall provide evidence, prior to manufacturing, that the following type tests have been successfully performed on equipment that is identical to the proposed equipment to be incorporated in the works:

- Short-time current tests.
- Temperature rise test.
- Lightning Impulse test.
- High-voltage power frequency wet withstand test.
- Determination of errors (10%, 100% and 120%).

7.6.3 Routine Tests

The following routine tests shall be carried out in accordance with SANS 60044-1, Section 6, Sub clause 6.1 and 6.2:

- Verification of terminal marking.
- Power-frequency dry withstand test on primary winding.
- Partial discharge measurement.
- Power-frequency dry withstand test on secondary winding(s).
- Power-frequency withstand tests, between sections.
- Over-voltage, inter-turn withstand test.
- Determination of accuracy class (errors, and phase displacement/composite error).
- Sealing test (visual test only).

The *Employer* may waive the type test if the certificates of type tests performed on identical current transformers are available and acceptable to the *Employer*.

7.6.4 Factory Acceptance Testing

The *Employer* reserves the right to inspect and evaluate all manufacturing and testing facilities relating to the outdoor current transformers offered, both before and at any time during manufacturing.

The *Employer* reserves the right to inspect any ordered current transformers before shipment, or at any stage of manufacture. This inspection will entail a thorough check to ensure complete compliancewith this standard, technical schedule and the approved manufacturer's drawings.

The *Contractor* shall submit the quality control plans to the *Employer*, indicating all inspection hold points. The *Employer* may add further inspection hold and/or witness points. The *Contractor* shall make due allowance for these activities in the manufacturing programme and, to avoid delays, shall give sufficient, agreed upon, advance notice of the date of inspection. The *Employer* will not accept late delivery on the basis of inspection delays.

The *Contractor* shall obtain a written clearance from the *Employer* prior to dispatch of the equipment from the OEM/manufacturer"s premises to Site. This clearance shall be confirmed on the routine test certificates. No clearance shall be given where there are any outstanding defects resulting from Factory Acceptance Testing (FAT).

Table 15: Technical Schedule for 88 kV Outdoor Current Transformers

Item	Description	Engineer's Specifications	Contractor's Specifications
1	**Service Conditions**		

1.1	Altitude	1800	
1.2	Climate conditions	Coastal & Inland	
1.3	Ambient Temperature	-10 ºC to +45 ºC	
1.4	Level of pollution that equipment will be subjected to	High	
1.5	Lightning area	Yes	
2	**General requirements**		
2.1	Nominal system voltage (Un)	88 kV	
2.2	Maximum system voltage (line-to-line) (Um)	145 kV	
2.3	Number of phases	1	
2.4	Nominal continuous primary current	2500 A	
2.5	Nominal short time current (Thermal)	40 kA	
2.6	Nominal short time current (Dynamic)	64 kA	
2.7	Time for which thermal applies	3 s	
2.8	Power frequency short-duration withstand voltage	275 kV	
2.9	Lightning impulse withstand voltage	650 kV	
3	**Details of CT Cores**		
3.1	Number of cores	6	
3.2	Core Layout Arrangement	PBBPMM	
3.3	Number of Metering cores	2	

Item	Description	Engineer's Specifications	Contractor's Specifications
3.4	Number of Protection cores	2	
3.5	Number of Buszone cores	2	
4	**Metering Cores**		
4.1	Position of Cores	Cores 5 & 6	
4.2	Nominal ratio	1/2400 MR	
4.3	Rated burden	See Table 15b	
4.4	Accuracy class	See Table 15b	
5	**Protection Cores**		
5.1	Position of Cores	Cores 1 & 4	
5.2	Nominal turns ratio	1/2400T MR	
5.3	Continuous current rating		
5.4	Primary	2500	
5.5	Secondary	1	
5.6	Accuracy class	5P20	
5.7	Rated knee-point voltage Vk	See Table 15a	
5.8	Magnetising current	See Table 15a	
5.9	Maximum total secondary winding resistance Ri	See Table 15a	
6	**Buszone Cores**		
6.1	Position of Cores	Cores 2 & 3	
6.2	Nominal turns ratio	1/1600T MR	
6.3	Accuracy class	PX	
6.4	Rated knee-point voltage Vk	See Table 15c	
6.5	Magnetising current	See Table 15c	
6.6	Maximum total secondary winding resistance Ri	See Table 15c	
7	**Primary Terminal**		
7.1	Type	Stem	
7.2	Orientation	Horizontal	
7.3	Size	38 mm	

The current transformers core specifications shall be in accordance to the following:

- **Protection Core Specifications**
  The protection cores are designated as cores 1 and 4 of the secondary core configuration. Details of the required ratio tappings and associated information shall be as indicated in Table 15a below.

Table 15a: 88 kV CT – Protection Cores 1 and 4 Arrangement

Maximum Core Ratio	Tapping	Ratio	Class	Vknee (min) (V)	Imag (max). (mA)	Rct (Ω) @ 75 °C
MR 2 400/1	S2–S3	1/200T	5P20	200	300	0,8
	S1–S2	1/400T		400	150	1,6
	S1–S3	1/600T		600	100	2,4
	S4–S5	1/800T		800	75	3,2
	S3–S4	1/1 000T		1 000	60	4,0

- **Metering Core Specifications**
  Metering cores shall provide for multi-ratio tappings from 400/1 to 2400/1. Further details are indicated in Table 15b below:

Table 15b: 88 kV CT – Measurement Cores 5 and 6 Arrangement

Maximum Core Ratio	Tapping	Ratio	Class	Burden	Security Factor
MR 2 400/1	S2–S3	1/200T	0,2	2,5 VA	-
	S1–S2	1/400T		5 VA	FS 20
	S1–S3	1/600T		10 VA	-
	S4–S5	1/800T		10 VA	-
	S3–S4	1/1 000T		10 VA	-
	S2–S4	1/1 200T		10 VA	-
	S1–S4	1/1 600T		10 VA	-
	S3–S5	1/1 800T		10 VA	-
	S2–S5	1/2 000T		10 VA	-
	S1–S5	1/2 400T		10 VA	-

Bus Zone Core Specifications

CTs shall be provided with two bus zone cores. These cores shall provide multiple tappings with turn ratios of 1/1000, 1/1200 and 1/1600. Details of the required ratios and associated requirements are provided in Table 15c below.

Table 15c: 88 kV CT – Buszone Cores 2 and 3 Arrangement

Maximum Core Ratio	Tapping	Ratio	Class	Vknee (min) (V)	Imag (max). (mA)	Rct (Ω) @ 75 °C
MR 1 600/1	S1–S2	1/1 000T	PX	550	50	2
	S1–S3	1/1 200T		660	42	2,4
	S1–S4	1/1 600T		880	31	3,2

7.7 88 kV Outdoor Voltage Transformers

VTs shall comply with the requirements of NRS 030 and the requirements as set out in this specification. VTs shall comply with the environmental operating conditions set out in NRS 030.

The VT supplies for the protection and measurements circuits shall be taken into a junction box mounted in a suitable position on the medium lattice structure.

The *Contractor* shall include all costs associated with the installation of the transformers pertaining to delivery and off-loading and shall make provision for all cranes and/or rigging equipment as may be necessary for installation of the VT onto the lattice structure.

7.7.1 Tests

Tests shall be carried out in accordance with SANS 60044-5.

7.7.2 Routine Tests

The following routine tests shall be carried out at the OEM"s premises:

- Polarity and verification of terminal markings.
- Power frequency dry withstand test on primary windings.
- Partial discharge measurement.
- Power frequency test between sections and on secondary windings.
- Test for accuracy.
- Over-voltage inter-turn withstand test.
- Sealing test.

7.7.3 Type Tests

Certificates for the following type tests, conducted in accordance with SANS 60044-5, shall be submitted:

- Temperature rise test.
- Short circuit withstand capability test.
- Lightning Impulse test on primary windings.
- Wet test and determination of errors.

7.7.4 Factory Acceptance Testing

The *Employer* reserves the right to inspect and evaluate all manufacturing and testing facilities relating to the outdoor voltage transformers offered, both before and at any time during manufacturing.

The *Employer* reserves the right to inspect any ordered voltage transformers before shipment, or at any stage of manufacture. This inspection will entail a thorough check to ensure complete compliancewith this standard, technical schedule and the approved manufacturer's drawings.

The *Contractor* shall submit the quality control plans to the *Employer*, indicating all inspection hold points. The *Employer* may add inspection hold and/or witness points. The *Contractor* shall make due allowance for these activities in the manufacturing programme and, to avoid delays, shall givesufficient, agreed upon, advanced notice of the date of inspection. The *Employer* will not accept late delivery on the basis of inspection delays.

The *Contractor* shall obtain a written clearance from the *Employer* prior to dispatch of the equipment from the OEM/manufacturer"s premises to Site. This clearance shall be confirmed on the routine test certificates. No clearance shall be given where there are any outstanding defects resulting from Factory Acceptance

Table 17: Technical Schedule for 88 kV Outdoor Voltage Transformers

Item	Description	Engineer's Specifications	Contractor's Specifications
1	**Service Conditions**		
1.1	Altitude	1 800 m	
1.2	Climate conditions	Coastal	
1.3	Ambient Temperature	-10 °C to 45 °C	
1.4	Level of pollution that equipment will be subjected to	High	
1.5	Lightning area	Yes	
2	**General requirements**		
2.1	Nominal system voltage (Un)	88 kV	
2.2	Maximum system voltage (line-to-line) (Um)	145 kV	
2.3	Frequency	50 Hz	

2.4	Number of single phase Voltage Transformers per set	3	
2.5	Rated Burden per Phase	100 / 50 VA	
2.6	Accuracy Class	3P / 0.2	
2.7	Primary Voltage	132 / √3	
2.8	Secondary Voltage	110 / √3	
2.9	Power frequency short-duration withstand voltage	275 kV	
2.10	Lightning impulse withstand voltage	650 kV	
2.11	Power Winding required	No	
3	**Creepage distance**		
3.1	Minimum creepage distance for other than medium pollution (IEC 60815)	31 mm/kV	
4	**Secondary Protection**		
4.1	Method	Fuses	
4.2	Current rating of fuses	32 A	
4.3	Maximum permissible duration of secondary short circuit current	1	
5	**Primary Terminal**		
5.1	Type	Stem	
5.2	Orientation	Vertical	
5.3	Size		

7.8 6.6 kV Voltage Transformers

Table 18: Technical Schedule for 6.6 kV Outdoor Voltage Transformers

Item	Description	Engineer's Specifications	Contractor's Specifications
1	Name of manufacturer		
2	Manufacturer"s type & designation	Indoor	
3	Rated primary voltage	6.6kV / √3	
4	Rated secondary voltage	110V / √3	
5	Rated frequency	50Hz	
6	Rated burden	100 / 50 VA	
7	Accuracy class	3P / 0.2	
8	No. of winding	3	
9.	Rated voltage factor a. Continuous 1.2 b. 30 sec. 1.5		
10	Temp. rise at 1.25 times rated voltage with rated burden		

7.9 88 kV Surge Arresters

The surge arresters shall be designed for protection of the HV Yard equipment from switching surges and lightning surges. Surge arresters shall be mounted on a custom made bracket, suitably positioned on the power transformers, adjacent to the 88 kV and 6.6 kV bushings. Purpose made support brackets shall be provided for this purpose and shall be included in the supply rate of the power transformers.

- All ferrous, non-current carrying components exposed to the atmosphere shall be hot-dip galvanized in accordance with SANS 121.
- Arresters shall withstand short-circuit currents without violent shattering and shall have the ability to self-extinguish any fire caused by an arc.

Any design changes shall be verified by testing and shall be subject to written approval. The surge arresters shall be of the gapless Metal (Zinc) Oxide (ZnO) type, unless specified or instructed otherwise.

7.9.1 Tests

Type and routine tests on arresters shall be conducted in accordance with SANS 60099-4. Single copies of type test reports, in English, shall be submitted by the *Contractor* for review.

Type tests reports from in-house testing laboratories will be accepted, subject to proof of the long- term, in-service performance of the product range. The *Contractor* shall, upon request by the *Employer,* provide further test reports from an accredited testing laboratory to verify the validity of any in-house test reports. An accredited testing laboratory is defined as a laboratory that holds valid

certification issued by ILAC (International Laboratory Accreditation Corporation) or one of its members. The *Employer* reserves the right to appoint a representative to inspect the arresters at any stage of manufacture and to witness and verify any tests.

7.9.2 Type Tests

The *Contractor* shall provide copies of the following type tests:

- Insulation withstand test of the surge arrester housing.
- Residual voltage test.
- Long duration current impulse withstand test.
- Operating duty tests.
- Power frequency voltage versus time characteristic.
- Short-circuit test.
- Natural ageing and pollution performance test. Surge arresters shall be tested in accordance with the Koeberg Insulator Pollution Test Station (KIPTS) natural ageing and pollution performance test procedure for outdoor insulator products, with particular reference to Section 3: Particular Requirements for Surge Arresters: Section 34-215.
- Internal partial discharge test.
- Moisture ingress test.
- Bending moment test: The manufacturer's declared values for the specified long-term bending loads shall be stated.

7.9.3 Routine Tests

The following routine tests that shall be conducted:

- Measure reference voltage (U_{ref}).
- Residual voltage test.
- Internal partial discharge test.

7.9.4 Factory Acceptance Testing

The *Employer* reserves the right to inspect and evaluate all manufacturing and testing facilities relating to the outdoor surge arresters offered, both before and at any time during manufacturing.

The *Employer* reserves the right to inspect any ordered outdoor surge arresters before shipment, or at any stage of manufacture. This inspection will entail a thorough check to ensure complete compliance with this standard, technical schedule and the approved manufacturer's drawings.

The *Contractor* shall submit the quality control plans to the *Employer*, indicating all inspection hold points. The *Employer* may add inspection hold and/or witness points. The *Contractor* shall make due allowance for these activities in the manufacturing programme and, to avoid delays, shall givesufficient, agreed upon, advanced notice of the date of inspection. The *Employer* will not accept late delivery on the basis of inspection delays.

The *Contractor* shall obtain a written clearance from the *Employer* prior to dispatch of the equipment from the OEM/manufacturer"s premises to Site. This clearance shall be confirmed on the routine test

certificates. No clearance shall be given where there are any outstanding defects resulting from Factory Acceptance Testing (FAT).

Table 19: Technical Schedule for 88 kV Surge Arrestors

Item	Description	Engineer's Specifications	Contractor's Specifications
1	**Operating Conditions**		
1.1	Altitude	up to 1800 m	
1.2	Average Humidity	30 to 90	
1.3	Intensity of Solar Radiation	1,1 kW/m²	
1.4	IEC pollution level	Coastal HVH (31 mm/kV specific creepage)	
1.5	Lightning activity	High	
1.6	System earthing	Effective	
1.7	System configuration	3	
1.8	Nominal system voltage (U_n)	88 kV	
1.9	Maximum system voltage (U_m)	195 kV	
1.10	Supply frequency	50 Hz	
1.11	BIL of equipment to be protected	350 kV peak	
2	**Electrical Characteristics of Arrester**		
2.1	Arrester classification	Station class	
2.2	IEC line discharge class	Class 2	
2.3	Nominal lightning discharge current (8/20 µs)	10 kA	
2.4	Minimum energy absorption capability for a single high current impulse, 100 kA 4/10 µs in per unit of MCOV	3,4 kJ/kV	
2.5	Minimum continuous operating voltage MCOV (U_c)	48 kV	
2.6	Maximum residual voltage (U_{res}) at 10 kA (8/20 µs)	165 kV	
3	**Arrester housing**		
3.1	Minimum external creepage distance:	2263 mm	
4	**Arrester housing profile design**		
	IEC 60815 annex D parameters:		
4.1	C	≥20	
4.2	s/p	≥0,65	
4.3	Ld/d	≤5	

4.4	P1 – P2	≥15	
4.5	CF	≤3,5	
4.6	PF	≥0,7	
5	**Arrester mounting details**		
5.1	Orientation	Vertical	
5.2	Method of mounting	Tripod base	
6	**Arrester line terminal**		
6.1	Type	Stem	
6.2	Diameter	26 mm	
6.3	Minimum length	100 mm	
6.4	Orientation	Vertical	

7.10 6.6 kV Surge Arresters

Table 20: Technical Schedule for 6.6 kV Surge Arrestors

Item	Description	Specified	
1	**Operating Conditions**		
1.1	Altitude	up to 1800 m	
1.2	Average Humidity	30 to 90	
1.3	Intensity of Solar Radiation	1,1 kW/m²	
1.4	IEC pollution level	Coastal HVH (31 mm/kV specific creepage)	
1.5	Lightning activity	High	
1.6	System earthing	Effective	
1.7	System configuration	3	
1.8	Nominal system voltage (U_n)	6.6 kV	
1.9	Maximum system voltage (U_m)	24 kV	
1.10	Supply frequency	50 Hz	
1.11	BIL of equipment to be protected	95 kV peak	
2	**Electrical Characteristics of Arrester**		
2.1	Arrester classification	Station class	
2.2	IEC line discharge class	Class 2	
2.3	Nominal lightning discharge current (8/20 µs)	10 kA	
2.4	Minimum energy absorption capability for a single high current impulse, 100 kA 4/10 µs in per unit of MCOV	3,4 kJ/kV	
2.5	Minimum continuous operating voltage MCOV (U_c)	24 kV	
2.6	Maximum residual voltage (U_{res}) at 10 kA (8/20 µs)	95 kV	
3	**Arrester housing**		
3.1	Minimum external creepage distance:	372 mm	
4	**Arrester housing profile design**		
	IEC 60815 annex D parameters:		
4.1	C	≥ 20	
4.2	s/p	≥ 0,65	

4.3	Ld/d	≤ 5	
4.4	P1 – P2	≥ 15	
4.5	CF	≤ 3,5	
4.6	PF	≥ 0,7	
5	**Arrester mounting details**		
5.1	Orientation	Vertical	
5.2	Method of mounting	Base	
6	**Arrester line terminal**		
6.1	Type	Threaded	
6.2	Diameter	M12	
6.3	Minimum length	50 mm	
6.4	Orientation	Vertical	

7.11 88 kV Post Insulators

KWAKWATSI Substation shall be equipped with 88 kV and 6.6 kV post insulators in the HV Yard.

7.11.1 Routine Tests

Routine tests shall be performed in accordance with SANS 60168 on all post insulators units prior to dispatch from the OEM"s premises.

Test certificates, including the results of routine production tests, shall be retained by the *Contractor*/OEM and shall be available for the *Employer's* inspection. The following tests are to be carried out on all insulator units:

- Visual examination.
- Mechanical test (50% of the specified mechanical failing load, applied in four mutually perpendicular directions, each for a minimum time of 3 s).

The 88 kV post insulators shall be in accordance with the Technical Schedule shown in Table 21 below.

Table 21: Technical Schedule for 88 kV Outdoor Post Insulators

Item	Description	Engineer's Specifications	Contractor's Specifications
1	**General**		
1.1	"IEC 60273" Classification	C4-550	
1.2	Specific creepage distance	31 mm/kV	
2	**Insulator details**		
2.1	Insulator type	Solid core	
2.2	Insulator material	Porcelain	
2.3	Colour of glaze	Dark Brown	
3	**Electrical Insulation Characteristics**		
3.1	Rated lightning impulse withstand voltage (peak)	550 kV	
3.2	Rated short time power freq. withstand voltage, wet	230 kV r.m.s	
4	**Dimensional characteristics**		
4.1	Creepage factor (l/S)	4 (31 mm/kV)	
4.2	Shed profile: Plain or Alternating	Alternating	
4.3	Minimum shed spacing to projection (s/p) ratio	0.65	

4.4	Minimum distance between sheds of the same diameter	30 mm	
4.5	Maximum creepage distance vs. clearance	5	
4.6	Insulator height (across mounting flanges)	1220 ± 1 mm	
4.7	Maximum nominal diameter of insulating part	300 mm	
5	**Mechanical Properties**		
5.1	Bending (cantilever) failing load	≥ 4 kN	
5.2	Torsion failing load	≥ 3000 Nm	
6	**Fixing Arrangements**		
6.1	Top fitting pitch circle diameter	127 mm	
6.2	Top fitting - number of holes	4	
6.3	Top fitting - diameter of holes	M16	
6.4	Bottom fitting pitch circle diameter	127 mm	
6.5	Bottom fitting - number of holes	4	
6.6	Bottom fitting - diameter of holes	M16	
6.7	Flange material	Cast iron	
6.8	Metal finish - minimum hot dip galvanizing thickness	100 µm	
6.9	Mounting bolt: Type	Grade 8.8	
6.10	Confirmation of the integrity of the supplied fastening arrangement	Yes	

7.12 Aluminium Tubular Busbar

The tubular busbars shall be aluminium alloy with the following technical requirements:

- Aluminium Alloy Tubing – Grade 6061-T6 (D65S).
- 120 mm Outside Diameter.
- 112 mm Inside Diameter.
- 4 mm Wall Thickness.
- Rated Current 2500 A.
- Centipede conductor shall be installed inside the tube for at least two-thirds of its length, to suppress Aeolian vibrations.
- The Centipede conductor shall be fixed to the end cap on one side only. One side of the bar shall have a sliding type clamp for expansion.

Table 22: Technical Schedule for Aluminium Tubular Busbar

S.No.	Particulars			
1.	Manufacturer's Name & Address.			
2.	Individual wires :			
(i)	**Aluminum**			
	(a)	Minimum Diameter of wire (mm)		
	(b)	Nominal Diameter of wire (mm)		
	(c)	Maximum Diameter of wire (mm)		
	(d)	Cross sectional area (sq.mm)		
	(e)	Mass per km. (kg./Km)		
	(f)	Minimum breaking load		
		□ Before stranding (kN)		
		□ After stranding (kN)		
	(g)	Maximum DC resistance 20^0C at (Ohm/km)		
(ii)	**Steel**			
	(a)	Minimum Diameter of wire (mm)		
	(b)	Nominal Diameter of wire (mm)		
	(c)	Maximum Diameter of wire (mm)		
	(d)	Cross sectional area (sq.mm)		
	(e)	Mass per Km. (kg./Km)		
	(f)	Minimum breaking load.		
		□ Before stranding (KN)		
		□ After stranding (KN)		

	(g)	Maximum DC resistance at 20^0C (Ohm/km.)		
3.	Zinc coating of steel stands :			
	(a)	Number of dips the steel wise can withstand (process test)		
		□ Before stranding		
		□ After stranding		
	(b)	Maximum weight of coating.		
		Before stranding (gm/m^2)		
		After stranding (gm/m^2)		
4.	Conductors :			
	(a)	Sectional area of Aluminum.		
	(b)	Total sectional area		
	(c)	Approx. overall dia (mm)		
	(d)	Approx. Mass per km. (kg./km.)		
	(e)	Calculated Maximum DC resistance at 20^0C (Ohm/km.)		
	(f)	Approx. calculated breaking load (kN)		
	(g)	Final modulus of elasticity		
	(h)	Coefficient of linear expansion per ^{0}C		
5.	Lay Ratio.			
6.	Continuous Maximum current rating of conductor and temperature (for given current load) above 40^0C ambient temperature.			
7.	Drum details.			
8.	Standard length.			
9.	Applicable standard.			

7.13 Lightning Mast

Table 23: Technical Schedule for Lightning Mast

Item	Description	Schedule	
1	Name of manufacturer		
2	Place of manufacture		
3	Manufacturer"s identification reference		
4	Standard to which mast complies		
5	Does the design of the mast comply with all the requirements of SANS 10225 and this specification?		
6	Is the mast design approved and certified by a qualified professional structural engineer?		
7	Standard to which steel tubes comply		
8	Material of mast		
9	Is the mast design accompanied by comprehensive strength calculations?		
10	Standard to which welding complies		
11	Standard to which galvanising complies		
12	Mass of mast		
13	Is the mast marked in accordance with the requirements of 4.9?		
14	Is all the information requested in 4.10.2 supplied?		
15	Calculated natural frequency of mast		
16	Expected service life of mast		

7.14 Fire Extinguisher

Table 24: Technical Schedule for Fire Extinguishers

S.NO.	Particulars		
1.0	CO_2 type fire extinguisher		
1.1	Manufacturer"s name		
1.2	Applicable IS:		
1.3	Capacity		
	(i) Trolley mounted		
	(ii) Wall mounted		
	(iii) Filling ratio		
1.4	Discharge duration from time of operating valve		
	(i) 11 kg. Cylinder (sec.) Min/Max.		
	(ii) 22 kg. Cylinder (sec.) Min/Max.		
1.5	Test pressure		
1.6	Empty weight of cylinder.		
1.7	Filled weight of cylinder.		
2.0	Dry Chemical powder type fire extinguisher		
2.1	Manufacturer / make		
2.2	Applicable IS:		
2.3	Capacity (i) Wall mounted		
	(ii) Trolley mounted		
2.4	Composition of powder		
2.5	Material of body		

2.6	Thickness of sheet.		
2.7	Minimum bursting pressure		

7.15 Earth Grid

Table 25: Technical Schedule for the Earth Grid

S.No.	Particulars		
1.	Manufacturer's Name.		
2.	Dia of MS rounds		
3.	Dia of MS electrodes (3 m long)		
4.	Size of MS flats. a) b) c)		
5.	Grade of Mild steel.		
6.	Material composition.		
7.	Electrical resistivity.		
8.	Modules of elasticity.		
9.	Tolerance on dimension.		
10.	Whether test certificates will be provided		

7.16 Control and Relays

Table 26: Technical Schedule for Control and Relays

1	Name of manufacturer		
2	Manufacturer"s type & designation		
3	Size of control panel		
4	Shade of the paint inside and outside of the panel		
	i) Inside		
	ii) Outside		
5	Painting process used		
6	Make of panel wiring		
7	Make of mountings		
	i) Ammeters		
	ii) Voltmeters		
	ii) MVAR meter		
	iv) P.F. meter		
	v) Terminal blocks		
	vi) Semaphore		
	vii) Control switches		
	viii) Aux. relavs		

7.17 LVAC Distribution Board

Table 27: Technical Schedule for LVAC Distribution Board

	Particular	**Unit**	**Value**
	<u>Air Circuit Breaker :</u>		
	Make		
	Rating		
a.	b. Number of pole c. Service voltage d. Normal current e. Frequency f. Making capacity in peak i) Symmetrical ii) Asymmetrical g. Short time current (1 second or 3 second	 Volts Amps. H kiloamp kA MVA kA kA	

	as applicable) h. Whether ACB is of indoor type.		
	Constructional features a. No. of breaks in circuit per pole b. Total length of break per pole c. Type of main contacts d. Type of arcing contacts and or arc control device e. Minimum clearance in air i) Between pole ii) Between live parts & earth f. Method of closing i) Whether hand or power ii) Whether the circuit breaker is designed to Close and latch on making or is fitted with making current release. iii) Whether the Circuit breaker is trip free. g. Power required at designed normal voltage to close circuit breakers. h. Normal voltage of shunt trip coils. i. Power required at normal voltage for shunt trip coils.	Nos. mm mm mm mm	
	Operating particulars : a. Opening time b. Make time	Sec.	
	c. Arc durations be stated for given breaking current, including resistance arc duration (if any) separately.	Sec.	
	Whether draw out type		
	No. of years for which under satisfactory use.		

	Moulded case circuit breaker / isolators		
	Make		
	Rating a. No. of pole b. Service voltage c. Normal current d. Frequency e. Rupturing capacity symmetrical	Volts Amps. C/s MVA 433 volts. at	
	Protection devices		Over load/ short circuit protection.
	Type of main contacts		
	Type of arc control devices		
	Whether MCCB is trip free		
	Operating particulars a. Operating time at rated breaking current b. Make time at rated / breaking current		
	Whether provided with standard flush mounting base assembly.		
	No. of years for which under satisfactory use.		
	L.T. SWITCHBOARD		
	Make		
	Bus bar rating		
	Bus bar material		
	Bus bar spacing		
	Size of busbar		
	Rupturing capacity of busbar		
	Guage size of sheet steel.		
	CURRENT TRANSFORMER		

	Make		
	Type		
	Rated voltage		
	Rated primary current		
	Rated secondary current		
	Rated continuous thermal current temperature rise over ambient		
	Mounting details		
	Overall dimensions		

7.18 DC System Technical Schedule

The DC system shall be designed, manufactured and tested in accordance with the following standards.

List of applicable standards

Standard	Title
IEC 60623	Secondary cells and batteries containing alkaline or other non-acid electrolytes-vented nickel-cadmium prismatic rechargeable single cells
IEEE 1115	IEEE Recommended practice for sizing Nickel-cadmium batteries
IEC 60127	Miniature fuses
IEC 60146	Semiconductor converters
IEC 60269	Low voltage fuses
IEC 60947	Low-voltage switchgear and control gear

This list of standards is not exhaustive and reference to a particular standard or recommendation in this specification does not relieve the supplier of the necessity of providing the goods complying with relevant standards and recommendations.

7.18.1 Battery Charger

The substation shall utilize 2 battery chargers, one for each battery bank to ensure redundancy of the DC system. The battery chargers shall be hot-swappable redundant battery charging system such that each unit is a 100% duty charger having both boost and float charging facilities. The chargers shall be silicon controlled rectifier type, suitable for charging batteries from the nominal LV voltage shown in the Terms of Reference. The battery chargers shall include a battery management system and the chargers shall be voltage controlled and current limiting. The charger shall be able to:

- Supply the initial charging requirements
- Boost charge the battery after an emergency discharge

- Supply the maximum load whilst on float charge`

The chargers shall be of high efficiency, short control response time, low output ripple without battery being connected and rated for continuous output short circuit operation as per the specific details provided in the technical schedules. The chargers shall be of solid state full wave, fully controlled using silicon rectifiers and complete with all switches, fuses, contacts and instruments. The output voltage shall be regulated from 0 to 100% load even with ±10% variations in input AC supply voltage and ±5% frequency variations.

The chargers shall:

- Be solid state micro-processor controlled
- Automatically switch into the boost charging mode when the battery bank has discharged below a preset value. A battery charge/discharge ampere-hour sensing device shall be provided to control the boost mode on/off switching as well as the boost charging time
- Be capable of recharging within twelve hours the battery bank to a condition enabling the battery bank for another cycle of emergency discharge as shown in the technical schedules. Simultaneously, the charger shall be capable of feeding the rated load of the entire DC busbar.
- Have all alarms and indications shown in the technical schedules reporting locally and to the operational control center via SCADA.
- Have output voltage failure detection insensitive to switching surges or transient loss of voltage due to faults on the power system
- Have load sharing and current limiting circuits built-in each module.
- Have a soft start feature.
- Have AC input isolation by the use of a two winding transformer.
- Have an LED indicator to show the AC supply is active.

Additionally, the battery charger shall be provided with the output voltage and ammeter requirements shown in the technical schedules.

Suitable means shall be provided such that when the charger is operating in float charge mode and switching to boost charge mode the voltage at the outgoing distribution terminals shall be automatically limited to within the tolerances specified.

The maintenance and operation instruction manuals and spare parts reference list shall be supplied with the battery charger.

7.18.2 Battery Charger Cubicle Construction

Approved vermin-proof ventilation shall be provided at or near the top and bottom of the enclosure.

Combustible or flammable materials shall not be used in the construction of the enclosure excluding painting.

All cubicles shall be arranged for front access. Front access shall be by means of stiff side-hinged, lift-off doors which shall be lockable. They shall have a minimum ingress protection of IP54.

Cubicles shall be spacious enough to permit full and easy access to all terminals and equipment mounted in the cubicle.

All cubicles shall be provided with a brass earth terminal stud not less than 10 mm in diameter for earthing the cubicle.

The charger cubicle shall be arranged for bottom cable entry bearing in mind that a large number of cables are to be terminated. Suitable, removable gland plates of acceptable dimensions and located in approved positions shall be provided for glanding of incoming and outgoing cables. The gland plate shall consist of the number of removable sections and clearance from the ground shown in the technical schedules. Gland plates shall be left unpunched and the minimum thickness of the gland plates shall be as shown in the technical schedules.

7.18.3 Battery Bank(s)

The battery bank shall consist of batteries of the type shown in the technical schedules suitable for low rate discharge applications. The batteries shall be of ultra-low maintenance type designed for use in substations over long periods.

The cell containers shall be of robust, impact resistant construction in translucent material permitting visual inspection of electrolyte and shall be having built-in vent caps (if required). They shall be mounted as described in the technical schedules. The following shall be followed in selection and installation of the battery bank(s).

- Each cell is readily accessible and can be removed from its position without having to remove or shift adjacent cells
- The cell containers shall be marked with maximum and minimum electrolyte levels
- The lead or nickel plated intercell connectors as well as the cell terminals are suitably insulated by PVC shrouds, sleeving or cover plates
- The batteries shall be shipped uncharged, with the liquid electrolyte shipped in separate non-returnable containers. 10% extra electrolyte shall be supplied to account for spillage during transit and erection
- The system must maintain the output voltage within the specified range even after a 24 hour discharge period
- Throughout the lifetime of the battery the efficiency of a discharge-recharge cycle shall not fall below the level specified in the technical schedules
- The bank of battery cells shall be earthed in the center and the poles of the battery shall not be earthed
- Inter-cell connections shall allow some degree of flex to prevent stress on cell terminals and the battery bank shall be supplied complete with all necessary inter-cell and main terminal connections. All connections shall be of the bolted type designed for low contact resistance throughout the lifetime of the battery.

The battery bank terminal cables shall be routed via a double pole miniature circuit breaker (MCB), and the MCB shall be selected so as to discriminate for a fault on the DC bus. The rating of the

battery MCB shall be at least twice the rating of the largest DC MCB used in the distribution circuits and shall be so sized that they do not fail through fatigue brought on by normal charge/discharge conditions.

All battery cells shall be clearly identified by permanent numbering. The following information shall be provided on a permanent identification plate with each battery:

- Manufacturer
- Year of manufacture
- Voltage and nominal capacity

7.18.4 DC Distribution Board

The DC Control and distribution board shall be equipped with MCBs and housed in a floor or wall mounted cubicle with natural ventilation. The DC distribution board shall not be mounted in the same cubicle as the battery charger. The cubicle shall have a hinged door that gives front access to the entire switchboard. The bottom plate of the DC distribution board shall be of detachable type for entryof outgoing feeder cables.

The equipment shall be capable of carrying, making and breaking the maximum possible fault current and details of the make-up of this shall be supplied as part of the Technical Bid. Curves of battery current plotted against time under short circuit conditions shall be supplied as part of the Technical Bid.

Outgoing distribution cables shall be connected directly to the relevant MCB of the DC distribution board. The cabling and wiring terminations shall be shrouded to avoid accidental short circuit or earthing of the battery. PVC insulation shall be used for fuse wiring connections. The DC board shall have a minimum of 16 ways/circuits to supply DC to different circuits in the substation.

The DC distribution board shall be provided with the voltmeter(s) and ammeter(s) shown in the technical schedules.

The busbars and all “live” terminals shall be covered by a removable front cover plate to prevent accidental contact when doing switching.

Table 28: DC System Technical Schedule

No.	Particulars	Unit	Engineer’s Specifications	Bidders Specifications
1	**General**			
1.001	Applicable Specification		DC System Specification	N/A
1.002	Substation		KWAKWATSI	N/A
1.003	DC System Nominal Voltage	V	110	N/A
1.004	DC System Operating Range	V	108-130	
1.05	Bidder / supplier		*STATE*	
1.06	Manufacturer name		*STATE*	
1.07	Country of origin		*STATE*	
1.08	Manufacturers datasheet		*ATTACH*	
2	**Battery Charger**			
2.0	***General***			N/A
2.001	Number of chargers		4	

No.	Particulars	Unit	Engineer's Specifications	Bidders Specifications
2.002	Mounting	Details	Wall or Floor	
2.003	Minimum clearance from floor	mm	300	
2.004	Maximum Height	mm	1500	
2.005	Removable gland plate sections	Number	5	
2.006	Thickness of gland plate	mm	2.5	
2.007	Cooling	Details	Natural air cooling / self forced cooling	
2.1	***Inputs***			N/A
2.101	Input voltage	Vac	216-264	
2.102	Input frequency	Hz	47.5-52.5	
2.103	Input power factor		> 0.8	
2.104	Input protection	Details	Over current and over voltage	
2.2	***Outputs***			N/A
2.201	Nominal voltage	Vdc	110	N/A
2.202	Float voltage range	Vdc	*STATE*	
2.203	Maximum float voltage	Vdc	127.8	
2.204	Boost voltage range	Vdc	*STATE*	
2.205	Maximum voltage	Vdc	137.5	
2.206	Voltage ripple	%	< 1%	
2.207	Transient response for 25% load change at 50% of load	%	5%	
2.208	Rated charging current	A	TBC	
2.209	Output protection	Details	Short circuit and over voltage	
2.210	Charger digital voltmeter	Operating range	0-125% of nominal	
2.211	Charger digital ammeter	Operating range	0-150% of rating	
2.3	***Properties***			N/A
2.301	Efficiency at full load	%	> 80%	
2.302	Circuit breakers (thermo-magnetic)	Details	Input, battery bank(s), DC distribution board	
2.4	***Indications and Alarms***			N/A
2.401	Mains healthy	Details	Indication	
2.402	Boost charge activated	Details	Indication	
2.403	Float charge activated	Details	Indication	
2.404	Low voltage alarm	V	108	
2.405	High voltage alarm	V	130	
2.406	Charger output failure	Details	Alarm	
2.407	Battery earth fault	Details	Alarm	
2.408	Battery high resistance or open circuit	Details	Alarm	
3	**Battery Banks**			
3.0	***General***			N/A
3.001	Type	Details	Nickel Cadmium	
3.002	Rack mounting	Details	Floor with 300mm clearance	
3.003	Number of Battery Banks	number	4	
3.004	Parallel Operation Required	Yes/No	Yes	
3.005	Battery output voltmeter	Details	Digital meter	
3.006	Exposed conductors	Details	Shrouded	

No.	Particulars	Unit	Engineer's Specifications	Bidders Specifications
3.007	Terminal connections	Details	Bolted	
3.1	***Battery Arrangement***			N/A
3.101	Battery Capacity	Ah	*300*	
3.102	Nominal Voltage per Cell	V	*STATE*	
3.103	Maximum voltage per cell	V	*STATE*	
3.104	Number of Cells per Bank	Number	*STATE*	
3.2	***Lifetime***			N/A
3.201	Design Life	Years	20	
3.202	Topping up period	Years	10	
3.203	End of life ampere-hour efficiency	%	90	
3.204	End of life watt-hour efficiency	%	75	
3	**DC Distribution Board**			
3.0	***General***			N/A
3.001	Type	Details	Cubicle with hinged door	
3.02	Rack mounting	Details	Floor or Wall	
3.03	Ventilation	Details	Natural	
3.1	***Monitoring***			N/A
3.101	Output voltage meter range	%	0-125% of nominal voltage	
3.102	Battery charge / discharge ammeter	%	0-200% of normal standing load	
3.103	Distribution board load ammeter	%	0-150% of normal standing load	

7.19 DEFINITIONS AND ABBREVIATIONS

7.19.1 Definitions

Table 29: Definition of Terms

Term	Definition
Grid Code	The Electricity (Primary Grid Code) Regulations, 2003
Quality of Supply	The measure of the ability of the distribution system to provide supply that meets the voltage quality requirements of the Grid Code Regulations
Regulator	The Electricity Regulatory Authority established under the Electricity Act, 1999
Reliability of Supply	The measure of the ability of the distribution system to provide supply to consumers
Safety Code	The Electricity (Safety Code) Regulations, 2003
Technical Losses	Power losses that are a result of the physical nature of the electrical network
Voltage Profile	A measure of the voltage variances over a period of time

7.19.2 Abbreviations

Table 30: Table of Abbreviations

Abbreviation	Description
AVR	Automatic Voltage Regulator
CCD	Capital and Contracts Division
CTs	Current Transformers
Cum	Cubic Metres
DC	Direct Current
ERA	Electricity Regulatory Authority

Abbreviation	Description
Hz	Hertz
IP	Ingress Protection
kV	kilovolt
LED	Light Emitting Diode
MCB	Miniature Circuit Breaker
MK	Marshalling Kiosk
m	Metres
mm	Millimetres
MV	Medium Voltage
MVA	Megavolt amps
OC/EF	Over Current and Earth Fault
OLTC	On Load Tap Changer
OTDR	Optical Time Domain Reflectometer
PCC	Precast Concrete
PRD	Pressure Relief Device
PVC	Polyvinyl Chloride
RCC	Reinforced Concrete
RTU	Remote Terminal Unit
s	Seconds
SCADA	Supervisory Control and Data Acquisition
SEF	Sensitive Earth Fault
SHREQ	Safety, Health, Risk, Environment and Quality
SIT	Site Integration Testing
S/S	Substation

Abbreviation	Description
Tx	Transformer
VA	Volt amps
VIP	Ventilated Improved Pit Latrine
VTs	Voltage Transformers
WBM	Water Bound Macadam
XLPE	Cross Linked Polyethylene

7.19.3 Normative references

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

7.19.4 Informative

1. The Electricity (Primary Grid Code) Regulations
2. The Electricity (Safety Code) Regulations, 2003.

7.20 APPLICABLE STANDARDS

Table 31: Table of Applicable Standards

Standard	Title
BS 476	Fire tests on building materials and structures. Methods for determination of the contribution of components to the fire resistance of a structure
BS 5266-1	Emergency lighting - Part 1: Code of practice for the emergency escape lighting of premises
BS 5839-1	Fire detection and fire alarm systems for buildings. Code of practise for design, installation, commissioning and maintenance of systems in non-domestic premises
BS 5839-3	Fire detection and fire alarm systems for buildings. Specification for automatic release mechanisms for certain fire protection equipment
BS 6387	Test methods for resistance to fire of cables required to maintain circuit integrity under fire conditions
BS 7430	Code of practice for protective earthing of electrical installations

Standard	Title
BS 7671	Requirements for electrical installations
BS 7870-1	LV and MV polymeric insulated cables for use by distribution and generation utilities: General
BS 7870-2	LV and MV polymeric insulated cables for use by distribution and generation utilities: Methods of test
BS 7870-8.1	LV and MV polymeric insulated cables for use by distribution and generation utilities: Specification for multicore and multipair cables for installation above and below ground: Single wire armoured and PVC sheathed multicore cable with copper conductors
BS 7870-8.2	LV and MV polymeric insulated cables for use by distribution and generation utilities: Specification for multicore and multipair cables for installation above and below ground: Single wire armoured and PVC sheathed multipair cable with copper conductors
BS EN 1022-2	Welding. Recommendations for welding of metallic materials Arc welding of ferrite steels.
BS EN 10240	Internal and/or external protective coatings for steel tubes. Specification for hot dip galvanized coatings applied in automatic plants.
BS EN 1838	Lighting applications. Emergency lighting
BS EN 22063	Metallic and other inorganic coatings. Thermal spraying. Zinc, aluminium and their alloys.
BS EN 50522	Earthing of power installations exceeding 1 kV a.c.
BS EN 54-22	Fire detection and fire alarm systems for buildings. Manual call points
BS EN 54-2	Fire detection and fire alarm systems for buildings. Control and indicating equipment
BS EN 54-4	Fire detection and fire alarm systems for buildings. Power supply equipment
BS EN 60793-3	Optical fibres - Part 3: Outdoor cables
BS EN ISO 1460	Metallic coatings. Hot dip galvanized coatings on ferrous materials. Gravimetric determination of the mass per unit area.
BS EN ISO 1461	Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods
BS EN ISO 8501-1	Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings.

Standard	Title
BS EN ISO 8503-1	Preparation of steel substrates before application of paints and related products. Surface roughness characteristics of blast-cleaned steel substrates Specifications and definitions for ISO surface profile comparators for the assessment of abrasive blast- cleaned surfaces.
BS 2562	Specification for Cable Boxes for Transformers and Reactors
BS 5499	Graphical Symbols and Signs – Safety Signs, Including Fire Safety Signs
BS 6435	Specification for Unfilled Enclosures for the Dry Termination of HV Cables for Transformers and Reactors.
BS EN 10244-2	Steel Wire and Wire Products. Non-Ferrous Metallic Coatings on Steel Wire – Part 2 – Zinc or Zinc Alloy Coatings
BS EN 50180	Bushings above 1 kV up to 36 kV and from 250 A to 3.15 kA for liquid filled transformers.
BS EN 50216	Power Transformer and Reactor Fittings.
BS EN ISO 12944-2	Paints and Varnishes. Corrosion Protection of Steel Structures by Protective Paint Systems. Classification of Environments.
BS EN ISO 14001	Environment Management Systems. Requirements with Guidance for use.
BS EN ISO 9000	Management and Quality Assurance Standards
CIBSE LG12	CIBSE Lighting Guide 12: Emergency Lighting Design Guide
EIA/TIA-598-C	Optical fibre cable colour coding
IEC 60099-4	Surge Arresters - Part 4: Metal-oxide surge arresters without gaps for a.c. systems
IEC 60099-5	Surge Arresters - Part 5: Selection and application recommendations
IEC 60127	Miniature fuses
IEC 60146	Semiconductor converters
IEC 60189	Low frequency cables and wires with PVC insulation and sheath (parts 1 to 3)
IEC 60227	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V - Part 1: General requirements
IEC 60228	Conductors of insulated cables
IEC 60229	Electric cables – Tests on extruded over sheaths with a special protective function

Standard	Title
IEC 60230	Impulse tests on cables and their accessories.
IEC 60269	Low voltage fuses
IEC 60287	Calculation of the continuous current rating of cables (100% load factor).
IEC 60475	Method of sampling insulating liquids
IEC 60502-1	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um = 1.2 kV) up to 30 kV (Um = 36 kV) – Part 1: Cables for rated voltages from 1 kV (Um = 1.2 kV) up to 3 kV (Um = 3.6 kV).
IEC 60529	Degrees of protection provided by enclosures (IP code)
IEC 60529	Degrees of protection provided by enclosures (IP code)
IEC 60617	Graphical symbols for diagrams
IEC 60623	Secondary cells and batteries containing alkaline or other non-acid electrolytes - Vented nickel-cadmium prismatic rechargeable single cells
IEC 60724	Short-circuit temperature limits of electric cables with rated voltages of 1 kV (Um = 1,2 kV) and 3 kV (Um = 3,6 kV)
IEC 60793-2	Optical Fibres - Part 2: Product specifications
IEC 60822	Common test methods for insulating and sheathing materials of electric cables and optical cables
IEC 60870-5-101	Transmission protocols, companion standards especially for basic telecontrol tasks
IEC 60870-5-104	Transmission protocols, network access for IEC 60870-5-101 using standard transport profiles
IEC 60885	Electric test methods for electric cables.
IEC 60947	Low-voltage switchgear and controlgear
IEC 60947-7	Terminal block requirements
IEC 61000-4	Electromagnetic compatibility (EMC): Test and measurement techniques (All Parts)
IEC 62305-1	Protection against lightning - General principles
IEC 62305-2	Protection against lightning - Risk Management
IEC 62305-3	Protection against lightning - Physical Damage to Structures and Life Hazard

Standard	Title
IEC 62305-4	Protection against lightning - Electrical and Electronic Systems within Structures
IEC 60071	Insulation Coordination
IEC 60076	Power Transformers
IEC 60085	Thermal evaluation and classification of electrical insulation.
IEC 60137	Insulated bushings for ac voltages above 1000V.
IEC 60156	Insulating Liquids – Determination of the breakdown voltage at power frequency – Test method
IEC 60214	On Load Tap Changers
IEC 60296	Fluids for electrotechnical applications. Unused mineral insulating oils for transformers and switchgear.
IEC 60354	Loading guide for oil-immersed transformers
IEC 60437	Radio Influence Voltage Measurement
IEC 60518	Dimensional Standardization of terminals for high voltage switchgear and control gear.
IEC 60529	Degrees of protection provided by enclosures.
IEC 60616	Terminal and tapping markings for power transformers
IEC 60815	Guide for Selection of insulators in respect of polluted conditions.
IEC 61850	Communication networks and systems in substations
IEC 61869-1	Instrument Transformers – Part: General Requirements
IEC 61869-2	Instrument Transformers – Part 2: Additional Requirements for Current Transformers
IEC 61869-3	Instrument Transformers – Part 3: Additional Requirements for Inductive Transformers.
IEEE 2215	IEEE Recommended practice for sizing Nickel-cadmium batteries
IEEE 1613	IEEE Standard environmental and testing requirements for communications networking devices installed in electric power substations
IEEE 80	IEEE Guide for Safety in AC Substation Grounding
IEEE 81	IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System

Standard	Title
ISO/IEC 22801	Information technology - Generic cabling for customer premises
ESKOM Standards	
34-465	Generic requirements with regard to Distribution protection equipment enquiries and contracts
DISASABD2	The Distribution Group"s Generic requirements with regard to protection equipment enquiries and contracts
DISSCAAK9	Specification for Labels on Control Panels, Relay Panels and Other Indoor and Outdoor Equipment
DISSCABU0	Specification for dehydrating breathers fitted to transformers, reactors and on-load tap changers.

C6: EPWP GUIDELINES

The Ministerial Determination 4, Expanded Public Works Programmes, issued in terms of section 50 of the Basic Conditions of Employment Act of 1997 by the Minister of Labour in Government Notice R949 in Government Gazette 9745 of 4 May 2012, as reproduced below, shall apply to works described in the scope of work as being labour intensive and which are undertaken by unskilled or semi-skilled workers.

Introduction

1.1 This document contains the standard terms and conditions for workers employed in elementary occupations on Expanded Public Works Programme (EPWP). These terms and conditions do NOT apply to persons employed in the supervision and management of a EPWP.

1.2 In this document –

(a) "department" means any department of the State, implementing agent or contractor;

(b) "employer" means any department, implementing agency or contractor that hires workers to work in elementary occupations on a EPWP;

(c) "worker" means any person working in an elementary occupation on a EPWP;

(d) "elementary occupation" means any occupation involving unskilled or semi-skilled work;

(e) "management" means any person employed by a department or implementing agency to administer or execute an EPWP;

(f) "task" means a fixed quantity of work;

(g) "task-based work" means work in which a worker is paid a fixed rate for performing a task;

(h) "task-rated worker" means a worker paid on the basis of the number of tasks completed;

(i) "time-rated worker" means a worker paid on the basis of the length of time worked.

C6.1: TERMS OF WORK

6.1.1 Workers on EPWP are employed on a temporary basis or contract basis.

C6.2: NORMAL WORKING HOURS

6.2.1 An employer may not set tasks or hours of work that require a worker to work–

(a) more than forty hours in any week

(b) on more than five days in any week; and

(c) for more than eight hours on any day.

6.2.2 An employer and worker may agree that a worker will work four days per week. The worker may then work up to ten hours per day.

6.2.3 A task-rated worker may not work more than a total of 55 hours in any week to complete the tasks allocated (based on a 40-hour week) to that worker.

C6.3: MEAL BREAKS

6.3.1 A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.
6.3.2 An employer and worker may agree on longer meal breaks.
6.3.3 A worker may not work during a meal break. However, an employer may require a worker to perform duties during a meal break if those duties cannot be left unattended and cannot be performed by another worker. An employer must take reasonable steps to ensure that a worker is relieved of his or her duties during the meal break.
6.3.4 A worker is not entitled to payment for the period of a meal break. However, a worker who is paid on the basis of time worked must be paid if the worker is required to work or to be available for work during the meal break.

C6.4: SPECIAL CONDITIONS FOR SECURITY GUARDS

6.4.1 A security may work up to 55 hours per week and up to eleven hours per day.

6.4.2. A security guard who works more than ten hours per day must have a meal break of at least one hour or two breaks of at least 30 minutes each.

C6.5: DAILY REST PERIOD

Every worker is entitled to a daily rest period of at least twelve consecutive hours. The daily rest period is measured from the time the worker ends work on one day until the time the worker starts work on the next day.

C6.6: WEEKLY REST PERIOD

Every worker must have two days off every week. A worker may only work on their day off to perform work which must be done without delay and cannot be performed by workers during their ordinary hours of work ("emergency work").

C6.7: WORK ON SUNDAYS & PUBLIC HOLIDAYS

6.7.1 A worker may only work on a Sunday or public holiday to perform emergency or security work.

6.7.2 A task-rated worker who works on a public holiday/Sunday must be paid –
(a) the worker"s daily task rate, if the worker works for less than four hours;
(b) double the worker"s daily task rate, if the worker works for more than four hours.
6.7.3 A time-rated worker who works on a public holiday/Sunday must be paid –
(a) the worker"s daily rate of pay, if the worker works for less than four hours on the public holiday;
(b) double the worker"s daily rate of pay, if the worker works for more than four hours on the public holiday

C6.8: SICK LEAVE

6.8.1 Only workers who work four or more days per week have the right to claim sick-pay in terms of this clause.
6.8.2 A worker who is unable to work on account of illness or injury is entitled to claim one day"s paid sick

leave for every full month that the worker has worked in terms of a contract.

6.8.3 A worker may accumulate a maximum of twelve days" sick leave in a year.

6.8.4 Accumulated sick-leave may not be transferred from one contract to another contract.

6.8.5 An employer must pay a task-rated worker the worker"s daily task rate for a day"s sick leave.

6.8.6 An employer must pay a time-rated worker the worker"s daily rate of pay for a day"s sick leave.

6.8.7 An employer must pay a worker sick pay on the worker"s usual payday.

6.8.8 Before paying sick-pay, an employer may require a worker to produce a certificate stating that the worker was unable to work on account of sickness or injury if the worker is –

(a) absent from work for more than two consecutive days; or

(b) absent from work on more than two occasions in any eight-week period.

6.8.9 A medical certificate must be issued and signed by a medical practitioner, a qualified nurse or a clinic staff member authorized to issue medical certificates indicating the duration and reason for incapacity.

6.8.10 A worker is not entitled to paid sick-leave for a work-related injury or occupational disease for which the worker can claim compensation under the Compensation for Occupational Injuries and Diseases Act.

C6.9: MATERNITY LEAVE

6.9.1 A worker may take up to four consecutive months" unpaid maternity leave.

6.9.2 A worker is not entitled to any payment or employment-related benefits during maternity leave.

6.9.3 A worker must give her employer reasonable notice of when she will start maternity leave and when she will return to work.

6.9.4 A worker is not required to take the full period of maternity leave. However, a worker may not work for four weeks before the expected date of birth of her child or for six weeks after the birth of her child, unless a medical practitioner, midwife or qualified nurse certifies that she is fit to do so.

6.9.5 A worker may begin maternity leave –

(a) four weeks before the expected date of birth; or

(b) on an earlier date –

(i) if a medical practitioner, midwife or certified nurse certifies that it is necessary for the health of the worker or that of her unborn child; or

(ii) if agreed to between employer and worker; or

(c) on a later date, if a medical practitioner, midwife or certified nurse has certified that the worker is able to continue to work without endangering her health.

6.9.6 A worker who has a miscarriage during the third trimester of pregnancy or bears a still- born child may take maternity leave for up to six weeks after the miscarriage or stillbirth.

C6.10: FAMILY RESPONSIBILITY

6.10.1 Workers, who work for at least four days per week, are entitled to three days paid family responsibility leave each year in the following circumstances -

(a) When the employee"s child is born;

(b) when the employee"s child is sick;

(c) in the event of a death of –

(i) the employee"s spouse or life partner;

(ii) the employee"s parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling.

C6.11: STATEMENT OF CONDITIONS

6.11.1 An employer must give a worker a statement containing the following details at the start of employment –

(a) The employer"s name and address and the name of the EPWP;
(b) the tasks or job that the worker is to perform; and
(c) the period for which the worker is hired or, if this is not certain, the expected duration of the contract
(d) The worker"s rate of pay and how this is to be calculated;
(e) the training that the worker will receive during the EPWP.

6.11.2 An employer must ensure that these terms are explained in a suitable language to any employee who is unable to read the statement.

6.11.3 An employer must supply each worker with a copy of these conditions of employment.

C6.12: KEEPING RECORDS

6.12.1 Every employer must keep a written record of at least the following –

(a) the worker"s name and position;
(b) Copy of an acceptable worker identification
(c) in the case of a task-rated worker, the number of tasks completed by the worker;
(d) in the case of a time-rated worker, the time worked by the worker;
(e) Payments made to each worker.

6.12.2 The employer must keep this record for a period of at least three years after the completion of the EPWP.

C6.13: PAYMENT

6.13.1 An employer must pay all wages at least monthly in cash or by cheque or into a bank account.

6.13.2 A worker may not be paid less than the minimum EPWP rate of R70.59 per day or per task. This will be adjusted annually on the 1st November in line with inflation (available CPI as provided by Stats SA six (6) weeks before implementation.

6.13.3 A task-rated worker will only be paid for tasks that have been completed.

6.13.4 An employer must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the contractor having submitted an invoice to the employer.

6.13.5 A time-rated worker will be paid at the end of each month.

6.13.6 Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.

6.13.7 Payment in cash or by cheque must take place –

(a) at the workplace or at a place agreed to by the worker;
(b) during the worker"s working hours or within fifteen minutes of the start or finish of work;
(c) in a sealed envelope which becomes the property of the worker.

6.13.8 An employer must give a worker the following information in writing –

(a) the period for which payment is made;
(b) the numbers of tasks completed or hours worked;
(c) the worker"s earnings;
(d) any money deducted from the payment;
(e) the actual amount paid to the worker.

6.13.9 If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it

6.13.10 If a worker"s employment is terminated, the employer must pay all monies owing to that worker within one month of the termination of employment.

C6.14: DEDUCTIONS

6.14.1 An employer may not deduct money from a worker"s payment unless the deduction is required in terms of a law.

6.14.2 An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.

6.14.3 An employer who deducts money from a worker"s pay for payment to another person must pay the money to that person within the time period and other requirements specified in the agreement law, court order or arbitration award concerned.

6.14.4 An employer may not require or allow a worker to –

(a) repay any payment except an overpayment previously made by the employer by mistake;
(b) state that the worker received a greater amount of money than the employer actually paid to the worker; or
(c) pay the employer or any other person for having been employed.

C6.15: HEALTH AND SAFETY

6.15.1 Employers must take all reasonable steps to ensure that the working environment is healthy and safe.

6.15.2 A worker must –

(a) work in a way that does not endanger his/her health and safety or that of any other person;
(b) obey any health and safety instruction;
(c) obey all health and safety rules of the EPWP;
(d) use any personal protective equipment or clothing issued by the employer;
(e) report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

C6.16: COMPESATION FOR INJURIES AND DISEASES

6.16.1 It is the responsibility of the employers (other than a contractor) to arrange for all persons employed on a EPWP to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993.

6.16.2 A worker must report any work-related injury or occupational disease to their employer or manager.

6.16.3 The employer must report the accident or disease to the Compensation Commissioner.

6.16.4 An employer must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months. The employer will be refunded this amount by the Compensation Commissioner. This does NOT apply to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

C6.17: TERMINATION

6.17.1 The employer may terminate the employment of a worker for good cause after following a fair procedure.

6.17.2 A worker will not receive severance pay on termination.

6.17.3 A worker is not required to give notice to terminate employment. However, a worker who

wishes to resign should advise the employer in advance to allow the employer to find a replacement.

6.17.4 A worker who is absent for more than three consecutive days without informing the employer of an intention to return to work will have terminated the contract. However, the worker may be re-engaged if a position becomes available.

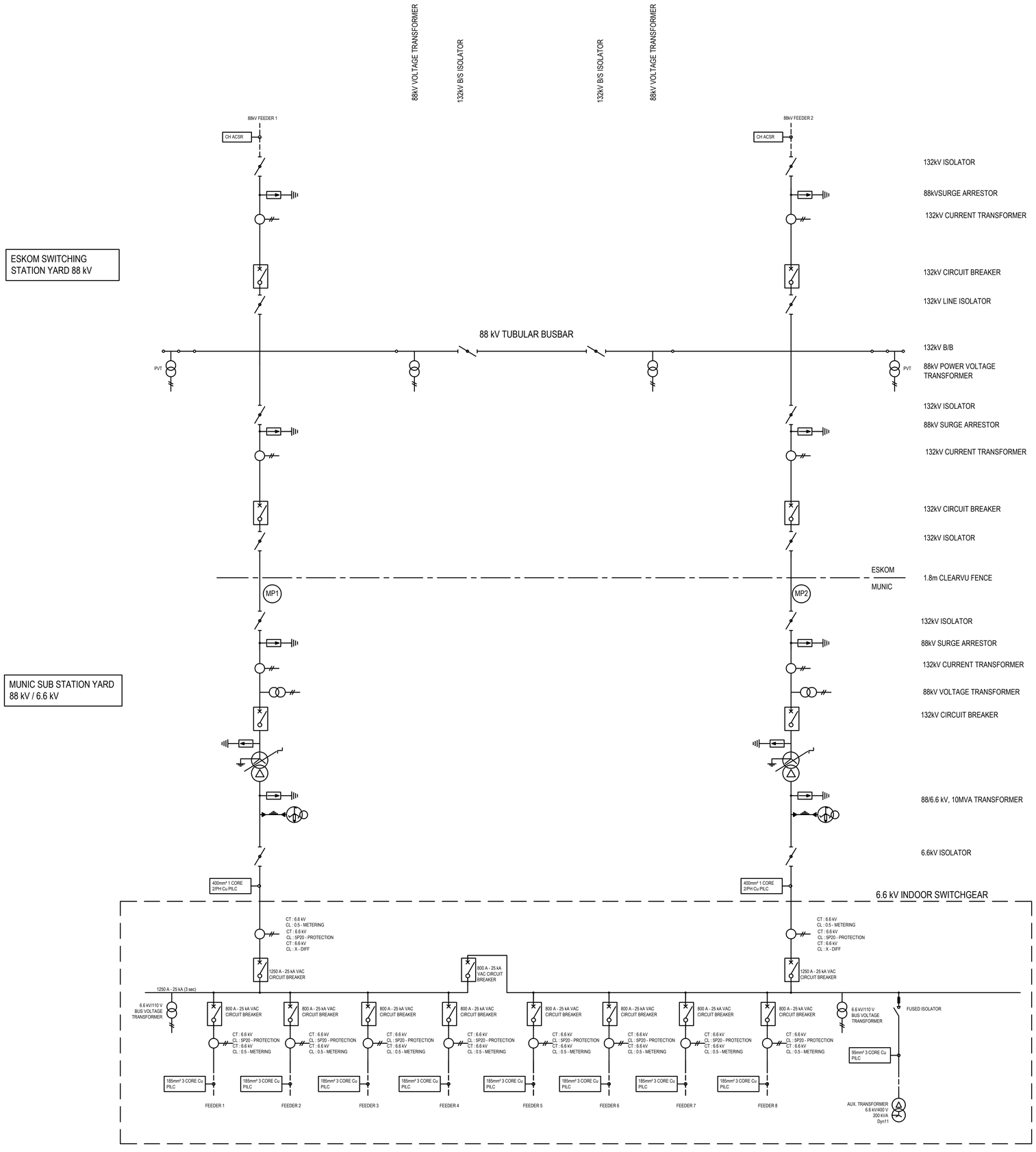
6.17.5. A worker who does not attend required training events, without good reason, will have terminated the contract. However, the worker may be re-engaged if a position is available.

C6.18: CERTIFICATE OF SERVICE

6.18.1 On termination of employment, a worker is entitled to a certificate stating –

(a) the worker's full name;
(b) the name and address of the employer;
(c) the EPWP on which the worker worked;
(d) the work performed by the worker;
(e) any training received by the worker as part of the EPWP;
(f) the period for which the worker worked on the EPWP;
(g) any other information agreed on by the employer and worker.

C6.19: DESIGN DRAWINGS



NEW KOPPIES 88 kV/6.6 kV SUBSTATION SINGLE LINE DIAGRAM

NTS

LEGEND

TECHNICAL DATA

132/88kV	
ISOLATOR	3150A 132kV 88kV
SURGE ARRESTOR	
CURRENT TRANSFORMER	See Table Below
88kV CIRCUIT BREAKER	132kV 3150A 88kV
ISOLATOR	3150A 132kV
132 B/S ISOLATOR 88kV VOLTAGE TRANSFORMER 88kV POWER VT	
ISOLATOR	3150A 132kV
SURGE ARRESTOR	88kV
CURRENT TRANSFORMER	See Table Below
CIRCUIT BREAKER	132kV 3150A 88kV
ISOLATOR EARTH SWITCH	3150A 132kV
ISOLATOR	3150A 132kV
SURGE ARRESTOR	88kV
CURRENT TRANSFORMER	See Table Below
VOLTAGE TRANSFORMER	
CIRCUIT BREAKER	3150A 132kV
SURGE ARRESTOR	88kV
POWER TRANSFORMER	10 MVA 88 kV/6.6 kV Dyn11
NER	6.6kV, 360A
SURGE ARRESTOR	6.6kV
AUXILIARY TRANSFORMER	6.6kV / 415V
ISOLATOR	3150A 6.6kV

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MUTEO CONSULTING

TEL: (013) 752 2750
FAX: (013) 755 3982
Email: admin@muteo.co.za
Website: www.muteo.co.za

OFFICE NO.9 & 12 LIZA'S COURT
28 VAN RENSBURG STREET
SONHEUWEL DORP
NELSPRUIT, 1201
MPUMALANGA, SOUTH AFRICA

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Revision Schedule

Rev	Date	by	Description
0	2022.03.09	TL	ISSUED FOR TENDER

Discipline: ELECTRICAL ENGINEERING

Project: NEW KOPPIES SUBSTATION

Description: NEW KOPPIES 88/6.6 kV SUBSTATION SINGLE LINE DIAGRAM

DESIGNED BY	DRAWN BY	APPROVED BY	ECSA NUMBER
T. MAKUMULE	T. LEBOHO	S. MANDEBVU	20120237
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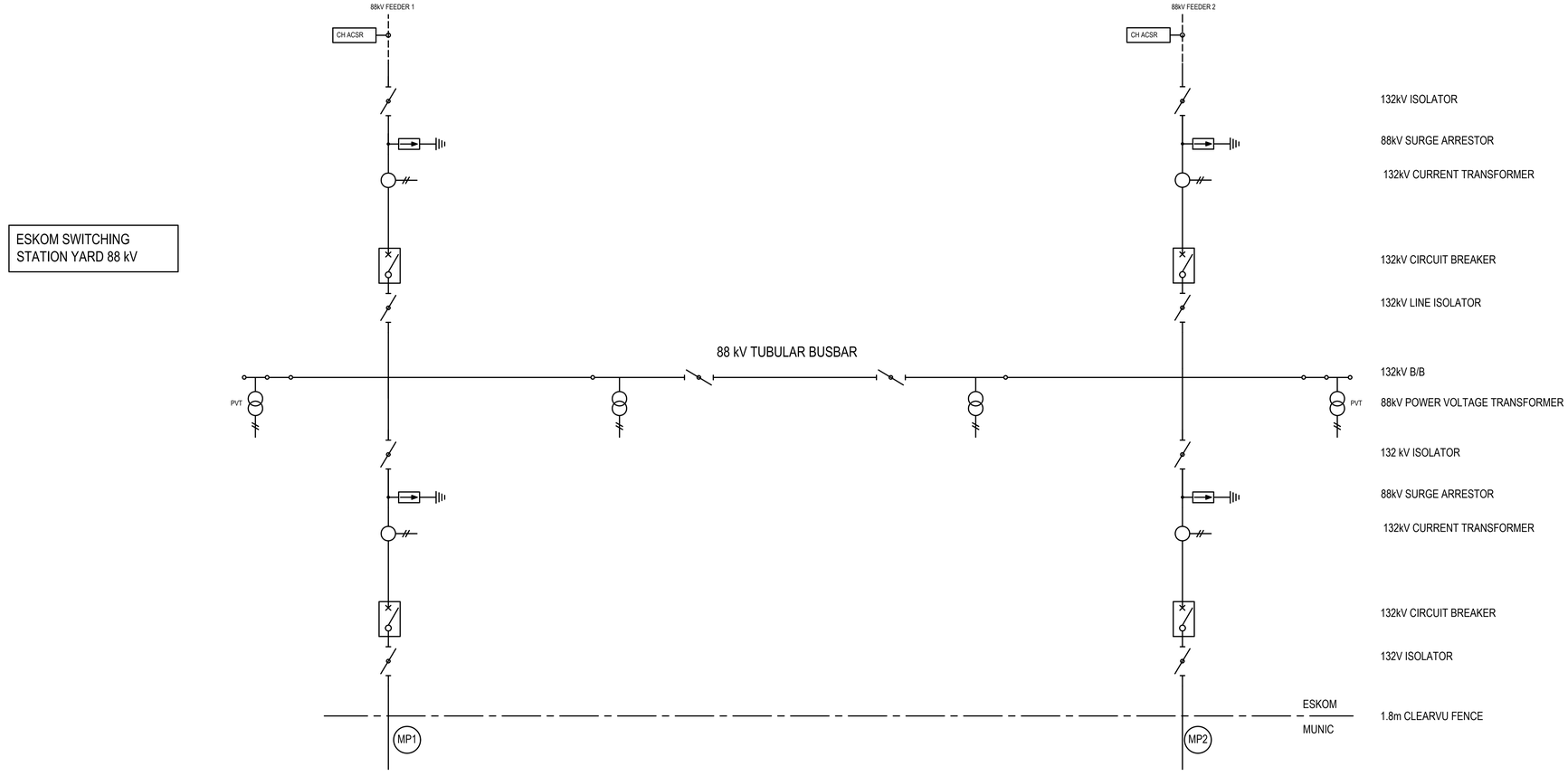

NEW KOPPIES ESKOM 88 kV/6.6 kV SUBSTATION SINGLE LINE DIAGRAM

NTS

LEGEND	TECHNICAL DATA	
LINES/TRAFRS	132/88kV	
	ISOLATOR	3150A 132kV
	SURGE ARRESTOR	88kV
	CURRENT TRANSFORMER	See Table Below
	88kV CIRCUIT BREAKER	132kV 3150A 88kV
	ISOLATOR	3150A 132kV
PVT	132 B/S ISOLATOR 88kV VOLTAGE TRANSFORMER 88kV POWER VT	
	ISOLATOR	3150A 132kV
	SURGE ARRESTOR	88kV
	CURRENT TRANSFORMER	See Table Below
	CIRCUIT BREAKER	132kV 3150A 88kV
	ISOLATOR EARTH SWITCH	3150A 132kV
	ISOLATOR	3150A 132kV
	SURGE ARRESTOR	88kV
	CURRENT TRANSFORMER	See Table Below
	VOLTAGE TRANSFORMER	
	CIRCUIT BREAKER	3150A 132KV
	SURGE ARRESTOR	88kV
	POWER TRANSFORMER	10 MVA 88 kV/6.6 kV Dyn11
	NER	6.6kV, 360A
	SURGE ARRESTOR	6.6kV
	AUXILIARY TRANSFORMER	6.6kV / 410kV
	ISOLATOR	3150A 6.6kV

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MUTEO CONSULTING
TEL: (013) 752 2750
FAX: (013) 755 3982
Email: admin@muteo.co.za
Website: www.muteo.co.za
OFFICE NO.9 & 12 LIZA'S COURT
28 VAN RENSBURG STREET
SONHEUWEL DORP
NELSPRUIT, 1201
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Revision Schedule

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ELECTRICAL ENGINEERING — Discipline

NEW KOPPIES SUBSTATION — Project

NEW KOPPIES ESKOM 88 kV/6.6 kV SUBSTATION SINGLE LINE DIAGRAM — Description

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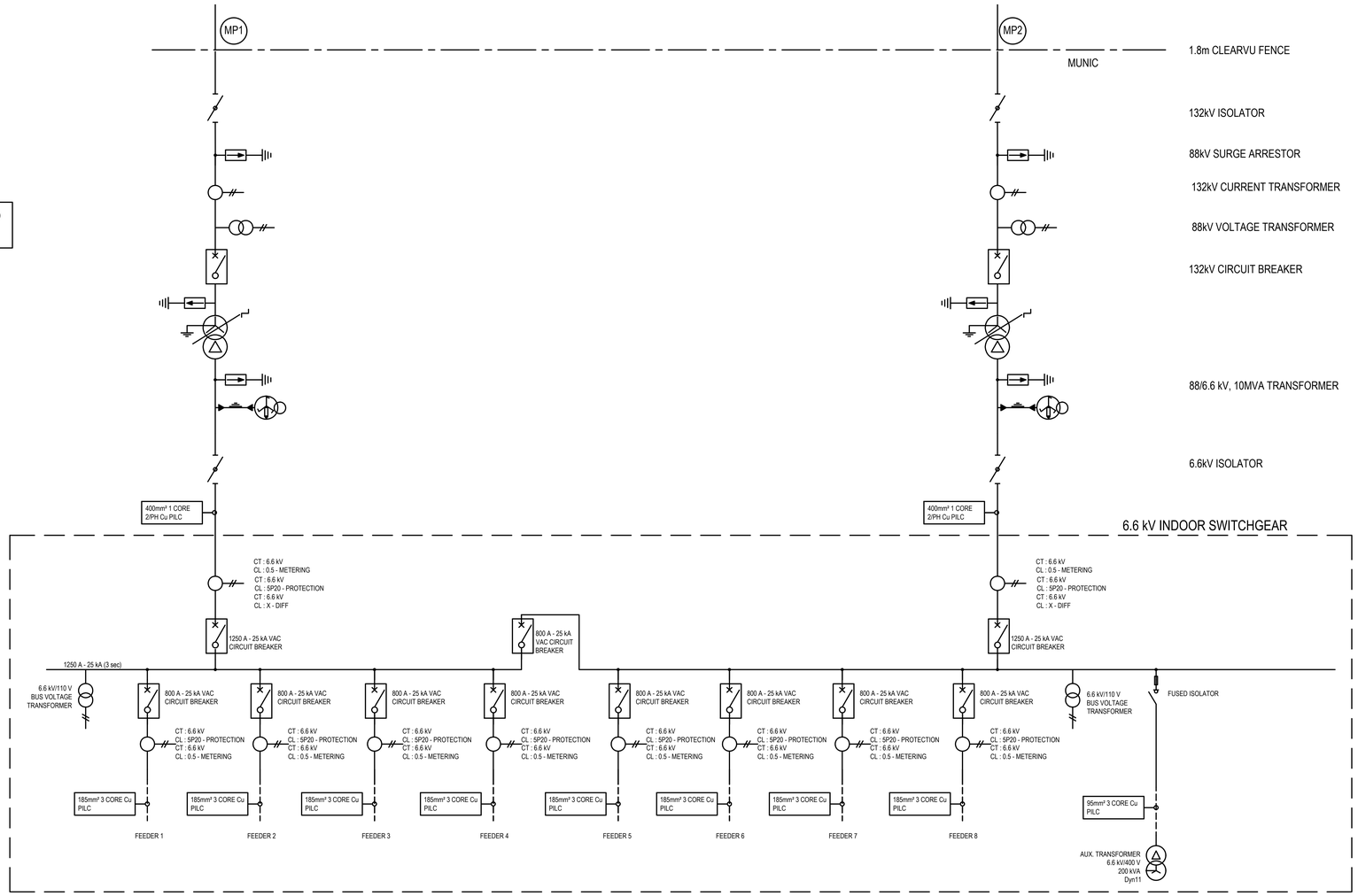
MUNIC SUB STATION YARD
88 kV / 6.6 kV



NEW KOPPIES MUNIC 88 kV/6.6 kV SWITCHING STATION SINGLE LINE DIAGRAM
NTS

LEGEND	TECHNICAL DATA	
LINES/TRAFRS	132/88kV	
	ISOLATOR	3150A 132kV
	SURGE ARRESTOR	88kV
	CURRENT TRANSFORMER	See Table Below
	88kV CIRCUIT BREAKER	132kV 3150A 88kV
	ISOLATOR	3150A 132kV
PVT	132 B/S ISOLATOR 88kV VOLTAGE TRANSFORMER 88kV POWER VT	
	ISOLATOR	3150A 132kV
	SURGE ARRESTOR	88kV
	CURRENT TRANSFORMER	See Table Below
	CIRCUIT BREAKER	132kV 3150A 88kV
	ISOLATOR EARTH SWITCH	3150A 132kV
	ISOLATOR	3150A 132kV
	SURGE ARRESTOR	88kV
	CURRENT TRANSFORMER	See Table Below
	VOLTAGE TRANSFORMER	
	CIRCUIT BREAKER	3150A 132kV
	SURGE ARRESTOR	88kV
	POWER TRANSFORMER	10 MVA 88 kV/6.6 kV Dyn11
	NER	6.6kV, 360A
	SURGE ARRESTOR	6.6kV
	AUXILIARY TRANSFORMER	6.6kV / 110V
	ISOLATOR	3150A 6.6kV

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TEL: (013) 752 2750
FAX: (013) 755 3982
Email: admin@muteo.co.za
Website: www.muteo.co.za

OFFICE NO.9 & 12 LIZA'S COURT
28 VAN RENSBURG STREET
SONHEUWEL DORP
NELSPRUIT, 1201
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Project: NEW KOPPIES SUBSTATION

Description: NEW KOPPIES MUNIC 88 kV/6.6 kV SUBSTATION SINGLE LINE DIAGRAM

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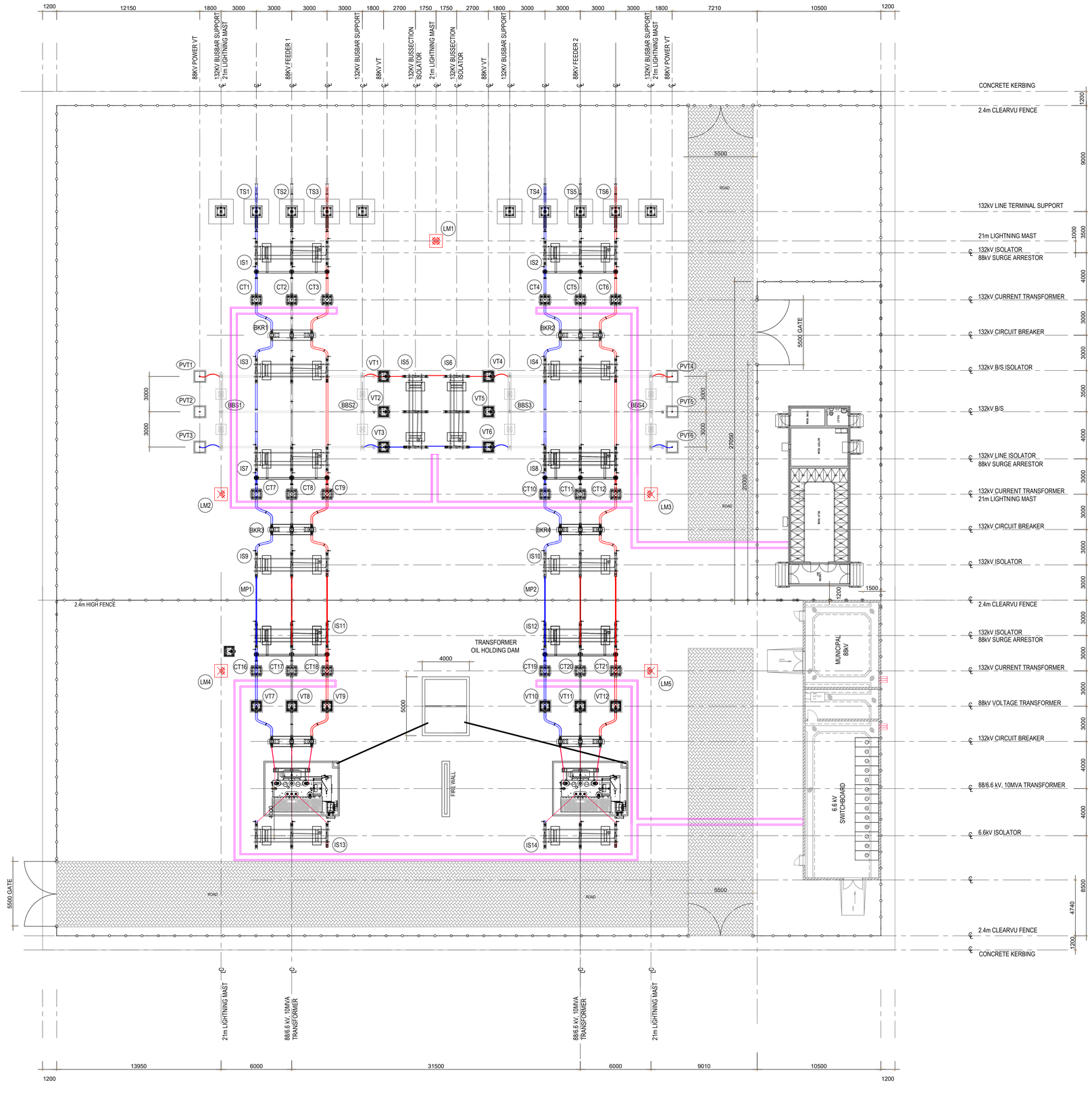

NEW KOPPIES 88 kV/6.6 kV SUBSTATION YARD FLOOR PLAN

SCALE 1:125

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TEL: (013) 752 2750
FAX: (013) 755 3982
Email: admin@muteo.co.za
Website: www.muteo.co.za

OFFICE NO.9 & 12 LIZA'S COURT
28 VAN RENSBURG STREET
SONHEUWEL DORP
NELSPRUIT, 1201
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ELECTRICAL ENGINEERING — Descipline

NEW KOPPIES SUBSTATION — Project

88kV/6.6kV SUBSTATION YARD LAYOUT — Description

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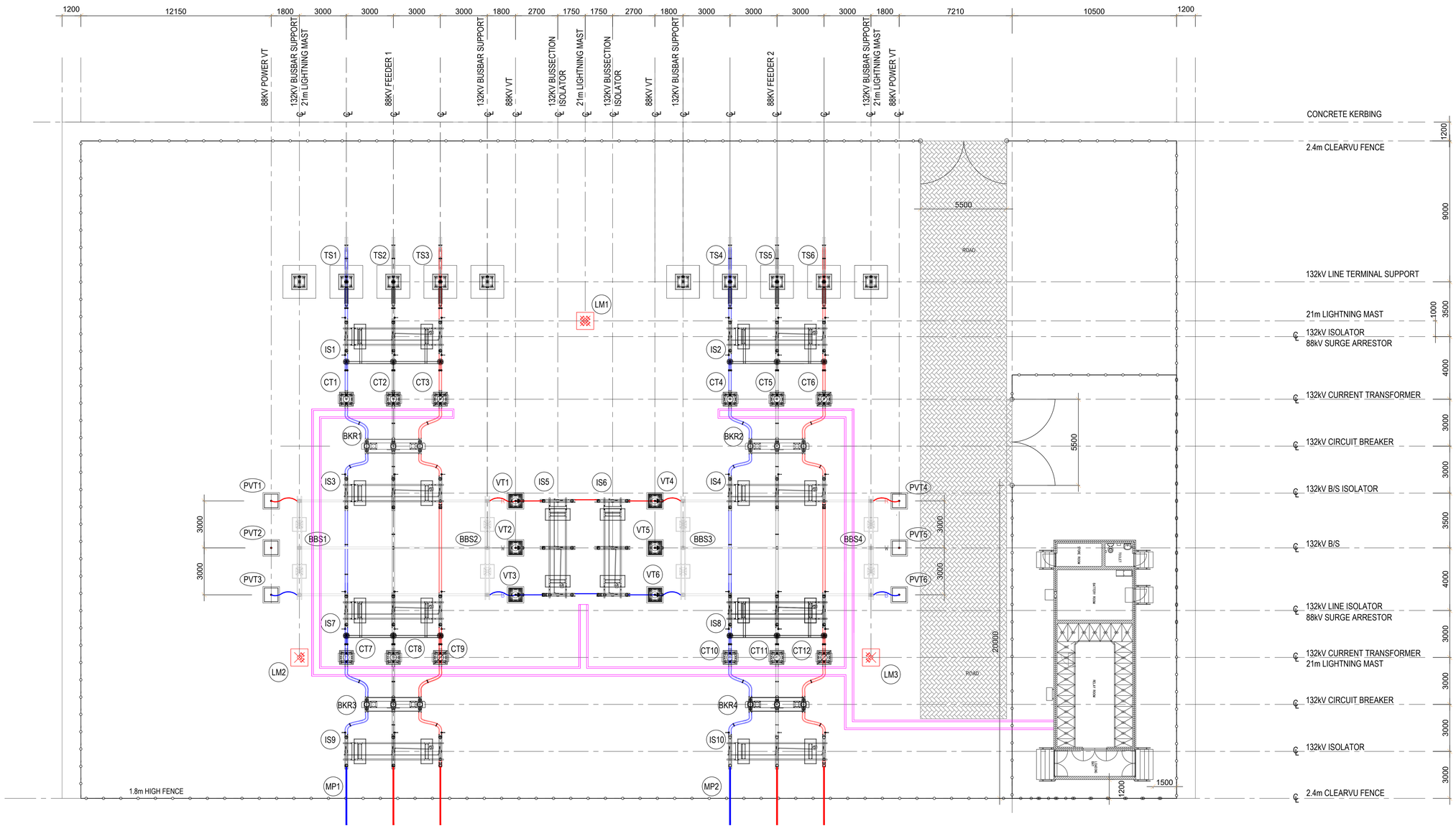

NEW KOPPIES 88 kV ESKOM SWITCHING STATION YARD FLOOR PLAN

SCALE 1:125

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FAX: (013) 755 3982
Email: admin@muteo.co.za
Website: www.muteo.co.za

OFFICE NO.9 & 12 LIZA'S COURT
28 VAN RENSBURG STREET
SONHEUWEL DORP
NELSPRUIT, 1201
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NEW KOPPIES SUBSTATION — Project

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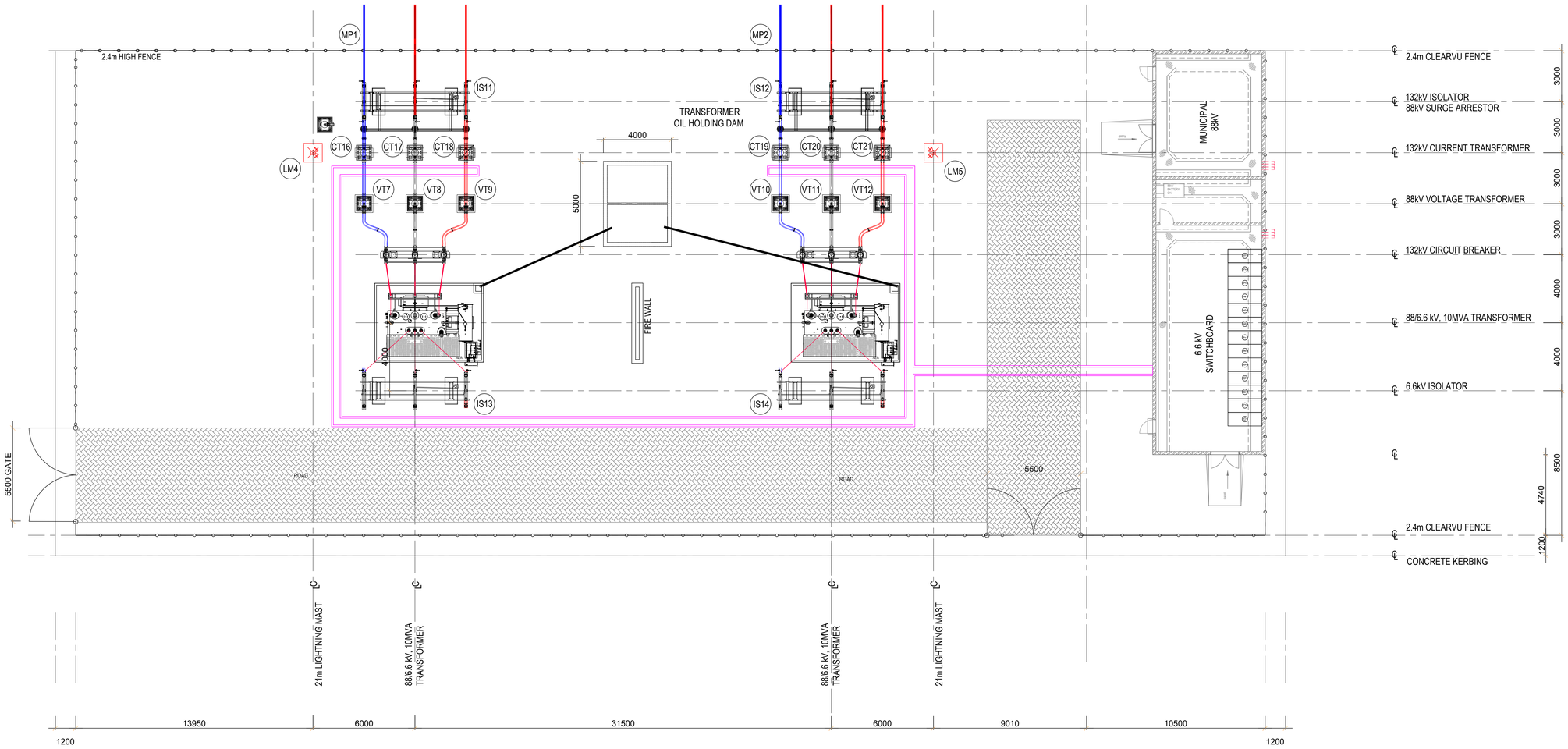

NEW KOPPIES MUNIC 88 kV/6.6 kV SWITCHING STATION YARD FLOOR PLAN

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FAX: (013) 755 3982
Email: admin@muteo.co.za
Website: www.muteo.co.za

OFFICE NO.9 & 12 LIZA'S COURT
28 VAN RENSBURG STREET
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NEW KOPPIES SUBSTATION — Project

88 kV/ 6.6 kV MUNIC SWITCHING STATION YARD LAYOUT — Description

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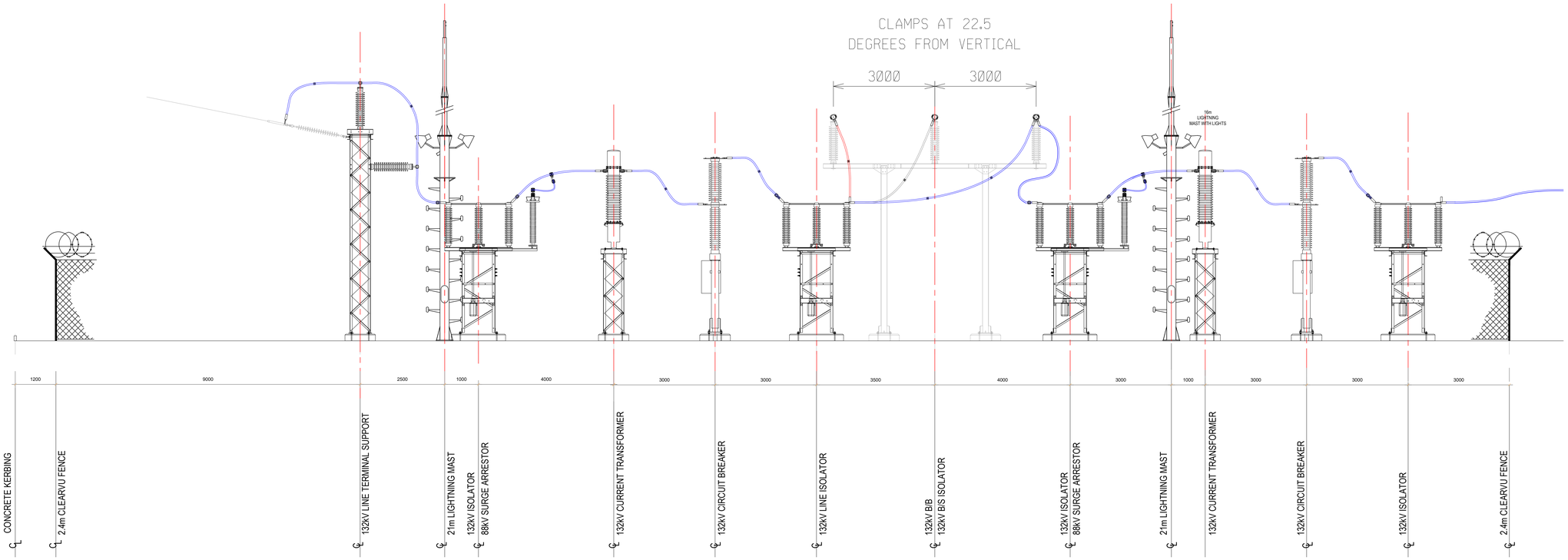

NEW KOPPIES 88kV ESKOM SWITCHING STATION YARD SECTION/ELEVATION

SCALE 1:50

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MUTEO CONSULTING

TEL: (013) 752 2750
FAX: (013) 755 3982
Email: admin@muteo.co.za
Website: www.muteo.co.za

OFFICE NO.9 & 12 LIZA'S COURT
28 VAN RENSBURG STREET
SONHEUWEL DORP
NELSPRUIT, 1201
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NEW KOPPIES SUBSTATION — Project

88 kV ESKOM SWITCHING STATION YARD SECTIONS/ELEVATIONS LAYOUT — Description

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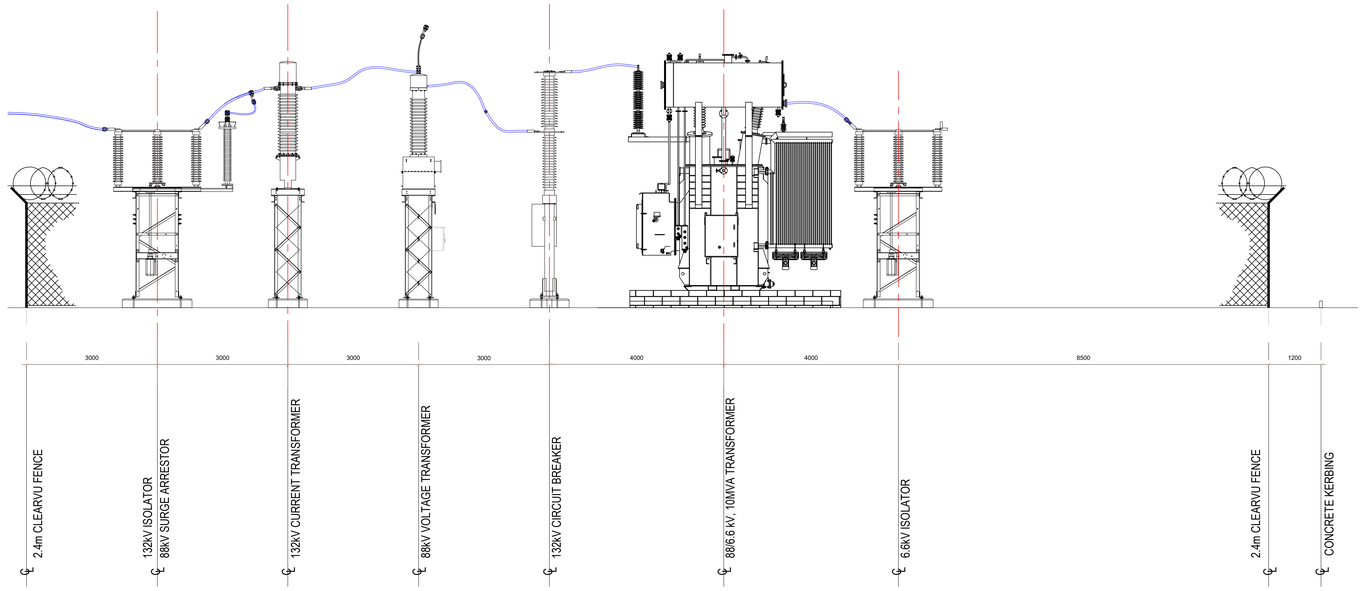
DRAWING NUMBER

EL-800-EL



NEW KOPPIES 88 kV/6.6kV MUNIC SWITCHING STATION YARD ELEVATION

SCALE 1:50

DRAWING ISSUED FOR

	TENDER		

CONSULTANT

MUTEO CONSULTING

TEL: (013) 752 2750
FAX: (013) 755 3982
Email: admin@muteo.co.za
Website: www.muteo.co.za

OFFICE NO.9 & 12 LIZA'S COURT
28 VAN RENSBURG STREET
SONHEUWEL DORP
NELSPRUIT, 1201
MPUMALANGA, SOUTH AFRICA

CLIENT

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Revision Schedule

Rev	Date	by	Description
0	2022.03.09	TL	ISSUED FOR TENDER

ELECTRICAL ENGINEERING — Descipline

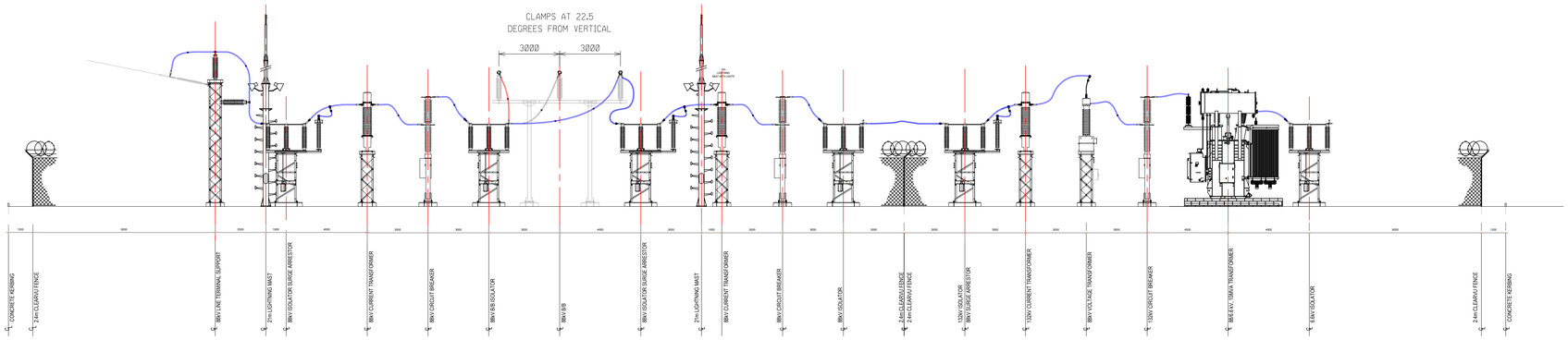
NEW KOPPIES SUBSTATION — Project

88 kV/6.6kV MUNIC SWITCHING STATION YARD SECTIONS/ELEVATIONS LAYOUT — Description

DESIGNED BY	DRAWN BY	APPROVED BY	ECSA NUMBER
L. MKIZE	T. LEBOHO	S. MANDEBVU	20120237
DATE	**SCALE**	**SHEET SIZE**	**SIGNATURE**
2020.11.26	As indicated	A0	

DRAWING NUMBER

EL-801-EL



NEW KOPPIES 88 kV/6.6kV SWITCHING STATION YARD ELEVATION

SCALE 1:100

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CONSULTANT

MUTEO CONSULTING

TEL: (013) 752 2750
FAX: (013) 755 3982
Email: admin@muteo.co.za
Website: www.muteo.co.za

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Revision Schedule

Rev	Date	by	Description
0	2022.03.09	TL	ISSUED FOR TENDER

Discipline: ELECTRICAL ENGINEERING

Project: NEW KOPPIES SUBSTATION

Description: 88 kV/6.6kV MUNIC SWITCHING STATION YARD SECTIONS/ELEVATIONS LAYOUT

DESIGNED BY	DRAWN BY	APPROVED BY	ECSA NUMBER
L. MKIZE	T. LEBOHO	S. MANDEBVU	20120237

DATE	SCALE	SHEET SIZE	SIGNATURE
2020.11.26	As indicated	A0	

DRAWING NUMBER: EL-802-EL