DEPARTMENT

COMMUNITY SERVICES

DIRECTORATE

Energy Management

DIVISION

HV Operations

PROCUREMENT DOCUMENT : Infrastructure (GCC 2015)

Documents can be obtained, free of charge, in electronic format, from
the National Treasury's eTenders website or the eThekwini Municipality website

Contract No: **34827-5E**

Contract Title: **Supply, Delivery, Installation and Testing of Outdoor 132 kV and 275 kV Switchgear and Associated Equipment for a Period of Thirty-Six Months for Various Substations**

Estimated CIDB: Grade: **9** Class: **EP**

CLARIFICATION MEETING AND QUERIES

Clarification Meeting: No Clarification Meeting

Meeting Location: Date, Time: Not Applicable

Queries can be addressed to: The Employer's Agent's Representative: **Name: Qaphela Ngubane**
Tel: 031-311-9432
eMail: Qaphela.Ngubane@durban.gov.za. Bidders are requested to submit email queries related to the bid. All email queries are to be submitted by 2026-10-15 and Emailed questions & answers will be consolidated and posted on eTenders/Municipal website/Ethekwini Supplier Portal for the benefit of all Tenderers by 2026-10-22.

TENDER SUBMISSION

Tender Submission: The Tender Offer (hard copy) shall be delivered to:

Delivery location: The Tender Box in the foyer of the Municipal Building,166 KE Masinga Road, Durban

Closing Date/ Time: **Friday, 30 October 2026** **at** 11h00

JDE Submission: An **electronic submission** is also to be made via the eThekwini Municipality **JDE System (ESP Module)**

JDE Queries Contact: Lindo Dlamini: Tel: 031-322-7133 / 031-322-7153
Email: supplier.selfservice@durban.gov.za

Tender Offers submitted via any means other than that stated in the Tender Data will be deemed invalid

Issued by:

ETHEKWINI MUNICIPALITY

Deputy Head: HV Operations

Date of Issue: 11/09/2026

Version: 01/12/2025

FOR OFFICIAL USE ONLY

Tenderer Name:			VAT Registered: Yes No
	Price (excl)	VAT	Price (incl)
Submitted:	R	R	R
Corrected:	R	R	R

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PART T1: TENDERING PROCEDURES

T1.1.1: TENDER NOTICE AND INVITATION TO TENDER

Tenders are hereby invited for the works to [Supply, Deliver, Install and Test of Outdoor 132 kV and 275 kV Switchgear and Associated Equipment for a Period of Thirty-Six Months for Various Substations.]

Subject	Description	Tender Data
Employer	The Employer is the eThekwini Municipality as represented by: **Deputy Head: HV Operations**	C.1.1.1
Tender Documents	Documentation is to be downloaded from the **National Treasury's eTenders website** or the **eThekwini Municipality Website:** • https://www.etenders.gov.za/ • https://www.durban.gov.za/pages/business/procurement	C.1.2
CIDB Eligibility	It is estimated that Tenderers should have a CIDB contractor grading designation of 9 EP (or higher).	C.2.1.2
Meeting Type	No Clarification Meeting	C.2.7
Meeting Details	Not Applicable	C.2.7
Seek Clarification	Queries relating to these documents are to be addressed to the Employer's Agent's Representative whose contact details are: Name: Qaphela Ngubane Tel: 031-311-9432 eMail: Qaphela.Ngubane@durban.gov.za. Bidders are requested to submit email queries related to the bid. All email queries are to be submitted by 2026-10-15 and Emailed questions & answers will be consolidated and posted on eTenders/Municipal website/Ethekwini Supplier Portal for the benefit of all Tenderers by 2026-10-22.	C.1.4
Submitting a Tender Offer	The Tender Offer (hard copy) shall be delivered to: The Tender Box in the foyer of the Municipal Building,166 KE Masinga Road, Durban An **electronic submission**, via the eThekwini Municipality **JDE System (ESP Module)**, is also to be made. Refer to Part T1.1.2 and Tender Data: C.2.13. Notwithstanding the **electronic submission**, a tender offer will only be deemed valid if the "hard copy" submission has been made.	C.2.13
Closing Time	The Tender Offer (hard copy) shall be delivered, and the electronic submission completed, both on or before **30/10/2026**, at or before 11h00.	C.2.15
Evaluation of Tender Offers	**Either the 80/20 or 90/10** Price Preference Point System, as specified in the **SCM Policy: Section 52: Preferential Procurement** will be applied in the evaluation of tenders. **Tender Data: C.3.11: Evaluation of Tender Offers** details the awarding of Preference Points, and other related evaluation requirements.	C.3.11

Requirements for sealing, addressing, delivery, opening, and assessment of tenders are stated in the Tender Data

CIDB B.U.I.L.D. Programme Standards	
Standard for Indirect Targeting for Enterprise Development through Construction Works Contracts	**Not Applicable**
Standard for Developing Skills through Infrastructure Contracts	**Not Applicable**

T1.1.2: NOTES TO TENDERERS

These "Notes to Tenderers" are intended to provide guidance regarding tendering obligations and requirements.

Compliance requirements are stated in the relevant parts of the Tender Data: T1.2.

GENERAL

1) The words BID, TENDER, QUOTATION, and REQUEST FOR QUOTATION (RFQ) are interchangeable throughout this procurement document.

2) **JDE-ESP Module** refers to the Ethekwini Supplier Portal module on the eThekwini Municipality JDE System. Refer to Part T1.1.2.

eThekwini Supply Chain Management Policy (SCMP)

The requirements as stated in the Employer's SCM Policy include, but are not limited to, the following:

1) Section 14(4): ETM Supplier Database

The eThekwini Supply Chain Management Policy requires suppliers/ service providers/ contractors to be registered on the **eThekwini Municipality's Supplier Portal**.

In the event of the Tenderer not being registered on the eThekwini Municipality's Supplier Portal, the Tenderer must register on the internet at www.durban.gov.za by following these links:

- Business
  - Supply Chain Management (SCM)
    - Accredited Supplier and Contractor Database.

The following is to be noted:

- The information for registration as in the possession of the eThekwini Municipality will apply.
- It is the Tenderer's responsibility to ensure that the details submitted to the Municipality are correct.
- Tenderers are to register prior to the submission of tenders.

2) Section 20(1)(d)(i): Audited Financial Statements

Audited Financial Statements are required to be submitted if the value of the tender offer exceeds R10 million (incl. VAT). See **Returnable Form: MBD 5** and **Returnable Form: Contracts awarded by Organs of State** in the past 5 years.

3) Section 20(1)(d)(iii): Contracts Awarded during the past 5 Years

Tenderers are to include with their submission a listing of any contracts awarded to the Tenderer during the past 5 years, including particulars of any material non-compliance or dispute concerning the execution of the contracts. Tenderers are referred to **Returnable Form: MBD 5**

4) Section 13.1(b)(vii), 20(1)(d)(ii), 28.2(d), 29.6(a), 38.1(d), and 29.14: Municipal Rates and Taxes (Fees)

Tenderers are to refer to **Returnable Form: Declaration of Municipal Fees** to certify that they have no undisputed commitments for municipal services towards any municipality. Prior to an award, a Tenderer's municipal rates and taxes cannot be in arears. Should a Tenderer be in arrears with respect to municipal services and has formalised an agreement with the respective municipality to offset the arrears, the agreement must be in place at time of tender closing.

5) Section 21.2: Tender Validity

Tenders are to remain valid for twelve (12) months after the expiry of the **original tender validity period** as stated in the **Tender Data**, unless the Municipality is notified, in writing, of anything to the contrary.

The eThekwini Municipality reserves the right to request confirmation from Tenderers of tender validity at any time during the twelve (12) month period.

6) Section 28(2)(d), Section 28(2)(h) and Section use 29(12): Certifications and Registrations

CIDB Registration and Status, B-BBEE Certificates, and Tax Compliance Status PINs must be valid at the time of tender closing, and before final award.

The Tenderer's Tax Compliance Status, CIDB Registration and Status (if required), and B-BBEE Level Status (if required), will be verified using the National Treasury Central Supplier Database (CSD). Tenderers are referred to **Returnable Form: Compulsory Enterprise Questionnaire**.

It is the Tenderer's responsibility to ensure that their data on the CSD is kept updated and correctly reflects the status of the tendering entity.

7) Section 28(2)(f), and 52.5.13: Joint Ventures (JV)

Each party of a JV must submit separate Tax Compliance Status PINs. Unless otherwise stated, the requirements for a single entity submission in terms of documentation requirements, will apply to each member of a JV making a submission.

As proof that a JV has been formalised, or that the parties to the JV agree to formalise the JV should they be successful in being recommended for the award of this tender, Tenderers are referred to **Returnable Form: Joint Venture Agreements**.

8) Section 49.1.2: Complaints and Objections (Appeals)

A non-refundable tariff, as per the approved Council tariffs, is payable by the Complainant to the Municipality. Proof of the payment of the Fee must be attached to the complaint.

CIDB

Regulation 25(8)

9) It should be noted that this contract, unless otherwise stated, is not part of a **Targeted Development Programme (TDP)**. The CIDB provisions in relation to a Contractor's **Potentially Emerging (PE) status** do not apply.

Tenderers are referred to **CIDB Inform Practice Note #32**: "**Application of the Potentially Emerging (PE) Status**".

B.U.I.L.D. Programme

10) A programme to accelerate transformation in the construction industry, increase the capacity of the construction industry to deliver infrastructure and support the growth of emerging contractors, was launched on 14 March 2024 by the Deputy Minister of Public Works and Infrastructure and the Construction Industry Development Board.

Details of the B.U.I.L.D. Programme were published in a Government Gazette in 2020 (GG 43726) and B.U.I.L.D. has gradually been phased in at various levels of government and the private sector. The CIDB, a public entity with the mandate to promote improved performance in construction, oversees the programme and manages the B.U.I.L.D Fund.

The B.U.I.L.D programme determines that public sector entities which implement construction projects, that meet certain minimum requirements, must include developmental goals to the deliverables defined in the tenders. If applicable, Contractors are required to include these goals in the plans and pricing when they submit their tender bids.

T1.1.3: INFORMATION REGARDING THE ETHEKWINI JDE SYSTEM

This Part (T1.1.3) is for information purposes only.

Compliance requirements are stated in Part T1.2: Tender Data.

1) General

eThekwini Municipality Bids, Tenders and Quotations (hereafter referred to as Tenders) are going to be submitted using the JDE System.

This JDE System will be used for:

- Viewing of available (open) Tenders,
- Downloading procurement documentation for Tenders,
- Uploading completed and signed Tender documentation,
- Completion and submission of Tenders electronically,
- Viewing the Tender opening schedule.

2) Registrations

To be granted access to the **JDE System** prospective service providers must be registered on the **National Treasury's Central Supplier Database (CSD)**, the **eThekwini Municipality Supplier Portal**, and the **eThekwini Municipality JDE System**.

National Treasury: Central Supplier Database

- Registration can be made on https://secure.csd.gov.za .
- Service Providers will be issued a **"MAAA"** number when registered.

eThekwini Municipality Supplier Portal

- Registration can be made on https://www.durban.gov.za by following these links:
  >Business **>**Supply Chain Management (SCM) **>**Accredited Supplier & Contractor Database.

eThekwini Municipality JDE System

- Service providers requiring access must send an email to supplier.selfservice@durban.gov.za
  A copy of the **Director's ID** is required:
- On receipt of this email, the Procurement and Supply Chain Management (P&SCM) Directorate will respond with the login credentials and a link to the **JDE System**.

3) Assistance with using the JDE System

The following P&SCM Official(s) can be contacted in connection with the use of the **JDE System**:

General Queries:

- Lindo Dlamini — Tel: 031 322 7153 or 031 322 7133; Email: supplier.selfservice@durban.gov.za

Technical Queries:

- Kgopotso Maja — Tel: 031 322 3808; Email: kgopotso.maja@durban.gov.za

4) Viewing of available tenders

By following link https://rfq.durban.gov.za/jde/E1Menu.maf prospective Service Providers will be able to view available (open) Tender opportunities without signing into the system. However, Service Providers will not be able to respond to a Tender without being signed into the system using a JDE User ID and Password.

5) Tender documentation

By accessing the **JDE System** (using https://rfq.durban.gov.za/) and viewing any available Tenders, prospective Service Providers will be able to download the relevant Tender documentation.

The Tender documentation consists of the **TENDER** and **CONTRACT Parts**, as described in the INDEX, and will include any drawings and other information (if applicable). Referred to, or included in the documentation, are the **Standard Conditions of Tender (and associated Tender Data),** and the **Conditions of Contract (and associated Contract Data)** which will govern the tendering and contract processes respectively.

6) Submission of tender offers

Reference is to be made to the **Tender Data: C.2.13** that specifies compliance requirements.

Should the **Tender Offer** be required in "**hard copy**" format, the submission is to be delivered to the Delivery Location as stated in the **Tender Data**.

In addition to the above, **Tender Offers are also to be SUBMITTED ELECTRONICALLY** (uploaded) on the eThekwini Municipality JDE System (Ethekwini Supplier Portal (JDE-ESP) Module). Notwithstanding the **electronic submission**, a tender offer will only be deemed valid if the "hard copy" submission has been made. The "hard copy" submission will be deemed to be the ruling version.

Bidders are responsible for resolving all access rights and submission queries on the JDE System before the tender closing date/ time, as stated in the **Tender Data: C.2.15**.

7) Viewing the Tender opening schedule

Users on the **JDE System** will be able to view the **Tender Opening Schedule** for each closed Tender. The tender opening schedule will also be made available on the eThekwini Municipal website at URL:
https://www.durban.gov.za/pages/business/publication-of-received-bids

PART T1: TENDERING PROCEDURES

T1.2: TENDER DATA

T1.2.1 STANDARD CONDITIONS OF TENDER

The conditions of tender are the **Standard Conditions of Tender** as contained in **Annex C** of the CIDB Standard for Uniformity in Construction Procurement as published in Government Gazette No 42622, Board Notice 423 of 8 August 2019, as duplicated below.

The Standard Conditions of Tender make several references to the **Tender Data** for details that apply specifically to this tender. The **Tender Data** (T1.2.2) shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender.

Annex C

Standard Conditions of Tender

C.1 General

C.1.1 Actions

C.1.1.1 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 C.2 and C.3, timeously and with integrity, and behave equitably, honestly and transparently, comply with all legal obligations and not engage in anticompetitive practices.

C.1.1.2 The employer and the tenderer and all their agents and employees involved in the tender process shall avoid conflicts of interest and where a conflict of interest is perceived or known, declare any such conflict of interest, indicating the nature of such conflict. Tenderers shall declare any potential conflict of interest in their tender submissions. Employees, agents and advisors of the employer shall declare any conflict of interest to whoever is responsible for overseeing the procurement process at the start of any deliberations relating to the procurement process or as soon as they become aware of such conflict and abstain from any decisions where such conflict exists or recuse themselves from the procurement process, as appropriate.

Note:
1) A conflict of interest may arise due to a conflict of roles which might provide an incentive for improper acts in some circumstances. A conflict of interest can create an appearance of impropriety that can undermine confidence in the ability of that person to act properly in his or her position even if no improper acts result.

2) Conflicts of interest in respect of those engaged in the procurement process include direct, indirect or family interests in the tender or outcome of the procurement process and any personal bias, inclination, obligation, allegiance or loyalty which would in any way affect any decisions taken.

C.1.1.3 The employer shall not seek, and a tenderer shall not submit a tender, without having a firm intention and the capacity to proceed with the contract.

C.1.2 Tender Documents

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

C.1.3 Interpretation

C.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.

C.1.3.2 These conditions of tender, the ***Tender Data*** and tender schedules which are required for tender evaluation purposes, shall form part of any contract arising from the invitation to tender.

C.1.3.3 For the purposes of these conditions of tender, the following definitions apply:

a) **conflict of interest** means any situation in which:
   i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfil his or her duties impartially;
   ii) an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or
   iii) incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.

b) **comparative offer** means the price after the factors of a non-firm price and all unconditional ***discounts*** it can be utilised to have been taken into consideration;

c) **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;

d) **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;

C.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 readily read, copied and recorded. Communications 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***.

C.1.5 Cancellation and Re-Invitation of Tenders

C.1.5.1 An employer may, prior to the award of the tender, cancel a tender if-

a) due to changed circumstances, there is no longer a need for the engineering and construction works specified in the invitation;
b) funds are no longer available to cover the total envisaged expenditure;
c) no acceptable tenders are received;
d) there is a material irregularity in the tender process.

C.1.5.2 The decision to cancel a tender invitation must be published in the same manner in which the *original* tender invitation was advertised.

C.1.5.3 An employer may only with the prior approval of the relevant treasury cancel a tender invitation for the second time.

C.1.6 Procurement procedures

C.1.6.1 General

Unless otherwise stated in the ***Tender Data***, a contract will, subject to C.3.13, be concluded with the tenderer who in terms of C.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submissions that are received at the closing time for tenders.

C.1.6.2 Competitive negotiation procedure

C.1.6.2.1 Where the ***Tender Data*** require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of C.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of C.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

C.1.6.2.2 All responsive tenderers or at least a minimum of not less than three responsive tenderers that are highest ranked in terms of the evaluation criteria stated in the ***Tender Data*** shall be invited to enter into competitive negotiations based on the principle of equal treatment, keeping confidential the proposed solutions and associated information.

Notwithstanding the provisions of C.2.17, the employer may request that tenders be clarified, specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or

distort competition or have a discriminatory effect.

C.1.6.2.3 At the conclusion of each round of negotiations, tenderers shall be invited by the employer to revise their tender offer based on the same evaluation criteria, with or without adjusted weightings. Tenderers shall be advised when they are to submit their best and final offer.

C.1.6.2.4 The contract shall be awarded in accordance with the provisions of C.3.11 and C.3.13 after tenderers have been requested to submit their best and final offer.

C.1.6.3 Proposal procedure using the two stage-system

C.1.6.3.1 Option 1

Tenderers shall in the first stage submit technical proposals and, if required, cost parameters around which a contract may be negotiated. The employer shall evaluate each responsive submission in terms of the method of evaluation stated in the ***Tender Data***, and in the second stage negotiate a contract with the tenderer scoring the highest number of evaluation points and award the contract in terms of these conditions of tender.

C.1.6.3.2 Option 2

C.1.6.3.2.1 Tenderers shall submit in the first stage only technical proposals. The employer shall invite all responsive tenderers to submit tender offers in the second stage, following the issuing of procurement documents.

C.1.6.3.2.2 The employer shall evaluate tenders received during the second stage, in terms of the method of evaluation stated in the ***Tender Data***, and award the contract in terms of these conditions of tender.

C.2 Tenderer's obligations

C.2.1 Eligibility

C.2.1.1 Submit a tender offer only if the tenderer satisfies 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.

C.2.1.2 Notify the employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the employer as the basis in a prior process to invite the tenderer to submit a tender offer and obtain the employer's written approval to do so prior to the closing time for tenders.

C.2.2 Cost of tendering

C.2.2.1 Accept that, unless otherwise stated in the ***Tender Data***, 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 complies with requirements.

C.2.2.2 The cost of the tender documents charged by the employer shall be limited to the actual cost incurred by the employer for printing the documents. Employers must attempt to make available the tender documents on its website so as not to incur any costs pertaining to the printing of the tender documents.

C.2.3 Check documents

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

C.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.

C.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.

C.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.

C.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***.

C.2.8 Seek clarification

Request clarification of the tender documents, if necessary, by notifying the employer at least five (5) working days before the closing time stated in the ***Tender Data***.

C.2.9 Insurance

Be aware that the extent of insurance to be provided by the employer (if any) might 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.

C.2.10 Pricing the tender offer

C.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 fourteen (14) days before the closing time stated in the ***Tender Data***.

C.2.10.2 Show VAT payable by the employer separately as an addition to the tendered total of the prices.

C.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***.

C.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.

C.2.11 Alterations to documents

Do 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.

C.2.12 Alternative tender offers

C.2.12.1 Unless otherwise stated in the ***Tender Data***, submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted as well as a schedule that compares the requirements of the tender documents with the alternative requirements that are proposed.

C.2.12.2 Accept that an alternative tender offer must be based only on the criteria stated in the ***Tender Data*** or criteria otherwise acceptable to the employer.

C.2.12.3 An alternative tender offer must only be considered if the main tender offer is the winning tender.

C.2.13 Submitting a tender offer

C.2.13.1 Submit one tender offer only, either as a single tendering entity or as a member in a joint venture to provide the whole of the works identified in the ***Contract Data*** and described in the scope of works, unless stated otherwise in the ***Tender Data***.

C.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 legibly in non-erasable ink.

C.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.

C.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.

C.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.

C.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.

C.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***.

C.2.13.8 Accept that the employer will 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.

C.2.13.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the ***Tender Data***.

C.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.

C.2.15 Closing time

C.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***. Accept that proof of posting shall not be accepted as proof of delivery.

C.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.

C.2.16 Tender offer validity

C.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***.

C.2.16.2 If requested by the employer, consider extending the validity period stated in the ***Tender Data*** for an agreed additional period with or without any conditions attached to such extension.

C.2.16.3 Accept that a tender submission that has been submitted to the employer may only be withdrawn or substituted by giving the employer’s agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted. If the validity period stated in C.2.16 lapses before the employer evaluating tender, the contractor reserves the right to review the price based on Consumer Price Index (CPI).

C.2.16.4 Where a tender submission is to be substituted, a tenderer must submit a substitute tender in accordance with the requirements of C.2.13 with the packages clearly marked as “SUBSTITUTE”.

C.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 competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.

Note: *Sub-clause C.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.*

C.2.18 Provide other material

C.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.

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

C.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***.

C.2.20 Submit securities, bonds and policies

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***.

C.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.

C.2.22 Return of other tender documents

If so instructed by the employer, return all retained tender documents within twenty-eight (28) days after the expiry of the validity period stated in the ***Tender Data***.

C.2.23 Certificates

Include in the tender submission or provide the employer with any certificates as stated in the ***Tender Data***.

C.3 The employer's undertakings

C.3.1 Respond to requests from the tenderer

C.3.1.1 Unless otherwise stated in the ***Tender Data***, respond to a request for clarification received up to five (5) working days before the tender closing time stated in the ***Tender Data*** and notify all tenderers who collected tender documents.

C.3.1.2 Consider any request to make a material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used to prequalify a tenderer to submit a tender offer in terms of a previous procurement process and deny any such request if as a consequence:

a) an individual firm, or a joint venture as a whole, or any individual member of the joint venture fails to meet any of the collective or individual qualifying requirements;
b) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or
c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

C.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 that tender documents are available until three (3) working 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, shall then notify all tenderers who collected tender documents.

C.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.

C.3.4 Opening of tender submissions

C.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.

C.3.4.2 Announce at the meeting 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 and, where applicable, the total of his prices, number of points claimed for its BBBEE status level and time for completion for the main tender offer only.

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

C.3.5 Two-envelope system

C.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.

C.3.5.2 Evaluate functionality of the technical proposals offered by tenderers, then advise 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 functionality evaluation more than the minimum number of points for functionality stated in the ***Tender Data***, and announce the score obtained for the technical proposals and the total price and any points claimed on BBBEE status level. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for functionality.

C.3.6 Non-disclosure

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.

C.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.

C.3.8 Test for responsiveness

C.3.8.1 Determine, after opening and before detailed evaluation, whether each tender offer properly received:

a) complies with 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.

C.3.8.2 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:

a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,
b) significantly change the Employer's or the tenderer's risks and responsibilities under the contract, or
c) 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.

C.3.9 Arithmetical errors, omissions and discrepancies

C.3.9.1 Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern.

C.3.9.2 Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with C.3.11 for:

a) the gross misplacement of the decimal point in any unit rate;
b) omissions made in completing the pricing schedule or bills of quantities; or
c) arithmetic errors in:
   (i) line-item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or
   (ii) the summation of the prices.

C.3.9.3 Notify the tenderer of all errors or omissions that are identified in the tender offer and either

confirm the tender offer as tendered or accept the corrected total of prices.

C.3.9.4 Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:

a) If bills of quantities or pricing schedules apply 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 shall be corrected.

b) 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 tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

C.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.

C.3.11 Evaluation of tender offers

The Standard Conditions of Tender standardize the procurement processes, methods and procedures from the time that tenders are invited to the time that a contract is awarded. They are generic in nature and are made project specific through choices that are made in developing the ***Tender Data*** associated with a specific project.

Conditions of tender are by definition the document that establishes a tenderer's obligations in submitting a tender and the employer's undertakings in soliciting and evaluating tender offers. Such conditions establish the rules from the time a tender is advertised to the time that a contract is awarded and require employers to conduct the process of offer and acceptance in terms of a set of standard procedures.

The CIDB Standard Conditions of Tender are based on a procurement system that satisfies the following system requirements:	**Qualitative interpretation of goal**
Requirement	
Fair	The process of offer and acceptance is conducted impartially without bias, providing simultaneous and timely access to participating parties to the same information.
Equitable	Terms and conditions for performing the work do not unfairly prejudice the interests of the parties.
Transparent	The only grounds for not awarding a contract to a tenderer who satisfies all requirements are restrictions from doing business with the employer, lack of capability or capacity, legal impediments and conflicts of interest.
Competitive	The system provides for appropriate levels of competition to ensure cost effective and best value outcomes.
Cost effective	The processes, procedures and methods are standardized with sufficient flexibility to attain best value outcomes in respect of quality, timing and price, and least resources to effectively manage and control procurement processes.

The activities associated with evaluating tender offers are as follows:

a) Open and record tender offers received
b) Determine whether or not tender offers are complete
c) Determine whether or not tender offers are responsive
d) Evaluate tender offers
e) Determine if there are any grounds for disqualification
f) Determine acceptability of preferred tenderer
g) Prepare a tender evaluation report
h) Confirm the recommendation contained in the tender evaluation report .

C.3.11.1 General

The employer must appoint an evaluation panel of not less than three persons conversant with the proposed scope of works to evaluate each responsive tender offer using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the ***Tender Data***.

C.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.

C.3.13 Acceptance of tender offer

Accept the tender offer; if in the opinion of the employer, it does not present any risk and only if the tenderer:

a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement;
b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract;
c) has the legal capacity to enter into the contract;
d) is not; insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act No. 2008, bankrupt or being wound up, has his/her affairs administered by a court or a judicial officer, has suspended his/her business activities or is subject to legal proceedings in respect of any of the foregoing;
e) complies with the legal requirements, if any, stated in the ***Tender Data***; and
f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

C.3.14 Prepare contract documents

C.3.14.1 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 and
c) other revisions agreed between the employer and the successful tenderer.

C.3.14.2 Complete the schedule of deviations attached to the form of offer and acceptance, if any.

C.3.15 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.

C.3.16 Registration of the award

An employer must, within twenty-one (21) working days from the date on which a contractor's offer to perform a construction works contract is accepted in writing by the employer, register and publish the award on the cidb Register of Projects.

C.3.17 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.

C.3.18 Provide written reasons for actions taken

Provide upon request written reasons to tenderers for any action that is taken in applying these conditions of tender but withhold information which is not in the public interest to be divulged, which is considered to prejudice the legitimate commercial interests of tenderers or might prejudice fair competition between tenderers.

T1.2.2 TENDER DATA

Each item of data given below is cross-referenced to the clause in the **Standard Conditions of Tender** to which it mainly applies.

C.1: GENERAL

C.1.1 The employer:

The Employer for this Contract is the **eThekwini Municipality** as represented by:
Deputy Head: **HV Operations**

C.1.2 Tender documents:

The Tender Documents issued by the Employer comprise:

1) The Procurement Document comprising of the PARTS as listed in the "INDEX" on page 1.
2) EXCEL Bill of Quantities file, if issued separately.
3) **Drawings**, issued separately from this document, or bound in Section C3.4: "Particular Specifications".

Electronically downloaded documentation is obtainable from the National Treasury's **eTenders Website** and/ or the **eThekwini Municipality Website** at URL:

- https://www.etenders.gov.za/
- https://www.durban.gov.za/pages/business/procurement

Tenderers are to regularly check both web sites for the downloadable documentation.

C.1.4 Communication and employer's agent:

The Employer's Agent is:

Name: Mokwape Lekganyane
Tel: 031-311-9628
eMail: Mokwape.Lekganyane@durban.gov.za

The Employer's Agent's Representative is:

Name: Qaphela Ngubane
Tel: 031-311-9432
eMail: Qaphela.Ngubane@durban.gov.za.
Bidders are requested to submit email queries related to the bid. All email queries are to be submitted by 2026-10-15 and Emailed questions & answers will be consolidated and posted on eTenders/Municipal website/Ethekwini Supplier Portal for the benefit of all Tenderers by 2026-10-22.

The Tenderer's contact details, as indicated on **Returnable Document "Compulsory Enterprise Questionnaire"**, shall be deemed as the only valid contact details for the Tenderer for use in communications between the Employer's Agent and the Tenderer during tender evaluation.

C.1.6 Procurement procedures:

The following Sections of the **Standard Conditions of Tender** are not applicable to this tender:

- **C.1.6.2: Competitive negotiation procedure,** and
- **C.1.6.3: Proposal procedure using the two-stage system**.

C.1.6.2 Procurement procedures:

The competitive negotiation procedure shall be applied.

C.1.6.3 Procurement procedures:

Option 2 of the proposal procedure using the two-stage system shall be applied.

C.2: TENDERER'S OBLIGATIONS

C.2.1 Eligibility:

Entities may only submit one (1) tender offer, either as a single tendering entity or as a partner of a joint venture. Should a tendering entity submit more than one (1) tender, **all** submissions by that tendering entity, including submissions where the entity is a partner of a joint venture, will be deemed not to be eligible.

C.2.1.1 Eligibility: General

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

(a) In the event of a Compulsory Clarification Meeting:
  i) the Tenderer fails to attend the Compulsory Clarification Meeting, or
  ii) the Tenderer fails to have **Returnable Document "Certificate of Attendance at Clarification Meeting / Site Inspection"** signed by the Employer's Agent or their representative at the meeting.

(b) At the time of tender closing, the Tenderer is not registered on the **National Treasury Central Supplier Database (CSD)** and the **eThekwini Municipality Supplier Portal**. In the case of a Joint Venture, this requirement will apply individually to each party in the Joint Venture. Tenderers are to reference **Returnable Document "Compulsory Enterprise Questionnaire"** (section 1.5) and **Returnable Document "CSD Registration Report"**.

(c) In the case of Joint Venture (JV) submissions, two or more JV entities have common directors/ shareholders or common entities tendering for the same works.

(d) The following documentation is not completed in full, signed, and returned with the tender submission. **Failure to comply will result in the tender offer being deemed non-responsive.**
- T2.2.1: Compulsory Enterprise Questionnaire.
- T2.2.5: MBD 4: Declaration of Interest.
- T2.2.6: MBD 5: Declaration for Procurement Above R10 Million.
- T2.2.7: MBD 6.2: Declaration for Local Production and Content.
- T2.2.8: MBD 8: Declaration of Bidder's Past SCM Practices.
- T2.2.9: MBD 9: Certificate of Independent Bid Determination.
- T2.2.10: Declaration of Municipal Fees

(e) The certificates listed in the **Tender Data: C.2.23: Certificates** are to be included with the tender submission. **Failure to comply will result in the tender offer being deemed non-responsive.**
- T2.2.1: SARS Tax Compliance Status - PIN Issued (submitted with the Compulsory Enterprise Questionnaire).
- T2.2.12: Central Supplier Database (CSD) Report.
- T2.2.13: CIDB Registration and Status.

C.2.1.2 **Eligibility: CIDB**

Tenderers are to reference the provisions of **Tender Data: C.2.23 "Certificates,** and **Returnable Document "Verification of CIDB Registration and Status"** with respect to CIDB registration.

Only those Tenderers who are registered (as "Active") with the CIDB (at time of tender closing), in a contractor grading designation equal to or higher than a contractor grading designation 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, for a **9EP** class of construction work, are eligible to have their tenders evaluated.

Joint ventures are eligible to submit tenders provided that:

(a) Every member of the joint venture is registered (as "Active") with the CIDB (at time of tender closing),

(b) The lead partner has a contractor grading designation in the **9EP** class of construction work and has a grading designation of not lower than one level below the required grading designation, and

(c) The combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations (2013) is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a **9EP** class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.

C.2.2.2 **The cost of the tender documents:**

Replace this paragraph with the following:

"Documents are to be downloaded, free of charge, from the **National Treasury's eTenders website** or the **eThekwini Municipality's Website**."

C.2.5 **Reference documents:**

Tenderers are to obtain their own copies of:

1) The **Conditions of Contract** identified in Section C1.2.1.1.
Tenderers/ Contractors are required to obtain their own copies.

2) The **Specifications** identified in Section C3.3.1.
Tenderers/ Contractors are required to obtain their own copies.

3) The following acts, regulations, policies, and standards referred to in this document, including but not limited to:
   - The Employer's Supply Chain Management Policy (as at advertising date).
   - The Occupational Health and Safety Act No 85 and Amendment Act No 181 of 1993, and the Construction Regulations (2014).
   - The Construction Industry Development Board Act No 38 of 2000 and the Regulations issued in terms of the Act (July 2013 as amended).
   - The Preferential Procurement Policy Framework Act (PPPFA), and the PPPFA Regulations (November 2022).
   - The Amended Construction Sector Code (Government Gazette No.41287) applicable to B-BBEE compliance measurement.
   - SANS 1921:2004 – Construction and Management Requirements for Works Contract, Parts 1-3.
   - South African Road Traffic Signs Manual - Vol 2: Chapter 13: Roadworks Signing.
   - CIDB Standard for Developing Skills Through Infrastructure Contracts, published in Gazette Notice No. 48491 of 28 April 2023.

- CIDB Standard for Indirect Targeting for Enterprise Development through Construction Works Contracts, published in Gazette Notice No. 36190 of 25 February 2013.
- Any other eThekwini Policy documents referenced in the Tender Documents.

C.2.6 **Acknowledge addenda:**

Add the following paragraphs:

"Addenda will be published on the **eThekwini Municipality website** as stated in **Tender Data: C.1.2**. Tenderers are to ensure that this website is consulted for any published addenda pertaining to this tender up to three days before the tender closing time as stated in the **Tender Data**."

"Acknowledgement of receipt of the addenda will be by the return of the relevant completed, dated, and signed portion of the addenda, to the physical or email address as specified on the addenda."

Failure of the Tenderer to comply with the requirements of the addenda will result in the tender submission being made non-responsive.

C.2.7 Clarification meeting:

Clarification Meeting Type: No Clarification Meeting
Not Applicable

Bidders are requested to submit emailed queries related to the bid. All emailed queries are to be submitted to the **Employer's Agent's Representative** (refer to C.1.4) by 2026/10/15. Emailed questions and answers will be consolidated and posted on the eTenders/Municipal website for the benefit of all tenderers by 2026/10/22

In the event of a Compulsory Clarification Meeting the Tenderer's representative(s) must be able to clearly convey the discussions at the meeting to the person(s) responsible for compiling the entity's tender offer.

If an attendance register is applicable, Tenderers must sign the attendance register and provide the name of the tendering entity.

Tenderers are referred to Clause C.2.1.1(a).

C.2.10.2 Pricing the tender offer:

The following is to be noted in terms of Tenderers being **VAT Registered,** or being a **Non-VAT Vendor** (ie. not VAT registered).

If the Tenderer is **VAT registered**, the Tenderer's Rates in the Bill of Quantities (BoQ) are to exclude VAT. VAT is to be shown separately on the BoQ summary page, and on the Form of Offer (Part C1.1.1).

If the Tenderer is a **Non-VAT Vendor**, the Tenderer's Rates in the Bill of Quantities are to include VAT. VAT is not to be shown separately on the BoQ summary page, or on the Form of Offer (Part C1.1.1). VAT will not be added to, or deducted from, rates or prices submitted from **Non-VAT Vendors**. The tendered priced will be deemed to include all VAT, taxes, and any applicable excise duties.

Tenderers are to refer to Part C2.1: PRICING ASSUMPTIONS / INSTRUCTIONS prior to pricing the tender offer.

C.2.12 Alternative tender offers:

No alternative tender offers will be considered.

C.2.13 Submitting a tender offer:

The signed Tender Offer ("hard copy") is to be sealed in an envelope, addressed to the City Manager, marked with the **identification details** and be delivered to the **delivery address**, both as stated below.

The **Tender Offer** (hard copy) is to be delivered to the following **delivery address**:
the Tender Box in the foyer of the Municipal Building, 166 KE Masinga Road, Durban

Identification details to be shown on the hard copy package are:
Contract No. : 34827(5E)

- Contract Title : Supply, Delivery, Installation and Testing of Outdoor 132 kV and 275 kV Switchgear and Associated Equipment for a Period of Thirty-Six Months for Various Substations

Tender Offers are also to be **SUBMITTED ELECTRONICALLY** (uploaded) on the eThekwini Municipality **JDE System** (Ethekwini Supplier Portal (ESP Module)). For information pertaining to the JDE System, Tenderers are referred to **Section T1.1.2**.

Notwithstanding the **electronic submission**, a tender offer will only be deemed valid if the "hard copy" submission has been made. The "hard copy" submission will be the governing submission.

The Tender documentation, issued by the eThekwini Municipality (refer to **Tender Data: C.1.2**), is to be printed in its entirety. Printing should be done on white A4 paper, with printing on only one side of the paper. (It is suggested that the Tender documentation is not stapled, or punched for filing, prior to scanning, as this could affect the scanning process.)

After completion and signature (using **BLACK INK**), the entire Tender document is to be scanned to a single PDF (**P**ortable **D**ocument **F**ormat) document, at a resolution of 300 DPI (dots per inch). The PDF document is to be uploaded via the (Tender specific) upload option on the JDE System (ESP Module). Tenderers are responsible for resolving all access rights and submission queries on the JDE System before the tender closing date/ time (**Tender Data: C.2.15**).

Tender Offer delivery, and the electronic submission on the JDE System, are both to be completed on or before the closing date/ time stated in the **Tender Data: C.2.15**.

The submission of Tender Offers via any means other than that stated above will not be accepted, and those that are will be deemed invalid.

Parts of each tender offer communicated on paper shall be submitted as an original.

C.2.15 Closing date and time:

The closing time is:

- **Date:** Friday, 30 October 2026
- **Time:** 11h00

11h00

The **delivery of the hard copy AND** the completion of the requirements on the **JDE System (ESP Module)** are be completed prior to the Tender **closing date and time** as stated above. Any Tender

Offer submitted thereafter will not be considered.

C.2.16 Tender offer validity:

The Tender Offer validity period is **120 Days** (original validity period) from the closing date for submission of tenders.

In terms of the SCM Policy (Cl.21.2) tenders must remain valid for acceptance for a period of twelve (12) months after the expiry of the original validity period, unless the Municipality is notified in writing of anything to the contrary by the tenderer.

The eThekwini Municipality reserves the right to request confirmation from Tenderers of tender validity at any time during the twelve (12) month period.

C.2.20 Submit securities, bonds, policies:

The Tenderer is required to submit with their tender offer: a letter of intent for surety bonds to be submitted.

C.2.23 Certificates:

Refer to **T2.1: "List of Returnable Documents"** for a listing of certificates that must be provided with the tender. All certificates must be valid at the time of tender closing.

Tenderers are to include a printout of the required documents/ certificates at the back of their tender submission.

1) **SARS Tax Compliance Status – PIN Issued**

Reference is to be made to **Returnable Document "Compulsory Enterprise Questionnaire"** which requires the "SARS Tax Compliance Status – PIN Issued" to be included with this returnable document.

2) **Central Supplier Database (CSD)**

Reference is to be made to **Returnable Document "CSD Registration Report"**.

The entities **CSD Registration Report**, obtained from the National Treasury Central Supplier Database (CSD), is to be included in the tender submission (https://secure.csd.gov.za).

Separate **CSD Registration Reports** are required for each party to a Joint Venture.

3) **CIDB Registration** (if applicable)

Reference is to be made to **Returnable Document "Verification of CIDB Registration and Status"**.

Tenderers are to include with their submission a printout of their **CIDB Registration**, obtained from the CIDB website (https://portal.cidb.org.za/RegisterOfContractors/).

Separate **CIDB Registration printouts** are required for each party to a Joint Venture.
The **Joint Venture Grading Designation Calculator** printout should be included when making a submission as a Joint Venture:
(https://registers.cidb.org.za/PublicContractors/JVGradingDesignationCalc)

The date of obtaining the CIDB printout(s) is to be indicated on the printout and should be on or after the date of advertising of this tender. The Tenderer's registration with the CIDB must be reflected as "Active" as at the date of tender closing.

Failure to comply with 1), 2), and 3) above will result in the tender offer being deemed non-responsive.

4) B-BBEE Status Level of Contribution Certificate

Tenderers are referred to **Returnable Document "MBD 6.1: Preference Points Claim"** for the B-BBEE Certificate requirements. Notwithstanding the completion of **Returnable Document "MBD 6.1: Preference Points Claim"**, should a B-BBEE Status Level of Contribution Certificate not be returned no points for Preferential Procurement will be deemed to have been claimed.

The Amended Construction Sector Code (Government Gazette No.41287) is applicable to the B-BBEE compliance measurement of all entities that fall within the Construction Sector (Built Environment Professionals (BEP) and Contractors). The requirements for measurement and verification of entities are contained in the "Amended Code Series CSC000: Framework for Measuring Broad Based Black Economic Empowerment in the Construction Sector", as published in Notice 931 of 2017, Government Gazette No.41287 of 01/12/2017.

An EME Contractor with a Total Annual Revenue of less than R3 million, or a BEP with a total annual revenue of less than R1.8 million, may present an affidavit OR a certificate issued by the CIPC, OR an authorised B-BBEE verification certificate by a SANAS accredited Verification Agency.

Any B-BBEE Certificate where the entity has been assessed using **Generic Codes** will not be accepted.

C.3: THE EMPLOYER'S UNDERTAKINGS

C.3.1.1 Respond to requests from the tenderer:

Replace the words "five working days" with "three working days".

C.3.2 Issue addenda:

Add the following paragraph:

"Addenda will be published on the National Treasury's **eTenders Website** and/ or the **eThekwini Municipality Website."** (Refer to **Tender Data: C.1.2**).

C.3.4 Opening of Tender Submissions:

Tenders will be opened immediately after the closing time for tenders. The public reading of tenders will take place in the P&SCM Boardroom, 6th Floor, (Municipal Building), 166 KE Masinga Road, Durban.

The tender opening schedule will also be made available on the eThekwini Municipal website at URL: https://www.durban.gov.za/pages/business/publication-of-received-bids

C.3.9 Arithmetical errors, omissions and discrepancies:

Add the following Clause:

"C.3.9.5 Reject a tender offer if the Tenderer does not accept the correction of the arithmetical error in the manner described in C.3.9.4."

Any interactions between the Tenderer and the Employer in terms of this clause will be conducted through the Employer's Agent (or Representative) as identified in **Tender Data** C.1.4.

C.3.11 Evaluation of Tender Offers:

Eligibility

Tenders will be checked for compliance with the ELIGIBILITY requirements, as specified in the **Tender Data: C.2.1**. Tenders not in compliance will be deemed non-responsive.

Functionality

FUNCTIONALITY will be used in the evaluation of tenders.

FUNCTIONALITY will be evaluated to determine the responsiveness of tenders received. The minimum score for FUNCTIONALITY is 60 points. Those tenders not achieving the minimum score will be deemed non-responsive.

The functionality Criteria, Sub-Criteria, Points per Criteria/ Sub-Criteria, Returnable Documentation and Schedules, Method of Evaluation, and Prompts for Judgement are as specified in **Part T1.2.3: Additional Conditions of Tender**.

Preference Point System

The procedure for the evaluation of responsive tenders is **PRICE AND PREFERENCE**, in accordance with the Employer's **SCM Policy: Section 52: Preferential Procurement**.

The **80/20** preference points system, for requirements with a Rand value of up to R50,000,000 (all applicable taxes included), will be applied. The Formula used to calculate the **Price Points (max. 80)** will be according to that specified below.

The 9**0/10** preference points system, for requirements with a Rand value above R50,000,000 (all applicable taxes included), will be applied. The Formula used to calculate the **Price Points (max. 90)** will be according to that specified below.

It is unclear (at the time of advertising) which of the two preference point systems applies, either the **80/20 or 90/10** preference point system will apply, determined by the price offered by the lowest acceptable tender.

Price Points

The financial offer will be reduced to a comparative basis using the **Tender Assessment Schedule**.

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

90/10 Procurement System

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

Where: Ps = Points scored for comparative price of bid under consideration
Pt = Comparative price of bid under consideration
Pmin = Comparative price of lowest acceptable bid

Preference Points

Reference is to be made to **Returnable Form: MBD 6.1: Preference Points Claim**.

Broad-Based Black Economic Empowerment (SCM Policy Section 52.5)

The provisions of the SCM Policy: **Section 52.5: Broad-Based Black Economic Empowerment** shall apply. Reference is to be made to **Returnable Form: MBD 6.1: Preference Points Claim**.

Preference Points will be derived from points claimed for their B-BBEE Status Level of Contributor, as indicated on their B-BBEE Status Level Verification Certificates, on **Returnable Form: T2.2.6: MBD 6.1**, in accordance with the table below.

80/20 Preference Points System (maximum Preference Points: 20)				
B-BBEE Level Contributor	Preference Points		B-BBEE Level Contributor	Preference Points
1	20		5	8
2	18		6	6
3	14		7	4
4	12		8	2
Non-Compliant: 0				

90/10 Preference Points System (maximum Preference Points: 10)				
B-BBEE Level Contributor	Preference Points		B-BBEE Level Contributor	Preference Points
1	10		5	4
2	9		6	3
3	7		7	2
4	6		8	1
Non-Compliant: 0				

C.3.13 Acceptance of tender offer:

In addition to the requirements of **Tender Data: C.3.13** of the **Standard Conditions of Tender**, tender offers will only be accepted if:

(a) The Tenderer's municipal rates and taxes are not in arears, or they have made arrangements to meet outstanding municipal fee obligations.

(b) The Tenderer's tax compliance status has been verified, or they have made arrangements to meet outstanding tax obligations.

(c) If applicable, the Tenderer is **registered**, and **"Active"**, with the **Construction Industry Development Board** in an appropriate contractor grading designation.

(d) The Tenderer or any of its directors/ shareholders are n**ot 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.

(e) The Tenderer has not:
   i) Abused the Employer's Supply Chain Management System; or
   ii) Failed to perform on any previous contract and has been given a written notice to this effect.

(f) The Employer is reasonably satisfied that the Tenderer has in terms of the Construction Regulations (2014), issued in terms of the Occupational Health and Safety Act (1993), the **necessary competencies and resources to carry out the work safely**.

The Municipality does not bind itself to accept the lowest or any tender. It reserves the right to accept the whole or any part of a tender to place orders. Bidders shall not bind the Municipality to any minimum quantity per order. The successful Tenderer(s) shall be bound to provide any quantities stipulated in the specification.

The municipality has a firm intention to proceed with the work, subject to funding being identified. Notwithstanding the **Standard Conditions of Tender: C.1.1.3** of, the municipality reserves the right to award or not award the tender based on the municipalities available budget.

C.3.15 Complete adjudicator's contract:

Refer to the Conditions of Contract and the Contract Data.

C.3.17 Copies of contract:

The number of paper copies of the signed contract to be provided by the Employer is ONE (1). Tenderers are referred to the requirements as stated in the **Tender Data: C.2.13**.

T1.2.3 ADDITIONAL CONDITIONS OF TENDER

T1.2.3.1 Complaints and Objections (Appeals)

Reference is to be made to Clause 49 of the eThekwini Supply Chain Management Policy.

In terms of Section 49 of the Ethekwini SCM Policy any person aggrieved by decisions taken in the implementation of the SCM System may lodge, within 14 days of notification thereof, a written objection against the decision. The objection with regard to the decision is to be directed to:

The City Manager
Attention Ms S. Pillay eMail: Simone.Pillay@durban.gov.za
P O Box 1394
DURBAN
4000

Any objection will only be processed upon receipt of a non-refundable administration fee of **R6 131.00** (including VAT), as stipulated in the Municipality's current SCM Policy. An objection will only be considered upon receipt of proof of payment of this fee which must be paid into the following bank account as a real-time payment:

EThekwini Metropolitan Municipality
First National Bank (FNB)
Account Number: 631-6574-6331
Reference Number: **34827-5E**

T1.2.3.2 Prohibition on awards to persons in the service of the state

Clause 44 of the Supply Chain Management Regulations states that the Municipality or Municipal Entity may not make any award to a person:

(a) Who is in the service of the State;
(b) If that person is not a natural person, of which a director, manager, principal shareholder or stakeholder is a person in the service of the state; or
(c) Who is an advisor or consultant contracted with the municipality or a municipal entity.

Should a contract be awarded, and it is subsequently established that Clause 44 has been breached, the Employer shall have the right to terminate the contract with immediate effect.

T1.2.3.3 Code of Conduct and Local Labour

The Tenderers shall make themselves familiar with the requirements of the following policies:

- Code of Conduct;
- The Use of CLOs and Local Labour.

T1.2.3.4 Functionality Specification

Functionality Evaluation is applicable to this tender.

The value of W_2 is 100. The Functionality criteria (and sub criteria if applicable) and maximum score in respect of each of the criteria are as follows:

Functionality Criteria / Sub Criteria		Maximum Points Score
Tenderer's Experience		30
Project Organogram and Experience of Key Staff	Projects Manager	10
	Professional Design Engineers	10
	Site Supervisors	10
	Installation Technician	10
	Test Technician	10
Construction Methodology, Programme & Quality Control		20
	Maximum possible score for Functionality (M_s)	100

The minimum number of evaluation points for Functionality is **60**. Only those Tenderers who achieve the minimum number of Functionality evaluation points (or greater) will be eligible to have their tenders further evaluated.

Functionality shall be scored by not less than three evaluators and the scores of each of the evaluators will be averaged, weighted and then totalled to obtain the final score for Functionality. Each evaluation criteria will be assessed in terms of six indicators and scores allocated according to the following table:

Level 0	Level 1	Level 2	Level 3	Level 4	Level 5
No Response / response cannot be evaluated	Poor	Less than Acceptable	Acceptable	Above Acceptable	Excellent
0	20	40	60	80	100

Evaluation criteria will be adjudicated according to submissions made in accordance with the following schedules, which are found in T2.2: Returnable Schedules:

Functionality Criteria / Sub Criteria	Returnable Schedules
Tenderer's Experience	Experience of Tenderer
Project Organogram and Experience of Key Staff	a) Proposed Organisation and Staffing b) Key Personnel c) Experience of Key Personnel
Programme	Required Delivery Dates
Construction Methodology	a) Construction Approach, Methodology b) Schedule of Proposed Subcontractors c) Plant and Equipment
Quality Control	Quality Control Statement

The prompts for judgement for each of the evaluation criteria are listed below:

Unless otherwise stated, evaluation criteria will be adjudicated with respect to the contract specific Scope of Work, as specified in Part C.3. In this regard the following definitions apply to the evaluation criteria prompts for judgement:

- "**successfully completed**" implies a project has been completed on time and to specification.
- "**similar nature**" implies projects that include the supply, delivery, installation and testing of outdoor 132kV or 275kV switchgear.
- "**accredited degree / diploma**" implies a minimum 3-year qualification within the built environment, from a registered University or Institute of Technology.

Tenderer's Experience (weighting of 30)

Criterion: Tenderer's Experience	
Level 0	No information provided; OR submission of no substance / irrelevant information provided
Level 1	To have successfully completed (ie, on time and to specification) 1 project of a similar nature within the past 10 years.
Level 2	To have successfully completed (ie, on time and to specification) 2 projects of a similar nature within the past 10 years.
Level 3	To have successfully completed (ie, on time and to specification) 3 to 5 projects of a similar nature within the past 10 years.
Level 4	To have successfully completed (ie, on time and to specification) 6 to 8 projects of a similar nature within the past 10 years.
Level 5	To have successfully completed (ie, on time and to specification) 9+ projects of a similar nature within the past 10 years.

Project Organogram and Experience of Key Staff (weighting of 50)

The tenderer is to attach to this schedule the proposed composition of their staffing structure and their respective CVs. Each of the 5 resources [project manager, professional design engineer, site supervisor, installation technician and test technician] has a maximum score of 10 points and shall be evaluated individually. **Criterion: Project Organogram and Experience of Key Staff**

Level 0	No information provided; OR submission of no substance / irrelevant information provided
Level 1	**Proposed Organisation and Staffing**: To have provided an incomplete organogram **Projects Manager:** Minimum 2 years relevant experience and accredited 3- or 4-year relevant diploma/degree. **Professional Design Engineers:** Minimum 2 years relevant experience and relevant accredited 4 year degree & registered with ECSA as Professional Engineer. **Site Supervisors:** Minimum 2 years relevant experience and trade tested (or Minimum 2 years relevant experience and relevant accredited 3- or 4-year Electrical engineering diploma/degree). **Installation and Testing Team Leader:** Minimum 2 years relevant experience and trade tested (or Minimum 2 years relevant experience and relevant accredited 3- or 4-year Electrical engineering diploma/degree).
Level 2	**Proposed Organisation and Staffing**: To have provided an incomplete organogram **Projects Manager:** Minimum 4 years relevant experience and accredited 3- or 4-year relevant diploma/degree. **Professional Design Engineers:** Minimum 4 years relevant experience and relevant accredited 4 year degree & registered with ECSA as Professional Engineer. **Site Supervisors:** Minimum 4 years relevant experience and trade tested (or Minimum 2 years relevant experience and relevant accredited 3- or 4-year Electrical engineering diploma/degree). **Installation and Testing Team Leader:** Minimum 4 years relevant experience and trade tested (or Minimum 2 years relevant experience and relevant accredited 3- or 4-year Electrical engineering diploma/degree).
Level 3	**Proposed Organisation and Staffing**: To have provided a complete organogram that shows the staffing resources, and the availability of site supervisors, installation and testing teams. **Projects Manager:** Minimum 6 years relevant experience and accredited 3- or 4-year relevant diploma/degree. **Professional Design Engineers:** Minimum 6 years relevant experience and relevant accredited 4 year degree & registered with ECSA as Professional Engineer. **Site Supervisors:** Minimum 6 years relevant experience and trade tested (or Minimum 2 years relevant experience and relevant accredited 3- or 4-year Electrical engineering diploma/degree). **Installation and Testing Team Leader:** Minimum 6 years relevant experience and trade tested (or Minimum 2 years relevant experience and relevant accredited 3- or 4-year Electrical engineering diploma/degree).
Level 4	**Proposed Organisation and Staffing**: To have provided a complete organogram that shows the staffing resources, and the availability of 2 site supervisors, 2 installation and testing teams. **Projects Manager:** Minimum 8 years relevant experience and accredited 3- or 4-year relevant diploma/degree. **Professional Design Engineers:** Minimum 8 years relevant experience and relevant accredited 4 year degree & registered with ECSA as Professional Engineer. **Site Supervisors:** Minimum 8 years relevant experience and trade tested (or Minimum 2 years relevant experience and relevant accredited 3- or 4-year Electrical engineering diploma/degree). **Installation and Testing T Team Leader:** Minimum 8 years relevant experience and trade tested (or Minimum 2 years relevant experience and relevant accredited 3- or 4-year Electrical engineering diploma/degree).
Level 5	**Proposed Organisation and Staffing**: To have provided a complete organogram that shows the staffing resources, and the availability of 2 site supervisors, 2 installation and testing teams. **Projects Manager:** Minimum 10 years relevant experience and accredited 3- or 4-year relevant diploma/degree. **Professional Design Engineers:** Minimum 10 years relevant experience and relevant accredited 4 year degree & registered with ECSA as Professional Engineer. **Site Supervisors:** Minimum 10 years relevant experience and trade tested (or Minimum 2 years relevant experience and relevant accredited 3- or 4-year Electrical engineering diploma/degree). **Installation and Testing Team Leader:** Minimum 10 years relevant experience and trade tested (or Minimum 2 years relevant experience and relevant accredited 3- or 4-year Electrical engineering diploma/degree).

Programme (weighting of 5)

The programme (use **Drawing no. TD17 – Typical 132 kV Double Busbar Outdoor Switchyard**) should:

- List the individual construction activities broken down into appropriate levels of detail;
- Indicate the durations for the individual construction activities;
- Indicate the sequencing / overlapping of activities;
- Indicate the time interval used (days / weeks / months); and
- Indicate the critical path.

Criterion: Preliminary Programme	
Level 0	No information provided; OR submission of no substance / irrelevant information provided
Level 1	Submission of all the minimum required details. Tenderer's guaranteed duration to execute work with respect to the required durations is extended by 4 weeks or above.
Level 2	Submission of all the minimum required details. Tenderer's guaranteed duration to execute work with respect to the required durations is extended by 2 weeks.
Level 3	Submission of all the minimum required details. Tenderer's guarantee to execute work is as per the required durations.
Level 4	Submission of all the minimum required details. Tenderer's guaranteed duration to execute work with respect to the required durations is reduced by 2 weeks.
Level 5	Submission of all the minimum required details. Tenderer's guaranteed duration to execute work with respect to the required durations is reduced by 4 weeks or above.

Construction Methodology (weighting of 10)

Criterion: Construction Methodology	
Level 0	No information provided / irrelevant information provided
Level 1	Submission of some of the minimum required details for the methodology. Methodology encompasses activities associated with the scope of works.
Level 2	Submission of some of the minimum required details for the methodology. Methodology encompasses activities associated with the scope of works in an appropriate and logical order.
Level 3	Submission of all the minimum required details for the methodology. Methodology encompasses all activities associated with the scope of works in an appropriate and logical order; Plus: □ Including staff, plant and equipment resources □ Including subcontractors if applicable.
Level 4	Submission of all the minimum required details for the methodology. Methodology encompasses all activities associated with the scope of works in an appropriate and logical order; Plus: □ Including staff, plant and equipment resources, □ Including subcontractors if applicable, □ Additional methodology statements for minor activities.
Level 5	Submission of all the minimum required details for the methodology. Methodology encompasses all activities associated with the scope of works in an appropriate and logical order; Plus: □ Including staff, plant and equipment resources, □ Including subcontractors if applicable, □ Additional methodology statements for minor activities, □ Details ways to improve project outcomes and quality of outputs.

Quality Control (weighting of 5)

The tenderer is to discuss what tests and control measures are going to be employed on site to attain the specified results and is to cover the program associated activities.

Criterion: Quality Control	
Level 0	No information provided OR submission of no substance / irrelevant information provided
Level 1	Quality control statement only covers the required testing requirements
Level 2	Quality control statement only covers the required testing requirements and finishing works for some programmed activities.
Level 3	Submission of all minimum required details. Quality control statement covers the required testing requirements, process monitoring and finishing works, for all programmed activities.
Level 4	Submission of all minimum required details. Quality control statement covers the required testing requirements, process monitoring and finishing works, for all programmed activities; Plus: □ Additional quality control process □ Statement on remedial action to quality control.
Level 5	Submission of all minimum required details. Quality control statement covers the required testing requirements, process monitoring and finishing works, for all programmed activities; Plus: □ More than 4 additional quality control process. □ Statement on remedial action to quality control. □ ISO Accreditation

Functionality shall be scored by not less than three evaluators and the scores of each of the evaluators will be averaged, weighted and then totalled to obtain the final score for Functionality.

The weighted evaluation points for Functionality is **60**. Only those tenderers who achieve the minimum number of Functionality evaluation points (or greater) will be eligible to have their tenders further evaluated.

PART T2: RETURNABLE DOCUMENTS

T2.1 LIST OF RETURNABLE DOCUMENTS

T2.1.1 General

The Tender Submission Documentation must be submitted in its entirety. All forms must be properly completed and signed as required.

The Tenderer is required to complete and sign each and every Schedule and Form listed below to the best of their ability as the evaluation of tenders and the eventual contract will be based on the information provided by the Tenderer.

Failure of a Tenderer to complete the Schedules and Forms to the satisfaction of the Employer will inevitably prejudice the tender and may lead to rejection on the grounds that the tender is non-responsive.

T2.1.2 Returnable Schedules, Forms and Certificates

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T2.2.2	Certificate of Attendance at Clarification Meeting/ Site Inspection	36
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Technical or Functionality Evaluation

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Contract Part: The Tenderer is required to complete following forms:

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C1.2.2.2 Data to be Provided by Contractor 131
C2.2 Bill of Quantities..... 138

T2.2 RETURNABLE SCHEDULES, FORMS, AND CERTIFICATES

The returnable schedules, forms, and certificates, as listed in T2.1.2, can be found on pages 36 to 123.

NOTE

The **Form of Offer** (C1.1.1), The **Data to be Provided by Contractor** (C1.2.2.2), and the **Bill of Quantities** (C2.2) are also required to be completed by the tenderer.

T2.2.1 COMPULSORY ENTERPRISE QUESTIONNAIRE

Ref	Description	Tenderer to Complete	
1.1	Name of enterprise		
1.2	Name of enterprise's representative		
1.3	Email address of representative		
1.4	Contact numbers of representative	**Tel:**	**Cell:**
1.5	National Treasury Central Supplier Database Registration number	**MAAA**	
1.6	VAT registration number, if any:		
1.7	CIDB registration number, if any:		
1.8	Department of Labour: Registration number		
1.9	Department of Labour: Letter of Good Standing Certificate number		

2.0 **Particulars of sole proprietors and partners in partnerships (attach separate pages if more than 4 partners)**

	Full Name	Identity No.	Personal income tax No. *
2.1			
2.2			
2.3			

3.0 **Particulars of companies and close corporations**

3.1	Company registration number, if applicable:	
3.2	Close corporation number, if applicable:	
3.3	Tax Reference number, if any:	
3.4	* South African Revenue Service: Tax Compliance Status PIN:	

4.0 **MBD 4, MBD 6, MBD 8, and MBD9** issued by National Treasury must be completed for each tender and be included as a tender requirement.

* Tenderers are to include, at the back of their tender submission, a printout of their SARS "**Tax Compliance Status – PIN Issued**" certificate, failing which the tender submission will be deemed non-responsive.

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

i) authorizes the Employer to verify the Tenderer's tax clearance status from the South African Revenue Services that it is 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.

v) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.2 CERTIFICATE OF ATTENDANCE AT CLARIFICATION MEETING / SITE INSPECTION

Reference is to be made to the **Tender Data: C.2.1.1(a) and C.2.7**.

This is to certify that:

(entity name): .....

of (address): .....

.....

.....

was represented by the person(s) named below at the Clarification Meeting for Contract **34827-5E** held for all Tenderers, the details of which are stated in the **Tender Data: C.2.7**.

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: …… Name: ..... ……

Signature: …… Signature: ..... ……

Capacity: …… Capacity:……

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

Name: ……

Signature: ……

Date: ……

T2.2.3 MBD 4: DECLARATION OF INTEREST

MSCM Regulations: "**in the service of the state**" means to be:

(a) a member of:
  (i) any municipal council.
  (ii) any provincial legislature.
  (iii) the national Assembly or the national Council of provinces.
(b) a member of the board of directors of any municipal enterprise.
(c) an official of any municipality or municipal enterprise.
(d) an employee of any national or provincial department, national or provincial public enterprise 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 enterprise.
(f) an employee of Parliament or a provincial legislature.

"**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.

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 and/or take an oath declaring his/her interest.

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

3.1 Name of enterprise	
Name of enterprise's representative	
3.2 ID Number of enterprise's representative	
3.3 Position enterprise's representative occupies in the enterprise	
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 / sole proprietors / partners in partnerships, their individual identity numbers and state employee numbers must be indicated in paragraph 4 below. In the case of a joint venture, information in respect of each partnering enterprise must be completed and submitted.

3.8 Are you presently in the service of the state?	Circle Applicable	
	YES	NO

If yes, furnish particulars: ……

……

3.9	Have you been in the service of the state for the past twelve months? If yes, furnish particulars:	YES / NO
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? If yes, furnish particulars:	YES / NO
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? If yes, furnish particulars:	YES / NO
3.12	Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state? If yes, furnish particulars:	YES / NO
3.13	Are any spouse, child or parent of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state? If yes, furnish particulars:	YES / NO
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 ? If yes, furnish particulars:	YES / NO

4 The names of all directors / trustees / shareholders / members / sole proprietors / partners in partnerships, their individual identity numbers and state employee numbers must be indicated below. In the case of a joint venture, information in respect of each partnering enterprise must be completed and submitted

Full Name	Identity No.	State Employee No.	Personal income tax No.
Use additional pages if necessary			

Failure to complete this form in full, sign, and return with the tender submission will result in the tender offer being deemed non-responsive.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.4 MBD 5: DECLARATION FOR PROCUREMENT ABOVE R10 MILLION
(ALL APPLICABLE TAXES INCLUDED)

For all procurement expected to exceed R10 million (all applicable taxes included), bidders must complete the following questionnaire.

		Circle Applicable	
1.0	Are you by law required to prepare annual financial statements for auditing?	YES	NO

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.**
The audited annual financial statements are to be included at the back of the tender submission.

2.0	Do you have any outstanding undisputed commitments for municipal services towards any municipality for more than three months or any other service provider in respect of which payment is overdue for more than 30 days?	YES	NO

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

2.2 If YES, provide particulars.

……

……

3.0	Has any contract been awarded to you by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract?	YES	NO

3.1 If YES, provide particulars.

SEE Returnable Document "Contracts Awarded by Organs of State in the Past 5 Years"

4.0	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, provide particulars.

……

……

Failure to complete this form in full, sign, and return with the tender submission will result in the tender offer being deemed non-responsive.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, ***and, if required, that the requested documentation has been included in the tender submission****.*

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.5 CONTRACTS AWARDED BY ORGANS OF STATE IN THE PAST 5 YEARS

In terms of SCM Policy Section 20(1)(d)(iii), Tenderers are to provide details of Works undertaken for the Government or Public Sector entities/ Organs of State in the past 5 Years, including particulars of any material non-compliance or dispute concerning the execution of such contract.

Material non-compliance or dispute (Yes or No)													
Date Completed													
Value of Work													
Consulting Engineer/ Engineers representative													
Employer													
Contract Number													

I, the undersigned, who warrants that they are authorised to sign on behalf of the entity, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.6 MBD 6.1: PREFERENCE POINTS CLAIM) (SCMP 52.5: Broad-Based Black Economic Empowerment)

This form serves as a claim form for preference points for **Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution**. **Reference is to be made to the Tender Data: C.3.11.**

1.0 GENERAL CONDITIONS

1.1 The relevant **Preference Points System 90/10** applicable to this bid is stated in the **Tender Data: C.3.11**.

1.2 Failure on the part of a bidder to fill in and/ or sign this form, and submit a B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System (SANAS), or a Registered Auditor approved by the Independent Regulatory Board of Auditors (IRBA), or sworn affidavits in the case of Exempted Mico Enterprises or Qualifying Small Enterprises, together with the bid, will be interpreted to mean that preference points for **B-BBEE Status Level Of Contribution** are not claimed.

1.3 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.

2.0 ADJUDICATION USING A POINT SYSTEM

2.1 The bidder obtaining the highest number of total points will be recommended for the award of the contract.

2.2 Preference points shall be calculated after prices have been brought to a comparative basis taking into account all factors of non-firm prices and all unconditional discounts.

2.3 Points scored will be rounded off to the nearest 2 decimal places.

2.4 In the event that two or more bids have scored equal total points, the successful bid must be the one scoring the highest number of preference points for B-BBEE.

2.5 However, when functionality is part of the evaluation process and two or more bids have scored equal points including equal preference points for B-BBEE, the successful bid must be the one scoring the highest score for functionality.

2.6 Should two or more bids be equal in all respects the award shall be decided by the drawing of lots.

3.0 POINTS AWARDED FOR PRICE

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

90/10 Procurement System

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

Where:
- Ps = Points scored for comparative price of bid under consideration
- Pt = Comparative price of bid under consideration
- Pmin = Comparative price of lowest acceptable bid

4.0 POINTS ALLOCATED FOR B-BBEE STATUS LEVEL OF CONTRIBUTION

4.1 Preference points must be claimed by a bidder for attaining the **B-BBEE Status Level of Contribution** in accordance with the applicable table below:

80/20 Preference Points System	
B-BBEE Level Contributor	**Preference Points**
1	20
2	18
3	14
4	12
5	8
6	6
7	4
8	2
Non-Compliant	0

90/10 Preference Points System	
B-BBEE Level Contributor	**Preference Points**
1	10
2	9
3	7
4	6
5	4
6	3
7	2
8	1
Non-Compliant	0

4.2 All bidders must submit **B-BBEE Status Level of Contribution Certificates**, issued by either verification agencies accredited by the South African Accreditation System (SANAS), or by registered auditors approved by the Independent Regulatory Board for Auditors (IRBA), **or sworn affidavits** in a case of an Exempted Micro Enterprise (EME) or a Qualifying Small Enterprise (QSE).

4.3 Any enterprise with an annual Total Revenue of R 10 million or less qualifies as an Exempted Micro-Enterprise.

4.4 Exempted Micro-Enterprises are deemed to have B-BBEE Status of "Level Four Contributor" having a B-BBEE procurement recognition of 100% in terms of the Codes of Good Practice.

4.5 An Exempted Micro Enterprise (EME) with at least 51% black ownership qualifies as a Level 2 contributor with BBBEE level of 125% in terms of the Codes of Good Practice.

4.6 An Exempted Micro Enterprise with 100% black ownership qualifies as a Level 1 contributor with BBBEE level of 135% in terms of the Codes of Good Practice.

4.7 An Exempted Micro Enterprise that is regarded as a specialized enterprise with at least 75% black beneficiaries qualifies as a Level 1 contributor with BBBEE level of 135% in terms of the Codes of Good Practice.

4.8 An Exempted Micro Enterprise that is regarded as a specialized enterprise with at least 51% black beneficiaries qualifies as a Level 2 contributor with BBBEE level of 125% in terms of the Codes of Good Practice.

4.9 A Qualifying Small Enterprise (QSE) with at least 51% black ownership qualifies as a Level 2 contributor.

4.10 A QSE with 100% black ownership qualifies as a Level 1 contributor.

4.11 A QSE that is regarded as a specialized enterprise with at least 51% black beneficiaries qualifies as a Level 2 contributor with BBBEE level of 125% in terms of the Codes of Good Practice.

4.12 A QSE with less than 51% black ownership is required to submit a BBBEE level verification certificate issued by a BBBEE verification professional.

4.13 A Trust, consortium or joint venture:

(a) must submit a B-BBEE status level certificate in order to qualify for points;
(b) may qualify for points as an unincorporated entity provided, that they submit their consolidated scorecard is prepared for separate tender; and
(c) where no consolidated scorecard exists, the weighted average (in accordance with participation percentages) must be used and rounded off to the nearest status level.

4.14 Gazetted Sector Codes supersede Generic Codes.

5.0 SUB-CONTRACTING

5.1 B-BBEE points must not be awarded to a tenderer who intends sub-contracting more than 25% of the value of the contract to an enterprise that does not qualify for at least the points that such contractor qualifies for, unless the intended sub-contractor is an EME who has the ability and capability to execute the contract.

5.2 A person awarded a contract may not sub-contract more than 25% of the value of the contract to an enterprise that does not have an equal or higher B-BBEE status level, unless the intended sub-contractor is an EME who has the ability and capability to execute the contract.

5.3 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 prescribed minimum threshold.

6.0 BID DECLARATION

6.1 Bidders who wish to claim points in respect of **B-BBEE Status Level of Contribution** must complete the following:

B-BBEE Status Level of Contribution	Tenderer's Preference Points Claim (maximum of 10 points)
Points claimed must be in accordance with the relevant table reflected in paragraph 4.1 and must be substantiated by means of a B-BBEE Status Level of Contribution Certificate issued by a verification agency accredited by the South African Accreditation System (SANAS), or by registered auditors approved by the Independent Regulatory Board for Auditors (IRBA), or sworn affidavits in a case of an Exempted Micro Enterprise (EME) or a Qualifying Small Enterprise (QSE).	

Tenderers are to include, at the back of their tender submission, their B-BBEE Status Level of Contribution Certificate, or sworn affidavits, failing which no Preference Points will be deemed to have been claimed.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, ***and, if required, that the requested documentation has been included in the tender submission****.*

NAME (Block Capitals): ..... **Date**

SIGNATURE: ....

T2.2.8 MBD 8: DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

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

2.0 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.

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

a) abused the 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) wilfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years.
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).

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

	Circle Applicable	
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 YES, provide 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 YES, provide 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 YES, provide particulars.

……

……

		Circle Applicable	
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 YES, provide 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
	4.5.1 If YES, provide particulars.		
	…….		
	…….		

Failure to complete this form in full, sign, and return with the tender submission will result in the tender offer being deemed non-responsive.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both 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.

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.9 MBD 9: CERTIFICATE OF INDEPENDENT BID DETERMINATION

NOTES

[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.
[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.

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

2.0 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.

3.0 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. take 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. cancel 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.

4.0 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.

5.0 In order to give effect to the above, the below **Certificate of Independent Bid Determination** must be completed and submitted with the bid.

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid for: Contract **34827(5E)**
Enter the Contract Title: multiple lines allowable

in response to the invitation for the bid made by: ETHEKWINI MUNICIPALITY

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

I certify, on behalf of: ……

that:

(continued on next page)

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.
   (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.
   (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.

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.

Failure to complete this form in full, sign, and return with the tender submission will result in the tender offer being deemed non-responsive.

NAME (Block Capitals): ---------- **Date**

SIGNATURE: _____

T2.2.10 DECLARATION OF MUNICIPAL FEES

Reference is to be made to the **Tender Data: C.2.23 and C.3.13(a)**.

I, the undersigned, do hereby declare that the Municipal fees of:

.....

(full name of Company / Close Corporation / partnership / sole proprietary/Joint Venture)

(hereinafter referred to as the TENDERER) are, as at the date hereunder, fully paid or an Acknowledgement of Debt has been concluded with the Municipality to pay the said charges in instalments.

The following account details relate to property of the said TENDERER:

Account	Account Number: to be completed by Tenderer											
Consolidated Account												
Electricity												
Water												
Rates												
JSB Levies												
Other												

- If applicable, a copy of a recent (within the past 3 months) Metro Bill is to be provided.

I acknowledge that should the aforesaid Municipal charges fall into arrears, the Municipality may take such remedial action as is required, including termination of any contract, and any payments due to the Contractor by the Municipality shall be first set off against such arrears.

- Where the Tenderer's place of business or business interests are outside the jurisdiction of eThekwini municipality, a copy of the accounts/ agreements from the relevant municipality are to be provided.
- Where the Tenderer's Municipal Accounts are part of their lease agreement, then a copy of the agreement, or an official letter to that effect, is to be provided.
- Where a Tenderer's place of business or business interests are carried out from premises as part of any other agreement, then a copy of the agreement, or an official letter to that effect, is to be provided.

Tenderers are to include, at the back of their tender submission, copies of the above-mentioned account's, agreements signed with the municipality, lease agreements, or official letters.

Failure to complete this form in full, sign, and return the required documents with the tender submission will result in the tender offer being deemed non-responsive.

*I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, **and that the requested documentation has been included in the tender submission**.*

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.11 CONTRACTOR'S HEALTH AND SAFETY DECLARATION

Reference is to be made to Clauses C.2.1(e) and C.2.23 of the Tender Data.

In terms of Clause 5(1)(h) of the OHSA 1993 Construction Regulations 2014 (referred to as "the Regulations" hereafter), a Principal Contractor may only be appointed to perform construction work if the Client is satisfied that the Principal 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 2014.

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 2014.

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 **(Tenderers are to Circle Applicable - Yes or No)**:

	Circle Applicable	
(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

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 8, and competent persons as defined in Regulations 9, 10, 11, 12, 13, 14, 16, 17, 20, 21, 22, 23(1), 24, 25, 26, 27, 28 and 29, as applicable).

(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

(b) 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) Positions to be filled by persons to be trained or hired:	

(c) 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, the undersigned, hereby undertake, if this 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 7(1) of the Construction Regulations, which plan shall be subject to approval by the Client.

6 I, the undersigned, confirm that copies of this company's approved Health and Safety Plan, the Client's Safety Specifications as well as the OHSA 1993 Construction Regulations 2014 will be provided on site and will at all times be available for inspection by the Principal Contractor's personnel, the Client's personnel, the Employer's Agent, visitors, and officials and inspectors of the Department of Labour.

7 I, the undersigned, hereby confirm that adequate provision has been made in the tendered rates and prices in the Bill of Quantities to cover the cost of all resources, actions, training and all health and safety measures envisaged in the OHSA 1993 Construction Regulations 2014, and that I will be liable for any penalties that may be applied by the Client in terms of the said Regulations (Regulation 33) for failure on the Principal Contractor's part to comply with the provisions of the Act and the Regulations.

8 I, the undersigned, agree that failure to complete and execute this declaration to the satisfaction of the Client will mean that this company is unable to comply with the requirements of the OHSA 1993 Construction Regulations (2014) and accept that this tender will be prejudiced and may be rejected at the discretion of the Client.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): _____ **Date**

SIGNATURE: _____ _____

T2.2.12 CSD REGISTRATION REPORT

Reference is to be made to **Tender Data: C.2.1.1(b) and C.2.23**.

The **Tender Data: C.2.1: Eligibility**, requires a Tenderer to be registered, at the time of tender closing, on the **National Treasury Central Supplier Database (CSD)** as a service provider.

CSD Registration Reports can be obtained from the National Treasury's CSD website at
https://secure.csd.gov.za/Account/Login.

The following is an example of the printout obtained from the above website.
Note: the printout will contain more than one page.

CENTRAL SUPPLIER DATABASE FOR GOVERNMENT

Report Date:

Report Ran By:

CSD REGISTRATION REPORT

SUPPLIER IDENTIFICATION

Supplier number		Have Bank Account	
Is supplier active?		Total annual turnover	
Supplier type		Financial year start date	
Supplier sub-type		Registration date	
Legal name		Created by	
Trading name		Created date	
Identification type		Edit by	
Government breakdown		Edit date	
Business status		Restricted Supplier	
Country of origin		Restriction Last Verification Date	
South African company/CC registration number			

Tenderers are to include, at the back of their tender submission, a printout of their CSD Registration Report.

Failure to comply will result in the tender offer being deemed non-responsive.

*I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, **and that the requested documentation has been included in the tender submission**.*

NAME (Block Capitals): _____ **Date**

SIGNATURE: _____ _____

T2.2.13 CIDB REGISTRATION AND STATUS

Reference is to be made to the **Tender Data: C.2.1.2, C.2.23, and C.3.13(c).**

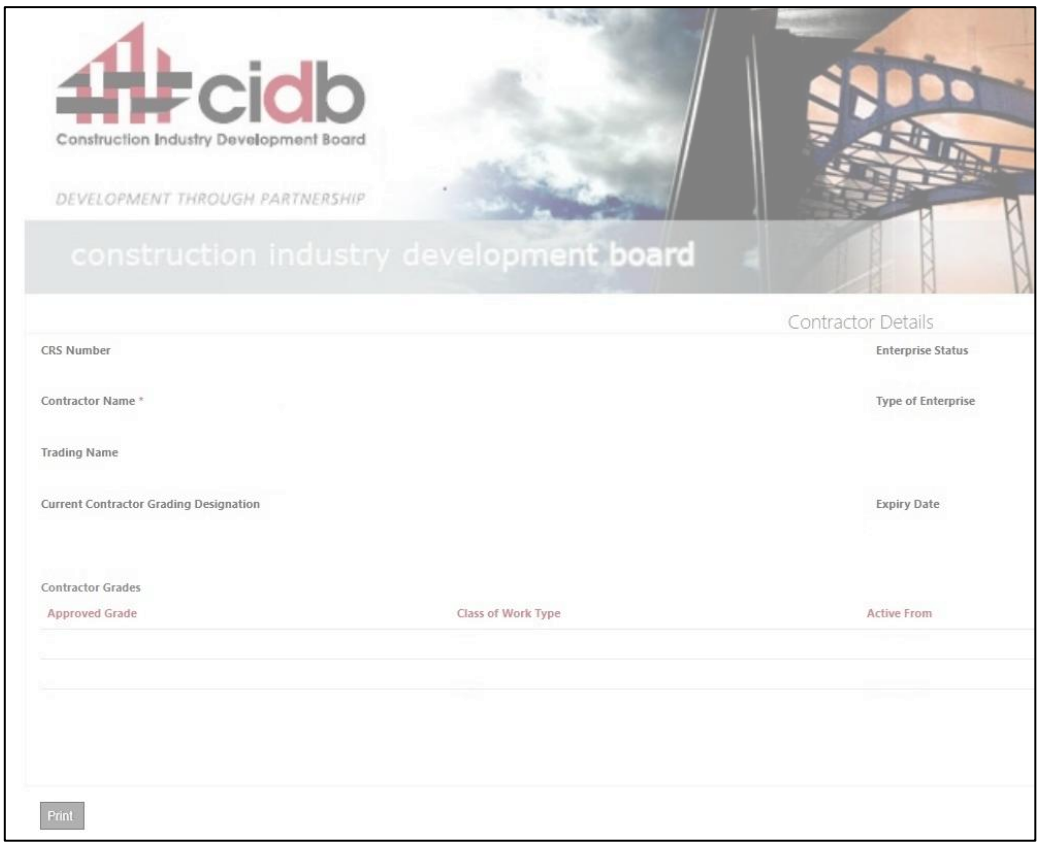
The **Tender Data: C.2.1.1: Eligibility**, requires a Tenderer to be registered, as "Active", with the CIDB (at time of tender closing), in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.

The required class of construction work is specified in the **Tender Data: C.2.1.2**.

CIDB Registrations can be obtained from the CIDB website at:

https://portal.cidb.org.za/RegisterOfContractors/

The following is an example of the printout obtained from the above website using the provided "Print" button.
Note: the printout may contain more than one page.



Tenderers are to include, at the back of their tender submission, a printout of their CIDB Registration and Status. The date of obtaining the CIDB Registration and Status printout is to be indicated on the printout and should be on or after the date of advertising of this tender.

Failure to comply will result in the tender offer being deemed non-responsive.

*I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, **and that the requested documentation has been included in the tender submission**.*

NAME (Block Capitals): _____ **Date**

SIGNATURE: ---------- ----------

T2.2.14 JOINT VENTURES AGREEMENTS

If this tender submission is to be made by an established Joint Venture, the Joint Venture Agreements and Power of Attorney Agreements are to be attached here.

Should the Joint Venture, at the time of submission, not yet be formalised, this form is to be completed in full and signed by all parties to the proposed Joint Venture.

The Lead Partner of the Joint Venture is to sign the **Form of Offer** in Section **C1.1.1**.

INTENT TO FORM A JOINT VENTURE

Should our submission for CONTRACT: **34827-5E** be successful, a Joint Venture will be established by the parties as listed below, as an unincorporated association, with the purposes of securing and executing the Contract, for the benefit of the Members.

Proposed Joint Venture			
Joint Venture Title (name):			
Represented by (name):		Tel:	
Lead Partner/ Member 1			
Entity Name:			
Ownership Interest in JV %:		CSD Registration:	MAAA
CIDB #:			
Represented by (name):		Signature:	
Partner/ Member 2			
Entity Name:			
Ownership Interest in JV %:		CSD Registration:	MAAA
CIDB #:			
Represented by (name):		Signature:	
Partner/ Member 3			
Entity Name:			
Ownership Interest in JV %:		CSD Registration:	MAAA
CIDB #:			
Represented by (name):		Signature:	

Note: All requirements for Joint Ventures, as stated elsewhere in this procurement document, must be complied with in full.

T2.2.15 RECORD OF ADDENDA TO TENDER DOCUMENTS

Reference is to be made to the **Tender Data: C.2.6**.

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		
6		
7		
8		
9		
10		

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

It is also confirmed that the requirements, as stated on the Addenda, have been complied with.

NAME (Block Capitals): _____ **Date**

SIGNATURE: ..... _____

T2.2.16 EXPERIENCE OF TENDERER

Refer to Additional Conditions of Tender: T1.2.3.4 for Functionality Points evaluation prompts (if applicable).

The following is a statement of works of similar nature (in relation to the scope of works) recently (within the past 10 years) executed by myself / ourselves.

Tenderers are to submit copies of signed completion certificates for all projects submitted.

EMPLOYER: CONTACT PERSON AND TELEPHONE NUMBER	CONSULTING ENGINEER: CONTACT PERSON AND TELEPHONE NUMBER	NATURE OF WORK	VALUE OF WORK (inclusive of VAT)	DATE COMPLETED

Attach additional pages if more space is required

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.17 PROPOSED ORGANISATION and STAFFING

Refer to Additional Conditions of Tender: T1.2.3.4 for Functionality Points evaluation prompts (if applicable).

The Tenderer should propose the structure and composition of their team i.e. the main disciplines involved, the key staff member / expert responsible for each discipline, and the proposed technical and support staff and site staff.

The roles and responsibilities of each key staff member / expert should be set out as job descriptions. In the case of an association / joint venture / consortium, it should, indicate how the duties and responsibilities are to be shared.

The Tenderer must attach their organization and staffing proposals to this page. (this is to include both the on-site and off-site staffing resources used for this project)

In addition to any lists, this information should also be shown in an organogram format (flow chart) clearly indicating the staff hierarchy and reporting lines, again for on- and off-site resources.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): _____ **Date**

SIGNATURE: _____ _____

T2.2.18 KEY PERSONNEL

Refer to Additional Conditions of Tender: T1.2.3.4 for Functionality Points evaluation prompts (if applicable).

The Tenderer shall list below the personnel which he intends to utilize on the Works, including key personnel (Project Manager, Engineering staff, and Site Supervisor) which may have to be brought in from outside if not available locally. Relevant certificates confirming qualifications shall be submitted with the tender.

Category of Employee	Qualification/Formal Training/ Registration (minimum)	Relevant Experience (minimum; post qualification)	Number of Persons	
			Key Personnel, Part of The Contractor's Organisation	Key Personnel to be Sourced Outside South Africa if not Available
Project Manager	Relevant built environment qualification or recognition of prior learning, recognised by relevant statutory body	Five years in similar projects as a Project Manager		
Professional Design Engineering	Four-year tertiary qualification recognized by ECSA. Registered with ECSA as a Professional Engineer.	Five years relevant experience		
Site Supervisor	Grade 10. Trade Tested Artisan or National Diploma	Five years relevant experience		
Installation Team (s)	Grade 10. Relevant training on construction	Three years relevant experience		
Commissioning Resources	Grade 10. Trade Tested Artisan or National Diploma	Five years relevant experience		
Others:.....				
.....				
.....				

Note: CVs of key personnel may be requested during the contract period.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.19 EXPERIENCE OF KEY PERSONNEL

Refer to Additional Conditions of Tender: T1.2.3.4 for Functionality Points evaluation prompts (if applicable).

The experience of assigned staff member in relation to the Scope of Work will be evaluated from three different points of view:

1) General experience (total duration of professional activity), level of education and training and positions held of each discipline specific team leader.
2) The education, training, skills and experience of the Assigned Staff in the specific sector, field, subject, etc which is directly linked to the scope of work.
3) The key staff members' / experts' knowledge of issues which the Tenderer considers pertinent to the project e.g. local conditions, affected communities, legislation, techniques etc.

A CV of the contract manager, site agent(s) and general foreman of not more than 2 pages should be attached to this schedule:

Each CV should be structured under the following headings:

a) Personal particulars
- name
- date and place of birth
- place (s) of tertiary education and dates associated therewith
- professional awards

b) Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations)

c) Skills

d) Name of current employer and position in enterprise

e) Overview of post-graduate / diploma experience (year, organization and position)

f) Outline of recent assignments / experience that has a bearing on the scope of work

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): _____ **Date**

SIGNATURE: ..... _____

T2.2.20 PRELIMINARY PROGRAMME/ REQUIRED DELIVERY DATES

Refer to Additional Conditions of Tender: T1.2.3.4 for Functionality Points evaluation prompts (if applicable).

This schedule shall be completed, signed and returned with the bid documents of which it forms part.

REQUIREMENTS

		Weeks	Bidders ability to meet required lead times (Yes/No)
1.1	Date of order	0	
1.2	Receipt of outstanding information and drawings for approval from time of order	≤ 6	
1.3	Delivery of equipment to site	≤ 30	
1.4	Where protection and control equipment is supplied by others: Completion of equipment installation and site testing Submission of all "as-tested" information	≤ 40	
1.5	Where protection and control equipment is supplied on this contract: Completion of equipment installation, cabling, testing and commissioning	≤ 40	
1.6	Submission of all "as-commissioned" information	≤ 40	

Failure to meet lead times specified above would result in the tender being deemed non-responsive.

BIDDER'S GUARANTEES

The following periods are to be given in weeks from date of each official order, whether or not it is possible to meet the required periods. Bids will be adjudicated according to this information.

		Weeks
2.1	Date of order	0
2.2	Receipt of outstanding information and drawings for approval	
2.3	Delivery of equipment to site	
2.4	Completion of equipment installation/cabling, etc.	
2.5	Completion of equipment testing and handover for energizing of all plant	
2.6	Submission of all "as-commissioned" information	

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): _____ **Date**

SIGNATURE: _____ _____

T2.2.21 CONSTRUCTION APPROACH, METHODOLOGY, AND QUALITY CONTROL

Refer to Additional Conditions of Tender: T1.2.3.4 for Functionality Points evaluation prompts (if applicable).

Construction Approach and Methodology

The construction approach and methodology must respond to the Scope of Work and outline the proposed approach to undertake the work showing a detailed programme including health and safety aspects, the use of plant and resources for this Project.

Quality Control

The quality control statement must discuss what tests and control measures are to be employed on site to attain the specified results and is to cover the program associated activities.

The Tenderer must attach their Construction Methodology and Quality Control information to this page.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): _____ **Date**

SIGNATURE: _____ _____

T2.2.22 SCHEDULE OF PROPOSED SUBCONTRACTORS

Refer to Additional Conditions of Tender: T1.2.3.4 for Functionality Points evaluation prompts (if applicable).

The following firms have been identified as possible subcontractors for work in this contract.

NAMES AND ADDRESSES OF PROPOSED SUBCONTRACTORS	NATURE AND EXTENT OF WORK TO BE SUBCONTRACTED	PREVIOUS EXPERIENCE WITH SUBCONTRACTOR

Attach additional pages if more space is required

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.23 PLANT and EQUIPMENT

Refer to Additional Conditions of Tender: T1.2.3.4 for Functionality Points evaluation prompts (if applicable).

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

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

DESCRIPTION (type, size, capacity etc)	QUANTITY	YEAR OF MANUFACTURE

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 accepted

DESCRIPTION (type, size, capacity etc)	QUANTITY	HOW ACQUIRED	
		HIRE/ BUY	SOURCE

Attach additional pages if more space is required

The Tenderer undertakes to bring onto site without additional cost to the Employer any additional plant not listed but which may be necessary to complete the contract within the specified contract period.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.24 CONTRACTOR'S HEALTH AND SAFETY PLAN

Refer to Additional Conditions of Tender: T1.2.3.4 for Functionality Points evaluation prompts (if applicable).

At tender stage only a brief overview (**to be attached to this page**) of the Tenderers perception on the safety requirements for this contract will be adequate.

Only the successful Tenderer shall submit separately the Contractor's Health and Safety Plan as required in terms of Regulation 7 of the Occupational Health and Safety Act 1993 Construction Regulations 2014.

The detailed safety plan will take into consideration the site specific risks as mentioned under C.3: Project Specification. A generic plan will not be acceptable.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): _____ **Date**

SIGNATURE: _____ _____

T2.2.25 CONTRACTOR'S HEALTH AND SAFETY DECLARATION

In terms of Clause 5(1)(h) of the OHSA 1993 Construction Regulations 2014 (referred to as "the Regulations" hereafter), a Principal Contractor may only be appointed to perform construction work if the Client is satisfied that the Principal 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 2014.

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 2014.

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:

Tenderers are To Circle Applicable

(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**

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 8, and competent persons as defined in Regulations 9, 10, 11, 12, 13, 14, 16, 17, 20, 21, 22, 23(1), 24, 25, 26, 27, 28 and 29, as applicable).

(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

(b) 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:
……..…..

……..…..

(c) 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 7(1) of the Construction Regulations, which plan shall be subject to approval by the Client.

6. I confirm that copies of my company's approved Health and Safety Plan, the Client's Safety Specifications as well as the OHSA 1993 Construction Regulations 2014 will be provided on site and will at all times be available for inspection by the Principal Contractor's personnel, the Client's personnel, the Employer's Agent, 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 Bill of Quantities to cover the cost of all resources, actions, training and all health and safety measures envisaged in the OHSA 1993 Construction Regulations 2014, and that I will be liable for any penalties that may be applied by the Client in terms of the said Regulations (Regulation 33) for failure on the Principal 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 Client will mean that I am unable to comply with the requirements of the OHSA 1993 Construction Regulations 2014, and accept that my tender will be prejudiced and may be rejected at the discretion of the Client.

NAME : ..... (Block Capitals)

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

T2.2.26 MANUFACTURING, TESTING AND INSPECTION REQUIREMENTS

This schedule must be completed, signed and returned with the tender documents of which it forms part.

Item	Description	Manufacturer	Place of Manufacture	Place of Testing	Place of Inspection
1	132 kV Circuit Breakers				
2	132 kV Disconnecting Circuit Breakers				
3	132 kV Capacitor Bank Circuit Breakers				
4	132 kV Isolators				
5	132 kV Earth Switches				
6	132 kV Voltage Transformers				
7	132 kV Current Transformers				
8	132 kV Post Type Insulators				
9	Gantries and Support Structures				
10	132 kV Compact Switchgear				
11	Galvanising of Steel-work				
12	132 kV Long Rod Insulators				
13	Stranded Flexible Conductor				
14	Tubular Conductor				
15	Connectors/Clamps				
16	132 kV Surge Arresters				
17	Marshalling Kiosks				
18	Earthing Electrodes				
19	275 kV Circuit Breakers				
20	275 kV Disconnecting Circuit Breakers				
21	275 kV Isolators				
22	275 kV Earth Switches				
23	275 kV Voltage Transformers				
24	275 kV Current Transformers				
25	275 kV Post Type Insulators				
26	275 kV Long Rod Insulators				
27	275 kV Surge Arresters				
28	Intelligent Key Cabinet Controller				
29	Intelligent Key Cabinet (Expansion)				
30	Row Expansion Module with key tracking and locking for above item				

NAME: ..... (Block Capitals)

SIGNATURE: ..... DATE: .....

T2.2.27 GUARANTEES AND PARTICULARS OF EQUIPMENT OFFERED

This schedule shall be completed, signed and returned with the tender documents of which it forms part.

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
1.0	**132 kV CIRCUIT BREAKER**		
1.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
1.2	(a) Specification to which circuit breaker complies:	IEC 62271-100	
	(b) Testing authority		
	(c) Test certificate number		
1.3	Classification of circuit breaker		
	(a) Re-strike performance during capacitive current breaking (line and cable charging)	C2	
	(b) Mechanical endurance	M2	
1.4	Arc energy assisted arc quenching as per technical specification	Yes	
1.5	Insulating and arc quenching medium	SF_6	
1.6	Operating mechanism:		
	(a) Close	motor charge spring	
	(b) Trip	motor charge spring	
1.7	Current rating	3 150 A	A
1.8	Symmetrical breaking capacity	40 kA	kA
1.9	Asymmetrical breaking capacity	40 kA	kA
1.10	Making capacity	100 kA(peak)	kA(peak)
1.11	Short-time current rating	40 kA for 3 s	kA for s
1.12	Make-time (from initiation of close mechanism to latching)		ms
1.13	Break time (from initiation of trip to arc extinction)		
	(a) Break time of circuit breaker without current	Max. 60 ms	ms
	(b) 10 % Symmetrical breaking capacity	Max. 60 ms	ms
	(c) 30 % Symmetrical breaking capacity	Max. 60 ms	ms
	(d) 60 % Symmetrical breaking capacity	Max. 60 ms	ms
	(e) 100 % Symmetrical breaking capacity	Max. 60 ms	ms
	(f) 100 % Asymmetrical breaking capacity	Max. 60 ms	ms
	(g) Short-time fault duty	Max. 60 ms	ms
1.14	Number of series breaks per phase	1	
1.15	Length of each break		mm
1.16	Method controlling voltage distribution		
1.17	Ratio of first phase to clear recovery voltage to normal voltage	1,5	
1.18	Peak value of restriking voltage	Re-strike free (kV)	kV

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
1.19	Rate of rise of striking voltage		
	(a) At 10 % symmetrical and asymmetrical breaking capacity		kV/µs
	(b) At 100 % symmetrical and asymmetrical breaking capacity		kV/µs
	(c) Short-circuit fault conditions at full symmetrical fault current		kV/µs
1.20	Peak value of overvoltage when interrupting low current below:		
	(a) 60 A capacitive	180 kV	kV
	(b) 100 A inductive	180 kV	kV
1.21	Maximum period between the opening of two different phases:	2 ms	ms
1.22	Auto re-close duty	O - 400 ms - OC	
1.23	Insulation material:		
	(a) External insulation	Silicone rubber	
	(b) Blast tubes		
	(c) Operating drives		
	(d) Contact inner enclosures		
1.24	EThekwini civil foundation drawing requirement for 132 kV circuit breaker as per drawing number TD 15 issued with bid document	Yes	
1.25	Insulation levels:		
	(a) Min. impulse withstand level across open contacts	650 kV	kV
	(b) Min. impulse withstand level to earth	650 kV	kV
	(c) One minute dry withstand voltage (50 Hz)	300 kV	kV
	(d) Total creepage distance (external insulation)	4 495 mm	mm
	(e) Arcing distance		mm
	(f) Min. air clearance (phase-to-phase)		mm
	(g) Min. air clearance (phase-to-earth)		mm
1.26	Mechanical strength of support insulator:		
	(a) Max. tensile working load		kN
	(b) Max. cantilever working load		kN
1.27	Number of trip coils per circuit breaker	2	
1.28	Control voltage (confirmed upon order)	110 or 220 V d.c.	V d.c.
1.29	Minimum battery voltage required for close	85 %	%
1.30	Minimum battery voltage required for trip	70 %	%
1.31	Battery energy required at nominal voltage to close circuit breaker	< 400 W	W
1.32	Battery energy required at nominal voltage to trip circuit breaker	< 400 W	W

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
1.33	Recommended number of open operations before inspection and maintenance of essential current carrying parts:		
	(a) Normal breaks at rated current	Min. 2 500	
	(b) Fault current breaks at maximum symmetrical breaking capacity	Min. 10	
1.34	Recommended limit of close/open operations before inspection and maintenance of essential operating mechanism parts	Min. 10 000	
1.35	Number of contacts available for status and alarms		
	(a) Spring discharge	1	
	(b) Low gas alarm	1	
	(c) Low gas lockout	1	
	(d) Motor MCB tripped	1	
	(e) Local control selected	1	
1.36	Number of available "a" auxiliary contacts N/O	Min. 9	
1.37	Number of available "b" auxiliary contacts N/C	Min. 9	
1.38	Mass of circuit breaker per pole		kg
1.39	Specification to which SF_6 complies with:	IEC 60376 and NRS 087	
	(a) Grade of technical grade SF_6 gas	≥ 99,7 %	%
	(b) Maximum permissible moisture content	1 %	%
	(c) Permissible impurity level of carbon tetraflouride	2 400 mg/kg	mg/kg
	(d) Maximum acceptable impurity level of water allowed	25 mg/kg	mg/kg
	(e) Maximum acceptable impurity level of mineral oil allowed	10 mg/kg	mg/kg
	(f) Total acidity expressed in HF	1 mg/kg	mg/kg
	(g) Double/single pressure system	single	
	(h) Normal operating pressure at 20 ºC		kPa
	(i) Minimum operating pressure at 20 ºC		kPa
	(j) Low pressure alarm		kPa
	(k) Lock-out pressure		kPa
	(l) Total volume of gas required at normal temperature and pressure (complete CB)		m^3
	(m) Type and material of all gas pipes	Marine grade flexible stainless steel or painted/coated copper gas pipes	
	(n) Guaranteed leakage rate of SF_6 per year	≤ 0,5 %	%
	(o) Type of material used for the gas seals		

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
1.40	SF_6 pressure gauge with gas pressure transmitter (temperature compensated)		
	(a) Pressure gauge (numerically marked in bar and kPA)	100 mm dial size	
	(b) Gas pressure transmitter	1 % accuracy with 6,5 - 20 mA output	
1.41	(a) Manufacturer and type of motor		
	(b) Output of motor		kW
	(c) Full load current of motor		A
	(d) Starting current of motor		A
	(e) Quantity of make-up gas required for one complete CB per year		m^3
	(f) Motor voltage (confirmed upon order)	110 or 220 V d.c.	V d.c.
	(g) Energy required to charge spring		J
1.42	(a) Specification to which HV terminal with rectangular shape complies as per drawing TD 15 Figure 2:	IEC 62271-301	
	(b) Testing authority		
	(c) Test certificate number		
1.43	The HV terminals shall be aluminium as per drawing number TD 15, Figure 2 with:	A 8 hole (2 × 4 pattern) flat pad with a 50 mm pitch (distance between holes) and a minimum thickness of 20 mm. Diameter of holes to be 14 mm (M12)	
1.44	Guarantee period of 132 kV circuit breaker	5 years	
1.45	Guarantee period against leaks and corrosion	10 years	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
2.0	**132 kV DISCONNECTING CIRCUIT BREAKER**		
2.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
2.2	(a) Specification to which disconnecting circuit breaker complies:	IEC 62271-108	
	(b) Testing authority		
	(c) Test certificate number		
2.3	Classification of circuit breaker		
	(a) Re-strike performance during capacitive current breaking (line and cable charging)	C2	
	(b) Mechanical endurance	M2	
2.4	Arc energy assisted arc quenching as per technical specification	Yes	
2.5	Insulating and arc quenching medium	SF_6	
2.6	Operating mechanism:		
	(a) Close	motor charge spring	
	(b) Trip	motor charge spring	
2.7	Current rating	3 150 A	A
2.8	Symmetrical breaking capacity	40 kA	kA
2.9	Asymmetrical breaking capacity	40 kA	kA
2.10	Making capacity	100 kA(peak)	kA(peak)
2.11	Short-time current rating	40 kA for 3 s	kA for s
2.12	Make-time (from initiation of close mechanism to latching)		ms
2.13	Break time (from initiation of trip to arc extinction)		
	(a) Break time of circuit breaker without current	Max. 60 ms	ms
	(b) 10 % Symmetrical breaking capacity	Max. 60 ms	ms
	(c) 30 % Symmetrical breaking capacity	Max. 60 ms	ms
	(d) 60 % Symmetrical breaking capacity	Max. 60 ms	ms
	(e) 100 % Symmetrical breaking capacity	Max. 60 ms	ms
	(f) 100 % Asymmetrical breaking capacity	Max. 60 ms	ms
	(g) Short-time fault duty	Max. 60 ms	ms
2.14	Number of series breaks per phase	1	
2.15	Length of each break		mm
2.16	Method controlling voltage distribution		
2.17	Ratio of first phase to clear recovery voltage to normal voltage	1,5	
2.18	Peak value of restriking voltage	Re-strike free (kV)	kV

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
2.19	Rate of rise of striking voltage		
	(a) At 10 % symmetrical and asymmetrical breaking capacity		kV/µs
	(b) At 100 % symmetrical and asymmetrical breaking capacity		kV/µs
	(c) Short-circuit fault conditions at full symmetrical fault current		kV/µs
2.20	Peak value of overvoltage when interrupting low current below:		
	(a) 60 A capacitive	180 kV	kV
	(b) 100 A inductive	180 kV	kV
2.21	Maximum period between the opening of two different phases:	2 ms	ms
2.22	Auto re-close duty	O - 400 ms - OC	
2.23	Insulation material:		
	(a) External insulation	Silicone rubber	
	(b) Blast tubes		
	(c) Operating drives		
	(d) Contact inner enclosures		
2.24	EThekwini civil foundation drawing requirement for 132 kV disconnecting circuit breaker as per drawing number TD 15, Figure 1 issued with bid document.	Yes	
2.25	Insulation levels:		
	(a) Minimum impulse withstand level across open contacts	650 kV	kV
	(b) Minimum impulse withstand level to earth	650 kV	kV
	(c) One minute dry withstand voltage (50 Hz)	300 kV	kV
	(d) Total creepage distance (external insulation)	4 495 mm	mm
	(e) Arcing distance		mm
	(f) Minimum air clearance (phase-to-phase)		mm
	(g) Minimum air clearance (phase-to-earth)		mm
2.26	Mechanical strength of support insulator:		
	(a) Maximum tensile working load		kN
	(b) Maximum cantilever working load		kN
2.27	Number of trip coils per circuit breaker	2	
2.28	Control voltage (confirmed upon order)	110 or 220 V d.c.	V d.c.
2.29	Minimum battery voltage required for close	85 %	%

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
2.30	Minimum battery voltage required for trip	70 %	%
2.31	Battery energy required at nominal voltage to close circuit breaker	< 400 W	W
2.32	Battery energy required at nominal voltage to trip circuit breaker	< 400 W	W
2.33	Recommended number of open operations before inspection and maintenance of essential current carrying parts:		
	(a) Normal breaks at rated current	Min. 2 500	
	(b) Fault current breaks at maximum symmetrical breaking capacity	Min. 10	
2.34	Recommended limit of close/open operations before inspection and maintenance of essential operating mechanism parts	Min. 10 000	
2.35	Number of contacts available for status and alarms		
	(a) Spring discharge	1	
	(b) Low gas alarm	1	
	(c) Low gas lockout	1	
	(d) Motor MCB tripped	1	
	(e) Local control selected	1	
2.36	Number of available "a" auxiliary contacts N/O	Min. 9	
2.37	Number of available "b" auxiliary contacts N/C	Min. 9	
2.38	Mass of circuit breaker per pole		kg
2.39	Specification to which SF_6 complies with:	IEC 60376 and NRS 087	
	(a) Grade of technical grade SF_6 gas	≥ 99,7 %	%
	(b) Maximum permissible moisture content	1 %	%
	(c) Permissible impurity level of carbon tetraflouride	2 400 mg/kg	mg/kg
	(d) Maximum acceptable impurity level of water allowed	25 mg/kg	mg/kg
	(e) Maximum acceptable impurity level of mineral oil allowed	10 mg/kg	mg/kg
	(f) Total acidity expressed in HF	1 mg/kg	mg/kg
	(g) Double/single pressure system	single	
	(h) Normal operating pressure at 20 ºC		kPa
	(i) Minimum operating pressure at 20 ºC		kPa
	(j) Low pressure alarm		kPa

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
2.39	(k) Lock-out pressure at 20 ºC		kPa
	(l) Total volume of gas required at normal temperature and pressure (complete CB)		m^3
	(m) Type and material of all gas pipes	Marine grade flexible stainless steel or painted/coated copper gas pipes	
	(n) Guaranteed leakage rate of SF_6 per year	≤ 0,5 %	%
	(o) Type of material used for the gas seals		
2.40	SF_6 pressure gauge with gas pressure transmitter (temperature compensated)		
	(a) Pressure gauge (numerically marked in bar and kPA)	100 mm dial size	
	(b) Gas pressure transmitter	1 % accuracy with 6,5 - 20 mA output	
2.41	(a) Manufacturer and type of motor		
	(b) Output of motor		kW
	(c) Full load current of motor		A
	(d) Starting current of motor		A
	(e) Energy required to charge spring		J
	(f) Quantity of make-up gas required for one complete CB per year		m^3
2.42	(a) Specification to which HV Terminal with rectangular shape complies as per drawing TD 15 Figure 2:	IEC 62271-301	
	(b) Testing authority with Test certificate number		
2.43	The HV terminals shall be aluminium as per drawing number TD 15, Figure 2 with:	A 8 hole (2 × 4 pattern) flat pad with a 50 mm pitch (distance between holes) and a minimum thickness of 20 mm. Diameter of holes to be 14 mm (M12)	
2.44	Locking mechanism: (a) Electrical interlocking between disconnecting circuit breaker and earth switch	Yes	
	(b) Mechanical interlock for prevention of breaker operation	Yes	
	(c) Facility for external padlocking in open and close positions	Yes	
2.45	Earthing switch: (a) Specification to which earth switch complies	IEC 62271-102	
	(b) Testing authority		
	(c) Test certificate number		
	(d) Short time current rating	40 kA for 3 s	kA for s

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
2.45	(e) Total number of "a" auxiliary contacts (open when earth switch open)	Min. 9	
	(f) Total number of "b" auxiliary contacts (closed when earth switch open)	Min. 9	
	(g) Total mass of isolator/earth switch combination on supporting structure		kg
	(h) Earthing switch built on to disconnecting circuit breaker	Yes	
2.46	Guarantee period of 132 kV disconnecting circuit breaker	5 years	
2.47	Guarantee period against leaks and corrosion	10 years	

3.0	**132 kV CAPACITOR BANK CIRCUIT BREAKER**		
3.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
3.2	(a) Specification to which circuit breaker complies:	IEC 62271-100	
	(b) Testing authority and Test certificate number		
3.3	Classification of circuit breaker		
	(a) Re-strike performance during capacitive current breaking (line and cable charging)	C2	
	(b) Mechanical endurance	M2	
3.4	Arc energy assisted arc quenching as per technical specification	Yes	
3.5	Insulating and arc quenching medium	SF_6	
3.6	Operating mechanism:	single pole	
	(a) Close	motor charge spring	
	(b) Trip	motor charge spring	
3.7	Current rating	3 150 A	A
3.8	Symmetrical breaking capacity	40 kA	kA
3.9	Asymmetrical breaking capacity	40 kA	kA
3.10	Making capacity	100 kA(peak)	kA(peak)
3.11	Short-time current rating	40 kA for 3 s	kA for s
3.12	Make-time (from initiation of close mechanism to latching)		ms
3.13	Break time (from initiation of trip to arc extinction)		
	(a) Break time of circuit breaker without current	Max. 60 ms	ms
	(b) 10 % Symmetrical breaking capacity	Max. 60 ms	ms
	(c) 30 % Symmetrical breaking capacity	Max. 60 ms	ms
	(d) 60 % Symmetrical breaking capacity	Max. 60 ms	ms
	(e) 100 % Symmetrical breaking capacity	Max. 60 ms	ms

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
3.13	(f) 100 % Asymmetrical breaking capacity	Max. 60 ms	ms
	(g) Short-time fault duty	Max. 60 ms	ms
3.14	Number of series breaks per phase	1	
3.15	Length of each break		mm
3.16	Method controlling voltage distribution		
3.17	Ratio of first phase to clear recovery voltage to normal voltage	1,5	
3.18	Peak value of restriking voltage	Re-strike free (kV)	kV
3.19	Rate of rise of striking voltage		
	(a) At 10 % symmetrical and asymmetrical breaking capacity		kV/µs
	(b) At 100 % symmetrical and asymmetrical breaking capacity		kV/µs
	(c) Short-circuit fault conditions at full symmetrical fault current		kV/µs
3.20	Peak value of overvoltage when interrupting low current below:		
	(a) 60 A capacitive	180 kV	kV
	(b) 100 A inductive	180 kV	kV
3.21	Maximum period between the opening of two different phases:	2 ms	ms
3.22	Auto re-close duty	O - 400 ms - OC	
3.23	Insulation material:		
	(a) External insulation	Silicone rubber	
	(b) Blast tubes		
	(c) Operating drives		
	(d) Contact inner enclosures		
3.24	EThekwini civil foundation drawing requirement for 132 kV circuit breaker as per drawing number TD 15 issued with bid document	Yes	
3.25	Insulation levels:		
	(a) Min. impulse withstand level across open contacts	650 kV	kV
	(b) Min. impulse withstand level to earth	650 kV	kV
	(c) One minute dry withstand voltage (50 Hz)	300 kV	kV
	(d) Total creepage distance (external insulation)	4 495 mm	mm
	(e) Arcing distance		mm
	(f) Min. air clearance (phase-to-phase)		mm
	(g) Min. air clearance (phase-to-earth)		mm
3.26	Mechanical strength of support insulator:		
	(a) Max. tensile working load		kN
	(b) Max. cantilever working load		kN

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
3.27	Number of trip coils per circuit breaker	2	
3.28	Control voltage (confirmed upon order)	110 or 220 V d.c.	V d.c.
3.29	Minimum battery voltage required for close	85 %	%
3.30	Minimum battery voltage required for trip	70 %	%
3.31	Battery energy required at nominal voltage to close circuit breaker	< 400 W	W
3.32	Battery energy required at nominal voltage to trip circuit breaker	< 400 W	W
3.33	Recommended number of open operations before inspection and maintenance of essential current carrying parts:		
	(a) Normal breaks at rated current	Min. 2 500	
	(b) Fault current breaks at maximum symmetrical breaking capacity	Min. 10	
3.34	Recommended limit of close/open operations before inspection and maintenance of essential operating mechanism parts	Min. 10 000	
3.35	Number of contacts available for status and alarms		
	(a) Spring discharge	1	
	(b) Low gas alarm	1	
	(c) Low gas lockout	1	
	(d) Motor MCB tripped	1	
	(e) Local control selected	1	
3.36	Number of available "a" auxiliary contacts N/O	Min. 9	
3.37	Number of available "b" auxiliary contacts N/C	Min. 9	
3.38	Mass of circuit breaker per pole		kg
3.39	Specification to which SF_6 complies to:	IEC 60376 and NRS 087	
	(a) Grade of technical grade SF_6 gas	≥ 99.7 %	%
	(b) Maximum permissible moisture content	1 %	%
	(c) Permissible impurity level of carbon tetraflouride	2 400 mg/kg	mg/kg
	(d) Maximum acceptable impurity level of water allowed	25 mg/kg	mg/kg
	(e) Maximum acceptable impurity level of mineral oil allowed	10 mg/kg	mg/kg
	(f) Total acidity expressed in HF	1 mg/kg	mg/kg
	(g) Double/single pressure system	single	
	(h) Normal operating pressure at 20 ºC		kPa
	(i) Minimum operating pressure at 20 ºC		kPa

	Description	Technical Details

Item		eThekwini Requirements	Tenderer's Offer
3.39	(j) Low pressure alarm		kPa
	(k) Lock-out pressure		kPa
	(l) Total volume of gas required at normal temperature and pressure (complete CB)		m^3
	(m) Type and material of all gas pipes	Marine grade flexible stainless steel or painted/coated copper gas pipes	
	(n) Guaranteed leakage rate of SF_6 per year	≤ 0,5 %	%
	(o) Type of material used for the gas seals		
3.40	SF_6 pressure gauge with gas pressure transmitter (temperature compensated)		
	(a) Pressure gauge (numerically marked in bar and kPA)	100 mm dial size	
	(b) Gas pressure transmitter	1 % accuracy with 6,5 - 20 mA output	
3.41	(a) Manufacturer and type of motor		
	(b) Output of motor		kW
	(c) Full load current of motor		A
	(d) Starting current of motor		A
	(e) Quantity of make-up gas required for one complete CB per year		m^3
	(f) Motor voltage (confirmed upon order)	110 or 220 V d.c.	V d.c.
	(g) Energy required to charge spring		J
3.42	(a) Specification to which HV Terminal with rectangular shape complies as per drawing TD 15 Figure 2:	IEC 62271-301	
	(b) Testing authority		
	(c) Test certificate number		
3.43	The HV terminals shall be aluminium as per drawing number TD 15, Figure 2 with:	A 8 hole (2 × 4 pattern) flat pad with a 50 mm pitch (distance between holes) and a minimum thickness of 20 mm. Diameter of holes to be 14 mm (M12)	
3.44	*Capacitor bank specifications (**For Information only**)*		
	(a) Reactance	*0,6 mH*	
	(b) Capacitance	*13,564 µF*	
	(c) Capacitive power	*72 MVAr*	
	(d) Expected number of operations per day	*1 × open and 1 × close*	
	(e) Grounding of capacitor bank	*Earthed via surge capacitors (refer to drawing C3.4.2)*	
	(f) Capacitor bank used as harmonic filter	*No*	
	(g) Series reactors used	*Yes*	
	(h) Value of series reactor	*0,6 mH*	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
3.45	Guarantee period of 132 kV circuit breaker	5 years	
3.46	Guarantee period against leaks and corrosion	10 years	
4.0	**132 kV ISOLATING SWITCH**		
4.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
4.2	(a) Specification to which isolator complies:	IEC 62271-102	
	(b) Testing authority		
	(c) Test certificate number		
4.3	Normal current rating	1 600 A or 3 150 A	A
4.4	Rated peak current	100 kA	kA
4.5	Short time current rating	40 kA for 3 s	kA for s
4.6	Contact material	Cu	
4.7	Surface treatment of contacts	Ag	
4.8	Isolation air gap (fully open)	1 450 mm	mm
4.9	Total number of available "a" auxiliary contacts N/O	Min. 9	
4.10	Total number of available "b" auxiliary contacts N/C	Min. 9	
4.11	Total number of available "early make – late break", "a" auxiliary contacts N/O	6	
4.12	Post type insulator details:		
	(a) Manufacturer's reference number		
	(b) Insulation material, external	Silicone rubber	
	(c) Core material		
	(d) Total creepage distance	4 495 mm	mm
	(e) Shrouded creepage	1 450 mm	mm
	(f) One minute dry withstand voltage (50 Hz)	300 kV	kV
	(g) Wet withstand voltage (50 Hz)	275 kV	kV
	(h) Impulse withstand voltage (1,2/50 µsec)	650 kV	kV
	(i) Maximum tensile working load	50 kN	kN
	(j) Maximum torsional working load	6 000 Nm	Nm

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
4.13	(k) Maximum cantilever	2 kN	kN
	(l) Minimum tensile failing load	100 kN	kN
	(m) Minimum torsional failing load	6 000 Nm	Nm
	(n) Minimum cantilever failing load	4 kN	kN
4.14	Total mass of insulators on supporting structures		kg
4.15	Motor drive voltage (confirmed at order)	110 or 220 V d.c.	V d.c
4.16	Guarantee period of 132 kV isolator	5 years	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
5.0	**132 kV EARTHING SWITCH**		
5.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
5.2	(a) Specification to which earth switch complies:	IEC 62271-102	
	(b) Testing authority	Yes	
	(c) Test certificate number	Yes	
5.3	Short time current rating	40 kA for 3 s	kA for s
5.4	Inherently interlocked with the associated isolator	Yes	
5.5	Total number of "a" auxiliary contacts (open when earth switch open)	Min. 9	
5.6	Total number of "b" auxiliary contacts (closed when earth switch open)	Min. 9	
5.7	Total mass of isolator/earth switch combination on supporting structure		kg
5.8	Guarantee period of 132 kV earth switch	5 years	
6.0	**132 kV VOLTAGE TRANSFORMER**		
6.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
6.2	(a) Specification to which voltage transformer complies:	IEC 60044-2 and IEC 60044-7	
	(b) Testing authority		
	(c) Test certificate number		
6.3	Insulation medium	Oil	
6.4	External insulation	Silicone rubber	
6.5	Rated burden per phase:		
	(a) Winding 1 (metering)	200 VA	VA
	(b) Winding 2 (protection)	200 VA	VA
6.6	Class to IEC 60044-2, IEC 60044-7		
	(a) Winding 1 (metering)	0,2	
	(b) Winding 2 (protection)	3P	
6.7	Secondary voltage	110 V a.c.	V a.c.
6.8	Type of voltage transformers offered	electromagnetic	
6.9	Quantity of oil (per single phase unit)		ℓ
6.10	Standard to which oil complies	SANS 555	
6.11	Number of stress grading foils		
6.12	Method used for internal discharge test		
6.13	Voltage level of internal discharge test	100 kV	kV
6.14	Total external creepage distance	4 495 mm	mm

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
6.15	Total shrouded creepage distance	1 450 mm	mm
6.16	Dry withstand voltage (50 Hz)	275 kV	kV
6.17	Wet withstand voltage (50 Hz)	275 kV	kV
6.18	Rated lightning impulse withstand voltage (1,2/50 µs)	650 kV	kV
6.19	Voltage at which partial discharge level is ≤ 5 pC	83 kV	kV
6.20	Total mass of voltage transformer on supporting structure (per phase)		kg
6.21	Design of voltage transformer	Explosion proof	
6.22	Guarantee period of 132 kV voltage transformer	5 years	
6.23	Guarantee period against leaks and corrosion	10 years	
7.0	**132 kV CURRENT TRANSFORMER**		
7.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
7.2	(a) Specification to which current transformer complies:	IEC 60044-8 and IEC 61869	
	(b) Testing authority/ Test certificate number		
7.3	(a) Insulation medium	Oil or SF_6	
	(b) Oil insulation type	Minimum oil	
7.4	External insulation	Silicone rubber	
7.5	Design	Hairpin	
7.6	Quantity of oil (per single phase unit)		ℓ
7.7	(a) Standard to which oil complies	SANS 555	
	(b) Standard to which SF_6 complies	IEC 60376	
7.8	Sealing/expansion method		
7.9	Number of stress grading foils		
7.10	Method used for internal discharge test		
7.11	Voltage level of internal discharge test	100 kV	kV
7.12	Total external creepage distance	4 495 mm	mm
7.13	Total shrouded creepage distance	1 450 mm	mm
7.14	Dry withstand voltage (50 Hz)	275 kV	kV
7.15	Wet withstand voltage (50 Hz)	275 kV	kV
7.16	Rated lightning impulse withstand voltage (1,2/50 µs)	650 kV	kV
7.17	Voltage at which partial discharge level is ≤ 5 pC	83 kV	kV
7.18	Short time current rating	40 kA for 3 s	kA for s
7.19	Current transformer core limiting dimensions:		
	(a) Maximum external diameter		mm

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
7.19	(b) Minimum ring diameter		mm
	(c) Total axial length available		
	(d) Total spare axial length available		
7.20	Total mass of current transformer on supporting structure (per phase)		kg
7.21	Guarantee period of 132 kV current transformer	5 years	
7.22	Guarantee period against leaks and corrosion	10 years	
8.0	**132 kV POST INSULATOR**		
8.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
8.2	(a) Specification to which post insulator complies:	IEC 61462, IEC 62155 and IEC 60273	
	(b) Testing authority		
	(c) Test certificate number		
8.3	Material of external insulation	Silicone rubber	
8.4	Total creepage distance	4 495 mm	mm
8.5	Minimum shrouded creepage distance	1 752 mm	mm
8.6	Minimum ratio of shed spacing to shed projection	0,8	
8.7	One minute dry withstand voltage (50 Hz)	300 kV	kV
8.8	Wet withstand voltage (50 Hz)	275 kV	kV
8.9	Rated lightning impulse withstand voltage (1,2/50 µs)	650 kV	kV
8.10	Maximum tensile working load	50 kN	kN
8.11	Maximum working torsion load	3 000 Nm	Nm
8.12	Maximum cantilever working load	2 kN	kN
8.13	Minimum tensile failing load	100 kN	kN
8.14	Minimum torsion failing load	6 000 Nm	Nm
8.15	Minimum cantilever failing load	4 kN	kN
8.16	Total mass of insulator on support structure		kg
8.17	Guarantee period of 132 kV post insulator	5 years	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
9.0	**132 kV COMPACT SWITCHGEAR**		
9.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
9.2	(a) Specification to which compact switchgear complies:	IEC 62271-205	
	(b) Testing authority and Test certificate number		
9.3	Mass of single busbar system		kg
9.4	Mass of support frame		kg
9.5	Mass of control cubicle		kg
9.6	Mass of SF_6 gas for complete filling		kg
9.7	Rated voltage	145 kV	kV
9.8	Rated current	3 150 A	A
9.9	Rated short time withstand current	40 kA	kA
9.10	Rated short circuit duration	40 kA for 3 s	kA for s
9.11	Rated peak withstand current	100 kA	kA
9.12	Rated power frequency withstand voltage (common value)	275 kV	kV
9.13	Rated power frequency withstand voltage (across the isolating distance)	315 kV	kV
9.14	Rated lightning impulse withstand voltage (1,2/50 µs)	650 kV	kV
9.15	Voltage at which partial discharge level is ≤ 5pC	83 kV	kV
9.16	Radio interference voltage level < 2 500 µV	83 kV	kV
9.17	Insulation of bushing	Silicone rubber	
9.18	Creepage distance of bushing	4 495 mm	mm
9.19	Connection diameter		mm
9.20	Cantilever operating load:		
	(a) Longitudinal		N
	(b) Transversal		N
	(c) Vertical		N
	(d) Maximum longitudinal load		N
	(e) Maximum transversal load		N
	(f) Maximum vertical load		N
9.21	Temperature rise of active parts at rated continuous current	< 130°C	°C
9.22	Temperature rise of terminals at rated continuous current	≤ 90°C	°C
9.23	Temperature rise of enclosure at rated continuous current	≤ 40°C	°C
9.24	Guaranteed leakage rate of SF_6 per year	≤ 0,5 %	%

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
9.25	Circuit breaker:		
	(a) Filling pressure at 20 ºC		kPa
	(b) Minimum service pressure at 20 ºC		kPa
	(c) Rated insulated pressure at 20 ºC		kPa
	(d) Alarm level 1 at 20 ºC (only alarm)		kPa
	(e) Alarm level 2 at 20 ºC(breaker lock or trip)		kPa
	(f) Type		
	(g) Operating mechanism (3 pole operated)	motor charge spring	
	(h) Maximum number of mechanical operations of drive mechanism		
	(i) Rated operating sequence	O – 0,3 s – CO – 1 min CO	
	(j) Stored switching sequence according to IEC 62271-205	O – CO	
	(k) Maximum number of operations at rated current	Min 5 000	
9.26	Enclosure:		
	(a) Design pressure		kPa
	(b) Routine pressure		kPa
	(c) Bursting pressure		kPa
	(d) Bursting disc release pressure		kPa
9.27	Circuit breaker motor:		
	(a) Rated voltage (confirmed upon order)	110 or 220 V d.c.	V d.c.
	(b) Rated power		W
	(c) Operating current		A
	(d) Starting current		A
	(e) Number of available "a" auxiliary contacts N/O	Min. 9	
	(f) Number of available "b" auxiliary contacts N/C	Min. 9	
9.28	Combined disconnector and earth switch:		
	(a) Type		
	(b) Operating mechanism	motor charge spring	
	(c) Rated voltage	145 kV	kV
9.29	(a) Rated power frequency withstand voltage		
	(1) Common value	275 kV	kV
	(2) Across the isolating distance	315 kV	kV
	(b) Rated lightning impulse withstand voltage (1,2/50 µs)		
	(1) With circuit breaker and isolator closed	650 kV	kV
	(2) Across isolating distance with circuit breaker and isolator open	750 kV	kV

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
9.29	(c) Rated current	3 150 A	A
	(d) Rated short circuit duration	40 kA for 3 s	kA for s
	(e) Rated peak current	100 kA	kA
	(f) Motor operating time (disconnector)		s
	(g) Rated auxiliary voltage	110 or 220 V d.c.	V d.c.
9.30	Disconnector motor		
	(a) Rated voltage	220 V a.c.	V a.c.
	(b) Rated power		W
	(c) Operating current		A
	(d) Starting current		A
	(e) Auxiliary contacts	Min. 5	
9.31	Specification to which SF_6 complies with:	IEC 60376 and NRS 087	
	(a) Grade of technical grade SF_6 gas	≥ 99,7 %	%
	(b) Maximum permissible moisture content	1 %	%
	(c) Permissible impurity level of carbon tetraflouride	2 400 mg/kg	mg/kg
	(d) Maximum acceptable impurity level of water allowed	25 mg/kg	mg/kg
	(e) Maximum acceptable impurity level of mineral oil allowed	10 mg/kg	mg/kg
	(f) Total acidity expressed in HF	1 mg/kg	mg/kg
	(g) Double/single pressure system	single	
	(h) Normal operating pressure		kPa
	(i) Minimum operating pressure		kPa
	(j) Low pressure alarm		kPa
	(k) Lock-out pressure		kPa
	(l) Total volume of gas required at normal temperature and pressure (complete CB)		m^3
	(m) Type and material of all gas pipes	Marine grade flexible stainless steel or painted/coated copper gas pipes	
	(n) Guaranteed leakage rate of SF_6 per year	≤ 0,5 %	%
	(o) Type of material used for the gas seals		
9.32	SF_6 pressure gauge with gas pressure transmitter (temperature compensated)		
	(a) Pressure gauge (numerically marked in bar and kPA)	100 mm dial size	
	(b) Gas pressure transmitter	1 % accuracy with 6,5 – 20 mA output	
9.33	Guarantee period of 132 kV compact switchgear	5 years	
9.34	Guarantee period against leaks and corrosion	10 years	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
10.0	**132 kV LONG ROD INSULATOR**		
10.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
10.2	(a) Specification to which 132 kV long rod insulator complies:	IEC 61109 and IEC 60815	
	(b) Testing authority		
	(c) Test certificate number		
10.3	(a) connecting length	1 752 mm	mm
	(b) mass of insulator		kg
	(c) external insulation material	Silicone rubber	
	(d) % Aluminium tri-hydrate	≥ 50 %	%
	(e) attachment type	16 mm ball and socket	
	(f) material of fittings	Hot-dip galvanised steel	
	(g) type of securing clip	Stainless steel W-clip	
10.4	Mechanical Strength:		
	(a) maximum working load of insulator set		kN
	(b) routine test load		kN
	(c) minimum failing load	120 kN	kN
10.5	Electrical Strength:		
	(a) minimum total creepage distance	4 495 mm	mm
	(b) minimum dry arc distance	1 100 mm	mm
	(c) minimum dry flashover voltage	300 kV	kV
	(d) minimum wet flashover voltage	275 kV	kV
	(e) lightning impulse withstand voltage (1,2/50 µs)	650 kV	kV
10.6	Sealing of Core		
	(a) Is the core fully encapsulated and fully sealed from the environment	Yes	
	(b) Additional seal required at insulator material-end fitting junction	Yes	
10.7	Suitably designed corona rings included on the live end of the insulator, 50 kA for 70 ms.	Yes	
10.8	(a) Limit of E-field on grading ring and end fitting	1,8 kV/mm	kV/mm
	(b) Limit of average E-field along housing surface	0,42 kV/mm	kV/mm
	(c) Limit of E-field at triple point	0,35 kV/mm	kV/mm
10.9	Guarantee period of 132 kV long rod insulator	5 years	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
11.0	**132 kV SURGE ARRESTER**		
11.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
11.2	(a) Specification to which surge arrester complies:	IEC 60099-4	
	(b) Testing authority		
	(c)Test certificate number		
11.3	Arrester nominal discharge current rating (8/20 µs impulse)	10 kA	kA
11.4	Arrester voltage rating	120 kV	kV
11.5	Maximum continuous operating voltage	92 kV	kV
11.6	Temporary over voltage capability	120 kV	kV
11.7	Rated frequency	50 Hz	Hz
11.8	Maximum peak discharge residual voltage:		
	(a) steep	< 372 kV	kV
	(b) lightning	< 336 kV	kV
	(c) switching	< 276 kV	kV
11.9	Max peak current @ 4/10 µs impulse	100 kA	kA
11.11.	Max peak current for long time impulse		kA
11.11	Energy dissipation ability @ U_{rated} for switching impulse	> 4,5 kJ/kV	kJ/kV
11.12	External insulation dry withstand voltage (50 Hz)	300 kV	kV
11.13	External insulation minimum impulse withstand level (1,2/50 µs)	650 kV	kV
11.14	Total external insulation creepage resistance	4 495 mm	mm
11.15	Total shrouded insulation creepage distance	1 450 mm	mm
11.16	Mass of single surge arrester		kg
11.17	Contact noise and partial discharge test method carried out by manufacturer		
11.18	Leakage current test method carried out by manufacturer		
11.19	Line discharge class	3	
11.20	External Insulation material	Silicone rubber	
11.21	Type of mounting	Insulated	
11.22	Sealing of core		
	(a) Is the core fully encapsulated and fully sealed from the environment	Yes	
	(b) Additional seal required at insulator material-end fitting junction	Yes	
11.23	Guarantee period of 132 kV surge arrester	5 years	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
12.0	**275 kV CIRCUIT BREAKER**		
12.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
12.2	(a) Specification to which circuit breaker complies:	IEC 62271-100	
	(b) Testing authority		
	(c) Test certificate number		
12.3	Classification of circuit breaker:		
	(a) Re-strike performance during capacitive current breaking (line and cable charging)	C2	
	(b) Mechanical endurance	M2	
12.4	Arc energy assisted arc quenching as per technical specification	Yes	
12.5	Insulating and arc quenching medium	SF_6	
12.6	Operating mechanism:		
	(a) Close	motor charge spring	
	(b) Trip	motor charge spring	
12.7	Current rating	3 150 A	A
12.8	Symmetrical breaking capacity	40 kA	kA
12.9	Asymmetrical breaking capacity	40 kA	kA
12.10	Control voltage (confirmed upon order)	110 or 220 V d.c.	V d.c.
12.11	Making capacity	100 kA (peak)	kA (peak)
12.12	Rated short circuit duration	40 kA for 3 s	kA for s
12.13	Make-time (from initiation of close mechanism to latching)		ms
12.14	Break-time (from initiation of trip to arc extinction):		
	(a) Break time of circuit breaker without current	Max. 60 ms	ms
	(b) 10 % Symmetrical breaking capacity	Max. 60 ms	ms
	(c) 30 % Symmetrical breaking capacity	Max. 60 ms	ms
	(d) 60 % Symmetrical breaking capacity	Max. 60 ms	ms
	(e) 100 % Symmetrical breaking capacity	Max. 60 ms	ms
	(f) 100 % Asymmetrical breaking capacity	Max. 60 ms	ms
	(g) Short-time fault duty	Max. 60 ms	ms
12.15	Number of series breaks per phase	1	
12.16	Length of each break		mm
12.17	Method of controlling voltage distribution		
12.18	Ratio of first phase to clear recovery to normal voltage	1,5	
12.19	Peak value of restriking voltage	Restrike free (kV)	kV

Item	Description	Technical Details

		eThekwini Requirements	Tenderer's Offer
12.20	Rate of rise of striking voltage:		
	(a) At 10 % symmetrical and asymmetrical breaking capacity		kV/µs
	(b) At 100 % symmetrical and asymmetrical breaking capacity		kV/µs
	(c) Short-time fault conditions at full symmetrical fault current		kV/µs
12.21	Peak value of over voltages when interrupting low current below:		
	(a) 60 A capacitive	180 kV	kV
	(b) 100 A inductive	180 kV	kV
12.22	Maximum period between the opening of two different phases	2 ms	ms
12.23	Auto re-close duty	O – 400 ms – CO	
12.24	Insulation material:		
	(a) External insulation (housing)	Silicone rubber	
	(b) Blast tubes		
	(c) Operating drives		
	(d) Contact inner enclosures		
12.25	Insulation levels:		
	(a) Min. impulse withstand level across open contacts	1 050 kV	kV
	(b) Min. impulse withstand level to earth	1 050 kV	kV
	(c) Total creepage distance (external insulation)	9 300 mm	mm
	(d) Arcing distance		mm
	(e) Minimum air clearance (phase-to-phase)		mm
	(f) Minimum air clearance (phase-to-earth)		mm
12.26	Mechanical strength of support insulator:		
	(a) Maximum tensile working load		kN
	(b) Maximum cantilever working load		kN
12.27	Number of trip coils per circuit breaker	2	
12.28	Min. battery voltage required for close	85 %	%
12.29	Min. battery voltage required for trip	70 %	%
12.30	Battery energy required at nominal voltage to close circuit breaker	< 400 W	W
12.31	Battery energy required at nominal voltage to trip circuit breaker	< 400 W	W
12.32	Recommended number of open operations before inspection and maintenance of essential current carrying parts:		
	(a) Normal breaks at rated current	Min. 2 500	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
12.32	(b) Fault current breaks at maximum symmetrical breaking capacity	Min. 10	
12.33	Recommended limit of close/open operations before inspection and maintenance of essential operating mechanism parts	Min. 10 000	
12.34	Number of available "a" auxiliary contacts N/O	Min. 9	
12.35	Number of available "b" auxiliary contacts N/C	Min. 9	
12.36	Number of contacts available for status and alarms:		
	(a) Spring discharge	1	
	(b) Low gas alarm	1	
	(c) Low gas lockout	1	
	(d) Motor MCB tripped	1	
	(e) Local control selected	1	
12.37	Mass of circuit breaker per pole		kg
12.38	Specification to which SF_6 gas complies:	IEC 60376 and NRS 087	
	(a) Grade of technical grade SF_6 gas	≥ 99,7 %	%
	(b) Maximum permissible moisture content	1 %	%
	(c) Permissible impurity level of carbon tetraflouride	2 400 mg/kg	mg/kg
	(d) Maximum acceptable impurity level of water allowed	25 mg/kg	mg/kg
	(e) Maximum acceptable impurity level of mineral oil allowed	10 mg/kg	mg/kg
	(f) Total acidity expressed in HF	1 mg/kg	mg/kg
	(g) Double/single pressure system	single	
	(h) Normal operating pressure at 20 ºC		kPa
	(i) Min. operating pressure at 20 ºC		kPa
	(j) Low pressure alarm		kPa
	(k) Lock-out pressure		kPa
	(l) Total volume of gas required at normal temperature and pressure (complete CB)		m^3
	(m) Type and material of all gas pipes	Marine grade flexible stainless steel or painted/coated copper gas pipes	
	(n) Guaranteed leakage rate of SF_6 per year	≤ 0,5 %	%
	(o) Type of material used for the seals		
12.39	SF_6 Pressure gauge with gas pressure transmitter (temperature compensated)		
	(a) Pressure gauge (Marked in bar and kPA)	100 mm dial size	
	(b) Gas pressure transmitter	1 % accuracy with 6,5 – 20 mA output	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
12.40	Circuit breaker motor:		
	(a) Manufacturer and type of motor		
	(b) Output of motor		kW
	(c) Full load current		A
	(d) Starting current		A
	(e) Energy required to charge spring		J
	(f) Quantity of make-up gas required for one complete CB per year		m^3
	(g) Motor voltage (confirmed upon order)	110 or 220 V d.c.	V d.c.
12.41	(a) Specification to which HV terminal with rectangular shape complies as per drawing TD 15 Figure 2:	IEC 62271-301	
	(b) Testing authority		
	(c) Test certificate number		
12.42	The HV terminals shall be aluminium as per drawing number TD 15, Figure 2 with:	A 8 hole (2 × 4 pattern) flat pad with a 50 mm pitch (distance between holes) and a minimum thickness of 20 mm. Diameter of holes to be 14 mm (M12)	
12.43	Guarantee period of 275 kV circuit breaker	5 years	
12.44	Guarantee period against leaks and corrosion	10 years	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
13.0	**275 kV DISCONNECTING CIRCUIT BREAKER**		
13.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
13.2	(a) Specification to which disconnecting circuit breaker complies:	IEC 62271-108	
	(b) Testing authority		
	(c) Test certificate number		
13.3	Classification of circuit breaker		
	(a) Re-strike performance during capacitive current breaking (line and cable charging)	C2	
	(b) Mechanical endurance	M2	
13.4	Arc energy assisted arc quenching as per technical specification	Yes	
13.5	Insulating and arc quenching medium	SF_6	
13.6	Operating mechanism:		
	(a) Close	motor charge spring	
	(b) Trip	motor charge spring	
13.7	Current rating	3 150 A	A
13.8	Symmetrical breaking capacity	40 kA	kA
13.9	Asymmetrical breaking capacity	40 kA	kA
13.10	Making capacity	100 kA(peak)	kA(peak)
13.11	Short-time current rating	40 kA for 3 s	kA for s
13.12	Make-time (from initiation of close mechanism to latching)		ms
13.13	Break time (from initiation of trip to arc extinction)		
	(a) Break time of circuit breaker without current	Max. 60 ms	ms
	(b) 10 % Symmetrical breaking capacity	Max. 60 ms	ms
	(c) 30 % Symmetrical breaking capacity	Max. 60 ms	ms
	(d) 60 % Symmetrical breaking capacity	Max. 60 ms	ms
	(e) 100 % Symmetrical breaking capacity	Max. 60 ms	ms
	(f) 100 % Asymmetrical breaking capacity	Max. 60 ms	ms
	(g) Short-time fault duty	Max. 60 ms	ms
13.14	Number of series breaks per phase	1	
13.15	Length of each break		mm
13.16	Method controlling voltage distribution		
13.17	Ratio of first phase to clear recovery voltage to normal voltage	1,5	
13.18	Peak value of restriking voltage	Re-strike free (kV)	kV

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
13.19	Rate of rise of striking voltage		
	(a) At 10 % symmetrical and asymmetrical breaking capacity		kV/µs
	(b) At 100 % symmetrical and asymmetrical breaking capacity		kV/µs
	(c) Short-circuit fault conditions at full symmetrical fault current		kV/µs
13.20	Peak value of overvoltage when interrupting low current below:		
	(a) 60 A capacitive	180 kV	kV
	(b) 100 A inductive	180 kV	kV
13.21	Maximum period between the opening of two different phases:	2 ms	ms
13.22	Auto Re-close duty	O - 400 ms - OC	
13.23	Insulation material:		
	(a) External insulation	Silicone rubber	
	(b) Blast tubes		
	(c) Operating drives		
	(d) Contact inner enclosures		
13.24	EThekwini civil foundation drawing requirement for 275 kV disconnecting circuit breaker as per drawing number TD 15, Figure 1 issued with bid document.	Yes	
13.25	Insulation levels:		
	(a) Minimum impulse withstand level across open contacts	1 050 kV	kV
	(b) Minimum impulse withstand level to earth	1 050 kV	kV
	(c) One minute dry withstand voltage (50 Hz)	460 kV	kV
	(d) Total creepage distance (external insulation)	9 300 mm	mm
	(e) Arcing distance		mm
	(f) Minimum air clearance (phase-to-phase)		mm
	(g) Minimum air clearance (phase-to-earth)		mm
13.26	Mechanical strength of support insulator:		
	(a) Maximum tensile working load		kN
	(b) Maximum cantilever working load		kN
13.27	Number of trip coils per circuit breaker	2	
13.28	Control voltage (confirmed upon order)	110 or 220 V d.c.	V d.c.
13.29	Minimum battery voltage required for close	85 %	%

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
13.30	Minimum battery voltage required for trip	70 %	%
13.31	Battery energy required at nominal voltage to close circuit breaker	< 400 W	W
13.32	Battery energy required at nominal voltage to trip circuit breaker	< 400 W	W
13.33	Recommended number of open operations before inspection and maintenance of essential current carrying parts:		
	(a) Normal breaks at rated current	Min. 5 000	
	(b) Fault current breaks at maximum symmetrical breaking capacity	Min. 20	
13.34	Recommended limit of close/open operations before inspection and maintenance of essential operating mechanism parts	Min. 10 000	
13.35	Number of contacts available for status and alarms		
	(a) Spring discharge	1	
	(b) Low gas alarm	1	
	(c) Low gas lockout	1	
	(d) Motor MCB tripped	1	
	(e) Local control selected	1	
13.36	Number of available "a" auxiliary contacts N/O	Min. 9	
13.37	Number of available "b" auxiliary contacts N/C	Min. 9	
13.38	Mass of circuit breaker per pole		kg
13.39	Specification to which SF_6 complies:	IEC 60376 and NRS 087	
	(a) Grade of technical grade SF_6 gas	≥ 99,7 %	%
	(b) Maximum permissible moisture content	1 %	%
	(c) Permissible impurity level of carbon tetraflouride	2 400 mg/kg	mg/kg
	(d) Maximum acceptable impurity level of water allowed	25 mg/kg	mg/kg
	(e) Maximum acceptable impurity level of mineral oil allowed	10 mg/kg	mg/kg
	(f) Total acidity expressed in HF	1 mg/kg	mg/kg
	(g) Double/single pressure system	single	
	(h) Normal operating pressure at 20 °C		kPa
	(i) Minimum operating pressure at 20 °C		kPa
	(j) Low pressure alarm		kPa

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
13.39	(k) Lock-out pressure		kPa
	(l) Total volume of gas required at normal temperature and pressure (complete CB)		m^3
	(m) Type and material of all gas pipes	Marine grade flexible stainless steel or copper gas pipes	
	(n) Guaranteed leakage rate of SF_6 per year	≤ 0,5 %	%
	(o) Type of material used for the seals		
13.40	SF_6 pressure gauge with gas pressure transmitter (temperature compensated)		
	(a) Pressure gauge (numerically marked in bar and kPA)	100 mm dial size	
	(b) Gas pressure transmitter	1 % accuracy with 6,5 - 20 mA output	
13.41	(a) Manufacturer and type of motor		
	(b) Output of motor		kW
	(c) Full load current of motor		A
	(d) Starting current of motor		A
	(e) Energy required to charge spring		J
	(f) Quantity of make-up gas required for one complete CB per year		m^3
13.42	(a) Specification to which HV terminal with rectangular shape complies as per drawing TD 15 Figure 2:	IEC 62271-301	
	(b) Testing authority		
	(c) Test certificate number		
13.43	The HV terminals shall be aluminium as per drawing number TD 15, Figure 2 with:	A 8 hole (2 × 4 pattern) flat pad with a 50 mm pitch (distance between holes) and a minimum thickness of 20 mm. Diameter of holes to be 14 mm (M12)	
13.44	Locking mechanism: (a) Electrical interlocking between disconnecting circuit breaker and earth switch	Yes	
	(b) Mechanical interlock for prevention of breaker operation	Yes	
	(c) Facility for external padlocking in open and close positions	Yes	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
13.45	Earthing switch: (a) Specification to which earth switch complies	IEC 62271-102	
	(b) Testing authority		
	(c) Test certificate number		
	(d) Short time current rating	40 kA for 3 s	kA for s
	(e) Total number of "a" auxiliary contacts (open when earth switch open)	Min. 9	
	(f) Total number of "b" auxiliary contacts (closed when earth switch open)	Min. 9	
	(g) Total mass of isolator/earth switch combination on supporting structure		kg
	(h) Earthing switch built on to disconnecting circuit breaker	Yes	
13.46	Guarantee period of 275 kV disconnecting circuit breaker	5 years	
13.47	Guarantee period against leaks and corrosion	10 years	

14.0	275 kV ISOLATING SWITCH		
14.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
14.2	(a) Specification to which isolator complies:	IEC 62271-102	
	(b) Testing authority		
	(c) Test certificate number		
14.3	Normal current rating	1 600 A or 3 150 A	A
14.4	Short time current rating	40 kA for 3 s	kA for s
14.5	Rated peak current	100 kA	kA
14.6	Number of breaks per phase	2	
14.7	Contact material	Cu	
14.8	Surface treatment of contacts	Ag	
14.9	Isolation air gap (fully open)	2 350 mm	mm
14.10	Total number of available "a" auxiliary contacts N/O	Min. 9	
14.11	Total number of available "b" auxiliary contacts N/C	Min. 9	
14.12	Total number of available "early make – late break", "a" auxiliary contacts N/O	6	
14.13	Post type insulator details:		
	(a) Manufacturer's reference number		
	(b) External insulation material	Silicone rubber	
	(c) Core material		
	(d) Total creepage distance	9 300 mm	mm

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
14.13	(e) Shrouded creepage distance	3 480 mm	mm
	(f) One minute dry withstand voltage (50 Hz)	460 kV	kV
	(g) Wet withstand voltage	420 kV	kV
	(h) Lightning Impulse withstand voltage (1,2/50 µs)	1 050 kV	kV
	(i) Maximum tensile working load	50 kN	kN
	(j) Maximum torsional working load	3 000 Nm	Nm
	(k) Maximum cantilever working load	2 kN	kN
	(l) Minimum tensile failing load	100 kN	kN
	(m) Minimum torsional failing load	6 000 Nm	Nm
	(n) Minimum cantilever failing load	4 kN	kN
14.14	Total mass of insulators on supporting structure		kg
14.15	Motor drive voltage (confirmed upon order)	110 or 220 V d.c.	V d.c.
14.16	Guarantee period of 275 kV isolator	5 years	

15.0	275 kV EARTHING SWITCH		
15.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
15.2	(a) Specification to which earth switch complies:	IEC 62271-102	
	(b) Testing authority		
	(c) Test certificate number		
15.3	Short time current rating	40 kA for 3 s	kA for s
15.4	Inherently interlocked with the associated isolator?	Yes	
15.5	Total number of "a" auxiliary contacts (open when earth switch open)	Min. 9	
15.6	Total number of "b" auxiliary contacts (closed when earth switch open)	Min. 9	
15.7	Total mass of isolator/earth switch combination on supporting structure		kg
15.8	Guarantee period of 275 kV earth switch	5 years	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
16.0	**275 kV VOLTAGE TRANSFORMER**		
16.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
16.2	(a) Specification to which voltage transformer complies:	IEC 60044-2 and IEC 60044-7	
	(b) Testing authority		
	(c) Test certificate number		
16.3	External insulation	Silicone rubber	
16.4	Insulation medium	Oil	
16.5	Secondary voltage	110 V a.c.	V a.c.
16.6	Rated burden per phase		
	(a) Winding 1 (metering)	200 VA	VA
	(b) Winding 2 (protection)	200 VA	VA
16.7	Class to IEC 60044-2 and IEC 60044-7		
	(a) Winding 1 (metering)	0,2	
	(b) Winding 2 (protection)	3P	
16.8	Type of voltage transformers offered	Electromagnetic or capacitive	
16.9	Quantity of oil (per single phase unit)		l
16.10	Standard to which oil complies	SANS 555	
16.11	Number of stress grading foils		
16.12	Method used for internal discharge test		
16.13	Voltage level for internal discharge test		kV
16.14	Total external creepage distance	9 300 mm	mm
16.15	Total shrouded creepage distance	3 480 mm	mm
16.16	One minute dry withstand voltage (50 Hz)	460 kV	kV
16.17	Wet withstand voltage (50 Hz)	420 kV	kV
16.18	Impulse withstand voltage (1,2/50 µs)	1 050 kV	kV
16.19	Voltage at which partial discharge level is ≤ 5 pC	173 kV	kV
16.20	Design of voltage transformer	Explosion proof	
16.21	Total mass of voltage transformer on supporting structure (per phase)		kg
16.22	Guarantee period of 275 kV voltage transformer	5 years	
16.23	Guarantee period against leaks and corrosion	10 years	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
17.0	**275 kV CURRENT TRANSFORMER**		
17.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
17.2	(a) Specification to which current transformer complies:	IEC 60044-8 and IEC 61869	
	(b) Testing authority		
	(c) Test certificate number		
17.3	(a) Insulation medium	Oil or SF_6	
	(b) Oil insulation type	Minimum oil	
17.4	External insulation	Silicone rubber	
17.5	Design	Hairpin	
17.6	Quantity of oil (per single phase unit)		l
17.7	Standard to which oil complies	SANS 555	
17.8	Sealing/expansion method		
17.9	Number of stress grading foils		
17.10	Method used for internal discharge test		
17.11	Voltage level for internal discharge test		kV
17.12	Total external creepage distance	9 300 mm	mm
17.13	Total shrouded creepage distance	3 480 mm	mm
17.14	One minute dry withstand voltage (50 Hz)	460 kV	kV
17.15	Wet withstand voltage (50 Hz)	420 kV	kV
17.16	Impulse withstand voltage (1,2/50 µs)	1 050 kV	kV
17.17	Voltage at which partial discharge level is ≤ 5pC	173 kV	kV
17.18	Short time current rating	40 kA for 3 s	kA for s
17.19	Current transformer core limiting dimensions:		
	(a) Maximum external diameter		mm
	(b) Minimum ring diameter		mm
	(c) Total axial length available		mm
	(d) Total spare axial length after fitting of specified cores		mm
17.20	Total mass of current transformer on supporting structure (per phase)		kg
17.21	Guarantee period of 275 kV current transformer	5 years	
17.22	Guarantee period against leaks and corrosion	10 years	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
18.0	**275 kV POST INSULATOR**		
18.1	Manufacturer		
	Manufacturer's reference number		
18.2	(a) Specification to which post insulator complies:	IEC 61462, IEC 62155, IEC 60273 and IEC 60815	
	(b) Testing authority		
	(c) Test certificate number		
18.3	Material of external insulation	Silicone rubber	
18.4	Total creepage distance	9 300 mm	mm
18.5	Minimum shrouded creepage distance	3 480 mm	mm
18.6	One minute dry withstand voltage (50 Hz)	460 kV	kV
18.7	Wet withstand voltage (50 Hz)	420 kV	kV
18.8	Impulse withstand voltage (1,2/50 µs)	1 050 kV	kV
18.9	Maximum tensile working load	50 kN	kN
18.10	Maximum torsional working load	3 000 Nm	Nm
18.11	Maximum cantilever working load	2 kN	kN
18.12	Minimum tensile failing load	100 kN	kN
18.13	Minimum torsional failing load	6 000 Nm	Nm
18.14	Minimum cantilever failing load	4 kN	kN
18.15	Total mass of insulator on support structure		kg
18.16	Guarantee period of 275 kV post insulator	5 years	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
19.0	**275 kV LONG ROD INSULATOR**		
19.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
19.2	(a) Specification to which long rod insulator complies:	IEC 61109 and IEC 60815	
	(b) Testing authority		
	(c) Test certificate number		
19.3	General detail:		
	(a) Connecting length of insulator (24 glass disc equivalent)	3 504 mm	mm
	(b) Mass of insulator		kg
	(c) Material of insulator	Silicone rubber	
	(d) Attachment type	20 mm ball and socket	
	(e) Material of fitting	Hot-dip galvanised steel	
19.4	Mechanical strength:		
	(a) Maximum working load of insulator set		kN
	(b) Route test load		kN
	(c) Minimum failing load	120 kN	kN
19.5	Electrical strength:		
	(a) Total creepage distance over complete set	9 300 mm	mm
	(b) Minimum dry arc distance	2 060 mm	mm
	(c) Minimum dry flashover voltage	460 kV	kV
	(d) Minimum ratio of shed spacing to shed projection	0,8	
	(e) Minimum wet flashover voltage	420 kV	kV
	(f) Lightning impulse withstand voltage (1,2/50 µs)	1 050 kV	kV
19.6	Sealing of core		
	(a) Is the core fully encapsulated and fully sealed from the environment	Yes	
	(b) Additional seal required at insulator material-end fitting junction	Yes	
19.7	Suitably designed corona rings included on the live end of the insulator, 50 kA for 70 ms.	Yes	
19.8	(a) Limit of E-field on grading ring and end fitting	1,8 kV/mm	kV/mm
	(b) Limit of average E-field along housing surface	0,42 kV/mm	kV/mm
	(c) Limit of E-field at triple point	0,35 kV/mm	kV/mm
19.9	Guarantee period of 275 kV long rod insulator	5 years	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
20.0	**275 kV SURGE ARRESTER**		
20.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
20.2	(a) Specification to which surge arrester complies:	IEC 60099-4	
	(b) Testing authority		
	(c) Test certificate number		
20.3	Arrester nominal discharge current rating (8/20 µs impulse)	10 kA	kA
20.4	Arrester voltage rating	240 kV	kV
20.5	Maximum continuous operating voltage	174 kV	kV
20.6	Temporary over voltage capability	240 kV	kV
20.7	Rated frequency	50 Hz	Hz
20.8	Maximum peak discharge voltage:		
	(a) Steep		kV
	(b) Lightning		kV
	(c) Switching		kV
20.9	Max peak current @ 4/10 µs impulse	100 kA	kA
20.10	Max peak current for long time impulse		kA
20.11	Energy dissipation ability @ U_{rated} for switching impulse	> 4,5 kJ/kV	kJ/kV
20.12	External insulation dry withstand voltage	460 kV	kV
20.13	External insulation minimum impulse withstand level	1 050 kV	kV
20.14	Total external insulation creepage distance	9 300 mm	mm
20.15	Total shrouded external insulation creepage distance	3 480 mm	mm
20.16	Mass of single surge arrester		kg
20.17	Contact noise and partial discharge test method carried out by manufacturer		
20.18	Leakage current test method carried out by manufacturer		
20.19	Line discharge class	3	
20.20	External insulation material	Silicone rubber	
20.21	Type of mounting	Insulated	
20.22	Guarantee period of 275 kV surge arrester	5 years	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
21.0	**STRENGTH OF MATERIALS**		
21.1	Form of construction of busbar support structure	Lattice or I Beam	
21.2	Material of busbar support structures	Hot dip galv. mild steel	
21.3	Minimum thickness of zinc coating	Heavy duty	
21.4	Form of construction of lightning masts	Sectional pole	
21.5	Material of lightning masts	Hot dip galv. mild steel	
21.6	Tensile breaking strength:		
	(a) Steel sections and plates	420 MPa	MPa
	(b) Mild steel nuts and bolts	550 MPa	MPa
	(c) High tensile steel nuts and bolts	700 MPa	MPa
21.7	Modulus of elasticity:		
	(a) Steel sections and plates	250 MPa	MPa
	(b) Mild steel nuts and bolts	240 MPa	MPa
	(c) High tensile steel nuts and bolts	290 MPa	MPa

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
22.0	**AAC STRANDED CONDUCTORS**		
	Stranded flexible conductors: Centipede Conductor		
22.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
22.2	(a) Specification to which Centipede and Bull conductors comply:	IEC 61089 and BS 215	
	(b) Testing authority		
	(c) Test certificate number		
22.3	(a) Conductor material	Aluminium	
	(b) Number of strands/conductor	37	
	(c) Diameter of strands	3,78 mm	mm
	(d) Overall diameter of conductor	26,46 mm	mm
	(e) Min. normal current rating	833 A	A
	(f) Max. resistance at 20 ºC	0,07 Ω/km	Ω/km
	(g) Ultimate strength	67,2 kN	kN
	(h) Mass per unit length	1,15 kg/m	kg/m
22.4	**Stranded flexible conductors: Bull Conductor**		
	(a) Conductor material	Aluminium	
	(b) Number of strands/conductor	61	
	(c) Diameter of strands	4,25 mm	mm
	(d) Overall diameter of conductor	38,25 mm	mm
	(e) Min. normal current rating	1 300 A	A
	(f) Max. resistance at 20ºC	0,03 Ω/km	Ω/km
	(g) Ultimate strength	139 kN	kN
	(h) Mass per unit length	2,4 kg/m	kg/m
23.0	**TUBULAR ALUMINIUM BUSBARS**		
23.1	**80 mm Rigid tubular conductors:**		
	(a) Conductor material and purity	99,98 % Aluminium	% Al
	(b) Outside diameter	80 mm	mm
	(c) Wall thickness	4 mm	mm
	(d) Normal current rating	1 700 A	A
	(e) Recommended distance between supports	10 m	m
	(f) Deflection under normal conditions (applicable to maximum span length)	70 mm	mm
	(g) Mass per unit length		kg/m

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
23.2	**100 mm Rigid tubular conductors:**		
	(a) Conductor material and purity	99,98 % Aluminium	% Al
	(b) Outside diameter	100 mm	mm
	(c) Wall thickness	4 mm	mm
	(d) Normal current rating	2 000 A	A
	(e) Recommended distance between supports	10 m	m
	(f) Deflection under normal conditions (applicable to maximum span length proposed)	45 mm	mm
	(g) Mass per unit length		kg/m
23.3	**120 mm Rigid tubular conductors:**		
	(a) Conductor material and purity	99,98 % Aluminium	% Al
	(b) Outside diameter	120 mm	mm
	(c) Wall thickness	8 mm	mm
	(d) Normal current rating	3 300 A	A
	(e) Recommended distance between supports	10 m	m
	(f) Deflection under normal conditions (applicable to maximum span length)	32 mm	mm
	(g) Mass per unit length		kg/m
24.0	**CLAMPS FOR BULL, CENTIPEDE CONDUCTOR AND TUBULAR BUSBARS**		
24.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
24.2	(a) Specification to which clamps comply:	SANS 51706	
	(b) Testing authority		
	(c) Test certificate number		
25.0	**MARSHALLING KIOSK**		
25.1	(a) Manufacturer		
	(b) Manufacturer's reference number		
25.2	(a) Specification to which marshalling kiosk complies	IEC 60529	
	(b) Testing authority		
	(c) Test certificate number		
25.3	Material of marshalling kiosk	Stainless steel 304 or 3CR12	
25.4	Degree of protection	IP 55	
25.5	Number of terminal connectors	Min. 150	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
25.6	Marshalling kiosk dimensions		
	(a) width	800 mm	
	(b) depth	600 mm	
	(c) height	> 1 200	
26	**Intelligent Key System**		
26.1	**Intelligent Key System Controller (IKSC)**		
26.1.1	What is the guaranteed minimum service life of the IKSC?	10 years	
26.1.2	What communication networking technology does the IKSC offer?	IEEE 802.3 (Ethernet)	
26.1.3	Is the IKSC directly addressable from the SCC?	YES	
26.1.4	Can the IKSC have the ability to identify each key that is attached within the cabinet?	YES	
26.1.5	Does the IKSC have the ability to provide custom user access for each key?	YES	
26.1.6	How can users access the system?	Biometric or card reader	
26.1.15	What standard does the IKSC support?	Wiegand	
26.2	**Intelligent Key Cabinet (IKC)**		
26.2.2	What is the guaranteed minimum service life of the IKC?	10 years	
26.2.6	What is the IP rating of the IKC?	IP 53	
26.2.8	How many keys can a single IKC accommodate?	10 to 180	
26.3	**Base Station Software**		
26.3.1	Where will the Base Station Software (BSS) reside?	Control Centre	
26.3.12	The database shall support a minimum of 1 000 sites	1000	
26.3.18	Can the IKS be configured remotely?	YES	

Item	Description	Technical Details	
		eThekwini Requirements	Tenderer's Offer
27.0	**Yard Equipment Monitoring**		
27.1	**Circuit Breaker Monitoring** (preferred requirement)		
27.1.1	Place of Manufacturer		
27.1.2	Part/Serial number		
27.1.3	Includes records of the number of operations		
27.1.4	Includes monitoring of SF6 gas pressure, density & leak		
27.1.5	Includes monitoring of excessive operating time: detect performance degrading due to friction or corrosion or mechanical wear		
27.1.6	Includes control circuit monitoring: Coil continuity, DC supply and temperature		
27.1.7	Includes arcing contact wear monitoring: records number of interruption operations and calculate arc energy		
27.1.8	Includes stored energy monitoring: frequency and time taken to rearm stored energy, monitor motor current for any change in profile		
27.2	**Disconnector Monitoring** (preferred requirement)		
27.2.1	Place of Manufacturer		
27.2.2	Part/Serial number		
27.2.3	Includes records of operations: number of operations		
27.2.4	Includes monitoring of excessive operating time: detect performance degrading due to friction or corrosion or mechanical wear		
27.2.5	Includes monitoring of excessive current		
27.2.6	Includes predictive maintenance		
27.2.7	Includes monitoring of malfunction		
27.3	Communication protocols comply with	IEC 61850 & DNP3	
27.4	Includes Cloud connectivity	Yes	
27.5	Includes software license	Yes	
27.6	Includes training eThekwini Electricity Staff as per Clause 16.10	System architecture, installation, operation, and maintenance	
27.7	Includes training documentation	Manual, system architecture, operation, and maintenance	
27.8	Includes digital connecting modem	Cloud connection	
27.9	Includes engineering work for integrating systems	Yes	

NAME: ..... (Block Capitals)
SIGNATURE: ..... DATE: .....
(of person authorised to sign on behalf of Tenderer)

T2.2.28 DETAILS OF DRAWINGS ISSUED AND REQUIRED

Drawings Issued with this Specification

The purpose of the schematic drawings issued with this enquiry is to clarify the requirements detailed in this specification. The issue of these does not absolve the contractor from the normal responsibility of providing a satisfactory scheme or submitting drawings of systems proposed for each order for approval by the Engineer.

The drawings listed below show the proposed layout of equipment and basic circuit schematic requirements.

- TD15 - Typical 132/11 kV Outdoor Substation Layout
- TD16 - Typical 132 kV Single Busbar Outdoor Switchyard Layout
- TD17 - Typical 132 kV Double Busbar Outdoor Switchyard Layout
- TD18 - Typical Control Schematic for 132 kV and 275 kV Switchgear
- LCDD 2016002 – Bases to be standardized for eThekwini Electricity

Drawings/ Documentation to be submitted with BID:

The following typical tender drawings and descriptive data shall be included with the tender:

a) Control schematic drawings for circuit breakers, compact switchgear, instrument transformers, disconnecting circuit breakers, isolators (motor and manual operated) and earth switches.
b) Scaled drawings for all items of equipment (shown on their support pedestals, where applicable).
c) Foundation drawings for all items of equipment or support pedestals where appropriate. The drawings shall be sufficiently detailed to allow the construction of the foundation plinths to proceed. Full details of parameters used in the design shall be shown.
d) Short circuit test certificates.
e) Certificates confirming the rated short time current of equipment offered.
f) Full technical specification and technical literature of all equipment offered.
g) **Bidders are to declare the period of the active phase (end of product commercialisation) and classic phase (end of full spare parts availability) for the 132 kV and 275 kV switchgear offered.**
h) The bidder shall provide the following documentation and training for the Intelligent Key System (IKS):
i) Full technical description of the operation of the Intelligent Key System.
j) Full technical description, circuit diagrams, component overlay and parts listing of all electronic circuit boards, modules, etc.
k) System operating manual.
l) Base station software manual
m) Fault Finding and Repair manual.
n) Onsite training for technical staff on electronic fault finding and maintenance (as per clause 16.10).
o) Onsite training for technical staff on system fault finding and maintenance (as per clause 16.10).
p) Onsite training for operators.

Working Drawings

These shall be submitted 6 weeks upon award of contract. Final as-built drawings shall also be submitted by the contractor on compact disc in AutoCAD 2024 version or lower format.

T2.2.29 TESTING REQUIRED

1. General

The tests shall be arranged to represent the working conditions as closely as possible.

All tests shall comply with the requirements of the latest issues of the IEC Publication which applies to the series of tests. The method of carrying out tests shall be as required by the Engineer or eThekwini Electricity's test official.

The following type tests shall be carried out where satisfactory test certificates applicable to the switchgear offered are not submitted with the Tender. The routine and sample tests shall be carried out at the manufacturer's works as a routine of the manufacture of the equipment, according to the recommendation of the relevant standard and shall be performed on all units or on a quality sampling method.

TEST DESCRIPTION	SPECIFICATION	TYPE	ROUTINE	SAMPLE	SPECIAL
Circuit Breakers	IEC 62271-100	✓	✓	✓	✓
Disconnecting Circuit Breakers	IEC 62271-108	✓	✓	✓	✓
Isolator and Earth Switches	IEC 62271-102	✓	✓	✓	✓
Post Insulators	IEC 60273	✓	✓	✓	✓
Compact Switchgear	IEC 62271 - 205	✓	✓	✓	✓
Surge Arresters	IEC 60099-4	✓	✓	✓	✓
Current Transformers	IEC 61869	✓	✓	✓	✓
Voltage Transformers	IEC 60044-2	✓	✓	✓	✓
Long Rod Insulator	SANS 61109	✓	✓	✓	✓
Insulator Fittings	SANS 60305	✓	✓	✓	✓
Galvanising	SANS 121			✓	
Gantry Structures				✓	

All the type tests results shall be submitted with the tender document

2. Factory Acceptance Testing

Factory acceptance testing shall include all the site tests which can practically be carried out in the factory.

3. Test After Erection On-Site

3.1. Mechanical checks – all isolators, earth switches, interlock mechanism, etc. to ensure perfect contact alignment, free movement of operating arms, etc.
3.2. Primary injection through current transformers to establish ratio and polarity.
3.3. Current transformer magnetisation characteristic measurements, tan delta, knee point, ratio, etc.
3.4. Circuit breaker operation, mechanism, checks, pressure restoration times, lock-out pressures, low pressure alarms, operating times, ductor test, speed test, timing test, dynamic resistance measurement, etc.
3.5. Voltage transformer, tan delta, excitation current, etc.
3.6. Surge Arresters, leakage current, Watt Losses, etc.
3.7. Indication and alarm checks (including spare auxiliary contacts).
3.8. Cable testing.
3.9. Protection operation/trip tests (only if applicable).
3.10. Local/Remote/Supervisory close and tripping tests.

Any other tests required to ensure that all equipment supplied on this contract satisfactorily meets the requirements of this contract and is ready for continuous commercial use.

4. Project Completion Documentation

Contractors are to compile and complete a spreadsheet detailing the relevant equipment attributes (DC numbers, Parameters, Designation etc.) upon completion of each and every project at the different substation sites. The information that is to be included in this document shall be confirmed with the Engineer and shall be subject to change depending on the project requirements.

T2.2.30 DIVERGENCES OF THE BID FROM THE TECHNICAL SPECIFICATIONS

This schedule shall be completed, signed and returned with the bid documents of which it forms part.

If the bid does not comply technically with this specification, in any respect, such divergences shall be detailed below in addition to any other reference thereto contained elsewhere in the bid or accompanying letter.

NAME :..... (Block Capitals)

SIGNATURE : ……..……..…… DATE: .....

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

T2.2.31 SURETY FORM PROFORMA

The Tenderer is required to submit with his tender a letter of intent from an approved insurer/banker undertaking to provide the Surety/Performance Bond in the format given below.

Contract No. _____

SURETY BOND-Proforma

..... (hereinafter referred to as the Surety) hereby binds itself as Surety for and co-principal debtor with …… (hereinafter referred to as the Contractor) unto the ETHEKWINI MUNICIPALITY (hereinafter referred to as the Council) for the due and complete performance by the Contractor of all the Contractor's obligations and liabilities under Contract……with the terms of which the Surety agrees that the Surety is acquainted, including any obligations or liabilities undertaken by the Contractor as a variations of, or in substitution for, any obligations or liabilities under the said contract. The suretyship shall be on the following conditions:-

1. The Surety shall remain bound notwithstanding any relaxation, indulgence or any extension of time granted to the Contractor, whether in accordance with the said Contract or otherwise, notwithstanding that any such relaxation, indulgence or extension might operate or has operated to the prejudice of the Surety.
2. The Surety shall remain bound in terms of this agreement notwithstanding that the Council may release any securities held by it for the fulfilment of the obligation of the Contractor or may release any other surety or sureties liable in respect of all or any obligations in respect of which the Surety is liable.
3. Unless the Surety has discharged its obligations hereunder in full and there is no obligation or liability whatsoever of any nature outstanding which the Surety is or may be liable to perform, the Council shall have the sole right to the exclusion of any right which the Surety might otherwise have, to claim and to be regarded as a Creditor in the event of the insolvency, liquidation or judicial management of the Contractor.
4. The Council may settle or comprise any claim which it might have against the Contractor arising of the Contractor's liabilities or obligations under the said Contract or any variation thereof or substitution therefor, and in the event of any such settlement or compromise the Surety shall be liable to carry out any obligation or liability of the Contractor in terms of any such settlement or compromise.
5. The Surety hereby renounces all benefits which would otherwise be available to the Surety and in the particular, but without affecting the generality of the foregoing, the beneficia ordinis seu excussionis. Divisionis. novae constitutionis.de doubus vel puribus reis debendi.non causa debiti.non numeratae pecuniae. erroris calculi and the benefit of revision of account.
6. Notwithstanding anything herein contained, the total liability of the Surety to the Council arising from this bond shall not exceed the sum of _____ together with such further sums for interest and costs as may in law be claimed from the Surety.
7. Upon the issue of a certificate signed by the City Treasurer or either of his authorised deputies as to the amount due, owing and payable by the Contractor to the Council, the Surety shall be obliged forthwith to pay such a sum as is mentioned in the said certificate, to the City Treasurer. Such payment shall be subject to adjustment as between the Surety and the Council as and when final details of the Council's damages arising from the said Contract are ascertained.

SIGNED by the said _____ at _____ on this the ___ day of _____

AS WITNESSES: 1. _____ 2. _____

_____
Signature of Surety

Postal Address of Surety:
PO Box _____

NAME :..... (Block Capitals)

SIGNATURE : ……..…….…… DATE: .....

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

T2.2.32 ALTERATIONS BY BIDDER

This schedule shall be completed, signed and returned with bid documents of which it forms part.

Should the Bidder desire to make any departures from, or modifications to, the ETHEKWINI MUNICIPALITY'S Special Conditions of Tender/Contract (Goods/Services) and Government Procurement General Condition of Contract, or the Technical Specification, or to qualify his Bid in any way, he shall set out his/her proposals clearly hereunder or alternatively state them in a covering letter attached to his bid and referred to hereunder, failing which the bid will be deemed to be unqualified.

Page	Clause or Item

NAME :..... (Block Capitals)

SIGNATURE : ……..……..…… DATE: .....

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

T2.2.33 DIVERGENCES OF THE BID FROM THE CONTRACTUAL SPECIFICATIONS

This schedule shall be completed, signed and returned with the bid documents of which it forms part.

If the bid does not comply contractually with this specification or with the Municipality's Special Conditions of Bid/Contract (Goods and Services), in any respect, such divergences shall be detailed below in addition to any other reference thereto contained elsewhere in the bid or accompanying letter.

NAME :..... (Block Capitals)

SIGNATURE : ……..……..…… DATE: .....

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

T2.2.34 BIDDER'S QUESTIONNAIRE

This schedule shall be completed, signed and returned with the bid documents of which it forms part.

***Bidder to complete Questionnaire by deleting that which is not applicable**

Ref.	Question	Employer's Requirement	Bidder's Response
1	Are contractual specifications and conditions understood?	Yes	*Yes/No
2	Are the technical specifications understood?	Yes	*Yes/No
3	Is the scope of work understood?	Yes	*Yes/No
4	Is Declaration of Municipal Fees Schedule completed?	Yes	*Yes/No
5	Is the Compulsory Enterprise Questionnaire completed?	Yes	*Yes/No
6	Has a **valid SARS Tax Clearance Certificate** been submitted as per MBD2?	Yes	*Yes/No
7	Is Declaration of Interest Schedule (MBD4) completed?	Yes	*Yes/No
8	Is the Declaration for Procurement above R10 million form (MBD5) completed?	Yes	*Yes/No
9	Is the Preferential Points document (MBD6.1) completed?	Yes	*Yes/No
10	Is the Declaration of Bidder's Past Supply Chain Management Practices form (MBD8) completed?	Yes	*Yes/No
11	Is the Certificate of Independent Bid Determination (MBD9) completed?	Yes	*Yes/No
12	Are the returnable schedules for the functionality criteria completed and supporting documents included with the bid?	Yes	*Yes/No
13	Is the delivery/ programme schedule completed?	Yes	*Yes/No
14	Is the list of Project References stated in the returnable schedule completed?	Yes	*Yes/No
15	Are the details of manufacturer's name and places of manufacture, testing and inspection of plant and equipment completed?	Yes	*Yes/No

NAME :..... (Block Capitals)

SIGNATURE : ……..……..…… DATE: .....

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

T2.2.34 BIDDER'S QUESTIONNAIRE (CONTINUED)

Ref.	Question	Employer's Requirement	Bidder's Response
16	Are all relevant technical schedules completed and required documentation included with the bid?	Yes	*Yes/No
17	Are there any deviations from the Technical Specification? If yes, specify all deviations in the returnable schedule.		*Yes/No
18	Is the confirmation of CIDB Registration submitted?	Yes	*Yes/No
19	Is the JV/ partnership agreement submitted (if applicable)?		*Yes/No
20	Is Acceptance of Undertaking in Terms of OHS Act completed?	Yes	*Yes/No
21	Are there any deviations from the Contractual Specification? If **yes**, specify all deviations in the returnable schedule.		*Yes/No
22	Has the previous 3 years audited financial statements been submitted?	Yes	*Yes/No
23	**Bid Prices:**		
23.1	Is the Form of Offer completed?	Yes	*Yes/No
23.2	Is the Price Schedule completed?	Yes	*Yes/No
23.3	Are the bid prices subject to Exchange Rate Variations? **If Yes, complete Rate of Exchange Questionnaire**.		*Yes/No
23.4	Are the bid prices subject to Contract Price Adjustments (CPA)? **If Yes, submit details to calculate Contract Price Adjustments**.		*Yes/No
24	Is the Bid complete with all the required information given?	Yes	*Yes/No

*Delete that which is not applicable

NAME :..... (Block Capitals)

SIGNATURE : ……..……..…… DATE: .....

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

T2.2.35 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

(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

(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

(1) 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.

NAME : ..... (Block Capitals)

SIGNATURE : ..... DATE: .....

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

T2.2.36 GUARANTEE PERIOD

This schedule shall be completed, signed and returned with the bid documents of which it forms part.

The Bidder confirms that all of the equipment offered carry a ten-year guarantee from handover date to the eThekwini Engineer. The Bidder further undertakes, to replace with new units, any of the equipment failing within the guarantee period.

NAME :..... (Block Capitals)

SIGNATURE : ……..……..…… DATE: .....

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

PART C1: AGREEMENT AND CONTRACT DATA

C1.1: FORM OF OFFER AND ACCEPTANCE

C1.1.1: OFFER

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract in respect of the following works:

Contract No: **34827(5E)**

Contract Title: **Supply, Delivery, Installation and Testing of Outdoor 132 kV and 275 kV Switchgear and Associated Equipment for a Period of Thirty-Six Months for Various Substations**

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

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

*** The offered total of the prices inclusive of Value Added Tax is:**

R..... (*In words* .....

.....)

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document to the Tenderer before the end of the period of validity stated in the Tender Data, whereupon the Tenderer becomes the party named as the Contractor in the Conditions of Contract identified in the Contract Data.

For the Tenderer:

*** Name of Tenderer** *(organisation)* **:** .....

*** Signature** *(of person authorized to sign the tender)* **:** .....

*** Name** *(of signatory in capitals)* **:** .....

Capacity *(of Signatory)* **:** .....

Address : .....

: .....

Telephone : .....

Witness:

Signature : ..... **Date** : .....

Name *(in capitals)* : : .....

Notes:
*** Indicates what information is mandatory.**
Failure to complete the mandatory information and sign this form will invalidate the tender.

C1.1: FORM OF OFFER AND ACCEPTANCE

C1.1.2: FORM OF ACCEPTANCE

This Form will be completed by the Employer

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

The terms of the contract are contained in:

- Part C1 : Agreement and Contract Data, (which includes this Agreement)
- Part C2 : Pricing Data, including the Bill of Quantities
- Part C3 : Scope of Work
- Part C4 : Site Information

and the schedules, forms, drawings and documents or parts thereof, which may be incorporated by reference into Parts C1 to C4 above.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules as well as any changes to the terms of the Offer agreed by the Tenderer and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Agreement. No amendments to or deviations from said documents are valid unless contained in this Schedule, which must be duly signed by the authorised representatives of both parties.

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

Notwithstanding anything contained herein, this Agreement comes into effect on the date when the Tenderer receives one fully completed original copy of this document, including the Schedule of Deviations (if any). Unless the Tenderer (now Contractor) within five days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this Agreement, this Agreement shall constitute a binding contract between the parties.

Signature *(person authorized to sign the acceptance)* **:** .....

Name *(of signatory in capitals)* **:** .....

Capacity *(of Signatory)* **:** .....

Name of Employer *(organisation)* **:** .....

Address : .....

: .....

Witness:

Signature : ..... **Date** : .....

Name*(in capitals)* : : .....

C1.1: FORM OF OFFER AND ACCEPTANCE
C1.1.3: SCHEDULE OF DEVIATIONS

This form will be completed by THE EMPLOYER and ONLY THE SUCCESSFUL TENDERER

1. **Subject** : ……..

Details : ……..

: ……..

2. **Subject** : ……..

Details : ……..

: ……..

3. **Subject** : ……..

Details : ……..

: ……..

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

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

FOR THE TENDERER		**FOR THE EMPLOYER**
……..……..	Signature	……..……..
……..……..	Name *(in capitals)*	……..……..
……..……..	Capacity	……..……..
……..……	Name and Address of	……..……
……..	Organisation	……..
……..		……..
……..		……..
……	Witness Signature	……
……..	Witness Name	……..
……..	Date	……..

C1.2: CONTRACT DATA

C1.2.1 CONDITIONS OF CONTRACT

C1.2.1.1 GENERAL CONDITIONS OF CONTRACT

The Conditions of Contract are the General Conditions of Contract for Construction Works (2015 3rd Edition) (GCC 2015) published by the South African Institution of Civil Engineering. Copies of these conditions of contract may be obtained from the South African Institution of Civil Engineering (Tel: 011-805-5947, Fax: 011-805-5971, E-mail: civilinfo@saice.org.za).

The Contract Data (including variations and additions) shall amplify, modify, or supersede, the GCC 2015 to the extent specified below, and shall take precedence and shall govern.

Each item of data given below is cross-referenced to the clause in the GCC 2015 to which it mainly applies.

C1.2.2 CONTRACT DATA

C1.2.2.1 DATA TO BE PROVIDED BY THE EMPLOYER

1.1.1.13 The **Defects Liability Period**, from the date of the Certificate of Completion, is **10 Year**.

1.1.1.14 The **time for achieving Practical Completion**, from the Commencement Date is **36 Weeks**. The period as stated in 5.3.2, and the 7 days referred to in 5.3.3, are included in the above time for achieving Practical Completion. The special non-working days as stated in 5.8.1 are excluded from the above time for achieving Practical Completion.

1.1.1.15 The Employer is the eThekwini Municipality as represented by:
Deputy Head: **HV Operations**

1.2.1.2 The address of the Employer is:
Physical: Energy Management Directorate, 1 Jelf Taylor Crescent, DURBAN, 4001
Postal: Energy Management Directorate, P.O. Box 147, DURBAN, 4001
Telephone: 031-311 9506 (t)
E-Mail: Veer.Ramnarain@Durban.gov.za

1.1.1.16 The name of the Employer's Agent is Mokwape Lekganyane
1.2.1.2(a) The address of the Employer' Agent is:
Physical: Energy Management Directorate, 1 Jelf Taylor Crescent, DURBAN, 4001
Postal: Energy Management Directorate, P.O. Box 147, DURBAN, 4001
Telephone: 031 311 9628(t)
E-Mail: Mokwape.Lekganyane@Durban.gov.za

1.1.1.26 The **Pricing Strategy** is by **Re-measurement Contract**.

3.2.3 The Employer's Agent shall obtain the **specific approval of the Employer** before executing any of his functions or duties according to the following Clauses of the General Conditions of Contract:

- 6.3: Council approval in order to authorise any expenditure in excess of the Tender Sum plus **15%** contingencies.

4.11.1 To carry out and complete the works, the Contractor shall employ a competent Site Agent and Foreman as part of the key staff. It is a requirement for the Contractor's Site Agent and Foreman to each have a minimum of 3 years relevant experience including experience on projects of a similar nature. The CV's of the Site Agent and the Foreman should be submitted to the Employer's

Agent's Representative for acceptance by the Division (reference is made to Cl.5.3.1 of the Contract Data).

Note:

i) "similar nature" implies projects that were of a value of at least 70% of this tender's value, and had a comparable Scope of Work in terms of technical requirements and operations.

ii) "experience" implies experience on projects of a similar nature.

iii) "accredited degree / diploma" implies a minimum 3-year qualification within the built environment, from a registered University or Institute of Technology.

5.3.1 The **documentation required** before commencement with Works execution are:

- 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)
- CV(s) of Key Site Staff (refer to Clause 4.11.1)
- Sub-Contracting (CPG) Implementation Plan (if applicable)
- If required to be registered, in terms of the Occupational Injuries and Diseases Act (130 of 1993 as amended), the Contractor is to supply proof of being registered and in good standing with the compensation fund by submitting a valid Letter of Good Standing from the Compensation Commissioner. Should the Contractor's Letter of Good Standing be expired, but an application for renewal has been made, the Contractor is to submit the expired Letter of Good Standing AND proof of an application for renewal.

5.3.2 The **time to submit the documentation** required before commencement with Works is **21 Days**.

5.3.3 Add the following paragraph:

"If a construction work permit, in terms of Clause 3(1) of the Construction Regulations (2014), is applicable, the instruction to commence carrying out of the works may only be issued once the construction work permit has been obtained by the Employer's Agent. If a construction work permit is applicable, the contractor shall allow for a minimum period of 37 days, after the submission (or re-submission) of the documentation referred to in Clause 5.3.1., for the issuing of the construction work permit."

5.4.2 The access and possession of Site shall not be exclusive to the Contractor but as set out in the Site Information.

5.8.1 The **non-working days** are **Saturdays and** Sundays.

(5.1.1) The **special non-working** days are:

- All statutory holidays as declared by National or Regional Government.
- The year-end break:
  - Commencing on the first working day after 15 December.
  - Work resumes on the first working day after 5 January of the next year.

5.8.1 Delete the words "sunset and sunrise" and replace with "17:00 and 07:00".

5.12.2.2 **Abnormal Climatic Conditions (Rain Delays)** - The numbers of days per month, on which work is expected not to be possible as a result of rainfall, for which the Contractor shall make provision, is given in the table below. During the execution of the Works, the Employer's Agent's Representative will certify a day lost due to rainfall only if at least 75% of the work force and plant on site could not work during that specific working day.

Extension of time as a result of rainfall shall be calculated monthly being equal to the number days certified by the Employer's Agent's Representative as lost due to rainfall, less the number

of days allowed for as in table below, which could result in a negative figure for certain months. The total extension of time for which the Contractor may apply, shall be the cumulative algebraic sum of the monthly extensions. Should the sum thus obtained be negative, the extension of time shall be taken as NIL.

Month	Days Lost	Average Rainfall	Month	Days Lost	Average Rainfall
January	4*	134	July	1	39
February	3	113	August	2	62
March	3	120	September	2	73
April	2	73	October	3	98
May	2	59	November	3	108
June	1	28	December	1*	102
TOTAL	27	1009mm	* = The number of working days lost allows for the annual statutory Construction holiday in December and January of each year.		

5.13.1 The **penalty for delay** in failing to complete the Works is **R 2 000** (per Day).

5.14.1 The **requirements for achieving Practical Completion** will be determined by the Employer's Agent (in consultation with the Contractor) and recorded in the minutes of the first Site Meeting / Handover Meeting. (Refer to 1.1.1.24 for a generic definition.) The requirements are to be regularly reviewed with respect to any variations to the Contract.

5.16.3 The **latent defect liability** period is **10 Years**.

6.2.1 **Security (Performance Guarantee)**: Delete the word "selected" and replace it with "stated".

The liability of the Performance Guarantee shall be as per the following table:

Value of Contract (incl. VAT)	Performance Guarantee Required
Less than or equal to R 1m	Nil
Greater than R 1m and less than or equal to R 10m	5% of the Contract Sum
Greater than R 10m	10% of the Contract Sum

6.10.1.5 The **percentage advance** on materials not yet built into the Permanent Works is **90%**.

The **percentage advance** on Plant not yet supplied to Site: **0 %.**

6.10.3 **Retention Money:** Delete the word "selected".
The percentage retention on the amounts due to the Contractor is 10%.
The limit of "retention money" is 10% of the Contract Sum.
Should the Contract Price exceed the Contract Sum then the limit of "retention money" is 10% of the Contract Price.
Interest will not be paid on retention withheld by the Employer.

8.6.1.1.2 The **value of Plant and materials** supplied by the Employer to be included in the insurance sum: **Not Required**.

8.6.1.1.3 The **amount to cover professional fees** for repairing damage and loss to be included in the insurance sum: **R 3 000 000**.

8.6.1.2 **SASRIA Coupon Policy** for Special Risks to be issued in joint names of Council and Contractor for the full value of the works (including VAT).

8.6.1.3 The limit of indemnity for **liability insurance**: **R 15 000 000.**

8.6.1.5 Furthermore, the insurance cover effected by the Contractor shall meet the following requirements:

Third Party Insurance (Public Liability)

- Minimum amount for any one occurrence, unlimited as to the number of occurrences, for the period of the contract, inclusive of the maintenance period: **R 20 000 000.**
- Consequential loss to be covered by policy: **Yes**
- Liability section of policy to be extended to cover blasting: **Nil.**
- Maximum excess per claim or series of claims arising out of any one occurrence: **R 40 000**.

Insurance of Works

- Minimum amount for additional removal of debris (no damage): **Nil.**

8.6.5 **Approval by Employer**: At the end of the sub-clause, add the following paragraph:

"Except where otherwise provided in the Special Conditions of Contract, the insurance cover effected by the Contractor in terms of this clause shall not carry a first loss amount greater than those set out below:

Contract Price	First Loss
Less than R 100,000	R 5,000
R 100,000 to R 500,000	R 10,000
R 500,000 to R 1,000,000	R 20,000
R 1,000,000 to R 2,000,000	R 30,000
R 2,000,000 to R 4,000,000	R 40,000
Greater than R 4,000,000	R 50,000

The insurance policy shall contain a specific provision whereby cancellation of the policy prior to the end of the period referred to in Cause 8.2.1 cannot take place without the prior written approval of the Employer. ”

10.7.1 Failing ad-hoc adjudication, the determination of disputes shall be by arbitration.

C1.2.2.2 DATA TO BE PROVIDED BY CONTRACTOR

1.1.1.9 The legal name of Contractor is:

……

……

……

……

1.2.1.2 The Physical address of the Contractor is:

……

……

……

……

The Postal address of the Contractor is:

……

……

……

……

The contact numbers of the Contractor are:

Telephone: ……

Fax: ……

The E-Mail address of the Contractor is:

……

6.5.1.2.3 The **percentage allowance** to cover overhead charges for daywork are as follows:

- % of the gross remuneration of workmen and foremen actually engaged in the daywork; …… %
- **%** on the net cost of materials actually used in the completed work. …… %

C1.2.3 ADDITIONAL CONDITIONS OF CONTRACT

C1.2.3.1 COMMUNITY LIAISON OFFICER

The Ward Councillor(s) in whose ward(s) work is to be done will, collectively, identify a community liaison officer (CLO) for the project and make the person known to the Contractor within two days of being requested to do so. The Contractor will be required to enter a written contract with the CLO that specifies:

- The hours of work and the wage rate of the CLO (200% of the Civil Engineering Industry minimum wage).
- The duration of the appointment.
- The duties to be undertaken by the CLO which could include:
  - Assisting in all respects relating to the recruitment of local labour.
  - Acting as a source of information for the community and councillors on issues related to the contract.
  - Keeping the Contractor advised on community issues and issues pertaining to local security.
  - Assisting in setting up any meetings or negotiations with affected parties.
  - Keeping a written record of any labour or community issue that may arise.
  - Any other duties that may be required by the Contractor.

Responsibility for the identification of a pool of suitable labour shall rest with the CLO, although the Contractor shall have the right to choose from that pool. The Contractor shall have the right to determine the total number labourers required at any one time and this may vary during the contract.

The Contractor shall have the right to replace labour that is not performing adequately. Should such occasion arise, it must be done in conjunction with the CLO.

Payment: The CLO will be reimbursed from the PC Sum item in the Preliminary & General Section of the Bill of Quantities.

C1.2.3.2 EMPLOYMENT OF LOCAL LABOUR

It is a condition of contract that the contractor will be required to employ local labour as specified in eThekwini Council Policy “The use of CLOs and Local Labour”. The contractor will be required to ensure that a minimum of 50% of the labour force is made up of local labour. For the purposes of this contract, “Local labour” will be deemed to be any **persons who reside within Ward(s) the whole metro of eThekwini Municipality.** The contractor will be required to provide proof of authenticity of local labour. Signed confirmation by the appointed CLO will suffice for this.

No additional costs will be entertained due to this Particular Specification. The contractor will remain responsible for providing proper supervision of all labour and will be responsible for the quality of work produced.

C1.2.3.3 SUB-CONTRACTING CONTRACTOR PARTICIPATION GOAL

It is a condition of contract that the contractor must allow for a minimum of **6%** of the contract value (excluding PC Sum items and Fixed Cost allowances) to be subcontracted to contractors who are **>51%** owned by Black People. Proof of payment to the subcontractors will be required to verify that the minimum has been achieved.

The penalty for not achieving the specified Sub-Contracting Goal will be 0.5% of the contract value (excluding PC Sum items and Fixed Cost allowances) for every 1% not achieved.

C1.2.3.4 FTE (Full Time Equivalent) EMPLOYMENT INFORMATION

It is a condition of contract that the Contractor supplies the Employer's Agent's Representative with information in respect of the employment of all foremen, artisans and Labour (skilled and unskilled) employed to work on this contract. The information required is:

- Initials (per ID doc)
- Last Name (per ID doc)
- ID Number
- Disability (y / n)
- Education Level

Level 1 Unknown	**Level 2** No Schooling	**Level 3** Grade 1-3	**Level 4** Grade 4	**Level 5** Grade 5-6
Level 6 Grade 7-8	**Level 7** Grade 9	**Level 8** Grade 10-11	**Level 9** Grade 12	**Level 10** Post Matric

- Category of Employment

Category A: Employed as Local Labour for this contract only
Category B: Temporarily employed by the Contractor
Category C: Permanently employed by the Contractor

In addition, the following information is required in respect of each person listed above, on a monthly basis:

- Number of days worked during the month;
- Daily wage rate;
- Number of training days during the month.

The information is to be forwarded in a format acceptable to the Employer's Agent's Representative, but preferably in the form of an emailed EXCEL file (an original file, to be used as a template, will be issued to the Contractor). Contractors without computer facilities will be required to submit a hard copy of the information in a format as agreed to between the Contractor and the Employer's Agent's Representative.

In addition to the tax invoice, to be submitted by the Contractor with his monthly statement, mentioned in Clause 6.10.4 of GCC 2015, the Employer reserves the right to withhold payment until the monthly FTE information has been forwarded to the Employer's Agent's Representative. No additional payment for complying with the above will be made and the Contractor is to make allowance for complying through the time related P & G items (sum) under Part AA: Preliminaries, of the Bill of Quantities.

C1.2.3.5 PERFORMANCE MONITORING OF SERVICE PROVIDERS

[For contract awards over R10m] The Contractor shall be subjected to "Performance Monitoring" assessments in terms of the applicable Section (S.53) of the Employer's Supply Chain Management Policy.

Key Performance Indicators (KPIs) are specified in the C3: Scope of Works, or will be discussed and agreed with the Contractor before commencement of the contract.

C1.2.3.6 EXCEPTED RISKS (Clause 8.3)

Pursuant to Clause 8.3 of the Conditions of Contract (GCC 2015), the Employer shall not be liable for the payment of standing time costs as a result of the occurrence of any of the "Excepted Risks" as defined under Clause 8.3.

However, the Employer shall reimburse the Contractor in respect of plant de-establishment and re-establishment costs as a result of "Excepted risks" when a written instruction to de-establish is issued to the Contractor.

C1.2.3.7 CIDB B.U.I.L.D. PROGRAMME

a) CIDB Skills Standard

It will be a condition of contract that the Contractor shall, in the performance of the contract, achieve the **Contract Skills Development Goal** (CSDG) established in the below referenced standard:

- CIDB Standard for Developing Skills Through Infrastructure Contracts, published in Gazette Notice No. 48491 of 28 April 2023.

b) CIDB Indirect Targeting Standard

It will be a condition of contract that the Contractor shall, in the performance of the contract, achieve the **Contract Participation Goal** (CPG) relating to the engagement of targeted enterprises as established in the below referenced standard:

- CIDB Standard for Indirect Targeting for Enterprise Development through Construction Works Contracts, published in Gazette Notice No. 36190 of 25 February 2013.

C1.2.3.8 Damages

Any liability on the contractor for damages or consequential damages, including but not limited to those arising from design defects, omissions, or negligence, shall be limited to the greater of either:
(a) the value of the required liability insurance specified, or
(b) the value of the damage suffered

C1.2.3.9 DURATION OF RESPONSIBILITY OF THE CONTRACTOR

The Contractor shall be entirely responsible for the security and safe keeping of all the plant and equipment supplied on the contract up until the date of the Handing Over Certificate. Thereafter the Contractor's responsibilities will be restricted to fulfilling the conditions necessary for the issue of a Completion Certificate as well as the obligations in terms of the Guarantee/Warranty subject to any qualifications stated in the Handing Over Certificate.
The dates of the various stages of acceptance by the Municipality of the works will be recorded on certificates signed by the Engineer and these dates will take precedence over any previously agreed or accepted dates for the purpose of administration of the contract. Copies of the certificates will be sent to the Contractor who will sign the certificates.

C1.2.3.10 HANDING OVER CERTIFICATES

Handing Over Certificates will record the date on which all or any part of the plant and equipment supplied on this contract is handed over by the Contractor to the Employer in a safe and satisfactory condition for energising and commercial operation irrespective of whether or not such plant and equipment is complete in every detail as called for in the specification. The Handing Over Certificate may be issued in advance of the Certificate of Completion and on any one contract more than one Handing Over Certificate may be issued.

C1.2.3.11 COMPLETION CERTIFICATE

A completion certificate shall record the date on which the Contractor has fulfilled their obligation to supply, deliver, erect and test all the equipment called for in the specification to the satisfaction of the Engineer. This will be the date of the commencement of the guarantee / warranty and maintenance periods.

C1.2.3.12 HANDLING FEE ON MATERIALS OR SERVICES REQUIRED BUT NOT LISTED IN THE BILL OF QUANTITIES

There shall be a handling fee paid to the Contractor for any form of variation services or materials required by the Engineer that is to be undertaken by a sub-contractor.
On values ≤ R100 000,00 the handling fee shall not exceed 10%
On values between R100 000,00 and R200 000,00 the handling fee shall not exceed 7.5%
On values ≥ R200 000,00 the handling fee shall not exceed 5%
The variation order shall be approved by the Engineer and issued to the Contractor in writing before any work is undertaken or materials supplied.

C1.2.3.13 OVERTIME

Under certain conditions the Contractor shall be required to work outside of normal working hours (weekends, public holidays and 18h00 to 06h00 on weekdays).
Before any work is undertaken outside of normal working hours, the Contractor shall obtain permission from the Engineer in writing.
The Contractor shall be reimbursed for the hours worked at the hourly labour rates submitted in the bill of quantities. The hourly rate of pay for each member of staff on duty shall be 0.5 times the unit labour rate for weekday night work and Saturdays and the full unit labour rate for work on Sundays and Public holidays.
The type and number of labour resources required shall be approved by the Engineer prior to commencement of the work.

C1.2.3.14 SUPERVISION IN LIVE SUBSTATIONS

For each team working in a live substation, the Contractor shall ensure that at least one of the team or a supervisor completes the eThekwini Safety Rules training programme to become competent to enter and work within substations. Upon passing a two-day Safety Rules course the candidates will be required to compile a portfolio of evidence for a period of 3 months and thereafter undergo a site assessment. After successfully completing the site assessment the candidate will receive a card for access into substations. No work within a live substation will be permitted without the presence of such competent person. The cost of the training shall be borne by the Contractor and shall be undertaken within 3 months of the contract award. The cost of the course is currently R 1000 and is subject to change without consultation.

C1.2.3.15 NATIONAL KEY POINTS (NKPs)

EThekwini Municipality has substations which are protected by the NKP Act and compliance with the Act and associated regulations is compulsory. Access to such sites shall be as per the requirements of the Act and this shall apply to all entering the sites regardless of the reason for entry or affiliation

C2.1: PRICING ASSUMPTIONS / INSTRUCTIONS

C2.1.1 GENERAL

The Bill of Quantities forms part of the Contract Documents and must be read and priced in conjunction with all the other documents comprising the Contract Documents (refer to F.1.2 of the Tender Data).

C2.1.2 PRICING INSTRUCTIONS AND DESCRIPTION OF ITEMS IN THE SCHEDULE

The quantities given in the Bill of Quantities are estimates only, and subject to re-measuring during the execution of the work. The Contractor shall obtain the Employer's Agent's detailed instructions for all work before ordering any materials or executing work or making arrangements for it.

The Works as finally completed in accordance with the Contract shall be measured and paid for as specified in the Bill of Quantities and in accordance with the General and Special Conditions of Contract, the Specifications and Project Specifications and the Drawings. Unless otherwise stated, items are measured net in accordance with the Drawings, and no allowance has been made for waste.

The validity of the contract will in no way be affected by differences between the quantities in the Bill of Quantities and the quantities finally certified for payment.

C2.1.3 QUANTITIES REFLECTED IN THE SCHEDULE

The prices and rates to be inserted by the Tenderer in the Bill of Quantities shall be the full inclusive prices to be paid by the Employer for the work described under the several items, and shall include full compensation for all costs and expenses that may be required in and for the completion and maintenance during the defects liability period of all the work described and as shown on the drawings as well as all overheads, profits, incidentals and the cost of all general risks, liabilities and obligations set forth or implied in the documents on which the Tender is based.

C2.1.4 The prices and rates to be inserted by the Tenderer in the Bill of Quantities shall be the full inclusive prices to be paid by the Employer for the work described under the several items, and shall include full compensation for all costs and expenses that may be required in and for the completion and maintenance during the defects liability period of all the work described and as shown on the drawings as well as all overheads, profits, incidentals and the cost of all general risks, liabilities and obligations set forth or implied in the documents on which the Tender is based.

C2.1.5 Each item shall be priced and extended to the "Total" column by the Tenderer, with the exception of the items for which only rates are required (Rate Only). If the Contractor omits to price any items in the Bill of Quantities, then these items will be considered to have a nil rate or price.

C2.1.6 All items for which terminology such as "inclusive" or "not applicable" have been added by the Tenderer will be regarded as having a nil rate which shall be valid irrespective of any change in quantities during the execution of the Contract.

C2.1.7 All rates and amounts quoted in the Bill of Quantities shall be in Rands and Cents and shall include all levies and taxes (other than VAT). VAT will be added in the Summary of the Bill of Quantities.

C2.1.8 "Rate Only" items:

The Tenderer shall fill in rates for all items where the words "Rate Only" appear in the "Total" column. "Rate Only" items have been included where:

(a) an alternative item or material is contemplated;

(b) variations of specified components in the make-up of a pay item may be expected; and

(c) no work under the item is foreseen at tender stage but the possibility that such work may be required is not excluded.

For "Rate Only" items no quantities are given in the "Quantity" column but the quoted rate shall apply in the event of work under this item being required. The Tenderer shall however note that in terms of the Tender Data the Tenderer may be asked to reconsider any such rates which the Employer may regard as unbalanced.

C2.1.9 The items described in "Outline Description" shall include all the accessories in terms of the Technical Specification, i.e. grouting bolts, fixing bolts, terminal connecting clamps, etc.

C2.1.10 The installation work described in "Outline

Description" shall include all work necessary for the successful completion of the installation as detailed in the Technical Specification and Section C3.2 (System Parameters and Particulars of Equipment Required).

C2.1.10 The Tenderer shall not adjust any of the estimated quantities in column 4 of the Bill of Quantities.

C2.1.11 All site establishment and Preliminary and General Contractor's expenses incurred in complying with the requirements of the tender document shall be included in the equipment installation rates.

C2.1.12 Where existing switchgear is being replaced the new switchgear may be required to be installed in phases, due to network constraints.

C2.1.13 Secondary cables, glands, lugs, ferrules, tape etc. may be supplied as part of this Contract. Secondary cables are re-measurable on site and will only be paid for the amount of secondary cables used. The contractor shall be responsible for managing the cable orders and excess for each project accordingly.

C2.1.14 Labour rates shall be used only for additional work and shall be upon approval by the Engineer.

C2.1.15 It is a condition of payment by the Municipality to registered VAT vendors that no payment for goods/services supplied shall be processed unless a tax invoice (complying with the requirements of Section 20 of the Value-Added Tax Act, 1991) is received from the supplier.

C2.1.16 Payment for Materials shall be made as follows:

1) 90% of the material price on delivery to site
2) 10% of the material price one month after the date of Handing Over
3) Delivery, erection and testing costs shall be paid for as the work proceeds and as certified by the Engineer's representative.

C2.1.17 Rate of Exchange:

Where the goods are imported the Contractor shall within seven days of date of Official Purchase Order, arrange through his bankers for the foreign commitment to be covered forward down to the Rand in order to fix the rate of exchange. The Contractor shall ensure that the forward cover is directly arranged with a reputable bank and not any other internal arrangement. The Contractor shall notify the Municipality as soon as possible thereafter regarding the rate which has been fixed on such forward exchange. The forward cover shall be from a reputable South African bank. The Contractor is to confirm with the employer prior to placing forward cover if the service provider is acceptable.

Where the contract is for the supply of an indefinite quantity of goods/services over a fixed period, the requirement to arrange forward cover in respect of variations in the rate of exchange within 7 days shall be applied to the notification of each order rather than notification of acceptance of tender. Any increase or decrease between the basic rate of exchange as at 12:00 on the date of advertisement of the bid and that existing at the date of establishment of the forward exchange cover within the period stipulated above shall be paid or deducted by the Municipality. Upon the failure of the Contractor to arrange forward exchange cover, the Contractor shall be liable should there be an increase in the basic rate of exchange occurring after the last mentioned date.

The bank charges incurred in obtaining the forward exchange cover shall be for the Municipality's account.

The Contractor shall on request:

(i) submit documentary proof of the exchange,
(ii) when an adjustment is claimed in terms of this sub-clause, whether by the Contractor or the Municipality, submit documentary proof to the satisfaction of the Municipality in respect of such claim.

C2.1.18 Freight, Duty, Landing Charges:

Where the Goods or Materials to be supplied have to be imported, the bidder shall, notwithstanding anything to the contrary contained in the General Conditions of Contract, base their tender on the duty and landing charges ruling as at the date fourteen days prior to the closing date of tenders and tenderers shall state such freight rates, duty and landing charges in the Bid. No claim by the Contractor for an adjustment will be entertained unless the details required by this Clause are included with their bid.

Where freight rates actually paid by the Contractor are higher or lower than the rates upon which the contract price was based then any difference between the freight rates upon which the tender was based and the

freight rates actually paid by the Contractor shall be paid or deducted by the Municipality, as the case may be.

Where the rates of duty or landing charges are varied between the date of bid and the date of clearing, any increase or decrease in the rates ruling at the date of tender, shall be paid or deducted by the Municipality.

The Contractor shall on request:
(i) submit documentary proof of the freight rates, duty and landing charges paid by him and,
(ii) when an adjustment is claimed in terms of this sub-clause, whether by the Contractor or the Municipality, submit documentary proof to the satisfaction of the Municipality in respect of such claim.

C2.1.19 Contract Price Adjustment:

This clause shall take precedence over all other clauses with respect to price adjustments. Should the bid prices be subject to contract price adjustments during the contract, such as for labour and for raw materials, the bid shall include details for calculating above adjustments in accordance with an industrially recognised contract price adjustment formula, such as that of Steel and Engineering Industries Federation of South Africa (SEIFSA).

a) Where SEIFSA indices cannot be applied, bidders shall submit details of alternative formulae for approval.
b) Where SEIFSA indices are used, the base indices shall be those published one month prior to month of bid closing.
c) Where the base index is defined as that last published, the date of the index shall not be more than four months prior to the month of bid closing.
d) Adjustments for Supply and Delivery shall be based on the index at least two months prior to the date the goods are ready for despatch in the case of the Consumer Price Index, Material or Labour adjustments and at least four months prior to despatch in the case of copper price adjustment.
e) Adjustments for Site Erection shall be based on the index for the month which is one month prior to the contractual completion of erection.
f) The calculation of contract price adjustment shall not be applied to more than 90% of the contract value.
g) Price adjustment claims shall be submitted within 120 days from date of each delivery or service and shall be accompanied by calculations showing how the adjustments were arrived at. Claims submitted after the stipulated 120 days will not be considered.

C2.1.20 & Order Quantities:

Bidders shall not bind the Employer to any minimum quantity within this Contract. The successful Bidder shall be bound to supply whatever quantities the Employer may actually require during the period of the contract, irrespective of the extent to which the total quantities ordered may be in excess of or below the estimated quantity for the period of performance described in the Contract Data.

C2.1.21 Address for Springfield Depot

(Within a 35 km radius):
Springfield Depot
11 Electron Road,
Springfield,
Durban,
4051
.

C2.2: BILL OF QUANTITIES

The Bill of Quantities follows and comprises of 23 pages. The pages are numbered 135 to 158.

Notes:

1. The items described in the outline shall include all the accessories required in terms of the technical specification. “Estimated Quantities” in this schedule refers to the quantity of each item to be used for adjudication purposes only. Total orders placed can be less or more than the estimated quantities in this Schedule.

2. The erection work outline shall include all preparation work, testing, etc. as detailed in the General Technical Specifications and in Part C3.1.1.

3. Tender prices submitted in Columns 1, 2, 3, 5 and 6 are to be exclusive of Value Added Tax. VAT is to be included in the Form of Offer.

4. All site establishment and P and G’s shall be included in the equipment installation rates.

5. Site re-establishment cost can only be claimed if the contractor has left the eThekwini Municipal area (upon agreement with employer) due to insufficient amount of work available, network constraints and returns to complete the outstanding works, subject to the approval of the Engineer.

6. Secondary cable, glands, lugs, ferrules, tape, etc shall be supplied by the Contractor. Secondary cable is re-measurable on site and shall be paid on the amount installed.

7. Holding down bolts shall be priced per set and shall include pricing of the templates required during the civil construction phase.

8. Where the contractor is required to work overtime, Saturdays and Sundays due to network constraints, etc the contractor shall claim for the work performed as per the BOQ plus:
    a. 0,5 times the unit installation rate for work performed overtime and Saturdays and
    b. 1 times the unit installation rate for work performed on Sundays and Public holidays.

9. There shall be a handling fee paid to the Principal Contractor for any form of variation work performed by a subcontractor which is not in the BOQ. The handling fee shall be:
    a. 10 % handling fee for work less than R 100 000.
    b. 7,5 % handling fee for work between R 101 000 – R 200 000.
    c. 5 % handling fee for work in excess of R 200 000.

C2.2 BILL OF QUANTITIES
SECTION 1 SUPPLY, DELIVERY, INSTALLATION AND TESTING OF OUTDOOR 132 kV AND 275 kV SWITCHGEAR AND ASSOCIATED EQUIPMENT

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		1	2	3	4	5	6	7
ITEM	**OUTLINE DESCRIPTION**	**UNIT SUPPLY PRICE (EXCL. VAT)**			**UNIT INSTALL.& SITE TESTING**	**EST. QTY.**	**TOTAL SUPPLY & DELIVERY PRICE (Excl. VAT) Cols. 3 × 5**	**TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5**
		F.O.B VALUE (SA CURRENCY)	**BALANCE (SA CURRENCY)**	**TOTAL (SA CURRENCY)**				
1.0	(a) 132 kV, 3 150 A three phase CIRCUIT BREAKER (b) Support structure (c) Hold-down bolts set & template					50 50 50		
2.0	(a) 132 kV, 3 150 A three phase DISCONNECTING CIRCUIT BREAKER (b) Support structure (c) Hold-down bolts set & template					30 30 30		
3.1	(a) 132 kV, 3 150 A three phase CAPACITOR BANK CIRCUIT BREAKER with point on wave switching (b) Control panel (c) Support structure (d) Hold-down bolts set & template					2 2 2 2		
3.2	(a) 132 kV, 3 150 A 3 x single phase set CAPACITOR BANK CIRCUIT BREAKER with point on wave switching (b) Control panel (c) Support structure (d) Hold-down bolts set & template					2 2 2 2		
4.0	(a) 132 kV, 1 600 A three phase hand operated ISOLATOR (b) Support structure (c) Hold-down bolts set & template					45 45 45		
5.0	(a) 132 kV, 3 150 A three phase hand operated ISOLATOR (b) Support structure (c) Hold-down bolts set & template					25 25 25		
6.1	(a) 132 kV, 1 600 A three phase MOTORISED ISOLATOR (b) Support structure (c) Hold-down bolts set & template					2 2 2		
6.2	(a) 132 kV, 3 150 A three phase MOTORISED ISOLATOR (b) Support structure (c) Hold-down bolts set & template					10 10 10		
						TOTAL CARRIED FORWARD		

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL.& SITE TESTING	EST. QTY.	TOTAL SUPPLY & DELIVERY PRICE (Excl. VAT) Cols. 3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
7.1	132 kV three phase hand operated EARTH SWITCH mounted on isolator structure including integral interlocking with associated isolator					55		
7.2	(a) 132 kV single phase hand operated EARTH SWITCH (b) Support structure (c) Hold-down bolts set & template					6 6 6		
8.1	(a) 132 kV, 1 600 A three phase "STAGGERED GANG LINKED" ISOLATOR (b) Support structure (c) Hold-down bolts set & template					15 15 15		
8.2	(a) 132 kV, 3 150 A three phase "STAGGERED GANG LINKED" ISOLATOR (b) Support structure (c) Hold-down bolts set & template					3 3 3		
9.0	(a) 132 kV single phase VOLTAGE TRANSFORMER (b) Support structure (c) Hold-down bolts set & template					27 27 27		
10.0	(a) 132 kV single phase CURRENT TRANSFORMER FOR FEEDER (b) Support structure (c) Hold-down bolts set & template					75 75 75		
11.0	(a) 132 kV single phase CURRENT TRANSFORMER FOR BUS SECTION/BUS COUPLER (b) Support structure (c) Hold-down bolts set & template					42 42 42		
	TOTAL CARRIED FORWARD							
		1	2	3	4	5	6	7

ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL. & SITE TESTING	EST. QTY.	TOTAL SUPPLY AND DELIVERY PRICE (Excl. VAT) Cols. 3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
12.0	(a) (i) 132 kV POST INSULATOR, mounted on (ii) Single phase 3 m high support structure (iii) Hold-down bolts set & template					6 6 6		
	(b) (i) 132 kV POST INSULATOR, mounted on (ii) Single phase 4,5 m high support structure (iii) Hold-down bolts set & template					12 12 12		
	(c) (i) 132 kV POST INSULATOR, mounted on (ii) Single phase 6,5 m high support structure (iii) Hold-down bolts set & template					20 20 20		
	(d) (i) Three phase 132 kV POST INSULATOR SET (ii) Three phase 3 m high support structure (iii) Hold-down bolts set & template					6 6 6		
	(e) (i) Three phase 132 kV POST INSULATOR SET (ii) Three phase 4,5 m high support structure (iii) Hold-down bolts set & template					12 12 12		
	TOTAL CARRIED FORWARD							

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL.& SITE TESTING	EST. QTY.	TOTAL SUPPLY & DELIVERY PRICE (Excl. VAT) Cols. 3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
12.0	(f) (i) Three phase 132 kV POST INSULATOR SET (ii) Three phase 6,5 m high support structure (iii) Hold-down bolts set & template					21 21 21		
13.0	(a) (i) 132 kV SURGE ARRESTER (ii) Single phase support structure (iii) Hold-down bolts set and template					72 72 72		
	(b) (i) 132 kV Three phase SURGE ARRESTER SET (ii) Support bracket for mounting onto transformer					15 15		
14.0	(a) (i) 132 kV 3 150 A overhead and cable fed compact switchgear consisting of CB, Isol, CTs, VT & ES (ii) Support structure (iii) Hold-down bolts set & template					1 1 1		
	(b) (i) 132 kV 3 150 A overhead fed compact switchgear consisting of CB, Isol, CTs, VT & ES (ii) Support structure (iii) Hold-down bolts set & template					1 1 1		
15.0	(a) 8 m high steel lattice GANTRY COLUMN complete with hold down bolts set and template					2		
	(b) 9 m high steel lattice GANTRY COLUMN complete with hold-down bolts set and template					6		
	(c) 10 m high steel lattice GANTRY COLUMN complete with hold-down bolts set and template					30		
	TOTAL CARRIED FORWARD							

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL& SITE TESTING	EST. QTY.	TOTAL SUPPLY & DELIVERY PRICE (Excl. VAT) Cols. 3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
15.0	(d) 11 m high steel lattice GANTRY COLUMN complete with hold-down bolts set and template					21		
	(e) 12 m high steel lattice GANTRY COLUMN complete with hold-down bolts set and template					6		
	(f) 10 m wide steel lattice GANTRY BEAM					9		
	(g) 11 m wide steel lattice GANTRY BEAM					18		
	(h) 12 m wide steel lattice GANTRY BEAM					21		
	(i) 4 m high steel lattice GANTRY EARTH PEAK with 3 m high extension mast					90		
16.0	(a) 18 m high LIGHTNING MAST complete with hold down bolts set and template					10		
	(b) 21 m high LIGHTNING MAST complete with hold down bolts set and template					1		
17.0	(a) 132 kV INSULATOR SET for connecting single Centipede conductor to gantry structure including all fittings between conductor and gantry					12		
	(b)132 kV INSULATOR SET for connecting twin Centipede conductor to gantry structure including all fittings between conductor and gantry					12		

	TOTAL CARRIED FORWARD							
		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL& SITE TESTING	EST. QTY.	TOTAL SUPPLY AND DELIVERY PRICE (Excl. VAT) Cols. 3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
17.0	(c) 132 kV INSULATOR SET for connecting single Bull conductor to gantry structure including all fittings between conductor and gantry					18		
	(d) 132 kV INSULATOR SET for connecting twin Bull conductor to gantry structure including all fittings between conductor and gantry					18		
18.0	(a) Centipede stranded conductor					3 500 m		
	(b) Bull stranded conductor					9 000 m		
19.0	(a) 80 mm Aluminium TUBULAR CONDUCTOR					500 m		
	(b) 100 mm Aluminium TUBULAR CONDUCTOR					100 m		
	(c) 120 mm Aluminium TUBULAR CONDUCTOR					100 m		
	(d) DAMPING CONDUCTOR for 80/100/120 mm tubular conductor					300 m		
	(e) BENDING CONDUCTOR for 80 mm or 100 mm tubular conductor (per bend)					50		
	(f) 80 mm Aluminium TUBULAR CONDUCTOR ENDCAP					100		
	(g) 100 mm Aluminium TUBULAR CONDUCTOR ENDCAP					25		
	(h) 120 mm Aluminium TUBULAR CONDUCTOR ENDCAP					25		
	(i) WELDING together of 80/100 or 120 mm tubular conductor					50		

	TOTAL CARRIED FORWARD							

		1	2	3	4	5	6	7
ITEM	**OUTLINE DESCRIPTION**	**UNIT SUPPLY PRICE (EXCL. VAT)**			**UNIT INSTALL& SITE TESTING**	**EST. QTY.**	**TOTAL SUPPLY & DELIVERY PRICE (Excl. VAT) Cols. 3 × 5**	**TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5**
		F.O.B VALUE (SA CURRENCY)	**BALANCE (SA CURRENCY)**	**TOTAL (SA CURRENCY)**				
	TOTAL BROUGHT FORWARD							
20.0	CONNECTING CLAMP for connecting circuit breaker to: (a) Single Centipede conductor					175		
	(a) Twin Centipede conductor					45		
	(b) Single Bull conductor					100		
	(c) Twin Bull conductor					15		
	(d) 80 mm tubular conductor (non-expansion)					5		
	(e) 100 mm tubular conductor (non-expansion)					5		
	(f) 80 mm tubular conductor (expansion)					5		
	(g) 100 mm tubular conductor (expansion)					5		
21.0	CONNECTING CLAMP for connecting isolator to: (a) Single Centipede conductor					150		
	(b) Twin Centipede conductor					115		
	(c) Single Bull conductor					95		
	(d) Twin Bull conductor					15		
	(e) 80 mm tubular conductor (non-expansion)					5		
	(f) 100 mm tubular conductor (non-expansion)					5		
	(g) 120 mm tubular conductor (non-expansion)					5		
	TOTAL CARRIED FORWARD							

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL.& SITE TESTING	EST. QTY.	TOTAL SUPPLY & DELIVERY PRICE (Excl. VAT) Cols. 3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
21.0	(h) 80 mm tubular conductor (expansion)					5		
	(i) 100 mm tubular conductor (expansion)					5		
	(j) 120 mm tubular conductor (expansion)					5		
22.0	CONNECTING CLAMP for connecting voltage transformer to Centipede conductor					25		
23.0	CONNECTING CLAMP for connecting current transformer to: (a) Single Centipede conductor					70		
	(b) Twin Centipede conductor					50		
	(c) Single Bull conductor					200		
	(d) Twin Bull conductor					5		
24.0	CONNECTING CLAMP for connecting post isolator to: (a) Single Centipede conductor					25		
	(b) Twin Centipede conductor					10		
	(c) Single Bull conductor					5		
	(d) Twin Bull conductor					5		
	(e) 80 mm tubular conductor (sliding)					1		
	(f) 80 mm tubular conductor (in-line expansion)					1		
	(g) 80 mm tubular conductor (fixed)					1		
	(h) 100 mm tubular conductor (sliding)					1		
	(i) 100 mm tubular conductor (in-line expansion)					1		
	TOTAL CARRIED FORWARD							

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL.& SITE TESTING	EST. QTY.	TOTAL SUPPLY & DELIVERY PRICE (Excl. VAT) Cols. 3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
24.0	(j) 100 mm tubular conductor (fixed)					1		
	(k) 120 mm tubular conductor (sliding)					1		
	(l) 120 mm tubular conductor (in-line expansion)					1		
	(m) 120 mm tubular conductor (fixed)					1		
25.0	CONNECTING CLAMP for connecting surge arrester to centipede conductor					80		
26.0	CONNECTING CLAMP for connecting single Centipede conductor to: (a) Single Centipede conductor (run and tap)					50		
	(b) Twin Centipede conductor (Y-type)					15		
	(c) Single Bull conductor (run & tap)					50		
	(d) Twin Bull conductor (Y-type)					10		
	(e) 80 mm tubular cond.					1		
	(f) 100 mm tubular cond.					1		
	(g) 120 mm tubular cond.					1		
27.0	CONNECTING CLAMP for connecting single Bull conductor to: (a) Single Centipede conductor (run and tap)					12		
	(b) Twin Centipede conductor (Y-type)					12		
	(c) Twin Bull conductor (Y-type)					12		
	(d) 80 mm tubular conductor					12		
	TOTAL CARRIED FORWARD							

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	NIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTAL. & SITE TESTING	EST. QTY.	TOTAL SUPPLY & DELIVERY PRICE (Excl. VAT) Cols.3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
27.0	(e) 100 mm tubular conductor					12		
	(f) 120 mm tubular conductor					12		
28.0	(a) CONNECTING CLAMP for connecting 80 mm tubular conductor to 100 mm tubular conductor					12		
	(b) CONNECTING CLAMP for connecting 100 mm tubular conductor to 100 mm tubular conductor					12		
	(c) CONNECTING CLAMP for connecting 80 mm tubular conductor to 100 mm tubular conductor					12		
29.0	(a) CONNECTING CLAMP for connecting 40 mm dia. stem of cable sealing end to Bull conductor					15		
	(b) CONNECTING CLAMP for connecting 40 mm dia. stem of cable sealing end to twin Centipede conductor					15		
	(c) CONNECTING CLAMP for connecting 60 mm dia. stem of cable sealing end to Bull conductor					15		
	(d) CONNECTING CLAMP for connecting 60 mm dia. stem of cable sealing end to twin Centipede conductor					15		
	TOTAL CARRIED FORWARD							

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL. & SITE TESTING	EST. QTY.	TOTAL SUPPLY & DELIVERY PRICE (Excl. VAT) Cols.3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
30.0	(a) CONNECTING CLAMP for connecting 26 mm dia. transformer stem to Centipede con					20		
	(b) CONNECTING CLAMP for connecting 26 mm dia. transformer stem to 80 mm tubular conductor					15		
31.0	(a) CONNECTING CLAMP for connecting single Elm conductor to single Centipede conductor					5		
	(b) CONNECTING CLAMP for connecting twin Elm conductor (spacing 380 mm) to single Bull Conductor					5		
	(c) CONNECTING CLAMP for connecting single Elm conductor to single Bull conductor					5		
32.0	(a) CONDUCTOR SPACER for twin Centipede conductor (150 mm spacing)					100		
	(b) CONDUCTOR SPACER for twin Bu (150 mm spacing)					100		
33.0	(a) AAAC PINE CONDUCTOR for lightning shielding					100 m		
	(b) FITTINGS for attaching Pine conductor to gantry earth peak					10		
	TOTAL CARRIED FORWARD							

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL. & SITE TESTING	EST. QTY.	TOTAL SUPPLY & DELIVERY PRICE (Excl. VAT) Cols.3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
34.0	(a) MARSHALLING KIOSK					35		
	(b) Addition of further 50 TERMINALS to marshalling kiosk					5		
	(c) Addition of PLUG IN CT TEST BLOCK to marshalling kiosk					5		
35.0	(a) EQUIPMENT LABEL					500		
	(b) WARNING / INSTRUCTION LABEL					250		
	(c) GANTRY LABEL					200		
	(d) PHASE DISK					300		
36.0	(a)Intelligent Key Cabinet Controller					10		
	(b)Intelligent Key Cabinet (Expansion)					30		
	(c)Row Expansion Module with key tracking and locking					45		
	(d)Base Station Software					1		
37.0	(a) 132 kV Circuit breaker KEY INTERLOCK facility					5		
	(b) 132 kV Isolator KEY INTERLOCK facility					5		
	(c) 132 kV Isolator MAG-BOLT INTERLOCK facility					65		
	TOTAL CARRIED FORWARD							

		1	2	3	4	5	6	7
ITEM	**OUTLINE DESCRIPTION**	**UNIT SUPPLY PRICE (EXCL. VAT)**			**UNIT INSTALL. & SITE TESTING**	**EST. QTY.**	**TOTAL SUPPLY & DELIVERY PRICE (Excl. VAT) Cols.3 × 5**	**TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5**
		F.O.B VALUE (SA CURRENCY)	**BALANCE (SA CURRENCY)**	**TOTAL (SA CURRENCY)**				
	TOTAL BROUGHT FORWARD							
37.0	(d) 132 kV Earth switch KEY INTERLOCK facility					10		
	(e) 132kV Earth switch MAG-BOLT INTERLOCK facility					15		
38.0	SECONDARY CABLE supply and laying* (rate per meter) (**See note 6 on Page 134**) (a) 4 core 16 mm^2					500 m		
	(b) 12 core 1,5 mm^2					500 m		
	(c) 24 core 1,5 mm^2					500 m		
	(d) 2 core 2,5 mm^2					500 m		
	(e) 4 core 4 mm^2					500 m		
	(f) 4 core 6 mm^2					500 m		
	(g) 7 core 2,5 mm^2					500 m		
	(h) 19 core 2,5 mm^2					500 m		
	(i) 4 core 2,5 mm^2					500 m		
	(j) 14 core 2,5 mm^2					500 m		
39.0	SECONDARY CABLE TERMINATION (rate per end) (**See Note 6 on Pg134**) (a) 4 core 16 mm^2 or 4 mm^2 or 6 mm^2 or 2,5 mm^2					100 ends		
	(b) 2 core 2,5 mm^2					100 ends		
	(c) 24 core 1,5 mm^2					100 ends		
	(d) 19 core 2,5 mm^2					100 ends		
	TOTAL CARRIED FORWARD							

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL. & SITE TESTING	EST. QTY.	TOTAL SUPPLY & DELIVERY PRICE (Excl. VAT) Cols.3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
40.0	Trenching and backfilling for secondary cabling and Earthing (hand pickable soil) (L × 0,3 m width × 0,5 m depth)					4000 m³		
41.0	(a) EARTH ELECTRODE					100		
	(b) 150 mm² cross-sectional area (50 mm x 3 mm) flat copper for main earth mesh and subsidiary earth connections					10 000 m		
	(c) 10 mm² round annealed copper rod					6 000 m		
	(d) 300 mm² cross-sectional area copper (50 mm x 6 mm) for transformer HV neutral connections to main earth mesh					300 m		
	(e) Equipment earth bolted connections using copper-clad steel equivalent to 150 mm² flat copper/ 10 mm² annealed copper					1500		
	(f) Brazed connections (copper to copper)					1000		
	(g) Bolted connection onto structure					1 000		
TOTAL CARRIED FORWARD								

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL. & SITE TESTING	EST. QTY.	TOTAL SUPPLY& DELIVERY PRICE (Excl. VAT) Cols.3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
41.0	(h) 70 mm^2 insulated stranded copper conductor					1 000 m		
	(i) Connecting of 70 mm^2 conductor to main earth mesh or equipment					300		
	(j) Tinned terminations (fence earth connection)					400		
	(k) Copper-clad steel equivalent to 70 mm^2 cross-sectional area copper					1 000 m		
	(m) Copper-clad steel equivalent to 150 mm^2 cross-sectional area copper					10 000 m		
	(n) Copper-clad steel equivalent to 300 mm^2 cross-sectional area copper					300 m		
42.0	ADAPTOR STRUCTURE for mounting 132 kV Circuit Breaker onto existing concrete base/s					1		
43.0	ADAPTOR STRUCTURE for mounting 132 kV Isolator onto existing concrete base/s					1		
44.1	Casting and installation of new concrete bases for (if required): (a) 132 kV Circuit Breaker (b) 132 kV Isolator (c) 132 kV Post Insulator (d) 132 kV Surge Arrester (e) 132 kV Current transformer (f) 132 kV Voltage transformer (g) 132kV Gantry Column					1 1 1 1 1 1 1		
	TOTAL CARRIED FORWARD							

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL.& SITE TESTING	EST. QTY.	TOTAL SUPPLY AND DELIVERY PRICE (Excl. VAT) Cols.3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
44.2	Casting and installation of new concrete bases for (if required): (a) 275 kV Circuit Breaker (b) 275 kV Isolator (c) 275 kV Post Insulator (d) 275 kV Surge Arrester (e) 275 kV Current transformer (f) 275 kV Voltage transformer (g) 275 kV Gantry Column					1 1 1 1 1 1 1		
45.0	Cutting of existing redundant concrete bases to ground level for: (a) 132/275 kV Circuit Breaker (b) 132/275 kV Isolator (c) 132/275 kV Surge Arrester (d) 132/275 kV Current transformer (e) 132/275 kV Voltage transformer (f) 132/275 kV Gantry column					1 1 1 1 1 1		
46.0	Chemical Anchor Bolt installed (a) M36, 1 000 mm for gantry (b) M20, 260 mm for equipm support structure (c) M8, 260 mm for equipment support structure (d) M10, 260 mm for equipment support structure (e) M12, 260 mm for equipment support structure (f) M27, 350 mm for equipment support structure					1 1 1 1 1 1		
	TOTAL CARRIED FORWARD							

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALLATION & SITE TESTING	EST. QTY.	TOTAL SUPPLY AND DELIVERY PRICE (Excl. VAT) Cols.3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
47.0	(a) DISMANTLING of existing Circuit Breaker including transport approx. 30 km for scrapping.					1		
	(b) DISMANTLING of existing Isolator including transport approx. 30 km for scrapping.					1		
	(c) DISMANTLING of existing gantry structure including transport approx. 30 km for scrapping.					1		
	(d) DISMANTLING of existing CT, including support and transporting approx. 30 km for scrapping.					1		
	(e) DISMANTLING of existing single phase post insulator or SA including support and transport approx. 30 km for scrapping.					1		
	(f) DISMANTLING of existing single phase VT and support, including transport approx. 30 km for scrapping.					1		
	(g) DISMANTLING of existing ABB COMPASS bay at Quarry Substation, including transport approx. 30 km for scrapping.					8		
	TOTAL CARRIED FORWARD							

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL. & SITE TESTING	EST. QTY.	TOTAL SUPPLY AND DELIVERY PRICE (Excl. VAT) Cols. 3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
48.0	(a) 275 kV, 3 150 A three phase CIRCUIT BREAKER (b) Support structure (c) Hold-down bolts set & template					5 5 5		
49.0	(a) 275 kV, 3 150 A three phase DISCONNECTING CIRCUIT BREAKER (b) Support structure (c) Hold-down bolts set & template					6 6 6		
50.0	(a) 275 kV, 1 600 A three phase HAND-OPERATED ISOLATOR (b) Support structure (c) Hold-down bolts set & template					2 2 2		
51.0	(a) 275 kV, 1 600 A three phase MOTORISED-ISOLATOR (b) Support structure (c) Hold-down bolts set & template					2 2 2		
52.0	(a) 275 kV, 3 150 A three phase HAND OPERATED ISOLATOR (b) Support structure (c) Hold-down bolts set & template					2 2 2		
	TOTAL CARRIED FORWARD							

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL. & SITE TESTING	EST. QTY.	TOTAL SUPPLY AND DELIVERY PRICE (Excl. VAT) Cols. 3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
53.0	(a) 275 kV, 3 150 A three phase MOTORISED ISOLATOR (b) Support structure (c) Hold-down bolts set & template					8 8 8		
54.0	275 kV three phase hand operated EARTH SWITCH mounted on isolator including integral interlocking with associated isolator					4		
55.0	(a) 275 kV single phase VOLTAGE TRANSFORMER (b) Support structure (c) Hold-down bolts set & template					3 3 3		
56.0	(a) 275 kV single phase CURRENT TRANSFORMER FOR FEEDER (b) Support structure (c) Hold-down bolts set & template					3 3 3		
57.0	(a) 275 kV single phase CURRENT TRANSFORMER FOR BUS SECTION/BUS COUPLER (b) Support structure (c) Hold-down bolts set & template					9 9 9		
	TOTAL CARRIED FORWARD							

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL. & SITE TESTING	EST. QTY.	TOTAL SUPPLY AND DELIVERY PRICE (Excl. VAT) Cols. 3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
	TOTAL BROUGHT FORWARD							
58.1	275 kV single phase POST INSULATOR without support structure					3		
58.2	275 kV single phase POST INSULATOR with support structure					3		
59.0	(a) 275 kV single phase SURGE ARRESTER (b) Support structure (c) Hold-down bolts set & template					18 18 18		
60.0	275 kV INSULATOR SET for connecting twin Bull conductors to gantry structure including all fittings between conductors and gantry					12		
61.0	Installation of other manufacturers' equipment including: (a) 275 kV Isolator (b) 275 kV Surge Arrester (c) 275 kV Post Insulator (d) 132 kV Isolator (e) 132 kV Circuit Breaker (f) 132 kV Current Transformer (g) 132 kV Voltage Transformer (h) 132 kV Earth Switch (three phase)					 6 3 6 6 2 6 3 1		
62.0	Site re-establishment fee in the event the contractor has to de-establish site camp due to network constraints and no availability of replacement projects (refer to Note 5 in C2.2)					5		
	TOTAL CARRIED FORWARD							

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL. & SITE TESTING	EST. QTY.	TOTAL SUPPLY AND DELIVERY PRICE (Excl. VAT) Cols. 3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols. 4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
63.0	Outdoor Equipment Monitoring (Breaker, Disconnector/ Isolator) (a) Circuit breaker sensor (b) Disconnector sensor (c) Monitoring module device for circuit breakers per substation (d) Monitoring module device for disconnectors per substation (e) Panel for monitoring module & digital connecting modem (to include Digital modem (for connect to cloud), terminations, wiring and power supply) per substation (f) Software License (Bidder to provide all details) (g) Cabling per meter (h) Training (as per Clause 16.10) (i) Engineering work to integrate systems					200 200 10 10 10 400 1000 5 1		
	TOTAL BROUGHT FORWARD							
TOTAL FOR SECTION 1: SUPPLY AND DELIVERY (EXCLUDING VAT)								N/A
TOTAL FOR SECTION 1: INSTALLATION AND SITE TESTING (EXCLUDING VAT)							N/A	

NAME OF TENDERER: ……

SIGNED: …… DATED: ……

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION SECTION 2.1: 132 kV OPTIONAL SPARES	UNIT SUPPLY PRICE (EXCL. VAT)			UNIT INSTALL. & SITE TESTING	EST. QTY.	TOTAL SUPPLY AND DELIVERY PRICE (Excl. VAT) Cols.3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols.4 × 5
		F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)				
1	Three phase set of 132 kV circuit breaker fixed contacts					1 set		
2	Three phase set of 132 kV circuit breaker moving contacts					1 set		
3	Three phase set of 132 kV circuit breaker arcing contacts					1 set		
4	Three phase set of 132 kV disconnecting circuit breaker contacts					1 set		
5	132 kV Circuit breaker close initiate coil					1		
6	132 kV Circuit breaker trip initiate coil					1		
7	Three phase set of 132 kV, 1 600 A isolator fixed contacts					1 set		
8	Three phase set of 132 kV, 1 600 A isolator moving contacts					1 set		
9	Three phase set of 132 kV, 3 150 A isolator fixed contacts					1 set		
10	Three phase set of 132 kV, 3 150 A isolator moving contacts					1 set		
11	Three phase set of 132 kV earth switch fixed contacts					1 set		
12	Three phase set of 132 kV earth switch moving contacts					1 set		
13	Motor drive mechanism for 132 kV isolator					1 set		
					TOTALS CARRIED FORWARD			

		1	2	3	4	5	6	7
ITEM	OUTLINE DESCRIPTION SECTION 2.2: 275 kV OPTIONAL SPARES	UNIT SUPPLY PRICE (EXCL. VAT) F.O.B VALUE (SA CURRENCY)	BALANCE (SA CURRENCY)	TOTAL (SA CURRENCY)	UNIT INSTALL. & SITE TESTING	EST. QTY.	TOTAL SUPPLY AND DELIVERY PRICE (Excl. VAT) Cols.3 × 5	TOTAL INSTALLATION & SITE TESTING PRICE (Excl. VAT) Cols.4 × 5
	TOTAL BROUGHT FORWARD							
1	Three phase set of 275 kV circuit breaker fixed contacts					1 set		
2	Three phase set of 275 kV circuit breaker moving contacts					1 set		
3	Three phase set of 275 kV circuit breaker arcing contacts					1 set		
4	Three phase set of 275 kV disconnecting circuit breaker contacts					1 set		
5	275 kV Circuit breaker close initiate coil					1		
6	275 kV Circuit breaker trip initiate coil					1		
7	Three phase set of 275 kV, 1 600 A isolator fixed contacts					1 set		
8	Three phase set of 275 kV, 1 600 A isolator moving contacts					1 set		
9	Three phase set of 275 kV, 3 150 A isolator fixed contacts					1 set		
10	Three phase set of 275 kV, 3 150 A isolator moving contacts					1 set		
11	Three phase set of 275 kV earth switch fixed contacts					1 set		
12	Three phase set of 275 kV earth switch moving contacts					1 set		
13	Motor drive mechanism for 275 kV isolator					1 set		
	TOTAL FOR SECTION 2: SUPPLY AND DELIVERY (EXCLUDING VAT)							N/A
	TOTAL FOR SECTION 2: INSTALLATION AND SITE TESTING(EXCLUDING VAT)						N/A	
	TOTAL FOR SECTION 1 AND SECTION 2 (EXCLUDING VAT)							
	TOTAL CARRIED FORWARD TO FORM OF OFFER (INCLUDING VAT)							

NAME OF TENDERER:……

SIGNED: …… DATED: ……

C2.3: RATE OF EXCHANGE

This page to be completed by Bidders offering goods ex import.

Base rates of exchange (As published by South African Reserve Bank at 12:00 on the date of the advertisement of the bid – proof of rate used to be attached to bid documents)	

Item	Currency applicable	FOB price

C2.4: CONTRACT PRICE ADJUSTMENT

This page is to be completed by bidders offering goods that are subject to contract price adjustment (CPA). A minimum of 10 % of the price tendered for each item shall be fixed and accommodated for in the adjustment formula. All the formulae and bas indices to be submitted with the bid as per Clause C2.1.19.

Item	Indices (eg: Seifsa table C2)	Percentage contribution to price	CPA formula (min 10 % of price to be fixed)

Additional items should be scheduled on a separate page which should be signed and dated by the Bidder.

Name: ..... (Block Capitals)

Signature: ..... Date: .....

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

PART C3: SCOPE OF WORK

		PAGE
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	C3.3.2 Environmental Management Plan	
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	C3.3.6 Section 37 (2) Agreement	
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C3.1: PROJECT DESCRIPTION AND SCOPE OF CONTRACT

C3.1.1 System Parameters and Details of Equipment Required

This contract is for the supply, delivery, installation and testing of outdoor 132 kV and 275 kV switchgear and associated outdoor yard equipment for a fixed period of three years. Individual orders for each substation project will be placed on this contract during the fixed period after contract award.

Proposed substation layout drawings will be issued in preparation for each order. The contractor will be required to carry out the detailed design based on these drawings (including any site measurements and/or survey), the cost of which shall be included in the unit supply price of the equipment.

Once the detailed design has been carried out, the contractor will be required to provide a schedule of quantities of items quoted in C2.2 Bill of Quantities. The order will be placed based on these quantities.

The quantities given in C2.2 Bill of Quantities are purely for adjudication purposes. The successful bidder shall, however, be bound to supply whatever quantities the Municipality may actually require during the period of the contract.

1. Equipment Required

Orders will be comprised of the following main items:

Item	Description
132 kV Outdoor Circuit Breaker	132 kV, 3 150 A three phase circuit breaker with support structure and hold-down bolts
132 kV Outdoor Disconnecting Circuit Breaker	132 kV, 3 150 A three phase disconnecting circuit breaker with support structure and hold-down bolts
132 kV Outdoor Capacitor Bank Circuit Breaker	132 kV, 3 150 A three phase capacitor bank circuit breaker with support structure and hold-down bolts
132 kV, 1 600 A Isolator	132 kV, 1 600 A three phase hand operated or motorised isolator with 0, 1 or 2 earth switches including integral interlocking, support structure and hold-down bolts
132 kV, 3 150 A Isolator	132 kV, 3 150 A three phase hand operated or motorised isolator with 0 or 1 earth switch including integral interlocking, support structure and hold-down bolts
132 kV Voltage Transformer	132 kV Voltage Transformer with support structure and hold-down bolts
132 kV Current Transformer	132 kV, 1 600 A or 3 200 A Current Transformer with four or three multi-ratio cores with support structure and hold-down bolts
132 kV Post Insulator	132 kV single phase and three phase sets of post insulators including support structures of various heights and hold-down bolts
132 kV long Rod Insulator	132 kV silicone rubber insulators for attaching conductors to gantry structures
132 kV Surge Arrester	132 kV silicone rubber housed surge arrester with support structure and hold-down bolts
132 kV Compact Switchgear	132 kV Compact Switchgear consisting of Circuit breaker, Isolator, Earth switch, CTs and VT combination with support structure and hold-down bolts.
Gantry Structure	Galvanised steel lattice gantry columns of various heights, gantry beams of various widths and earth peaks including hold-down bolts
Lightning Mast	Galvanised steel lightning masts of various heights including hold-down bolts
Conductor	Stranded aluminium alloy conductors of various cross-sections and tubular Aluminium busbars
Connecting Clamp	Clamps for connecting various conductor types to each other and to the various items of equipment
Marshalling Kiosk	3CR12 or stainless steel 304 marshalling kiosk including terminals, plug socket etc.

Item	Description
Miscellaneous Items	Labels, locks, interlocks, secondary cabling, earthing and spares
275 kV Outdoor Circuit Breaker	275 kV, 3 150 A three phase circuit breaker with support structure and hold-down bolts
275 kV Outdoor Disconnecting Circuit Breaker	275 kV, 3 150 A three phase disconnecting circuit breaker with support structure and hold-down bolts
275 kV, 1 600 A Isolator	275 kV, 1 600 A three phase hand operated or motorised isolator with 0, 1 or 2 earth switches including integral interlocking, support structure and hold-down bolts
275 kV, 3 150 A Isolator	275 kV, 3 150 A three phase hand operated or motorised isolator with 0 or 1 earth switch including integral interlocking, support structure and hold-down bolts
275 kV Voltage Transformer	275 kV Voltage Transformer with support structure and hold-down bolts
275 kV Current Transformer	275 kV, 1 600 A or 3 200 A Current Transformer with four or three multi ratio cores with support structure and hold-down bolts
275 kV Long Rod Insulator	275 kV silicone rubber insulators for stringing conductors to gantry structures
275 kV Post Insulator	275 kV single phase and three phase sets of post insulators including support structures of various heights and hold-down bolts
275 kV Surge Arrester	275k V silicone rubber housed surge arrester with support structure and hold-down bolts

2.0 General Details

2.1	Ambient temperature	-5 °C to 45 °C
2.2	Climatic conditions	Tropical with high humidity and subject to salt deposit and heavy industrial and marine pollution
2.3	Altitude	From sea level to 1 000 m
2.4	Maximum relative humidity	100 %
2.5	Lightning ground flash density	Up to 5 ground flashes/km²/year
2.6	Constructions supply available	400/230 V a.c.
2.7	Substation battery	Nominal 110 or 220 V d.c.
2.8	Access to site	Tarred or gravel road

3.0 System Parameters and Co-Ordinating Details

3.1	Nominal voltage	132 kV	275 kV
3.2	Highest service voltage	145 kV	300 kV
3.3	System frequency	50 Hz	
3.4	Symmetrical fault current	40 kA	
3.5	Earthing	HV neutral directly earthed	
3.6	Noise level for radio interference	SABS 177 (Appendix K)	
3.7	Minimum impulse withstand insulation level (1,2/50 µs wave)	650 kV	1 050 kV
3.8	Minimum 60 s 50 Hz withstand insulation level	275 kV	460 kV
3.9	Minimum clearance allowance for maximum swing and sag:		
	a) Between live metal and earth	1 450 mm	2 350 mm
	b) Between live metals of different phases	1 650 mm	2 600 mm
3.10	Minimum section clearance for open busbars, i.e. between live metal and positions of permissible access which includes positions on adjacent circuits which can be isolated and earthed independently (refer BS.162)	3 500 mm	4 600 mm

4.0 Circuit Breakers

4.1	Nominal current rating	3 150 A
4.2	Making capacity	100 kA (peak)
4.3	Short time (3 s) current rating	40 kA
4.4	Rated breaking capacity	40 kA
4.5	Controls	Electrical open and close controls from Local and Remote positions

5.0 Off-load Isolating Switches

5.1	Normal current rating	1 600 A	3 150 A
5.2	Short time (3 s) current rating	40 kA	40 kA
5.3	Control	Electrical open and close control from local control cubicle only	

6.0 Earthing Switches

6.1	Short time (3 s) current rating	40 kA
6.2	Making Capacity: a) Circuit earth switches and bus-bar earth switches b) Safety/Working earth switches	 High speed operation required for full make capacity of 63,6 kA (peak) Fault make capacity not required
6.3	Control: a) Circuit earth switches and bus-bar earth switches b) Safety/Working earth switches	 Electrical open and close from the Local control cubicle only Electrical open and close from the Local control cubicle only or manually operated

7.0 Current Transformers

	Description	Core	Purpose	Ratio & Class
7.1	132 kV and 275 kV Current transformer for feeder circuit	Core 1	Main Protection	1600/1200/1000/800/600/500/400/300/150/1 Class X*
		Core 2	Main Protection	1600/1200/1000/800/600/500/400/300/150/1 Class X*
		Core 3	Overcurrent	1600/1200/1000/800/600/500/400/1 15VA 5P10
		Core 4	Bus Zone	1600/1200/1000/800/600/500/400/300/150/1 Class X*
		Core 5	Bus Zone	1600/1200/1000/800/600/500/400//300/150/1 Class X*

***Class X Current Transformer Characteristics for Feeder Circuits**

Min. knee point voltage (on lowest ratio)	150 V
Max. exciting current at knee point voltage	100 mA
Max. secondary resistance at 75 °C (on highest ratio)	6 Ω

	Description	Core	Purpose	Ratio & Class
7.2	132 kV and 275 kV Current transformer for Bus Section/Bus Coupler	Core 1	Bus Zone	3200/2400/2000/1600/1200/1000/800/2 Class X**
		Core 2	Bus Zone	3200/2400/2000/1600/1200/1000/800/2 Class X**
		Core 3	Overcurrent	4800/4000/3200/2400/2000/1600/1200/ 1000/800/2 15VA 5P10

****Class X Current Transformer Characteristics for Bus Section/Bus Coupler Circuits**

Min. knee point voltage (on lowest ratio)	400 V
Max. exciting current at knee point voltage	100 mA
Max. secondary resistance at 75 °C (on highest ratio)	9 Ω

7.3 Class X CT Requirements

a) The knee point voltage shall not be lower than the value specified on the CT rating plate.

b) The knee point voltage must not be greater than 5 % of the specified value on the CT rating plate.

c) The magnetising current shall not be greater than the value specified on the CT rating plate.

d) The internal resistance shall not be greater than the value specified on the CT rating plate.

e) The knee point voltage and magnetising current should not differ by more than 5% when compared with the previous test results for the particular CT core, or with results from another CT of the same make, type, and batch number.

8.0 MECHANICAL INTERLOCKING

Where specified at the time of order, circuit breakers, isolators and/or earth switches shall have interlocking features as follows (in addition to integral interlocking as specified for isolators and associated earth switches):

Circuit Breaker Key Interlock	"Kastell" key required to close circuit breaker. Key trapped in lock while circuit breaker is closed. Key can be used in associated isolator/s when circuit breaker is open.
Isolator Key Interlock	"Kastell" key required to open or close isolator. Key can be removed after operation. Key to be obtained from associated circuit breaker.
Isolator Mag Bolt Interlock	Solenoid operated bolt to prevent operation unless energised by push button.
Earth Switch Key Interlock	"Kastell" key required to close earth switch. Key trapped in lock while earth switch is closed. Key to be obtained from associated 11 kV incomer circuit breaker (to be supplied by others).

9.0 LABELS

The following types of labels shall be specified at time of order:

Equipment label	Approx. size of label: 200 mm × 600 mm Lines of text: 3 Height of letters: 40 mm Thickness of letters: 4 mm Colours: Red on White or Black on Orange e.g.: MARIANNRIDGE 1 132kV LINE ISOLATOR
Warning/Instruction Label	Approx. size of label: 150 mm × 350 mm Lines of text: 3 or 4 Height of letters: 25 mm Thickness of letters: 3 mm Colours: Red on White or Black on Orange e.g.: FREE BOLT-INTERLOCK BY PRESSING BUTTON BEFORE OPERATING ISOLATOR
Gantry Label	Approx. size of label: 250 mm × 2 000 mm Lines of text: 1 Height of letters: 200 mm Thickness of letters: 15 mm Colours: Black on Orange e.g.: MARIANNRIDGE 1
Phase Disk	Approx. size of label: 150 mm diameter Lines of text: 1 character, R, W or B Height of letters: 100 mm Thickness of letters: 6 mm Colours: Black on Red, White or Blue
DC Label	Approx. size of label: 15 mm × 80 mm Lines of text: 1 Height of letters: 10 mm Thickness of letters: 0,5 mm Colours: Engraved Brass e.g.: DC 1234567
Key Tag Labels	Approx. size of label: 40 × 20 mm Colours: Black on White (for isolators), Red on White (for earth switches)

C3.2 GENERAL TECHNICAL SPECIFICATIONS
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16.0 OUTDOOR EQUIPMENT MONITORING

GENERAL

1.1 SCOPE

This contract is to cover the supply, delivery, installation, testing and remedial civil works related to outdoor type high voltage circuit breakers, isolating switches, instrument transformers, structures, disconnecting circuit breakers, compact switchgear, busbars and associated equipment to the requirements as set out in the following paragraphs and schedules. Earth mat design and installation. Ambient temperatures will not exceed 45 ºC.

1.2 QUALITY AND DESIGN OF EQUIPMENT AND CLIMATIC CONDITIONS

1.2.1 The equipment shall be suitable for use at sea level in an area subject to tropical conditions and a high incidence of lightning, and all surfaces subject to corrosion shall have a tropical finish to withstand the action of humid salt laden atmosphere.

1.2.2 The design, manufacture and testing of the equipment offered shall be strictly in accordance with this specification and the current editions of the following Standard Specifications, except where amended herein.

AC High-voltage switchgear and Control gear	SANS 62271-100
High-voltage switchgear and control gear - Part 102: Alternating current disconnectors and earthing switches	SANS 62271-102
Insulators	SANS 60305, SANS 60372, SANS 61109, SANS 61462, SANS 60815
Post Insulators	SANS 60273
Disconnecting Circuit Breakers	SANS 62271-108
Instrument transformers – Inductive voltage transformers	SANS 60044-2
Instrument transformers – Current Transformers	SANS 61869
Insulation Co-ordination	SANS 60071
Sulphur Hexafluoride (SF_6) Gas	SANS 60376
Insulated bushings for alternating voltages above 1 000 V	SANS 60137
High-voltage switchgear and Control gear – Compact switchgear	SANS 62271-205
Surge Arresters	SANS 60099-4
Composite Hollow Insulators	SANS 61462
Protection against corrosion of iron and steel in structures - Zinc and Aluminium coatings	SANS 14713
Hot-dip galvanised zinc coatings	SANS 121, SANS 763
Bolts and Nuts	SANS 1700
Busbars	SANS 1195
Unused and Reclaimed mineral Insulating oils for Transformers and Switchgear	SANS 555
Theft Deterrent Earthing Materials	NRS 102
Earth rods, Couplers and Clamps	SANS 1063
Guidelines for the Management of Sulphur Hexafluoride (SF_6) for use in Electrical Equipment	NRS 087

1.2.3 The equipment shall be designed to include all possible provisions for the safety of those concerned in the installation, operation and maintenance thereof.

1.2.4 All outdoor equipment shall be designed to prevent accumulation of water and moisture. As far as is practical, the top of all assemblies shall be sloped and the underside ventilated.

1.2.5 Where it is not possible to treat metal parts by painting or hot-dip galvanising these parts shall be constructed of stainless steel, brass or aluminium.

1.2.6 Marshalling kiosks shall be designed to be vermin proof and outdoor structures shall be designed and positioned to eliminate possible short circuits which could be caused by birds or animals. All openings in structures shall be suitably sealed to prevent nesting of birds and insects. Marshalling kiosks shall comply with Section 8.0 of the Technical Specification.

1.3 STATUTORY REQUIREMENTS

1.3.1 Design and Layout of Equipment

1.3.1.1 The contractor shall ensure that the design and layout of the equipment to be supplied on this contract is such that in the operating condition it shall comply fully with the regulations promulgated in terms of the Occupational Health and Safety Act (Act 85) of 1993 and Construction Regulations 2014, and the latest amendments thereof. Individual clauses of this specification or the Standard Specifications (listed in Clause 1.2.2) may stipulate conditions more severe than those required by the said Regulations.

1.3.1.2 Where equipment supplied on this Contract is to be positioned in the proximity of existing plant or structures, or plant or structures to be supplied on a separate contract, the Contractor shall establish beyond any doubt that the said Regulations shall not be contravened by virtue of this proximity during the erection and testing periods and in the final operating conditions. Any queries in this regard must be submitted in writing to the Engineer.

1.3.1.3 All pressure vessels shall be constructed, inspected and tested in accordance with the said Regulations. This shall include pressure vessels used for gas transport, storage and/or treatment.

1.3.1.4 Where special inspection and testing is required the cost shall be included in the contract price for the equipment and the contractor shall be responsible for the arrangement of such inspection and testing. As soon as a batch certificate or special certificate is received for a pressure vessel, a copy of this shall be sent to the Engineer for his information and the original of the certificate handed over at the time of take-over of the equipment.

1.3.2 Installation

The installation and testing shall be carried out in compliance with all applicable legislation.

1.3.3 Fencing or Enclosures

Notwithstanding the Clauses 1.3.1 and 1.3.2 above, unless specified in C3.1.1, the Contractor shall not be responsible for the erection of any new fencing or enclosures which are required in terms of the said Regulations when the equipment is in the operating condition.

1.4 GALVANISING

1.4.1 All ferrous materials shall be hot-dip galvanised and un-painted. Non-structural items may be zinc metal sprayed and painted where approved by the Engineer.

1.4.2 The pre-galvanising treatment, the hot process galvanising and the testing shall be carried out in accordance with SABS 763 and SABS 0214.

1.4.3 A minimum zinc thickness shall be 63 µm.

1.4.4 The preparation and the galvanising shall not adversely affect the function or the properties of the galvanised equipment.

1.4.5 Surfaces which are in contact with insulating oil in service shall not be galvanised.

1.4.6 The material shall be completely shaped, cut, drilled, countersunk, welded, etc. before galvanising.

1.4.7 Alternative processes shall not be used unless approved in writing by the Engineer.

1.4.8 The galvanising of bolts shall be carried out after all mechanical operations have been completed, but the associated nuts may be threaded after galvanising. The galvanised threads of bolts shall be cleaned of spelter by spinning or brushing.

1.4.9 If specified in C3.1.1 all galvanised outdoor steelwork shall be painted after erection in accordance with Clause 1.5

1.5 PAINTING

1.5.1 The prevention of corrosion is a major concern in the eThekwini Municipal area and all non-galvanised corrodible material shall be carefully painted.

1.5.2 The material shall be completely shaped, cut, drilled, countersunk, welded etc. before any paintwork commences.

1.5.3 Before painting the parts shall be thoroughly cleaned, to a cleanliness level of Sa 2,5, by sand or shot blasting or metal brushes to remove all traces of rust, scale or grease.

1.5.4 Immediately after cleaning all rough surfaces shall be filled and the priming coat of paint applied to all corrodible work.

1.5.5 The external surfaces of indoor control equipment (if required) shall receive a coat of an approved phosphate primer, an undercoat, and two coats of enamel paint (colour Eau-de-Nil) to SANS 1091.

1.5.6 The internal surfaces of cubicles containing wiring and other apparatus shall receive a coat of an approved phosphate primer, an undercoat and two coats of white enamel paint.

1.5.7 Where the Engineer agrees that it is impractical to galvanise a corrodible steel item which is to be used outdoors, the priming coat shall be a 2 part surface tolerant anti-corrosion 10 year durability primer. After completion of any works the paintwork shall be touched up where necessary and a coat of oil and weather resisting undercoat applied. After erection on site the equipment shall be cleaned down, touched up and then receive two coats of alkyd based hard gloss paint as approved by the Engineer. The final coat shall be grey to NO. 632 of BS 381C and shall be applied to a thickness of at least 0,35 mm.

1.6 BOLTS AND NUTS

1.6.1 Bolts and nuts shall comply in all respects with the current edition of SANS 1700 and shall be Grade 8.8, unless otherwise approved by the Engineer

1.6.2 The bolts, nuts and washers used for anchoring or outdoor galvanised steel work shall be hot dip galvanised in accordance with SANS 121 for heavy duty applications or made of 304, 306 or 318 stainless steel.

1.6.3 All bolts or studs shall project through the nuts but this projection shall not exceed 10 mm.

1.6.4 All nuts shall be locked in position by lock nuts; however lock washers of an approved type may be used where the nominal bolt or stud diameter is less than 25 mm.

1.6.5 For electrical connections, no brass bolt or stud shall be less than M6 size.

1.6.6 The hold down bolts shall be bonded together and connected to the earth mat under concrete (not visible earthing).

1.7 ALUMINIUM AND ALUMINIUM ALLOYS

1.7.1 Aluminium shall be of the highest purity commercially obtainable.

1.7.2 Aluminium and aluminium alloy castings shall be free from porosity.

1.8 SPARES

1.8.1 All spare parts or materials shall be delivered in approved cases suitable for storing such parts over a considerable period of time without deterioration due to climatic conditions or other causes.

1.8.2 In order to ensure longevity of spares, the Tenderer shall stipulate any special storage conditions with estimated/expected shelf life.

1.9 SPECIAL TOOLS

1.9.1 Where special tools are required for effecting adjustments, for installation purposes or for maintenance, a full kit of such tools shall be provided together with lockable cabinet(s).

1.9.2 The cost of the special tools shall be deemed to have been included in the price of the device for which they are required.

1.9.3 These tools shall be used during erection.

1.10 ADDRESSES FOR DELIVERY

1.10.1 Addresses for delivery of all equipment including locks, keys, tools and spares shall be as specified on each order.

1.10.2 Regardless of where the locks, keys, tools and spares are to be consigned, a copy of the delivery note and packing specification shall be sent to HV Projects Branch, eThekwini Electricity, 1 Jelf Taylor Crescent, Durban, 4001.

1.11 DISPOSAL OF REDUNDANT EQUIPMENT

1.11.1 Any hazardous chemical shall be safely removed from the electrical equipment and disposed using methods which comply with relevant environmental legislature.

1.11.2 All electrical plant, equipment and structures shall be transported to the Disposal Yard, 11 Electron Rd, Springfield, Durban, 4001, for disposal.

1.11.3 The rate for the disposal shall be included in C2.2.

1.12 STORAGE OF ELECTRICAL EQUIPMENT

Storage of all electrical equipment shall fully comply with the equipment manufacturer's storage requirements and the storage of such equipment shall by no means resulting in any harm to the environment and pose any safety risk to personnel, the general public or any other electrical equipment within its vicinity.

1.13 MODIFICATIONS AND RETROFITTING

The Contractor may be required to do some engineering work in design and re-configuration of installed electrical equipment for the purpose of retrofitting and interfacing with existing electrical equipment both physically and electrically through the ac/ d.c. circuits. A rate for the engineering time shall be included on the installation and site testing price provided in C2.2 Item 61.

1.14 SUPERVISION

For each team working, the Contractor needs to have an approved Supervisor to oversee the team. The Supervisor needs to complete the eThekwini training program to become Specifically Trained to enter and work within high voltage substations within 3 months of contract award. The cost of this training shall be borne by the Contractor.

1.15 NATIONAL KEY POINTS (NKP) SUBSTATIONS

EThekwini Municipality has HV substations which are protected by the NKP Act and compliance with the Act and associated regulations is compulsory. Access to such sites shall be as per the requirements of the Act and this shall apply to all entering the sites regardless of the reasons for entry or affiliation.

1.16 SITE ESTABLISHMENT

The Contractor shall set up an office in the eThekwini Municipal Area within 3 months of contract award. A representative shall make himself available for all project management and engineering related issues.

1.17 TEAM AVAILABILITY

The Contractor shall provide the necessary number of teams that are required to work at different sites simultaneously. The number of teams may vary, depending on the work that is in progress.

2.0 OUTDOOR CIRCUIT BREAKERS, INCLUDING DISCONNECTING CIRCUIT BREAKERS AND CAPACITOR BANK CIRCUIT BREAKERS

2.1 GENERAL

2.1.1 The SF_6 metal enclosed circuit breakers shall comply with the latest edition of the relevant standard specifications listed in Clause 1.2.2 and be suited to the system parameters and the duties specified in T2.2.17.

2.1.2 Circuit breakers shall generally be of the “live tank” vertical pole design with one interrupter per phase with the exception of the compact switchgear which shall be of the dead-tank-design.

2.1.3 The insulating and arc quenching medium shall be sulphur hexafluoride (SF_6) gas.

2.1.4 Circuit breakers shall have a motor charge spring operating mechanism.

2.1.5 The arc quenching design shall consist of a method whereby the arc energy is used to create a gas pressure increase in one chamber which, during the stroke of the circuit breaker operation, is released through the arc area into a lower pressure chamber, thereby providing arc quenching. The design shall be such that the required gas pressure increase for fault arc quenching is not derived from the drive mechanism only, thereby minimising the energy requirement of the drive mechanism.

2.1.6 All three phases of the circuit breaker shall open and close simultaneously, except in the case of capacitor bank breakers which shall be equipped with point on wave switching. The circuit breakers shall be Class A type and shall not cause over-voltages when switching capacitive currents of up to 60 A or the inductive magnetising currents of large power transformers.

2.1.7 Copies of short circuit test certificates must be submitted in support of the stated switchgear ratings.

2.1.8 External insulation shall be composite silicone rubber polymer, of at least 50 % aluminium tri-hydrate.

2.1.9 The circuit breakers shall have an approved mechanical method of indicating whether it is ‘OPEN’ or ‘CLOSED’. This shall apply to all phases and the indication shall be visible from the ground without opening the operating mechanism door.

A mechanically operated device shall indicate whether the spring is charged or free and this shall also be visible from the ground without opening the operating mechanism.

2.1.10 Cast iron shall not be used for components under pressure or subject to other mechanical strains or impulses.

2.1.11 The circuit breaker mechanism shall be suitable for the open/close/open duties specified for auto-reclose in T2.2.17.

2.1.12 It shall be possible to charge the spring manually. Each mechanism shall be supplied with a separate (removable) handle/lever for the manual charging of the spring or operating the mechanism and this shall be fixed to the operating mechanism, preferably inside the weatherproof door. A mechanical and/or electrical interlock shall inhibit electrical spring charge operation when the handle lever is inserted in

position for manual charge to prevent the accidental movement of the handle by the spring charge motor.

2.1.13 The mechanism shall be such that under no circumstances can a trip occur without the full potential energy required for breaking fault current. This applies particularly to a trip impulse during the closing operation or in the event of the mechanism failing to latch after a close operation.

2.1.14 The closing and tripping mechanisms shall be suitable for operating from the substation battery supply, the voltage of which shall be specified in C3.1.1.

2.1.15 The close initiate and tripping coils and the spring charging motors shall be suitable for operation at any voltage between 80 % and 115 % of the specified nominal voltage of the substation battery bank which is 110 V d.c. or 220 V d.c. Suitable thermal overload protection must be provided for the motor.

2.1.16 The control circuit shall incorporate an "anti-pumping" facility to prevent a second close should the circuit breaker fail to latch or if a protection relay initiates an immediate trip.

2.1.17 All three phases of the circuit breaker shall be controlled by one operating mechanism however circuit breakers with a single mechanism per pole are required for capacitor bank switching only.

2.1.18 Where mechanical interlocking is specified, or inherently required, the means of interlocking shall be subject to approval.

2.1.19 The pressure vessels shall meet the requirements of the Occupational Health and Safety Act and Construction Regulations 2014. Refer to Clause 1.3.

2.1.20 The mechanism shall have a counter to record the number of closing operations. This counter shall not be of a resettable type.

2.1.21 Each circuit breaker unit shall be provided with an operating mechanism which shall be mounted on the circuit breaker structure. Provision shall be made for a person to operate the circuit breaker from ground level.

2.1.22 Electrical 'OPEN' and 'CLOSE' control shall be possible locally or from a remote control panel to be supplied by others. A 'Local/Remote' changeover switch in the local control kiosk shall determine the controlling point.

2.1.23 Local mechanical tripping shall be possible.

2.1.24 For maintenance purposes it shall be possible to perform a slow-close manual operation and any extra mechanism required for this purpose shall be supplied as part of the special tools.

2.1.25 There shall be a 5 year guarantee on all circuit breakers however against leaks and corrosion the guarantee period is 10 years. In the event the SF_6 leakage rates of the circuit breaker are in excess of what is guaranteed, the OEM shall at his cost carry out repairs and replenish the SF_6.

2.1.26 A 100 mm temperature compensated gas pressure gauge (numerically marked in bar and kPA) with gas pressure transmitter shall be provided to assess actual SF_6 leakage rates. The gas pressure transmitter to monitor SF_6 gas pressure shall be a 6,5 – 20 mA current output with accuracy class (1 %). This is to ensure that the leakage rate of the SF_6 does not exceed guaranteed leakage rate values.

2.1.27 Flange protection grease using locktite 225 (red colour) or equivalent shall be used on all flange bolts using flat washers only. No spring washers shall be used.

2.1.28 A digital pressure gauge output shall be provided to assess SF_6 leakage rates.

2.1.29 Any method for detecting gas leakage, either incorporated in the equipment (e.g. concentric seals with pressure monitoring) or external detecting devices shall be fully described by the Tenderer. Recommended additional equipment must be priced in C2.2.

2.1.30 The 132 kV circuit breaker support spacing shall comply with eThekwini's foundation detail dimension as shown in Figure 1 on drawing TD 15.

2.1.31 All gas pipes shall be marine grade flexible stainless steel or painted/coated copper.

2.1.32 A certificate guaranteeing SF_6 purity to IEC 60376 shall be supplied with each circuit breaker. Upon filling and testing the circuit breaker, an SF_6 purity analysis shall be carried out by the supplier not less than 7 days after commissioning or as recommended by the OEM. All gas filling shall be done by an accredited

person. The following parameters shall be checked, recorded and a report submitted to eThekwini Electricity, HV Projects Branch after filling:

a) SF_6 content (purity) – not less than 98 %

b) Dew-point at rated filling pressure – at least -30 ºC

2.1.33 For the recording of the mechanical travel characteristics, travel curves for each phase shall be recorded. The location of the travel transducers on the circuit breakers shall be clearly indicated in the test report. The following measuring results shall be provided:

a) the total travel (mm)

b) the over-travel (mm)

c) the rebound (mm)

d) the under-travel (mm)

e) the contact penetration (mm)

f) moving-contact or operating rod position at the time of make or break

g) the average speed on closing (m/s)

h) the average speed on opening (m/s)

2.1.34 Electrical tests, shall include, but are not limited to the following:

a) measurement of the steady-state contact resistance of the main circuit; and

b) measurement of the dynamic contact resistance of the main circuit.

2.1.35 The following applies to capacitor bank circuit breakers:

a) The capacitor bank breakers shall be equipped with point on wave switching. The circuit breakers shall be Class A type and shall not cause over-voltages when switching capacitive currents of up to 60 A or the inductive magnetising currents of large power transformers.

b) The capacitor bank circuit breaker shall be capable of point-on-wave switching. All relays required for this shall be supplied together with the breaker and the full commissioning of the breaker shall be performed by the Contractor.

c) The circuit breaker shall be designed to withstand one OPEN and one CLOSE operation per day.

d) The circuit breaker shall be rated for capacitor duty and have 25 % greater current rating than conventional circuit breakers.

e) Contractors shall refer to T2.2.17 and C3.4.2 for further details on the capacitor bank circuit breaker.

2.2 COMPACT SWITCHGEAR (not applicable)

2.2.1 The compact switchgear shall fully comply with the requirements highlighted in Clause 1.3

2.2.2 The compact switchgear shall be able to perform the same interlocking functions as highlighted in Clause 2.1, 3.1, 3.2 and 3.3 of this Technical Specification.

2.2.3 The compact switchgear shall consist of sulphur hexafluoride (SF_6) gas insulated circuit breaker, isolating switches and earthing switches.

2.2.4 The switchgear shall be suitable for the continuous load current and short time through-fault current and this shall apply at the minimum rated working SF_6 gas density or pressure.

2.2.5 T2.2.17 must be carefully completed and submitted with the tender. Literature detailing all the technical aspects of the switchgear and, in particular, the form of construction must be submitted with the tender.

2.2.6 This contract shall include the supply and filling of completed switchgear with SF_6 gas to the correct density and subsequent supply and re-filling of any gas lost due to leakage during the guarantee period.

2.2.7 Routine, sample and special type tests that will be required are detailed in T2.2.19.

2.2.8 The cost of the supply and additional gas shall be tendered in C2.2.

2.2.9 Sections should be sectionalised as much as possible with the aim of minimising the amount of gas handled during installation and consequently the time for evacuation and filling, and also to limit the plant affected by a gas leak.

2.2.10 The switchgear shall be able to withstand the effects of an internal arc fault at the maximum system fault level for a minimum period of 3 s.

2.2.11 The compact switchgear enclosure shall be fabricated with non-magnetic materials.

2.2.12 The interior metal surfaces shall be finished smooth to facilitate cleaning and inspection.

2.2.13 No material shall be used internally that may deteriorate when exposed to SF_6 gas and arc products or that may contaminate the SF_6 gas.

2.2.14 The intersection gas seal shall be able to withstand the extreme pressure differential of maximum over pressure in one chamber (at least equal to the pressure of the pressure relief device) and with a vacuum drawn on the adjacent chamber.

2.2.15 An approved method shall be incorporated for the relief of abnormal pressure in gas sections which could cause damage to the main gas sections. Where the exhaust gases are vented to atmosphere this shall be in a controlled direction to ensure personnel safety. Pressure relief devices are not required on chambers filled with SF_6 gas provided specific exemption is granted by the Inspector of Machinery from the requirements of the Occupational Health and Safety Act and Construction Regulations.

2.2.16 The design of the gas seal and the material used shall ensure a permanent seal for all variations of temperature and mechanical forces normally expected with constant exposure to gas and vapours.

2.2.17 Any method for detecting gas leakage, either incorporated in the equipment (e.g. concentric seals with pressure monitoring) or external detecting devices shall be fully described by the Tenderer. Recommended additional equipment must be priced in C2.2.

2.2.18 The compact switchgear shall be designed for use with SF_6 gas complying with IEC 60376 and all gas supplied shall comply with the latest specification.

2.2.19 The nominal operating gas pressure and the minimum and maximum permissible operating gas pressures shall be stated in T2.2.17.

2.2.20 The gas pressure shall be such that, at the lowest temperature range specified in C3.1.1, there shall be no chance that the gas will liquefy. The switchgear shall not be dependent on heaters for satisfactory operation.

2.2.21 The initial gas pressure/density shall be such that, allowing for the guaranteed maximum leakage rate, no section would have to be replenished for at least 10 years.

2.2.22 The Tenderer shall submit a detailed vapour pressure graph which indicates the relationship between the SF_6 gas pressure, temperature and density. This graph shall indicate particularly the characteristics at the maximum and minimum gas pressure/densities.

2.2.23 Each compact switchgear shall be provided with a local control kiosk which shall be mounted on the bay to be controlled.

2.2.24 It must be possible to view the position of the disconnector and earth switch through a viewing window from ground level.

2.2.25 Current and voltage transformers shall be included on compact switchgear as per order. Dead-tank circuit breakers shall be supplied with integrated ring-type current transformers (CTs). CTs shall be located at the base of the outdoor bushings in the voltage/electric field free zone.

2.2.26 The compact switchgear shall be either cable fed or overhead fed, depending on the system requirements.

2.3 SULPHUR HEXAFLUORIDE (SF_6) GAS

2.3.1 Gas pressures shall be continuously monitored by temperature compensated pressure monitoring devices. The gas pressure shall be such that at -5°C there will be no chance that the gas will liquefy. A

dial type gauge responding to SF_6 density and indicating SF_6 pressure compensated for temperature shall be suitably sized (typical 100 mm diameter). A SF_6 density monitoring device (density switch) with an accuracy of 1 %, with the dial type gauge as a dual function, shall be provided. The annual leakage rate of SF_6 shall be less than 0,5 %.

2.3.2 The switchgear shall comply with the impulse and power frequency voltage withstand levels specified in C3.1.1 and this shall apply at the minimum rated working SF_6 gas density or pressure.

2.3.3 Low pressure alarms and switching lock-out shall be provided, as necessary. The low pressure alarm must be initiated well before the switching lock-out becomes necessary. One voltage free contact is required to indicate the low pressure alarm condition and another to indicate a switching lockout condition. These shall be connected to remote control panels to be supplied by others.

2.3.4 This contract shall include the supply and filling of completed switchgear with SF_6 gas to the correct density and subsequent supply and re-filling of any gas lost due to leakage during the guarantee period. The 132 kV circuit breaker gas filling/evacuation shall be with a DILO DN8 connection and the 275 kV circuit breaker gas filling/evacuation shall be with a DILO DN20 connection respectively.

2.3.5 SF_6 gas shall comply with the recommendations of IEC 60376 and NRS 087 and the method of filling shall ensure that the gas in the circuit breaker chambers is as pure and dry as is necessary for the conditions of service. It must be possible to draw a vacuum on the circuit breaker and associated gas filled chambers of up to 8 millibars without distortion or fracture of any part.

2.3.6 No material shall be used internally that may deteriorate when exposed to the SF_6 gas and the arc products or that may contaminate the SF_6 gas.

2.3.7 The design of the gas seal and the material used shall ensure a permanent seal for all variations of temperature and mechanical forces normally expected with constant exposure to gas and vapours.

2.3.8 The Tenderer shall submit a detailed vapour pressure graph which indicates the relationship between the SF_6 gas pressure, temperature and density. This graph shall indicate particularly the characteristics at the maximum, nominal and minimum gas pressures/densities.

2.3.9 Provision must be made to filter the arc products from the SF_6 gas and to test the condition of the gas in all chambers.

3.0 OUTDOOR ISOLATING AND EARTHING SWITCHES

3.1 ISOLATORS (DISCONNECTORS)

3.1.1 The isolators shall be three pole and shall be rated for the normal and short time current and service voltage specified in C3.1.1 and shall comply with IEC 62271-102.

3.1.2 For standard outdoor switchgear, the isolation operation shall be in the horizontal plane and of the centre rotating support insulator (double break per phase) type.

3.1.3 The double rotating support insulator (single centre break per phase) type will only be acceptable for staggered isolator arrangements.

3.1.4 The isolators shall not be required to make or break load current but must be amply rated for the make or break of the charging current of the busbars and bushings.

3.1.5 The minimum total air gap between terminals of the same pole with the isolator open shall provide for an impulse withstand level as specified in C3.1.1.

3.1.6 The arrangement of the isolator structure, isolator terminals and moving contacts shall be such as to allow safe maintenance of equipment connected to the 'dead' side of the isolator while the remaining circuits are alive.

3.1.7 All phases of the isolator shall open and close simultaneously.

3.1.8 The operating mechanism of the isolator shall be manually operated or motor operated with emergency manual operating provision (as specified in C3.1.1). The electrical circuit shall be automatically opened with the insertion of the manual operating handle.

3.1.9 The isolator moving contact mechanism shall be such as to be self locking at the extreme open or closed positions. This shall prevent the isolator opening due to forces experienced under normal or through fault conditions.

3.1.10 The isolator mechanism shall be mechanically and electrically (in the case of motorised isolators) interlocked with the associated earth switches such that it shall be impossible to close the isolator with the earth switches closed and vice versa.

3.1.11 For compact switchgear installations, under normal conditions the isolators shall be operated by electrical means for an open or close and, unless otherwise specified, shall be controlled from the local kiosk only. Manual operation must also be possible.

3.1.12 In compact switchgear installations the primary method of indicating whether the switch is open or closed must be mechanical and must be positively linked to the main operating arm of the switch. This indication must be clearly distinguishable from the normal operating level of the switch room. Electrical indicators in the local control kiosk shall provide a secondary method of indicating the switch position.

3.2 EARTH SWITCHES

3.2.1 The earth switches of compact switchgear shall comply with IEC 62271-102 and shall have a short time current duration of 3 s.

3.2.2 Unless otherwise specified in C3.1.1, the earth switches for compact switchgear shall be of the high speed type and be capable of closing onto a ‘live’ circuit without damage.

3.2.3 The earthing switches for standard switchgear shall be manually operated and shall be mechanically interlocked with the associated isolator such that it shall be impossible to close the earthing switch with the isolator closed and vice versa. The earthing switch(es) shall be an integral part of the associated isolating switch.

3.2.4 Unless otherwise specified in C3.1.1, compact switchgear earth switches shall, under normal conditions, be operated by electrical means from the local control cubicle but a manual close and open must also be possible.

3.2.5 All phases of the earthing switch shall open and close simultaneously.

3.2.6 Earth switch blades shall be painted yellow and green, the yellow sections being 300 mm long and the green sections 150 mm long, starting with yellow from the contact end. The colours shall be as per the applicable IEC standard for earthing equipment. The blades shall be suitably primed before painting.

3.3 GENERAL (ISOLATORS AND EARTH SWITCHES)

3.3.1 The mechanisms and the electrical connections of these switches shall be suitable for five years exposure to the weather between maintenance inspections.

3.3.2 The manual operating mechanisms of the isolators and earthing switches shall be designed for ease of operation. The control boxes and handles shall all be at a convenient height above ground level for manual operation.

3.3.3 All operating handles shall be lockable in both the open and closed position by means of padlocks.

3.3.4 The operating handles shall be earthed by means of a copper flexible connection to the mechanism box. The cross-sectional area of this connection shall be at least 80 mm^2.

3.3.5 Aluminium or aluminium alloy shall not be used for major fixing, mounting or operating components subject to mechanical stress or for components associated with the making and breaking of currents.

3.3.6 Where dissimilar metals are used in current carrying components, bi-metal interfaces shall be provided subject to the approval of the Engineer.

3.3.7 All current making or breaking components shall be tinned or plated and greased.

3.3.8 The mechanism boxes and auxiliary contact housings shall be thoroughly weatherproof. The control mechanism boxes shall be provided with an a.c. heater and shall be well ventilated.

3.3.9 Cabling of the secondary circuits shall be facilitated by the provision of an adequate removable gland plate and the wiring of all auxiliary switches to convenient terminal connectors.

3.3.10 Where specified, key type mechanical interlocking shall be required between isolators, earthing switches and circuit breakers.

3.4 ISOLATOR MOTOR DRIVE MECHANISMS

3.4.1 Motor drive mechanisms shall be suitable for manual operation and each mechanism shall be provided with a separate operating handle fixed to the mechanism box. A mechanical and/or electrical interlock shall inhibit electrical operation if the handle lever is inserted in position for manual operation to prevent the accidental movement of the handle by the motor.

3.4.2 Motors shall be suitable for operation from the substation battery supply, the voltage of which shall be as specified at the time of order.

3.4.3 Unless otherwise approved, the three phases of the isolator/earthing switch shall be operated from a single drive mechanism.

3.4.4 In cases where separate mechanisms for each phase have been approved, the circuit shall be coupled to ensure that all phases operate simultaneously. Alarm contacts must close after a suitable time delay if a discrepancy exists between the position of the individual phase drive mechanisms.

3.4.5 Control of the motor drive mechanisms shall be possible from the local control kiosk or from a remote source depending on the position of the 'local/remote' selector switch which is to be located in the local control kiosk.

3.4.6 Suitable resettable thermal overload protection must be provided for the motors.

3.4.7 For compact switchgear a provision shall be made for locking the mechanism in the open or closed position by means of padlocks. This facility must include the automatic isolation of the electrical control circuit.

4.0 AUXILIARY CONTACTS FOR CIRCUIT BREAKERS, ISOLATORS AND EARTHING SWITCHES

4.1 The circuit breakers, isolators and earth switches shall be provided with all the necessary auxiliary contacts and limit switches required for control, protection, interlocks, alarms, local indication, supervisory indication and spares as specified in T2.2.17.

4.2 Auxiliary contacts for circuit breakers must operate simultaneously with the main contacts, within ± 20 ms.

4.3 Auxiliary contacts for isolators and earthing switches must operate simultaneously with the main contacts, except where specified otherwise for CT switching (early make - late break).

4.4 The fitting of auxiliary relays to achieve the required number of auxiliary contacts will not be accepted.

4.5 All auxiliary contacts shall be adequately rated for the service intended with a minimum rating of 1 A continuous.

4.6 An auxiliary contact shall be wired in series with the trip coil and special attention shall be given to this to ensure correct timing and liberal rating for breaking of inductive currents.

4.7 An auxiliary contact shall be wired in series with the close coil circuits and shall be liberally rated to suit the breaking of inductive currents.

4.8 The auxiliary contacts shall be easily accessible, even when the primary circuit is 'live'.

5.0 INSTRUMENT TRANSFORMERS

5.1 VOLTAGE TRANSFORMERS

5.1.1 Voltage transformers shall be of the oil-immersed wound type. In the case of voltage transformers with a primary voltage of 275 kV, capacitive type voltage transformers will be considered.

5.1.2 Voltage transformers shall be hermetically sealed with provision for the expansion of oil and an approved level indicator.

5.1.3 Suitable valves shall be provided for draining, filling, sampling and filtering the oil.

5.1.4 Epoxy resin shall not be used as an insulator in the construction of the primary winding.

5.1.5 The secondary connections shall be fused at the voltage transformer. The secondary connections shall be earthed at one point only.

5.1.6 External insulation shall be composite silicone rubber polymer.

5.2 CURRENT TRANSFORMERS

5.2.1 Current transformers shall be of the oil immersed “hair pin” type or SF_6 insulated type.

5.2.2 Where the insulating medium is oil, current transformers using minimum oil shall be preferred.

5.2.3 Current transformers shall be hermetically sealed with provision for the expansion of oil and an approved level indicator.

5.2.4 Suitable valves shall be provided for draining, filling, sampling and filtering the oil.

5.2.5 Bidders offering current transformers which are filled with SF_6 shall detail methods of gas sealing and the method of constant gas pressure monitoring. Filling methods must be fully detailed.

5.2.6 All current transformer connections shall be brought out to a connection box accessible when the circuits are energised.

5.2.7 The insulation of the high voltage primary shall have stress relieving foils and the outer foil shall be brought out to an insulated terminal and earthed via a bolted link arrangement.

5.2.8 The securing of the individual current transformers in the common housing shall be such that vibration during service shall not damage the windings.

5.2.9 External insulation shall be composite silicone rubber polymer.

6.0 STRUCTURES, BUSBARS, INSULATORS AND CONNECTIONS

6.1 GENERAL

6.1.1 A drawing(s) shall be issued with each order detailing the envisaged layout of the substation equipment. The design and layout of the equipment to be supplied on each order shall be based on this envisaged layout.

6.1.2 The structures complete with busbars and droppers shall be designed such that under all conditions of loading, temperature variations and maximum swing under fault conditions the electrical clearances shall be equal to or greater than those specified in C3.1.1. The temperature variation of busbars shall be considered to be 75 ˚C to -5 ˚C.

6.1.3 Safety clearances to enable operation, inspection, cleaning, repairs, painting and normal maintenance work shall be strictly in accordance with statutory safety regulations.

6.2 LOADING CALCULATIONS AND FACTORS OF SAFETY

6.2.1 The assumed maximum working loads shall be the combined simultaneous loading of "dead weight", windage and tension loadings.

6.2.2 The "dead weight" shall be the vertical loading of the conductors, insulators and equipment supported by the structures and the structures themselves.

6.2.3 The windage loading shall be the product of an assumed wind pressure of 700 Pa and the "effective projected area" of the structures, equipment, insulators and conductors supported. The "effective projected area" is as follows:-

The true projected surface area of flat objects × 1.

The true projected surface area of round, elliptical or hexagonal objects × 0,6.

The true projected area of all the members of the side of lattice supporting structures × 1,5.

6.2.4 For equipment and structures of less than 10 m total height the wind pressure shall be assumed to be 900 Pa. For structures of total height above 10 m the assumed wind pressure shall be that determined from the curve of Pressure against Height as shown in Table 3 (section 4.5) of SABS 0160 - 1980 "Code of Practice for the general procedures and loadings to be adopted for the design of buildings", adjusted by multiplying the figure by a gusting factor of 1,37 (i.e. for a 140 km/h wind).

6.2.5 The tension loadings shall be the combination of the tensions applied to the supported yard conductors and the tension due to the incoming lines and earth wires. For calculation purposes the working tension

of each line conductor (or earth wire) shall be considered to be 4 500 N (i.e. 9 000 N per phase for twin conductors per phase) and allowance must be made for variation in landing direction (from that shown on the drawings issued with this specification) of up to 30° laterally and 20° vertically. The yard conductors shall be assumed to be at -5 °C for the calculation of the assumed maximum working load.

6.2.6 The ratio of unsupported length of compression members to their least radius of gyration shall not exceed 120 mm for main members or 200 mm for bracing members.

6.2.7 The calculated tension/compression stress of any member of the completed structure resulting from the assumed maximum working load shall not exceed 40 % of the elastic limit/crippling strength of that member (i.e. safety factor of 2,5).

6.2.8 The tension of each single conductor is not to exceed 4 500 N at -5 °C and a minimum safety factor of 2,5, based on the elastic limit or the 0,1 % proof stress, shall apply.

6.2.9 The strength of the insulator strings shall be such that a factor of safety of 3 exists at maximum assumed working load condition.

6.2.10 The clamps and connectors shall be such that no slipping shall occur at any load less than 3 times the maximum nominal working tension of 4 500 Newtons.

6.2.11 The design of the structures shall be such that under the assumed maximum working loads the deflection in the structures will not exceed the limits as specified by BS EN 1993 nor shall this deflection disturb the alignment of the apparatus supported.

6.3 MANUFACTURE AND ERECTION OF STRUCTURES

6.3.1 The design of the structures should preferably allow for the use of easily available standard steel sections. All structural steel shall be of mild steel to the requirements of BS 7668.

6.3.2 All members of the structure shall be manufactured with the utmost care. Jigs shall be used for cutting and drilling of the material such that when erected on site all members shall fit neatly together and all holes shall be truly aligned. No cutting, drilling, punching, etc. of steel already galvanised will be permitted.

6.3.3 Bolt hole clearances shall not exceed 2 mm for bolts of up to M15 and shall not exceed 3 mm for larger bolts unless otherwise approved by the engineer. Holes shall not be elongated unless otherwise approved.

6.3.4 Each fabricated member shall be stamped (before galvanising) with an erection mark corresponding to the markings shown on the final approved structural arrangement drawings.

6.3.5 The Engineer may, if he considers it necessary, instruct that portions of the structure be erected at the manufacturer's works.

6.3.6 All structural steelwork shall be hot-dip galvanised in accordance with this specification.

6.3.7 Care shall be taken that the galvanised surfaces are not damaged during storage, transport or erection.

6.3.8 The design of the structure and the procedure for erection shall ensure that no members are strained or damaged during erection of the structures or the erection and tensioning of conductors.

6.4 LIGHTNING MASTS

6.4.1 Where free standing lightning structures are specified in C3.1.1, these shall be composed of tubular sections wherein each section is locked into its mating section by means of a drive fit, to provide a rigid suitable structure.

6.4.2 The mast shall be designed with minimum safety factors of 2,5.

6.4.3 The structure shall be of high tensile steel to SAE/AISI 950X specification to a minimum tensile strength of 500 MPa. Manufacturer's data sheets of the materials used are to accompany the tender together with details of SABS specifications with which the material complies.

6.4.4 Each completed section is to be hot-dip galvanised after fabrication including all jointing pieces, flanges and nuts and bolts.

6.4.5 The last 3 m of the specified height may be a tube of minimum outside diameter of 50 mm.

6.4.6 The largest dimension at the base shall not exceed 1 m.

6.4.7 The use of incompatible materials without satisfactory separation will not be acceptable.

6.4.8 Approved means shall be provided for plumbing the mast after erection to compensate for any ground settlement.

6.4.9 Any condensate on the inside of the pole shall be adequately drained at the base and no pockets shall exist where water could accumulate.

6.4.10 Adequate provision shall be made for earthing of this mast. At least two separate earth connections of 150 mm^2 copper section shall be made to the main earth mat.

6.4.11 The cone of protection afforded by a mast shall be determined by assuming a protective angle of 30˚ (unless otherwise approved) and the area between two masts shall be treated in accordance with SANS 10313 -2010: Protection Against Lightning.

6.5 BUSBARS, CONNECTIONS AND CONNECTING CLAMPS

6.5.1 Busbars and connections shall be high conductivity copper or aluminium and shall be stranded or tubular as specified in each order.

6.5.2 The aluminium alloy used, its chemical composition, electrical and mechanical properties shall be in accordance with SANS 51706. The alloy shall not be prone to stress corrosion, cracking or layer corrosion.

6.5.3 All clamps and connectors shall have a current carrying capacity not less than the conductors joined thereto.

6.5.4 All clamps shall be specifically designed for the particular application such as to avoid deformation of the conductors.

6.5.5 Clamps for aluminium conductors shall be lined with soft aluminium where necessary.

6.5.6 The clamps to be used for joints of dissimilar metals shall have bimetallic interfaces and shall be to the approval of the Engineer.

6.5.7 All ferrous parts shall be hot-dip galvanised.

6.5.8 Rigid busbar shall be clamped at one end only and have flexible connections at the other end to allow for expansion and contraction.

6.5.9 Hollow tubular busbar shall be plugged at the ends.

6.5.10 Copper or copper alloy connections shall be tinned at the connection points.

6.5.11 Connections between transformer bushings and tubular busbars shall be arranged in a manner that prevents mechanical vibration caused by the transformer to progress along the busbar.

6.5.12 Stranded aluminium Centipede conductor shall be inserted into the tube to damp vibration.

6.5.13 The clamp materials shall be resistant to atmospheric corrosion.

6.6 INSULATORS

6.6.1 Long Rod Insulators

6.6.1.1 Long rod insulators shall be composed of silicone rubber with a fibre glass reinforcing rod providing mechanical strength.

6.6.1.2 All ferrous parts shall be hot-dip galvanised.

6.6.1.3 All accessories, including strain clamps, suspension clamps, arcing horns, turnbuckles, yoke plates, etc. shall be manufactured to SANS IEC 60273.

6.6.2 Post Insulators

6.6.2.1 All post insulators of the same voltage rating shall be identical, whether used for the support of busbars or as a part of other equipment.

6.6.2.2 The post insulators shall be capable of withstanding any shock loading which may be encountered in service and the deflection under the conditions of assumed maximum working loads shall not result in the misalignment of the contacts of isolators.

6.6.2.3 Post insulators shall be of composite silicone rubber polymer.

6.6.3 All insulators shall be suitable for live spray washing to remove salt and industrial deposit.

6.7 FOUNDATIONS

6.7.1 Drawings and specifications of the concrete foundations for the structures shall be submitted with the tender. These drawings shall be for foundation construction purposes only and no detail irrelevant to the civil works shall be included.

6.7.2 The minimum strength of concrete foundation bases, screed and/or grout shall be 25 MPa at 28 days. No pockets for hold-down bolt relocation shall be created in the foundation when pouring concrete.

6.7.3 The design of the foundation, hold-down bolts, support structure, baseplates and any adaptor plates shall cater for the baseplates and adaptor plates to be fixed and supported using levelling nuts without grout. The space (air gap) between the baseplate and the concrete foundation shall be a minimum of 40 mm and a maximum of 60 mm. No grout shall be used to fill the space between the baseplate and concrete foundation, unless otherwise specified.

6.7.4 Concrete bases may be required to be constructed under this contract as may be specified in the scope of work and/or bill of quantities such as where individual pieces of equipment are ordered, or under

separate contract, but the hold-down bolts, chemical anchor bolts, templates and plates or steel studs shall be provided on this contract.

6.7.5 The sizing of the items shall be designed fit for purpose, for example, the bolt section protruding from the concrete shall be sufficiently long for the air-gap, baseplate, hold-down washer and nut and free portion to allow for construction and adjustment tolerances. The hold-down bolt threads shall extend at least 40 mm into the concrete. The minimum diameter of hold-down bolts shall be 20 mm.

6.7.6 For new concrete foundations, and where it is necessary, hold-down bolts shall be required to be cast into the concrete foundation, unless otherwise specified. The Contractor shall provide templates for positioning of the hold-down bolts, the use of which shall be fully detailed on the foundation drawings. Two templates are required for a group of hold-down bolts to ensure that the hold-down bolts are held firmly in position. One template shall be for the permanent placement with the rebar within the concrete section. The other template shall be installed at the top of the hold-down bolt and this shall be removed after the concrete is cast and cured.

6.7.7 Existing concrete bases may have to be modified to fit in new support structures and the equipment by means of modifying and levelling the base and/or the use of adaptor plates and the use of chemical anchor bolts. Where necessary, this requirement shall be specified in the scope of works and/or bill of quantities. After the chemical anchor bolts are fixed, any crack, hollow or pocket in the concrete shall be filled and levelled off with proper high strength non-porous screed or non-shrink grout prior to the installation of the support structure. The levelling off shall ensure water run-off. The existing concrete surface shall be properly and correctly prepared to ensure proper bonding of the overlay/screed.

7.0 SURGE ARRESTERS

7.1 The surge arresters to be supplied on this contract shall be in accordance with IEC 60099-4 except where modified by this specification and shall be composed of silicon rubber polymer insulation.

7.2 The surge arresters shall be of the zinc oxide type.

7.3 The waterproof seals must be capable of withstanding severe temperature cycling in a very humid atmosphere. The quality of sealing is a major concern and full details of the method of sealing must be submitted with the tender.

7.4 The connector clamp at the top of each surge arrester must be sturdily attached to withstand the effects of the attached flexible conductor swaying in windy conditions.

7.5 The surge arresters are to be insulated from the supporting steel structure and connected to earth via a removable conductor.

8.0 MARSHALLING KIOSKS

8.1 The marshalling kiosks shall be fabricated of stainless steel of grade 304 or corrosion resistant steel 3CR12. The colour shall be BS 632 Admiralty Light Grey. Full details of the fabrication of these marshalling kiosks shall be sent to the Engineer for his specific approval before manufacture commences.

8.2 The marshalling kiosks shall be at least 800 mm wide, 600 mm deep and 800 mm in height from the gland plate to the top.

8.3 Access shall be provided at both back and front by hinged doors. These doors shall provide a weatherproof seal and shall provide a three point locking mechanism. Each door shall be fitted with a brass window latch. Each door shall also be equipped with a travel stop, which shall retain the door in the open position.

8.4 The top shall be sloped to avoid accumulation of water and the base, while vermin proofed, shall be well ventilated.

8.5 Heaters of adequate capacity shall be provided in the panel, clear of the terminal blocks and cable access. A local fuse and switch shall be provided for this heater.

8.6 Marshalling kiosks shall be fitted with a 15 A plug socket protected by a single phase circuit breaker incorporating earth leakage. The input terminal connectors shall be suitable for a 16 mm^2 cable.

8.7 The terminal connectors of a.c. supplies, d.c. circuits, current transformer circuits, supervisory and voltage transformer circuits shall be segregated as far as possible. All terminals of dangerous voltages shall be shrouded and marked.

8.8 Spring-loaded terminals shall be mounted on rails. The arrangement of these shall be to the approval of the Engineer.

8.9 The number of terminal blocks to be provided shall be a minimum of 150.

8.10 The cable gland plate shall be at least 800 mm above ground level and shall be made up of several separately removable gland plates for ease of drilling.

8.11 Drawings and specifications of the concrete base for the marshalling kiosks shall be submitted with the tender.

9.0 LABELS

9.1 The equipment shall be fitted with UV stabilised labels of painted aluminium material with engraved/etched and painted/powder coated text as further detailed in Section C3.1.1, Item 9. The text for each label will be provided at the time of order. Labels shall be provided with suitable mounting brackets.

9.2 Engraved brass registration labels bearing the Durban Corporation (DC) registration number shall be attached to the local control kiosk of each circuit breaker. The number for each label will be provided at time of order.

9.3 Each fuse, link, control handle and indicator shall be labelled to indicate the function.

10.0 LOCKS

10.1 All isolator and earthing switch mechanisms shall be provided with all-brass locks with brass shanks of an approved type. A sample of the locks shall be provided to the Engineer for approval.

10.2 The locks and keys shall be engraved to a code scheme comprising the circuit number and a consistent

system of postscript letters.

10.3 Two keys shall be provided for each lock, one of which shall have an engraved label matching the equipment designation label.

11.0 WIRING AND SECONDARY CABLING

11.1 Equipment wiring shall be coloured grey or black. Current transformer wiring circuits shall have a conductor cross-section of at least 2,5 mm^2.

11.2 All terminal connectors shall be spring-loaded. Lugs and terminals shall incorporate a feature which prevents the lugs from being inadvertently withdrawn from the terminal even if the terminal screw has not been tightened regardless of the orientation of the lugs. Full details of the terminal connectors shall be submitted for approval unless these were previously approved and accepted by eThekwini Electricity. Terminal connectors shall be suitable to accommodate 2,5 mm^2 and 4 mm^2 wire and shall be at least 10 mm wide.

11.3 All equipment shall be provided with a suitable cable tray/support to support the secondary cables between ground level and the point of termination of the cables, irrespective of whether secondary cabling is to be carried out by the Contractor or others. Cable tray and support structures shall be of suitable size and be galvanised. The cost of this cable tray shall be included in the cost of the equipment structure(s).

11.4 Secondary cabling will be carried out either on this contract or as part of another contract as advised upon order. The clauses below only apply if secondary cabling is required.

11.5 The Contractor shall collect the secondary cable from eThekwini Electricity stores located at its Springfield Park Complex, 11 Electron Road, Springfield, Durban. Supply of glands and other accessories shall be part of this contract at the unit rates tendered in C2.2.

11.6 The laying rate quoted in C2.2 shall include collection of cable, lifting of cable trench slabs, strapping to cable trays, etc. Excavation and reinstatement where necessary shall be at the unit rates tendered in C2.2. The laying rates shall be applied to the measured length of cable from gland to gland.

11.7 Any unused secondary cable left on site shall be marked indelibly with the type and length of the cable and the ends shall be taped or capped to prevent water ingress. Short lengths of unused cable shall be formed into coils and bound.

11.8 The termination rates quoted in C2.2 shall include glanding, stripping, marking of cores, crimping of terminal lugs, connecting and lacing.

11.9 All secondary cable laid in ducts and trenches shall be neat and orderly and to the satisfaction of the Engineer. Cables shall not be allowed to hang freely for distances in excess of 500 mm and shall be saddled to a rigid structure or supported on cable trays as necessary.

11.10 All cables shall be marked with a number tag fixed below and above the gland and the number shall correspond to the cable number on the cable schedule.

11.11 All wire armours or screens of cables shall be earthed.

11.12 Terminals at 110 V d.c. or 220 V a.c. and/or 220 V d.c. shall be segregated from other terminals and shrouded, with the voltage prominently marked on the shrouds. All terminations are to be clearly identified and connection of all wires and control cables shall be made by the manufacturer.

12.0 EARTHING

12.1 PRIMARY STATION EARTHING

12.1.1 The earthing of the substation shall be included in this contract, and the pricing shall allow for all necessary excavation, laying, jointing and reinstatement.

12.1.2 The Contractor shall have soil resistivity tests performed as part of the design element of the orders and the earthing design shall be submitted for approval prior to construction. The design is required to verify that step and touch potentials and ground potential rise are within acceptable limits as stipulated in SANS 725. The contractor shall at his expense test the earth mat once installed.

12.1.3 It shall be noted that in order to meet acceptable limits stipulated in 12.1.2, the perimeter of the earth mat installation may be required to extend beyond the perimeter of the substation.

12.1.4 The main earth shall be of copper with a cross-sectional area of at least 150 mm^2 or 10 mm^2 copper rods, forming a mesh covering the substation yard.

12.1.5 The conductors for the earth-mat shall be laid at a depth 500 mm unless otherwise stipulated by the initial earthing design.

12.1.6 The loop conductors should be laid in parallel line to form a grid and, where practical, along the structures or rows of equipment, to provide for short earth connections.

12.1.7 Multiple earth leads shall be used where high concentrations of current might occur.

12.1.8 Visual inspection/verification of the installation of the earth mat and the exothermically welded/brazed joints shall be closely monitored. These connections shall not be buried until inspected by the Engineer/Project Technician.

12.1.9 Any ferrous material used for clamping shall be galvanised.

12.1.10 All exposed copper work, except the tinned connection points, shall be painted with a black bitumous paint.

12.1.11 On the basis of the efficiency of the electrode, or group of electrodes, which shall be measured by the Contractor at his expense, the Engineer may require that the Contractor installs further electrodes at the time and the material rates quoted in C2.2.

12.1.12 If more than one electrode is specified per group, these shall be spaced at least 2 m apart and bonded with copper connections of not less than 300 mm^2 cross-sectional area.

12.1.13 All buried copper shall be left bare.

12.1.14 Depending on the expected fault current levels and the type of earthing material used to connect equipment to the main earthing grid, provision shall be made in the initial design to have to up to 4 connections made for each piece of equipment to the main earth grid.

12.1.15 The disconnecting link shall be a bolted copper strap of least 300 mm^2 cross sectional area and the faces shall be tinned. The link shall be housed in the concrete box (unless otherwise approved) which shall be fixed in position with the box lid at 150 mm above the unstoned ground level.

12.1.16 Copper clad steel shall be used to connect the equipment to the main earth mat.

12.2 EARTHING OF OUTDOOR EQUIPMENT

Power Transformers

12.2.1 Transformer tanks shall be connected to the main earth grid at least two fixed points by 150 mm² copper straps. All connections shall be clamped and bolted on at points specified by the manufacturer.

12.2.2 275/132 kV auto transformers shall be solidly earthed at the common neutral point by a 300 mm² copper strap connected directly to the main earth grid.

12.2.3 132/11 kV star/star transformers shall be solidly earthed on the HV neutral star point and shall be earthed via a neutral earthing resistor (NER) at LV neutral star connection point using 300 mm² strap.

12.2.4 132/33 kV star/delta transformers shall be solidly earthed on the HV neutral star point and shall be earthed via a neutral earthing compensator resistor (NECRT) on the LV delta connection point using 300 mm^2 strap.

12.2.5 33/11 kV delta/star transformers shall be solidly earthed on the LV neutral star point using 300 mm^2 strap. No earthing shall be present on the HV delta connection of the transformer.

12.2.6 The tank of the NER shall be earthed at two points using 150 mm² copper straps. All connections shall be bolted on.

12.2.7 Transformer marshalling kiosks (TMK) shall be earthed at designated points using 150 mm^2 copper straps.

12.2.8 Tap changers shall be earthed at designated points using 150 mm^2 copper straps.

12.2.9 Deluge piping systems installed in each transformer bay shall be connected at two points to the main earth grid by 150 mm^2 copper straps. Connections shall be clamped.

Disconnecting Link Box

12.2.10 In order to provide isolation between different earthing systems, all auxiliary earthing systems, such as those of cables and overhead lines, shall be connected to the main Earth Grid through a disconnecting link box.

12.2.11 The disconnecting link box shall be made up of a bolted copper strap of at least 300 mm² cross sectional area.

12.2.12 The disconnecting link box shall fixed in position by a suitable lid at least 150 mm above stoned ground.

Isolators and Earth Switches and Operating Mechanisms

12.2.13 The earthing switch shall be earthed on the outer phases with copper straps of 150 mm². The earth bar shall be directly connected to bottom end of the earth switch.

12.2.14 Isolator structures shall be earthed at two points on opposite sides of the structure with 150 mm^2 copper straps.

12.2.15 All operating mechanisms shall be earthed directly to the 150 mm^2 earth electrode with a 70 mm² insulated stranded copper conductor through a lug and bolt.

12.2.16 Yard marshalling kiosks (YMK) shall be earthed using a 70 mm² insulated stranded copper conductor

through a lug and bolt connection to a 150 mm^2 earth electrode tail.

CT and VT and CB

12.2.17 All mounting structures for CTs, VTs and CBs shall be earthed in two places to the main earth grid with copper straps of 150 mm².

12.2.18 All CTs shall be directly earthed to the main earth grid using a 150 mm².copper strap.

Cable Sealing Ends

12.2.19 Cable sealing end structures shall be earthed in two places to the main earth grid with copper straps of 150 mm².

Surge Arrestors

12.2.20 Surge Arrestors shall be earthed in two places to the main earth grid with copper straps of 150 mm². The earthing straps shall terminate directly on the bottom of the surge arrestor to allow for direct flow of fault current.

Post Insulators

12.2.21 Structures on which post insulators are mounted shall be earthed in two places to the main earth grid with copper straps of 150 mm².

Lightning Masts

12.2.22 Yard lightning masts shall be earthed in two places to the main earth grid with copper straps of 150 mm².

12.2.23 Lightning masts mounted on the substation buildings shall be earthed using 70 mm² insulated stranded copper conductor through guttering down piping. These connections shall be terminated onto tails brought up from the main earth grid using a lug and bolt connection.

Copper Clad Steel

12.2.24 Equivalent copper clad steel (CCS) conductor may be used to connect all equipment above ground to the earth mat.

12.2.25 The conductivity of the CCS rod used shall be at least equal to 40% that of a pure copper.

12.2.26 Connections shall be made on a vertical face wherever possible. No foundation bolts shall be used for any earthed connections.

12.2.27 All CCS connections to the main earth grid shall be exothermically welded in order to ensure maximum current transfer.

12.2.28 Signs shall be affixed to fences indicating the presence of steel within the earthworks. At least 8 labels shall be used throughout the perimeter or two per side fence. The sign shall contain a sample of the CCS used.

12.3 EARTHING IN SUBSTATION BUILDINGS

12.3.1 Control panels, battery chargers, cable racking and other indoor auxiliary equipment shall be bonded by insulated copper stranded conductor of minimum 70 mm^2 cross-section (or equivalent copper clad steel conductor). The bonding bar shall consist of 50 mm × 3 mm copper flat bar (or equivalent copper clad steel conductor) and shall form a closed ring if possible. This closed bonding ring shall be connected to the main substation earth mat at two points.

12.3.2 Earth bar installed in cable trenches or in the substation building shall be fixed neatly to the walls by brass or copper cleats. The cleats shall be spaced at a maximum of one metre. The cost of the cleats shall be included in the unit installation rate tendered.

12.3.3 All exposed copper work, except the tinned connection points shall be painted black.

12.4 EARTHING ELECTRODES

12.4.1 Earthing electrodes shall be of the extendible rod type and shall be 3,6 m long and must comply with SANS 1063.

12.4.2 The threads for the connector couplings shall be rolled and not machined.

13.0 ADDITIONAL CIVIL WORKS ENVIRONMENTAL REQUIREMENTS

13.1 Although all yard civil works shall be performed under a separate contract, the Engineer may request for additional or remedial work to be performed under this contract at existing substation sites as per SANS 1200.

13.2 The bidder shall provide a rate for all civil yard works outlined in C2.2, Bill of Quantities.

13.3 All civil yard works shall fully comply to statutory requirements outlined in Clause 1.3 page 171.

13.4 Furthermore the Contractor shall comply to the following Environmental Specifications when executing their civil works activities, including:

13.4.1 **Dust Control**

The Contractor shall:

a) Be responsible for the control of the dust arising from his operation and activities.

b) Implement dust control measures, which could include regular spraying of working/bare areas with water, at an application rate that will not result in soil erosion.

c) Record and communicate to the Engineer with regards to complaints received by the Contractor regarding dust.

13.4.2 Noise Control

The Contractor shall:

a) Take reasonable measures to limit noise levels during construction, taking into account the urban or agricultural setting of the project as applicable.

b) Comply with all government regulations regarding noise.

c) Keep noise levels within reasonable norms at all times.

d) Fit all vehicles and machinery with silencers that shall be properly maintained.

e) No amplified music shall be allowed nearby any residences. The use of radios, tape recorders, compact disc players, television sets, etc. shall not be permitted unless the volume is kept sufficiently low as to avoid any intrusion on members of the public or residence/occupants within range.

f) Not permit noise levels exceeding 85 dB, unless approved by the Engineer.

g) Confine approved construction activities generating output levels of 85 dB (A) or more and/or vibration, in the proximity of residential areas to hours 07h00 to 18h00 Mondays to Sundays. Noisy construction activities close to businesses might need to be restricted to times outside normal business hours. Should the Engineer sanction any construction activities outside of normal working hours, affected residents/occupants shall be notified at least 5 days in advance of the event.

13.4.3 Concrete Batching

The Contractor shall:

a) Locate concrete batching/mixing plants more than 200 m from the nearest waterhouse/wetland.

b) Bund the batching site with earth berms or sandbags to prevent runoff escaping.

c) Prepare a soak pits in which all water, which has been contaminated with concrete, is allowed to soak away.

d) Ensure that no water with a pH exceeding pH 9 reaches a stream as this would be in contravention of the National Water Act of 1998.

e) Use mortar boards, mixing trays and impermeable sumps at all mixing and supply points

f) Scrape waste concrete and cement sludge off the site and dispose in an approved landfill site.

g) Remove all waste concrete/cement sludge together with contaminated soil of the batching plant or any area where concrete was mixed once the site area is prepared for closure. The soil surface shall then be ripped to a depth of 150 mm and topsoil replaced evenly over the site and watered. Where the site was originally grassed, reseeding will be required.

h) Ensure that no concrete is spilled on public roads and that any accidental spillage is immediately cleaned up.

13.4.4 Trench and Foundation Excavation

The Contractor shall:

a) Keep trenching to a minimum through the use of single trenches for multiple service provision.

b) Keep trenching lengths as short as practically possible before backfilling and compacting. Unless permitted otherwise by the Engineer, no more than 300 m of trench per working gang shall be opened at any time.

c) The planning and selection of trench routes shall be undertaken in liaison with the Engineer and cognizance shall be given to minimizing the potential for soil erosion.

d) Clearly define and mark the permitted and working areas along the trench route and at the foundation sites with painted stakes prior to excavation.

e) Slope at least one end of any open trench or a section of the excavation to allow egress of any animal or person falling into the trench.

f) Shore trenches or excavations where they may pose a safety hazard to workers.

g) Re-fill trenches to the same level as (or slightly higher to allow for settlement) the surrounding land surface to minimize erosion. Excess soil shall be stockpiled in an appropriate manner.

h) Undertake backfilling as soon as practically possible in order to limit the risk of erosion and to encourage the rapid natural regeneration of the disturbed area.

i) Cover trenches, excavations and associated disturbed working areas, where specified, immediately after back filling with appropriate hard standing and/or planted with a suitable plant species. Where there is a particular high erosion risk, a fabric such as Geojute (biodegradable) shall be used in addition to planting.

13.4.5 Rock and Concrete Breaking

The Contractor shall:

a) Follow blasting protocols for boulders for busters use.

b) Notify occupants/residents at least one week prior to these activities commencing, and ensure that their concerns are addressed.

c) Supply a Method Statement should mechanical and/or chemical breaking be required to the Engineer for approval and await such approval before commencing with the activity.

13.4.6 Rehabilitation of Trenches and Impacted Areas

a) After backfilling the trench, the topsoil shall be replaced on top and only lightly compacted, e.g. by trampling under foot.

b) Where grass seeding is required, it must be carried out within 2 days of topsoil replacement and before lightly compacting the soil and preferably during the growing season.

c) Care shall be taken to ensure that the surface is finished in a manner, which does not result in the channelling of water or the concentration of flows.

d) Where slope gradients exceed 15 % in long section, anti-erosion berms shall be made which are angled at ± 10º across the contours such that they lead water off the disturbed corridor.

e) The erosion berms shall be made after backfilling and before topsoil replacement.

f) The Substation work area shall be left in a clean and tidy condition.

14.0 TESTS

14.1 GENERAL

14.1.1 All testing shall be arranged to represent the working conditions as closely as possible.

14.1.2 The Municipality reserves the right to appoint a representative to inspect the equipment at any stage of the manufacture and to be present at any of the tests required. Such inspection shall not relieve the Contractor of his responsibility for meeting all the requirements of the specification, and it shall not prevent subsequent rejection if such material or equipment is later found to be defective.

14.1.3 The Contractor shall give at least four weeks notice of the date on which the equipment will be ready for testing in order that the Engineer may arrange for the presence of a witness if deemed necessary. This shall be extended to two months notice if the testing is to be performed abroad.

14.1.4 Three copies of test certificates (in English) showing the results of all routine and type tests performed shall be supplied to the Municipality prior to the despatch of the equipment from the works.

14.1.5 Unless otherwise approved, test voltages shall be measured by means of an electrostatic voltmeter or a crest voltmeter which shall be connected to, and calibrated on, the high voltage side of the testing transformer.

14.2 TYPE TESTS

14.2.1 The equipment listed in T2.2.27 shall be type tested in accordance with the latest edition of the relevant SANS, BS Specification or IEC Specification with which it is required to comply.

14.2.2 Structures: The Engineer may require that each gantry type (self-supporting section) be erected at the manufacturer's works and be subjected to the design loadings.

14.2.3 Radio Interference Voltage Test: All high voltage equipment to be supplied on this contract shall be type tested in accordance with IEC 60437 to ensure that the radio interference noise level is within the acceptable limits.

14.2.4 Circuit Breakers: The operating characteristics of circuit breakers which are dependent on pressure/density of a gas for operation and/or insulation shall be tested at the pressure/density which would normally cause a lock-out.

14.2.5 Compact Switchgear: The operating characteristics of equipment dependant on pressure/density of a gas for operation and/or insulation shall be tested for compliance at the pressure/density which would normally cause lock-out.

14.3 ROUTINE AND SAMPLE TESTS

14.3.1 All pressure vessels shall be tested by an independent testing authority to ensure that these vessels comply in all respects with the Occupational Health and Safety Act of 1993 and Construction Regulations. The full set of Test Certificates signed by the independent testing authority shall be submitted to the Engineer as soon as these are available together with documentation to show to the satisfaction of the Engineer that the said testing authority is recognised by the Department of Manpower to be qualified for this testing. The equipment will not be accepted until such time as the Contractor has complied fully with the clause.

14.3.2 The equipment listed in T2.2.27 shall be tested as routine or by a sampling method in accordance with the latest edition of the relevant SABS, BS or IEC Specification with which it is required to comply.

14.3.3 Additional testing requirements are detailed in the clauses following or in T2.2.29.

14.3.4 Galvanising: The Engineer may require that samples of galvanised material are subjected to the tests laid down in the relevant specification.

14.4 SITE TESTING

Site testing shall be carried out as further detailed in T2.2.29 on page 97.

15 Intelligent Key System

15.1 Intelligent Key System Controller (IKSC)

15.1.1 The IKSC shall have a guaranteed minimum service life of ten years.

15.1.2 The IKSC shall make use of the IEEE 802.3 (Ethernet) communication networking technology between the Security Control Centre (SCC) and IKSC.

15.1.3 The IKSC shall be directly addressable from the SCC.

15.1.4 The IKSC shall have the ability to identify each key that is attached within the cabinet.

15.1.5 The IKSC shall have the ability to provide custom user access for each key.

15.1.6 Access to the system shall be granted via a card reader or biometrics.

15.1.7 Removing of keys

15.1.7.1 Only authorised keys shall be indicated to be removed via the touchscreen interface.

15.1.7.2 The user shall not be capable of removing unauthorised keys.

15.1.7.3 The IKSC shall have the ability to limit the amount of keys that can be taken simultaneously by any user.

15.1.8 Returning of keys

15.1.8.1 The correct slot shall be illuminated via the touch screen.

15.1.8.2 If the key/s are returned to the incorrect slot/s the IKSC shall have the ability to notify the user via the touch screen.

15.1.9 The IKSC shall maintain its own on-board storage of access data when communications to the master station goes offline.

15.1.10 The IKSC shall operate mainly in offline mode (from the master station server) and shall be responsible for authorising access. The controller must be able to accommodate access data for at least 4 000 users. This data will be periodically downloaded from the SCC master station server.

15.1.11 Access transactions that take place at the substation shall be stored on non-volatile memory on the IKSC for later downloading to the Security Control Centre. This information shall include but not be limited to, time and date, key ID number, authorised/unauthorised access. The memory must be capable of storing at least 8 000 transactions.

15.1.12 It shall be possible to add users to or delete users through the touch screen.

15.1.13 The base station shall be able to upload or download data to the IKSC at user defined times. This may either be conducted periodically (daily, weekly, etc.) or upon user request.

15.1.14 The IKSC shall make use of eTE's in-house fibre Wide Area Network (WAN) as a communication medium between the Security Control Centre and IKSC. EThekwini Electricity (EE) will provide the network switch that connects the controllers to the WAN.

15.1.15 The IKSC shall support the Wiegand standard.

15.1.16 The IKSC shall be suitably protected against supply variations and surges on the supply. Normal operation must not be affected by variations and surges of the duration and magnitude to be expected on a low voltage electricity supply (see IEC Report 664 - 1980).

15.1.17 Suitable surge and lightning protection shall be provided for all external connections of the equipment. The bidder shall describe the method of protection and the point of application, and tests carried out to confirm the effectiveness of the protection.

15.1.18 The equipment shall be protected against radio frequency interference. In particular no malfunction will be caused by operation of a VHF or UHF transmitter emitting 5 W at 0,5 m from any item of equipment.

15.2 Intelligent Key Cabinet (IKC)

15.2.1 The supply of the IKC shall include delivery, offloading, installation and commissioning.

15.2.2 The IKC and components shall have a guaranteed minimum service life of ten years.

15.2.3 Aluminium and aluminium alloys shall be of approved purity and composition in accordance with the requirements of SANS 989.

15.2.4 Materials that may, under the influence of heat, light or pressure, decompose or liberate compounds that corrode or otherwise affect other materials in contact with them must be avoided.

15.2.5 All enclosed compartments shall be adequately ventilated to restrict condensation and all parts shall be suitably protected against corrosion.

15.2.6 The IKC shall have an IP 53 rating.

15.2.7 Corresponding parts shall be fully interchangeable. Parts which are similar in appearance but not interchangeable shall be so designed as to prevent accidental interchanging.

15.2.8 A single IKC shall be able to accommodate 10 to 180 keys.

15.2.9 The IKC shall be modular in design and divided into rows. Each row shall have the ability to hold a minimum of 10 keys.

15.2.10 The IKC shall be equipped with an on-board robust touch screen interface.

15.2.11 The power supply available to the IKC is either a 110 Vdc or 220 Vdc supply from the substation battery charger.

15.2.12 The system shall be able to operate for 8 hours under power failure conditions. The power supplies offered shall supervise and disconnect the standby batteries when the level of charge of the batteries drops below 30 % of their capacity to ensure that the batteries are not damaged by being over-discharged. The batteries shall be sealed, maintenance free and shall be accommodated in the IKC.

15.3 Base Station Software

15.3.1 The Base Station Software (BSS) shall reside on the base station server(s) at the Control Centre.

15.3.2 The software shall be written in a programming language that supports operating system platform independence.

15.3.3 All software functionality shall be through a Graphical User Interface (GUI):

a) Navigation within the GUI shall be accomplished via the keyboard and mouse.

b) All major functions shall be available within one or two mouse clicks.

c) The GUI shall be user friendly and intuitive.

d) The system shall be synchronised via an NTP server. An NTP server address shall be supplied by eThekwini Electricity.

e) The software should be hardware agnostic and support multiple vendors where possible.

15.3.4 An installation wizard shall guide software installers through the installation process.

15.3.5 The software shall have a modular design comprising (and not limited to) the following key modules:

a) Polling module

b) Configuration module

c) Monitoring module

d) Database module

e) Context sensitive help module

f) Report generation module

15.3.6 Furthermore the software shall comprise (and not be limited to) the following support applications and utilities:

a) Alarm viewer utility

b) Transaction viewer

c) Database archive facility

d) Reporting Utility

15.3.7 The configuration module shall be suitable for users to configure, administrate and diagnose all aspects of the IKSC.

15.3.8 The BSS shall make provision for different levels of access for various users.

15.3.9 The BSS shall support either one of the following database types:

a) IBM DB2

b) Informix

c) MS SQL 2005 and later

d) MySQL - Preferred

e) Oracle - Preferred

f) Sybase

g) JDBC Compliant Database

15.3.10 The BSS database license shall be included in the bid price.

15.3.11 The BSS shall support virtualization.

15.3.12 The database shall support a minimum of 1 000 sites

15.3.13 All databases shall support the following features:

a) Support for multiple connections.

b) A manual querying facility.

c) Load balancing capabilities.

d) Password protection.

15.3.14 Multiple users shall be able to administrate the database.

15.3.15 There shall be provision for the database to reside on a host workstation, or on a dedicated server connected on a network.

15.3.16 A polling module is required to send and receive transactions to and from the IKSC. This action must happen without affecting the normal operation of the system.

15.3.17 The polling module must be capable of performing the following operations:

a) Auto detecting hardware on a communications bus.

b) Comparing and validating hardware on the communication bus with hardware records on the database.

c) Verifying hardware firmware versions.

d) Displaying real-time transactions on demand.

e) Indicating when hardware goes offline and generating an alert for this event.

15.3.18 The polling or configuration module must allow for remote configuration of the IKS.

15.3.19 For all reports, there shall be the option of printing the report, displaying it on the monitor and exporting

it as a CSV file.

15.3.20 The following report categories must be available but shall not be limited to:

a) Single site's transactions over a specified period.

b) All sites' transactions over a particular period.

c) Custom reports as required by eThekwini Electricity.

15.3.21 Summary of a site's report: This will include equipment incidents such as unit time-outs and power up messages.

15.3.22 Reports shall be capable of spanning at least a six month period of interest.

15.3.23 The BSS must provide configurable security options to limit system users' activity within it.

a) Such operator security shall be configurable on a per group basis

b) Each password protected application (inclusive of reports) shall have options to provide a user group with one of the following:

i. Full access: user is granted full access to everything in the application;

ii. Denied access: user is denied access to everything in the application; and

iii. Customised access: user can be configured to access designated features only.

15.3.24 The software shall provide for scheduled backups of data to specific local or network directories at specific times.

15.3.25 The BSS shall be based upon modern technology with the ability to provide rapid and easy amendment of configurations without the disruption to users or the system in general.

15.3.26 The system shall contain adequate fraud avoidance measures at workstation level.

15.3.27 The system shall include proper and adequate audit trails that will satisfy eThekwini Electricity's internal and external auditors in terms of checking on the integrity of the system and to safeguard against deliberate or other errors.

15.3.28 The system shall provide the facility to remotely allow a person access into a substation should the need arise (i.e. remote operating of strike latches). All overrides and exceptions shall be logged prior to access being granted.

15.3.29 There shall be an automatic facility to test the proper functioning of the IKS allowing for proactive fault finding.

15.3.30 It must be possible to administer and configure the BSS remotely e.g. through the use of VPN technologies and remote desktop.

15.3.31 The software must allow for easy expansion.

15.4 Documentation and training

The bidder shall provide the following documentation and training:

15.4.1 Full technical description of the operation of the IKS.

15.4.2 Full technical description, circuit diagrams, component overlay and parts listing of all electronic circuit boards, modules, etc.

15.4.3 System operating manual.

15.4.4 Base station software manual

15.4.5 Fault Finding and Repair manual.

15.4.6 Onsite training for technical staff on electronic fault finding and maintenance (as per clause 16.10). Venue for lecture room can be requested from the Employer.

15.4.7 Onsite training for technical staff on system fault finding and maintenance(as per clause 16.10). Venue for lecture room can be requested from the Employer.

15.4.8 Onsite training for operators.

16 Outdoor Equipment Monitoring System

16.1 Purpose:

The purpose of this section is to define the requirements for the implementation of a comprehensive condition monitoring system for outdoor yard circuit breakers, disconnector/isolators, as part of Outdoor 132 kV and 275 kV Switchgear.

16.2 Scope:

This requirement applies to outdoor yard circuit breakers and disconnector/isolators. Bidders are required to quote on the sensors on the primary plant, connectivity between the sensors and the modular monitoring device (to be housed in a panel), digital connecting modem to cloud server (to be housed in a panel). Employer already has the cloud based analytic/data system which this monitoring system shall connect to. This system will require specific inputs that will be monitored online.

16.3 The system shall be preferably capable of monitoring the following parameters:

	Circuit Breaker	**Disconnector/Isolator**
1	SF6 gas (pressure, density, leak)	Number of operations
2	Number of operations	Excessive current
3	Excessive operating time	Excessive operating time
4	Predictive maintenance	Predictive maintenance
5	Arcing contact wear	Board temperature
6	Control circuit (continuity, DC supply & coil temp)	Malfunction

16.4 Monitoring Frequency:

The sampling time shall preferably be real-time monitoring with a minimum frequency of 15 minutes and shall trigger immediate alerts in the event of abnormal conditions.

16.5 Integration with Cloud Server:

The condition monitoring system shall preferably be seamlessly integrated with the existing Cloud Server for the monitoring system, ensuring interoperability and unified monitoring.

16.6 Communication Protocols:

The system shall preferably support industry-standard communication protocols, such as IEC 61850 and DNP3, to enable efficient data exchange with other monitoring and control devices.

16.7 Remote Monitoring:

The condition monitoring system should allow for remote monitoring capabilities, enabling authorized personnel to access real-time data and analysis from off-site locations.

16.8 Documentation:

The supplier shall provide comprehensive documentation, including user manuals, system architecture, and training materials for operators and maintenance personnel.

16.9 Acceptance Testing:

Prior to final acceptance, the condition monitoring system must undergo thorough testing to ensure its functionality and compliance with the specified requirements.

16.10 Training (Outdoor Equipment System Monitoring and Intelligent Key System (IKS) in clause 15.4):

Successful Bidder shall include training in their price to train approximately 50 eThekwini Electricity staff on the installation, operation, configuration, architecture and maintenance. Class for the training shall be maximum 10 eThekwini Electricity staff at a time (approximately 5 sessions).

16.11 System details:

The Bidder shall provide the details of the system including the architecture, protocols, software, connectivity to cloud based system

C3.3: PARTICULAR SPECIFICATIONS

In addition to the Standardized and Project Specifications the following Particular Specifications / Policies shall apply to this contract and are available on web address: ftp://ftp.durban.gov.za/cesu/StdContractDocs/:

C3.3.1 Application for Accreditation on Supplier Database
C3.3.2 Environmental Management Specifications – eThekwini Municipality
C3.3.3 eThekwini Health and Safety Specification
C3.3.4 34827-5E Covid-19 Health and Safety Specification
C3.3.5 34827-5E Baseline Risk Assessment
C3.3.6 Section 37(2) Mandatory Agreement

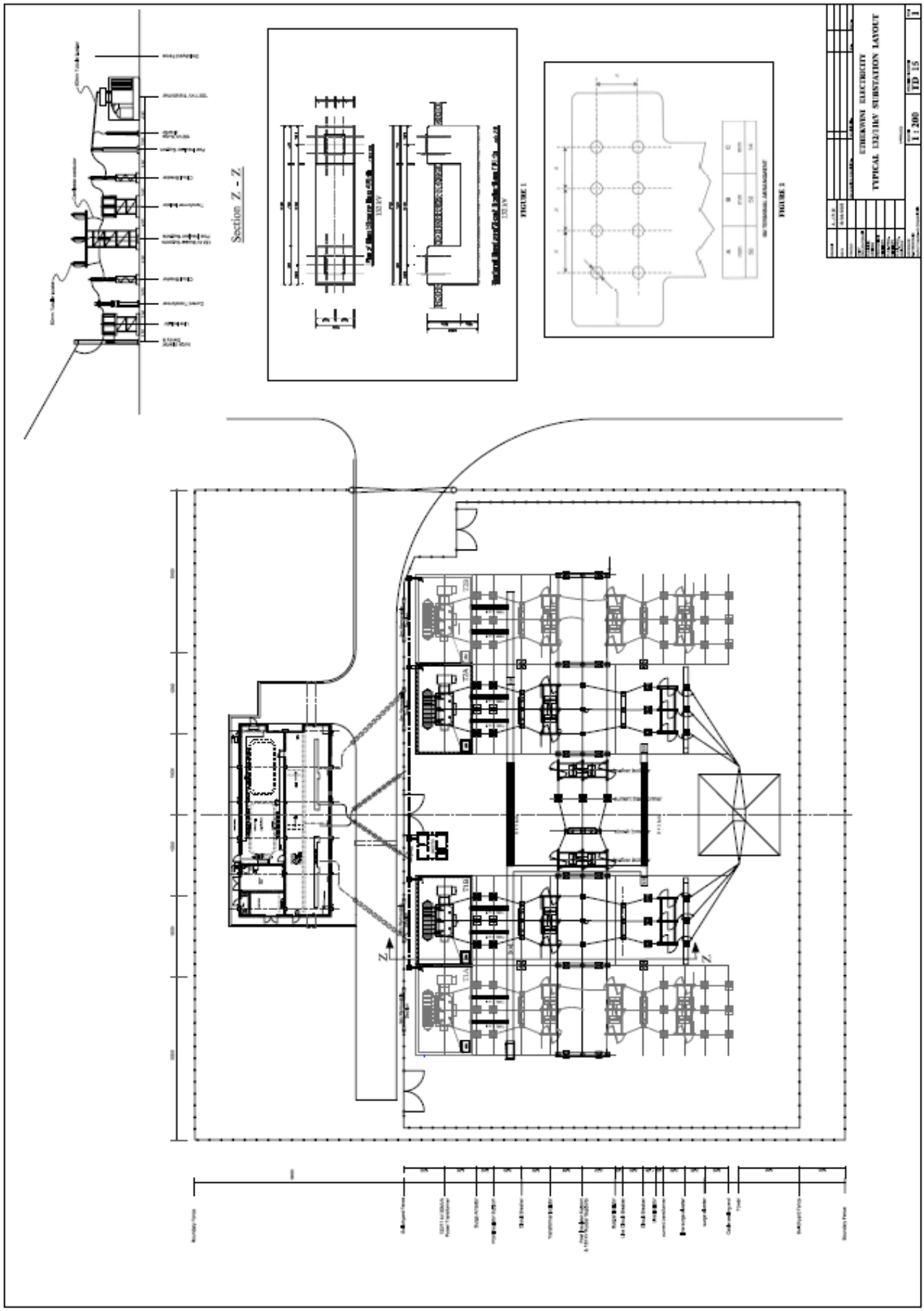
C3.4: CONTRACT DRAWINGS

C3.4.1 CONTRACT DRAWINGS / DETAILS

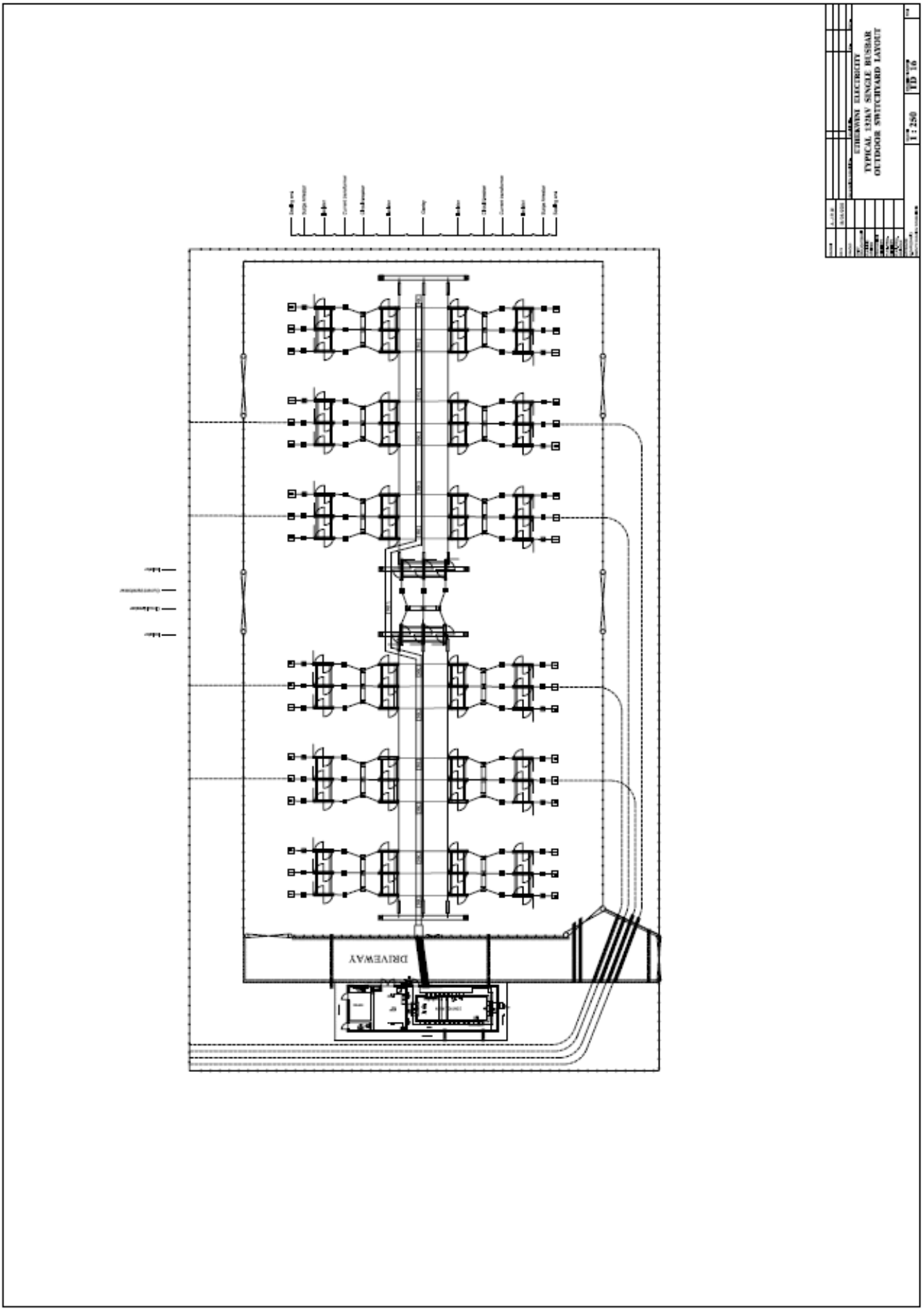
The drawings listed below show the proposed layout of equipment and basic circuit schematic requirements.

- TD15 - Typical 132/11 kV Outdoor Substation Layout
- TD16 - Typical 132 kV Single Busbar Outdoor Switchyard Layout
- TD17 - Typical 132 kV Double Busbar Outdoor Switchyard Layout
- TD18 - Typical Control Schematic for 132 kV and 275 kV Switchgear
- LCDD 2016002 – Bases to be standardized for eThekwini Electricity

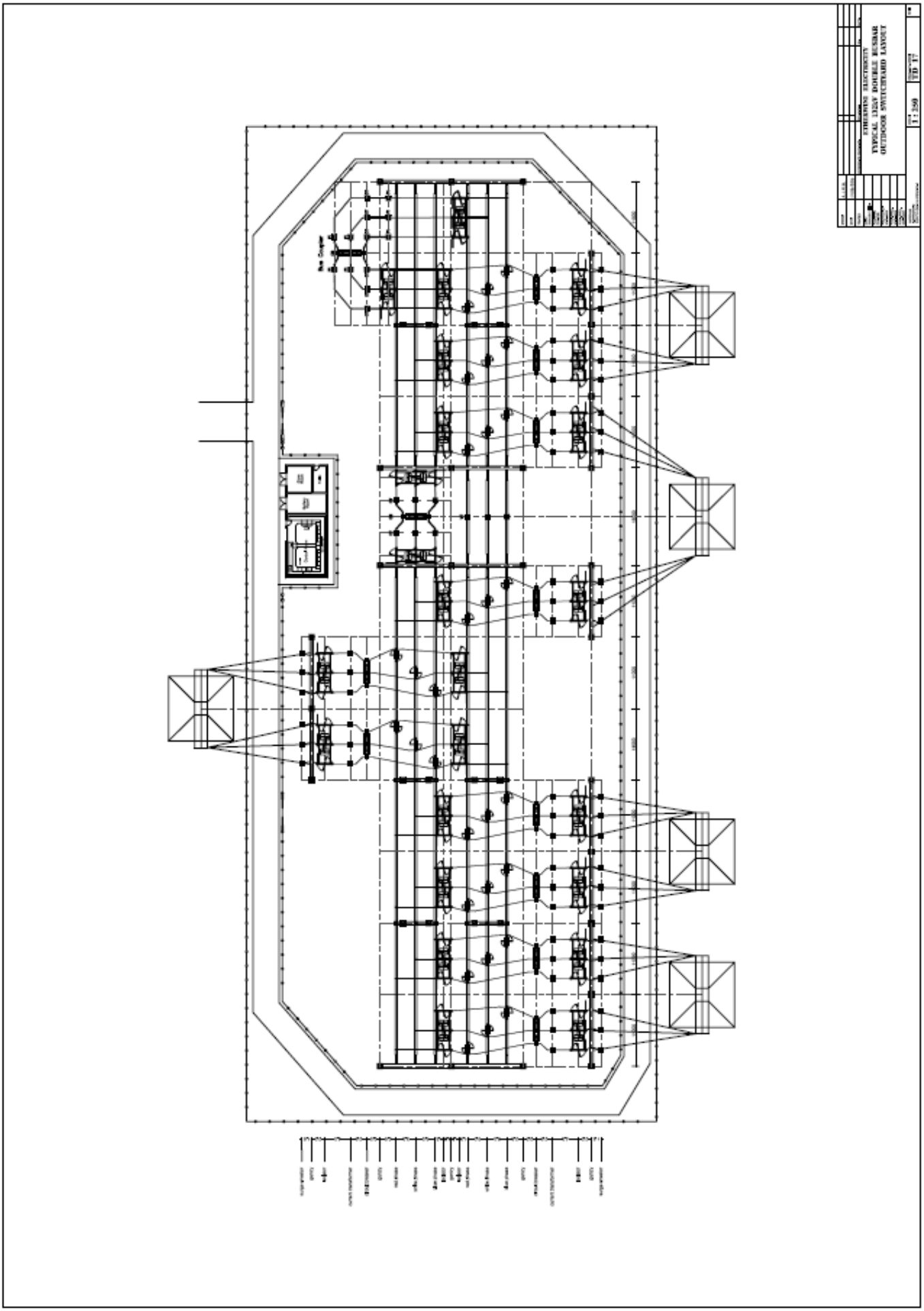
TD15 - Typical 132/11 kV Outdoor Substation Layout



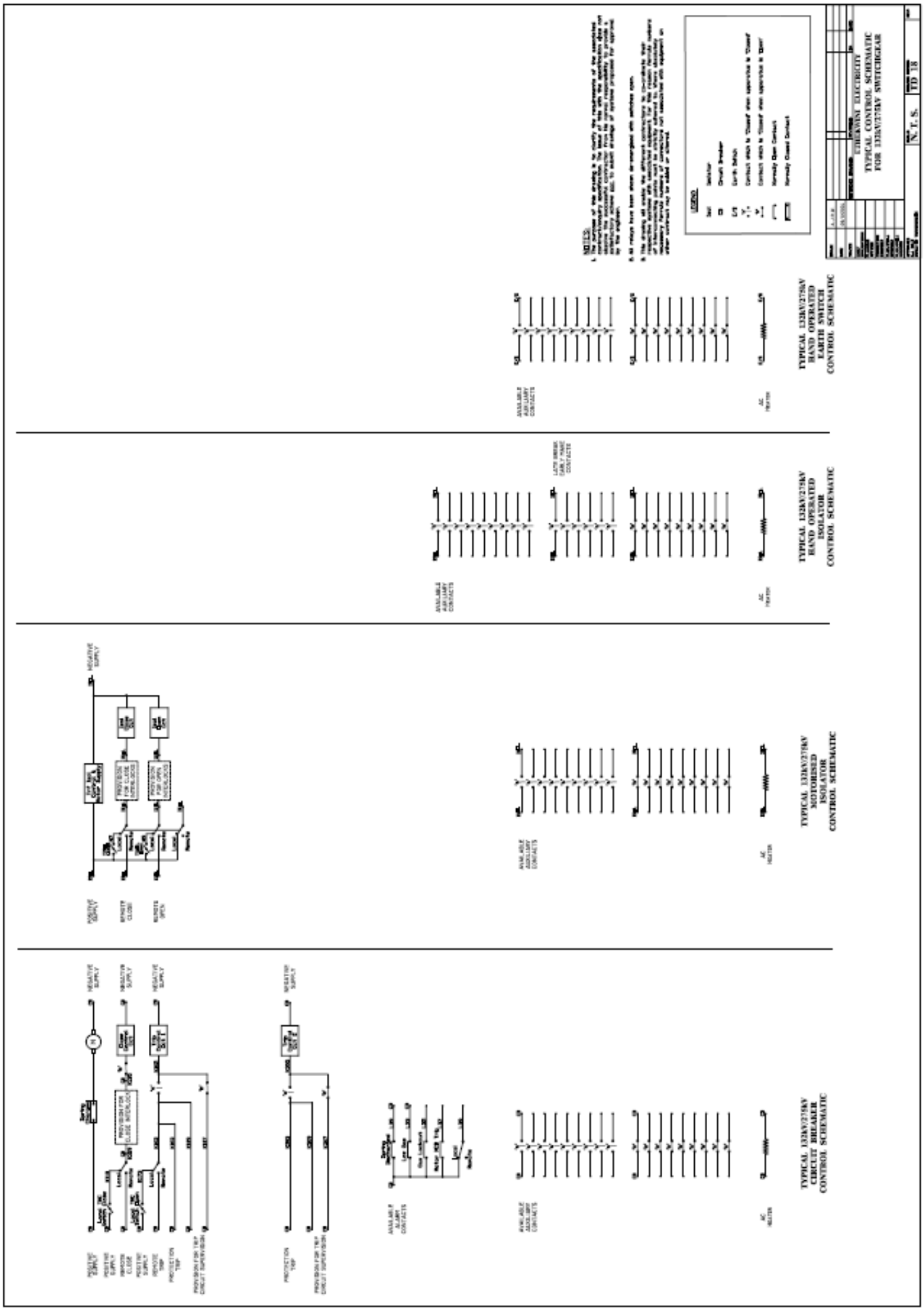
TD16 - Typical 132 kV Single Busbar Outdoor Switchyard Layout



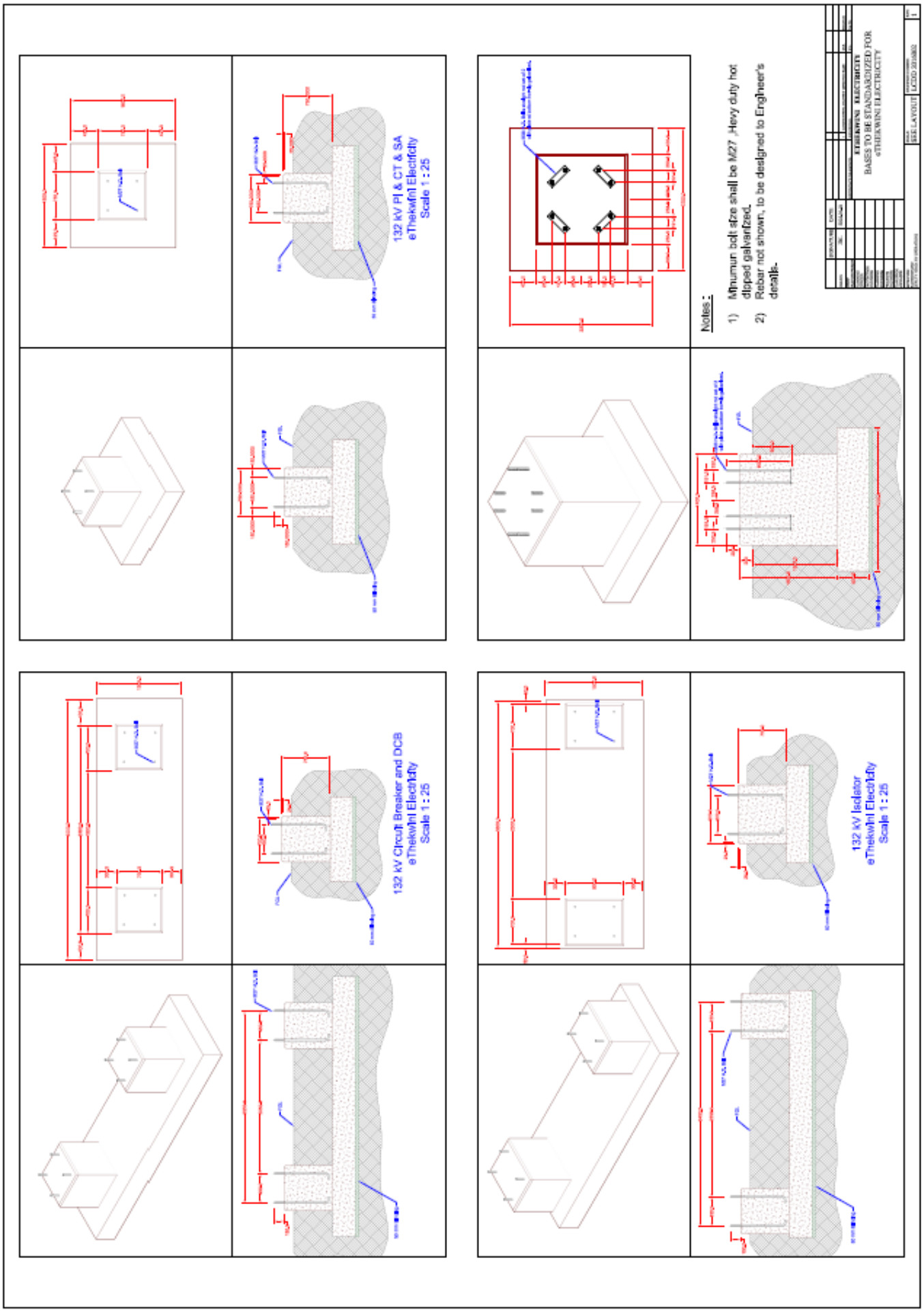
TD17 - Typical 132 kV Double Busbar Outdoor Switchyard Layout



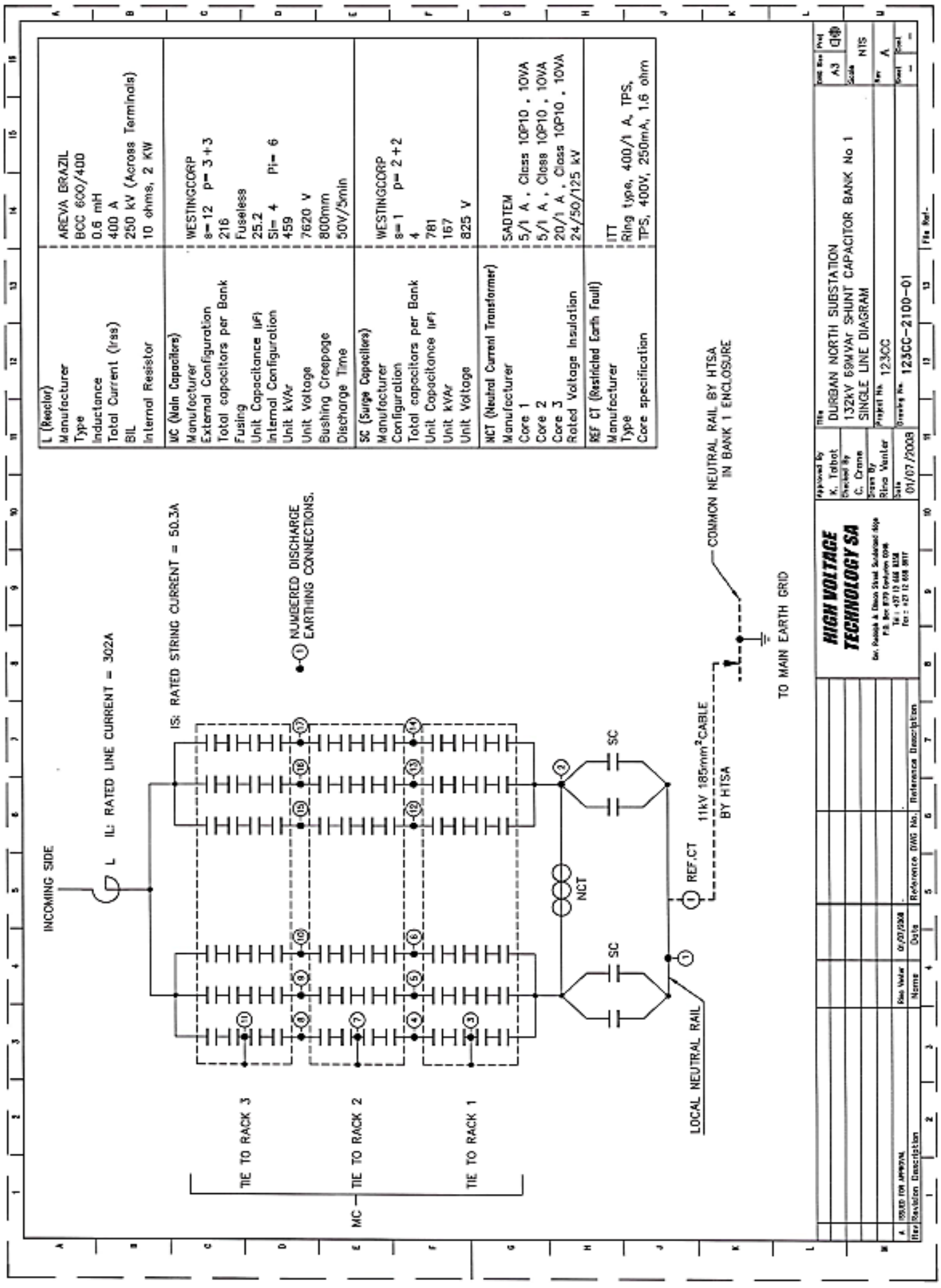
TD18 - Typical Control Schematic for 132 kV and 275 kV Switchgear



LCDD 2016002 – Bases to be standardized for eThekwini Electricity



C3.4.2 CAPACITOR BANK SINGLE LINE DIAGRAM



C3.5: ANNEXURES

C3.5.1 There are no Annexure

C4: SITE INFORMATION

C4.1 Locality Plan: Various sites within eThekwini Municipality.

C4.2 Condition of Site: To be shared as and when orders are done. This contract is over a period of 3-years.