DEPARTMENT

TECHNICAL SERVICES

DIRECTORATE

Electricity & Energy

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: **36503-5E**

Contract Title: SUPPLY, DELIVERY, OFF-LOADING, INSTALLATION AND TESTING OF PROTECTION AND CONTROL EQUIPMENT AND TE TESTING AND COMMISSIONING OF ASSOCIATED ELECTRICAL PLANT FOR A PERIOD OF THIRTY-SIX MONTHS FOR VARIOUS SUBSTATIONS

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

CLARIFICATION MEETING AND QUERIES

Clarification Meeting: Compulsory Clarification Meeting

Meeting Location: Main Executive Boardroom, Energy Management Directorate Headquarters.
Date, Time: On 11 Aug 2026 at 10h00

Queries can be addressed to: Fezeka Mhosho
The Employer's Agent's: 031 311 9206
Representative: eMail: Fezeka.Mhosho@durban.gov.za. All email queries are to be submitted by 2026-08-27 and Emailed questions & answers will be consolidated and posted on eTenders/Municipal website/Ethekwini Supplier Portal for the benefit of all Tenderers by 2026-09-03.

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: **18/09/2026** **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: 31/07/2026

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

INDEX to PROCUREMENT DOCUMENT

PART T1: TENDERING PROCEDURES

T1.1.1: TENDER NOTICE AND INVITATION TO TENDER

Tenders are hereby invited for the works to carry out the supply, delivery, off-loading, installation and testing of protection and control equipment; and the testing and commissioning of associated electrical plant 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 EB (or higher).	C.2.1.2
Meeting Type	Compulsory Clarification Meeting	C.2.7
Meeting Details	Main Executive Boardroom, Energy Management Directorate Headquarters. On 11 Aug 2026 at 10h00	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: Fezeka Mhosho 031 311 9206 eMail: Fezeka.Mhosho@durban.gov.za. All email queries are to be submitted by 2026-08-27 and Emailed questions & answers will be consolidated and posted on eTenders/Municipal website/Ethekwini Supplier Portal for the benefit of all Tenderers by 2026-09-03.	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 **18/09/2026**, at or before 11h00.	C.2.15
Evaluation of Tender Offers	**The 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 Supplier Self Service 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

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.

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:	The Employer's Agent's Representative is:
Name: Mokwape Lekganyane	Name: Fezeka Mhosho
Tel: 031-311-9628	Tel: 031-311-9206
eMail:Mokwape.Lekganyane@durban.gov.za	eMail: Fezeka.Mhosho@durban.gov.za

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.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.
- T2.2.8: 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 **9 EB or EP** 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 **9 EB or EP** 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 **9 EB or EP** 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: Compulsory Clarification Meeting

Main Executive Boardroom, Energy Management Directorate Headquarters
On 11 Aug 2026 at 10h00

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 2026/08/27. Emailed questions and answers will be consolidated and posted on the eTenders/Municipal website for the benefit of all tenderers by 2026/09/03.

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:

If a tenderer wishes to submit an alternative tender offer, the only criteria permitted for such alternative tender offer is that it demonstrably satisfies the Employer's standards and requirements,

the details of which may be obtained from the Employer's Agent.

Calculations, drawings and all other pertinent technical information and characteristics as well as modified or proposed Pricing Data must be submitted with the alternative tender offer to enable the Employer to evaluate the efficacy of the alternative and its principal elements, to take a view on the degree to which the alternative complies with the Employer's standards and requirements and to evaluate the acceptability of the pricing proposals. Calculations must be set out in a clear and logical sequence and must clearly reflect all design assumptions. Pricing Data must reflect all assumptions in the development of the pricing proposal.

Separate form/s of offer and BOQ and technical schedules shall be submitted for alternative offers. Alternative offers submitted without a fully completed and signed form of offer will not be considered.

Acceptance of an alternative tender offer will mean acceptance in principle of the offer. It will be an obligation of the contract for the tenderer, in the event that the alternative is accepted, to accept full responsibility and liability that the alternative offer complies in all respects with the Employer's standards and requirements.

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. : **36503-5E**
- Contract Title : **SUPPLY, DELIVERY, OFF-LOADING, INSTALLATION AND TESTING OF PROTECTION AND CONTROL EQUIPMENT AND TE TESTING AND COMMISSIONING OF ASSOCIATED ELECTRICAL PLANT 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, 18 September 2026**
- **Time : 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 from an approved insurer undertaking to provide the Performance Bond to the format included in T2.2 of this procurement document.

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.

The date of obtaining the CSD printout is to be indicated on the printout and should be on or after the date of advertising of this tender.

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

80/20 Procurement System **or** **90/10 Procurement System**

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

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: **36503-5E**

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

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		35
Project Organogram and Experience of Key Staff Minimum of 2 x teams.	Min of 2 x teams as per Schedule T2.2.16	10
	Project Manager	5
	Protection Design Engineers	5
	SCADA Design Engineers	5
	Site Supervisors	5
	Installation Teams	5
	Commissioning Teams	5
Preliminary Programme, Construction Methodology and Quality Control		25
	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**
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 Part T2.2: Returnable Schedules:

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

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 involves the supply, delivery, off-loading, installation, testing and commissioning of protection and control equipment required for an integrated electrical substation protection and control IEC 61850 system. This shall include protection schemes, loose protection IEDs, human machine interface (HMI), SCADA gateway, configuration software, communication networks, Ethernet switch, secondary cabling of all substation equipment and the full functional and operational testing of the completed substation installation and remote ends.
- "**experience**" implies experience on projects of a similar nature;
- "**accredited degree / diploma**" implies a minimum 3 year qualification within the built environment, from a registered University or Institute of Technology.

Criterion: Tenderer's Experience	
Level 0	No information provided; OR submission of no substance / irrelevant information provided
Level 1	To have provided 1 project of a similar nature and successfully completed the project within the past 10 years.
Level 2	To have provided 2 projects of a similar nature and successfully completed at least 1 of those projects within the past 10 years.
Level 3	To have provided 3 projects of a similar nature and successfully completed at least 2 of those projects within the past 10 years.
Level 4	To have provided 4 projects of a similar nature and successfully completed at least 3 of those projects within the past 10 years.
Level 5	To have provided 5 projects of a similar nature and successfully completed at least 4 of those projects within the past 10 years.

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 that does not show both the on-site and off-site staffing resources, and also the availability of two commissioning teams (main and alternative) and two engineering resources (main and alternative). **Project Manager**: Minimum 2 years relevant experience and relevant accredited 3 or 4 year diploma/degree. **Protection Design Engineers**: Minimum 2 years relevant experience and relevant accredited 3 or 4 year diploma/degree, and/or is not registered with ECSA. **SCADA Design Engineers**: Minimum 2 years relevant experience and relevant accredited 3 or 4 year diploma/degree, and/or is not registered with ECSA. **Site Supervisors**: Minimum 2 years relevant experience and trade tested or relevant accredited 3 or 4 year diploma/degree. **Installation Teams:** Minimum 1 year relevant experience, qualified artisan and relevant training on construction. **Commissioning Teams**: Minimum of two teams (depending on committed delivery times for each project) with minimum 2 years relevant experience and trade tested or relevant accredited 3 or 4 year diploma/degree.
Level 2	**Proposed Organisation and Staffing:** To have provided an incomplete organogram that does not show either the off-site or on-site staffing resources, and also the availability of two commissioning teams (main and alternative) and two engineering resources (main and alternative). **Project Manager**: Minimum 4 years relevant experience and relevant accredited 3 or 4 year diploma/degree. **Protection Design Engineer**: Minimum 4 years relevant experience and relevant accredited 3 or 4 year diploma/degree, and/or is not registered with ECSA. **SCADA Design Engineer**: Minimum 4 years relevant experience and relevant accredited 3 or 4 year diploma/degree, and/or is not registered with ECSA. **Site Supervisor**: Minimum 4 years relevant experience and trade tested or relevant accredited 3 or 4 year diploma/degree. **Installation Team:** Minimum 2 years relevant experience, qualified artisan and relevant training on construction. **Commissioning Team**: Minimum of two teams (depending on committed delivery times for each project) with minimum 4 years relevant experience and trade tested or relevant accredited 3 or 4 year diploma/degree.
Level 3	**Proposed Organisation and Staffing:** To have provided a complete organogram that shows both the on-site and off-site staffing resources, and the availability of two commissioning teams (main and alternative) and two engineering resources (main and alternative). **Project Manager**: Minimum 5 years relevant experience and relevant accredited 3 or 4 year diploma/degree. **Protection Design Engineer**: Minimum 5 years relevant experience and relevant accredited 3 or 4 year diploma/Design degree, and is registered with ECSA. **SCADA Engineer**: Minimum 5 years relevant experience and relevant accredited 3 or 4 year diploma/degree, and is registered with ECSA. **Site Supervisor**: Minimum 5 years relevant experience and trade tested or relevant accredited 3 or 4 year diploma/degree. **Installation Team:** Minimum 3 years relevant experience, qualified artisan and relevant training on construction. **Commissioning Team**: Minimum of two teams (depending on committed delivery times for each project) with minimum 5 years relevant experience and trade tested or relevant accredited 3 or 4 year diploma/degree.
Level 4	**Proposed Organisation and Staffing:** To have provided a complete organogram that shows both the on-site and off-site staffing resources, and the availability of three commissioning teams (main and alternatives) and three engineering resources (main and alternatives). **Project Manager**: Minimum 8 years relevant experience and relevant accredited 3 or 4 year diploma/degree. **Protection Design Engineer**: Minimum 8 years relevant experience and relevant accredited 3 or 4 year diploma/degree, and is registered with ECSA. **SCADA Design Engineer**: Minimum 8 years relevant experience and relevant accredited 3 or 4 year diploma/degree, and is registered with ECSA. **Site Supervisor**: Minimum 8 years relevant experience and trade tested or relevant accredited 3 or 4 year diploma/degree. **Installation Team:** Minimum 5 years relevant experience, qualified artisan and relevant training on construction. **Commissioning Team**: Minimum of two teams (depending on committed delivery times for each project) with minimum 8 years relevant experience and trade tested or relevant accredited 3 or 4 year diploma/degree.

Level 5	**Proposed Organisation and Staffing:** To have provided a complete organogram that shows both the on-site and off-site staffing resources, and the availability of four commissioning teams (main and alternatives) and four engineering resources (main and alternatives). **Project Manager**: Minimum 15 years relevant experience and relevant accredited 3 or 4 year diploma/degree **Protection Design Engineer**: Minimum 15 years relevant experience and relevant accredited 3 or 4 year diploma/degree, and is registered with ECSA. **SCADA Design Engineer**: Minimum 15 years relevant experience and relevant accredited 3 or 4 year diploma/degree, and is registered with ECSA. **Site Supervisor**: Minimum 15 years relevant experience and trade tested or relevant accredited 3 or 4 year diploma/degree. **Installation Team:** Minimum 8 years relevant experience, qualified artisan and relevant training on construction. **Commissioning Team**: Minimum of two teams (depending on committed delivery times for each project) with minimum 15 years relevant experience and trade tested or relevant accredited 3 or 4 year diploma/degree.

Criterion: Preliminary Programme, Construction Methodology and Quality Control	
Level 0	No information provided OR submission of no substance / irrelevant information provided
Level 1	Submission of all the minimum required details for the preliminary programme. Tenderer's guaranteed duration to execute work with respect to the required durations is extended by 6 weeks or above. Submission of some of the minimum required details for the methodology. Methodology encompasses activities associated with the scope of works. Quality control statement only covers the required testing requirements.
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 4 weeks. 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. Quality control statement only covers the required testing requirements and finishing works for some programmed activities.
Level 3	Submission of all the minimum required details. Tenderer's guarantee to execute work is as per the required durations. 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. 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 the minimum required details. Tenderer's guaranteed duration to execute work with respect to the required durations is reduced by 4 weeks. 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. 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 the minimum required details. Tenderer's guaranteed duration to execute work with respect to the required durations is reduced by 6 weeks or above. 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. 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

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.

T2.2 Returnable Schedules, Forms and Certificates

Entity Specific

Technical or Functionality Evaluation

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

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 **36503-5E** 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.

Circle Applicable

3.8	Are you presently in the service of the state? If yes, furnish particulars: ……	YES / NO
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 (80/20 or 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:

80/20 Procurement System **or** **90/10 Procurement System**

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

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 or 20 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:

T2.2.7 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: ---------- ----------

T2.2.8 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 **36503-5E**
SUPPLY, DELIVERY, OFF-LOADING, INSTALLATION AND TESTING OF PROTECTION AND CONTROL EQUIPMENT AND TE TESTING AND COMMISSIONING OF ASSOCIATED ELECTRICAL PLANT FOR A PERIOD OF THIRTY-SIX MONTHS FOR VARIOUS SUBSTATIONS

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: _____

T2.2.9 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:

T2.2.10 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:

T2.2.11 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. The date of obtaining the CSD 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:

T2.2.12 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).**

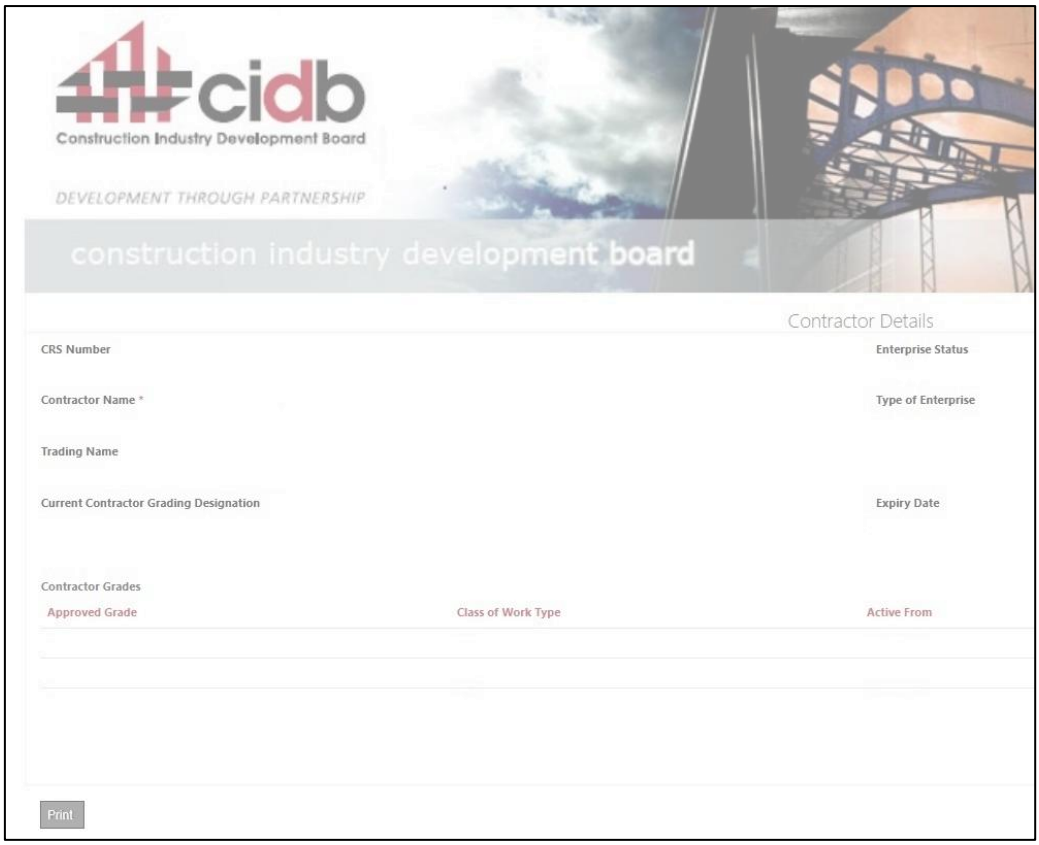
The **Tender Data: C.2.1.1: Eligibility**, requires a Tenderer to be registered, as "Active", with the CIDB (at time of tender closing), in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in 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: _____ _____

T2.2.13 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: **36503-5E** 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.

T2.2.14 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: ---------- _____

T2.2.15 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: -- ------------------------

2. Project Details Template

Details for each of the projects used as reference work shall be submitted separately using the Template below. Details provided shall be used for evaluation purposes.

Project Title				
Name of Company/Final Client				
Contact Person (Final Client)	**Name**	**Tel. No.**	**Cell No.**	**Email Address**

Brief Description of Project:

(Minimum details: Scope of Work, Substation Voltage Levels and number of bays, Year, Value, Roles and Responsibilities, Achievements and Challenges).

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:

T2.2.16 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 – all staffing information provided must relate to the resources proposed for this contract).

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. Please ensure that the organogram clearly identifies the respective key personnel for evaluation purposes.

A minimum of two teams comprising the key staff members shall be shown in the organogram. The maximum number of teams required for this contract shall depend on the committed delivery times for each project as per schedule T2.2.19.

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 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	Grade 12. Relevant built environment qualification or recognition of prior learning, recognised by relevant statutory body	Five years in similar projects as a Project Manager		
Protection Design Engineer	Grade 12. Three or four year tertiary qualification recognized by ECSA. Professional Registration with ECSA	Five years relevant experience		
SCADA Design Engineer	Grade 12. Three or four year tertiary qualification recognized by ECSA. Professional Registration with ECSA	Five years relevant experience		
Site Supervisor	Grade 10. Qualified Trade Tested Artisan or National Diploma	Five years relevant experience		
Installation Team (s)	Grade 10. Qualified Trade Tested Artisan. Relevant training on construction	Three years relevant experience		
Commissioning Resources	Grade 10. Qualified 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:

T2.2.18 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 Project manager, Protection Design Engineer, SCADA Design Engineer, Site Supervisor, Installation Team members, Commissioning Team members of not more than 2 pages should be attached to this schedule:

Please note that CVs for a minimum number of two installation and commissioning team members shall be submitted for evaluation purposes. The maximum number of teams required for this contract shall depend on the committed delivery times for each project as per schedule T2.2.19.

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: _____ _____

T2.2.19 PRELIMINARY PROGRAMME

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
1.1	Date of order	0
1.2	Receipt of outstanding information and drawings for approval	8
1.3	Delivery of loose IEDs to 11 kV switchgear supplier	12
1.4	Delivery of equipment to site	24
1.5	Completion of equipment installation/cabling, etc.	28
	Greenfield Substation Commissioning:	
1.6	Completion of equipment testing and handover for energizing of all plant for new substations	32
1.7	Submission of all “as-commissioned” information for new substations	34
	Brownfield Substation Commissioning:	
1.8	Equipment testing per 132 kV feeder bay	1
1.9	Equipment testing per 132/11 kV transformer bay	2
1.10	Equipment testing per 11 kV bay	3 days
1.11	Submission of all “as-commissioned” information per bay/(s) for existing substations	1
1.12	Can the required dates specified above be met?	YES/NO*

Note: As-commissioned information shall be submitted for clearance purposes after the completion of a bay/(s). The availability of bays for brownfield substations is dependent on outage availability. Outages may be provided for more than one bay at a time. All preparatory work for 11 kV switchgear shall be done off-site.

** Delete whichever is not applicable.

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
1.1	Date of order	0
1.2	Receipt of outstanding information and drawings for approval	
1.3	Delivery of loose IEDs to 11 kV switchgear supplier	
1.4	Delivery of equipment to site	
1.5	Completion of equipment installation/cabling, etc.	
	Greenfield Substation Commissioning:	
1.6	Completion of equipment testing and handover for energizing of all plant for new substations	
1.7	Submission of all “as-commissioned” information for new substations	
	Brownfield Substation Commissioning:	
1.8	Equipment testing per 132 kV feeder bay	

1.9	Equipment testing per 132/11 kV transformer bay	
1.10	Equipment testing per 11 kV bay	
1.11	Submission of all “as-commissioned” information per bay/(s) for existing substations	

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 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.

As a minimum the methodology shall include the details of the organisation in control of the activity, individuals responsible for the works, activity description, description of how the work will be managed, location of activities, plant and equipment required, step by step description of activities to be undertaken, hazard identification and risk assessment, safety precautions, training, emergency procedures, environmental compliance and method of safe-guarding existing structures/equipment in the vicinity of work.

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: _____ _____

T2.2.21 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

****Provide CVs that captures experience of similar nature for Sub Contractor***

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 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:

T2.2.23 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: _____ _____

T2.2.24 MANUFACTURE, TESTING AND INSPECTION (To be completed in full by tenderer)

Item No	Description	Manufacturer	Place of Manufacture	Place of Testing	Place of Inspection
1	Protection IEDs: (list all manufacturers)				
2	Control Panels:				
3	Human Machine Interface:				
4	Ethernet Switch/s:				
5	SCADA Gateway:				

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 GUARANTEES AND TECHNICAL PARTICULARS OF EQUIPMENT OFFERED

T2.2.25.1 MAKES AND MODELS OF IEDS FOR PROTECTION AND CONTROL SCHEMES

Item	Description	Section 1 132 kV Single Busbar Switchyard	Section 2 132 kV Double Busbar Switchyard	Section 3 132/11 kV Substation with 132 kV GIS	Section 4 132/11 kV Substation with Separated 132 kV Feeders and Transformers Feeders	Section 5 132/11 kV Substation with Combined 132 kV Feeders and Transformers Feeders
1.1	132 kV Current Differential Feeder Scheme a) Current Differential IED make and model for new remote ends					
	b) Current Differential IED make and model for existing remote ends					
	c) Current Differential IED make and model for 3-terminal schemes					
	d) Overcurrent, Earth Fault and Sensitive Earth Fault IED make and model					
1.2	132 kV Distance Feeder Scheme a) Distance IED make and model					
	b) Overcurrent, Earth Fault and Sensitive Earth Fault IED make and model					

Item	Description	Section 1 132 kV Single Busbar Switchyard	Section 2 132 kV Double Busbar Switchyard	Section 3 132/11 kV Substation with 132 kV GIS	Section 4 132/11 kV Substation with Separated 132 kV Feeders and Transformers Feeders	Section 5 132/11 kV Substation with Combined 132 kV Feeders and Transformers Feeders
1.3	132 kV Transformer Feeder Scheme Overcurrent and Earth Fault IED make and model					
1.4	132 kV Bus-Section Scheme Overcurrent and Earth Fault IED make and model					
1.5	132 kV Bus-Coupler Scheme Overcurrent and Earth Fault IED make and model					
1.6	132 kV Busbar Protection Scheme a) High Impedance IED make and model					
	b) CT Supervision IED make and model					
	c) Scheme Processor IED (if applicable) make and model					
	d) Number of High Impedance IEDs					
	e) Number of CT Supervision IEDs					

Item	Description	Section 1 132 kV Single Busbar Switchyard	Section 2 132 kV Double Busbar Switchyard	Section 3 132/11 kV Substation with 132 kV GIS	Section 4 132/11 kV Substation with Separated 132 kV Feeders and Transformers Feeders	Section 5 132/11 kV Substation with Combined 132 kV Feeders and Transformers Feeders
1.7	11 kV Feeder Scheme a) Cable Protection IED make and model			Free issue/blanking plate	Free issue/blanking plate	Free issue/blanking plate
	b) Overcurrent, Earth Fault and Sensitive Earth Fault IED make and model					
1.8	132/11 kV Transformer Scheme a) IED 1 (Differential and HV & LV REF) make and model					
	b) IED 2 (DOC and Overcurrent and Earth Fault) make and model					
	c) Voltage Regulating IED make and model					
1.9	11 kV General Control Scheme a) Scheme Processor IED make and model					
1.10	Combined 132 kV Feeder And Transformer Feeder Scheme a) Current Differential IED make and model					

Item	Description	Section 1 132 kV Single Busbar Switchyard	Section 2 132 kV Double Busbar Switchyard	Section 3 132/11 kV Substation with 132 kV GIS	Section 4 132/11 kV Substation with Separated 132 kV Feeders and Transformers Feeders	Section 5 132/11 kV Substation with Combined 132 kV Feeders and Transformers Feeders
	b) Scheme Processor IED (if applicable) make and model					
1.11	Backup Protection Scheme for 132/11 kV Transformers a) Overcurrent and Earth Fault IED make and model					
1.12	Underfrequency Loadshedding Scheme (UFLS) a) UFLS IED make and model					

T2.2.25.2 DETAILED INFORMATION FOR IEDS USED FOR PROTECTION AND CONTROL SCHEMES

The following Sections are to be completed for each make and model of each IED offered. Section pages are to be copied for the various makes and models of each IED.

T2.2.25.2.1 Overcurrent, Earth Fault And Sensitive Earth Fault IED For 132 kV Schemes

Item	Detailed Information	Required	Offered
2.1.1	IED Make And Model	-	
2.1.2	Specification to which the IED complies	IEC 61850	
2.1.3	Type of Ethernet Communication Port provided	100BaseFx	
2.1.4	Does the IED have a standard IRIG-B external time synchronising input?	-	
2.1.5	Number of CT Inputs	3 × O/C, 1 × E/F, 1 × SEF (where specified)	
2.1.6	Number of Binary Logic Inputs	Min as per Scheme Drawings	
2.1.7	Number of Output Contacts	Min as per Scheme Drawings	
2.1.8	Number of programmable LEDs	Min as per Scheme Drawings	
2.1.9	Do the protection setting ranges of the IED comply with the specification?	Yes	
2.1.10	Is a Sensitive Earth Fault function incorporated in the IED?	Where specified for the scheme	
2.1.11	Is a Breaker Fail function incorporated in the IED?	Yes	
2.1.12	Is an Auto Re-closing function incorporated in the IED?	As per Section C 3.2	
2.1.13	Is a Trip Circuit Supervision function incorporated in the IED?	Yes	
2.1.14	Does the IED have an LCD mimic?	As per Section C 3.2	
2.1.15	Can the logic functionality depicted in the logic schematic drawings be implemented in the IED?	Yes	
2.1.16	Is Protection Engineering function implemented over Ethernet?	Yes	
2.1.17	Is a PICS for this IED submitted with the tender?	Yes	
2.1.18	Is a MICS for this IED submitted with the tender?	Yes	
2.1.19	Is a brochure and technical manual for this IED submitted with the tender?	Yes	

Item	Detailed Information	Required	Offered
2.1.20	Type of coating to ensure long term stability in humid and corrosive environments	Conformal coating	

T2.2.25.2.2 Current Differential IED For 132 kV Schemes

Item	Detailed Information	Required	Offered
2.2.1	IED Make And Model	-	
2.2.2	Specification to which the IED complies	IEC 61850	
2.2.3	Type of Ethernet Communication Port provided	100BaseFx	
2.2.4	Does the IED have a standard IRIG-B external time synchronising input?	-	
2.2.5	Number of CT Inputs	3 x Phase and 1 x E/F	
2.2.6	Number of Binary Logic Inputs	Min as per Scheme Drawings	
2.2.7	Number of Output Contacts	Min as per Scheme Drawings	
2.2.8	Number of programmable LEDs	Min as per Scheme Drawings	
2.2.9	Do the protection setting characteristics of the IED comply with the specification?	Yes	
2.2.10	Is an Over-Current/Earth Fault function incorporated in the IED for Communication Failure?	Yes	
2.2.11	Does the IED comply with the remote end communication requirements specified?	Yes	
2.2.12	Is an Auto Re-closing function incorporated in the IED?	As per Section C 3.2	
2.2.13	Is a Trip Circuit Supervision function incorporated in the IED?	Yes, if not elsewhere	
2.2.14	Does the IED have an LCD mimic?	As per Section C 3.2	
2.2.15	Can the logic functionality depicted in the logic schematic drawings be implemented in the IED?	Yes	
2.2.16	Is Protection Engineering function implemented over Ethernet?	Yes	
2.2.17	Is a PICS for this IED submitted with the tender?	Yes	
2.2.18	Is a MICS for this IED submitted with the tender?	Yes	
2.2.19	Is a brochure and technical manual for this IED submitted with the tender?	Yes	

Item	Detailed Information	Required	Offered
2.2.20	Type of coating to ensure long term stability in humid and corrosive environments	Conformal coating	

T2.2.25.2.3 Distance IED For 132 kV Schemes

Item	Detailed Information	Required	Offered
2.3.1	IED Make And Model	-	
2.3.2	Specification to which the IED complies	IEC 61850	
2.3.3	Type of Ethernet Communication Port provided	100BaseFx	
2.3.4	Does the IED have a standard IRIG-B external time synchronising input?	-	
2.3.5	Number of CT Inputs	3 x Phase and 1 x E/F	
2.3.6	Number of VT Inputs	3 x Phase	
2.3.7	Number of Binary Logic Inputs	Min as per Scheme Drawings	
2.3.8	Number of Output Contacts	Min as per Scheme Drawings	
2.3.9	Number of programmable LEDs	Min as per Scheme Drawings	
2.3.10	Do the protection setting characteristics of the IED comply with the specification?	Yes	
2.3.11	Is an Auto Re-closing function incorporated in the IED?	As per Section C 3.2	
2.3.12	Is a Trip Circuit Supervision function incorporated in the IED?	Yes, if not elsewhere	
2.3.13	Does the IED have an LCD mimic?	As per Section C 3.2	
2.3.14	Can the logic functionality depicted in the logic schematic drawings be implemented in the IED?	Yes	
2.3.15	Is Protection Engineering function implemented over Ethernet?	Yes	
2.3.16	Is a PICS for this IED submitted with the tender?	Yes	
2.3.17	Is a MICS for this IED submitted with the tender?	Yes	
2.3.18	Is a brochure and technical manual for this IED submitted with the tender?	Yes	
2.3.19	Type of coating to ensure long term stability in humid and corrosive environments	Conformal coating	

T2.2.25.2.4 Busbar Protection IED /s For 132 kV Schemes

Item	Detailed Information	Required	Offered
2.4.1	High Impedance IED Make And Model CT Supervision IED make and model (if separate from above) Scheme Processor IED (if required)	- - -	
2.4.2	Which of the above IEDs comply with IEC 61850?	At least one	
2.4.3	Type of Ethernet Communication Port provided on IEC 61850 IED	100BaseFx	
2.4.4	Does the IEC 61850 IED have a standard IRIG-B external time synchronising input?	-	
2.4.5	Number of High Impedance Inputs	3 x Phase per zone	
2.4.6	Are the High Impedance Inputs current (with resistors) or voltage inputs	-	
2.4.7	Number of Binary Logic Inputs	Min as per Scheme Drawings	
2.4.8	Number of Output Contacts	Min as per Scheme Drawings	
2.4.9	Number of programmable LEDs	Min as per Scheme Drawings	
2.4.10	Do the protection setting characteristics of the IED comply with the specification?	Yes	
2.4.11	Can the logic functionality depicted in the logic schematic drawings be implemented in the IED?	Yes	
2.4.12	Is Protection Engineering function implemented over Ethernet?	Yes	
2.4.13	Is a PICS for this IED submitted with the tender?	Yes	
2.4.14	Is a MICS for this IED submitted with the tender?	Yes	
2.4.15	Is a brochure and technical manual for this IED submitted with the tender?	Yes	
2.4.16	Type of coating to ensure long term stability in humid and corrosive environments	Conformal coating	

T2.1.2.25.2.5 Overcurrent, Earth Fault And Sensitive Earth Fault IED For 11 kV Feeder Schemes

Item	Detailed Information	Required	Offered
2.5.1	IED Make And Model	-	
2.5.2	Specification to which the IED complies	IEC 61850	

Item	Detailed Information	Required	Offered
2.5.3	Type of Ethernet Communication Port provided	100BaseFx	
2.5.4	Does the IED have a standard IRIG-B external time synchronising input?	-	
2.5.5	Number of CT Inputs	3 × O/C, 1 × E/F, 1 × SEF (where specified)	
2.5.6	Number of Binary Logic Inputs	Min as per Scheme Drawings	
2.5.7	Number of Output Contacts	Min as per Scheme Drawings	
2.5.8	Number of programmable LEDs	Min as per Scheme Drawings	
2.5.9	Do the protection setting ranges of the IED comply with the specification?	Yes	
2.5.10	Is a Sensitive Earth Fault function incorporated in the IED?	Where specified for the scheme	
2.5.11	Is a Breaker Fail function incorporated in the IED?	No	
2.5.12	Is an Auto Re-closing function incorporated in the IED?	No	
2.5.13	Is a Trip Circuit Supervision function incorporated in the IED?	Yes	
2.5.14	Does the IED have an LCD mimic?	No	
2.5.15	Can the logic functionality depicted in the logic schematic drawings be implemented in the IED?	Yes	
2.5.16	Is Protection Engineering function implemented over Ethernet?	Yes	
2.5.17	Is a PICS for this IED submitted with the tender?	Yes	
2.5.18	Is a MICS for this IED submitted with the tender?	Yes	
2.5.19	Is a brochure and technical manual for this IED submitted with the tender?	Yes	
2.5.20	Type of coating to ensure long term stability in humid and corrosive environments	Conformal coating	

T2.2.25.2.6 Transformer Differential And HV&LV REF IED (IED 1) For 132/11 kV Transformer Schemes

Item	Detailed Information	Required	Offered
2.6.1	IED make and model	-	
2.6.2	Specification to which the IED complies	IEC 61850	

Item	Detailed Information	Required	Offered
2.6.3	Type of Ethernet communication port provided	100BaseFx	
2.6.4	Does the IED have a standard IRIG-B external time synchronising input?	-	
2.6.5	List which of the following functions will be performed by this IED: Directional Overcurrent protection	No	
	Overcurrent and Earth fault protection	No	
	2 Stage Standby Earth fault protection	-	
	HV Restricted Earth fault protection	Yes	
	LV Restricted Earth fault protection	Yes	
	Transformer Biased Differential protection	Yes	
	Transformer Trips and alarms	Yes	
	11 kV Auto-reclose	No	
	Bank Intertrip	-	
	Bus Zone tripping	-	
	11 kV (and 132 kV if applicable) Trip Circuit Supervision	-	
	Sequential Switching Initiate	-	
	HV Master trip	-	
	LV Master trip	-	
2.6.6	Number of CT inputs	3 × HV Diff, 3 × LV Diff, 1 × HV REF, 1 × LV REF, 1 × SBEF (If applicable)	
2.6.7	Number of Binary Logic Inputs	Min as per Scheme Drawings	
2.6.8	Number of Output Contacts	Min as per Scheme Drawings	
2.6.9	Number of programmable LEDs	Min as per Scheme Drawings	
2.6.10	Do the protection setting characteristics of the IED comply with the specification?	Yes	
2.6.11	Does the IED have an LCD mimic?	As per Section C 3.2 and if not elsewhere	
2.6.12	Can the logic functionality depicted in the logic schematic drawings be implemented in the IED?	Yes	

Item	Detailed Information	Required	Offered
2.6.13	Is Protection Engineering function implemented over Ethernet?	Yes	
2.6.14	Is a PICS for this IED submitted with the tender?	Yes	
2.6.15	Is a MICS for this IED submitted with the tender?	Yes	
2.6.16	Is a brochure and technical manual for this IED submitted with the tender?	Yes	
2.6.17	Type of coating to ensure long term stability in humid and corrosive environments	Conformal coating	

T2.2.25.2.7 Directional Overcurrent, Overcurrent and Earth Fault IED (IED 2) For 132/11 kV Transformer Schemes

Item	Detailed Information	Required	Offered
2.7.1	IED Make And Model	-	
2.7.2	Specification to which the IED complies	IEC 61850	
2.7.3	Type of Ethernet Communication Port provided	100BaseFx	
2.7.4	Does the IED have a standard IRIG-B external time synchronising input?	-	
2.7.5	List which of the following functions will be performed by this IED: Directional Overcurrent protection	Yes	
	Overcurrent and Earth fault protection	Yes	
	2 Stage Standby Earth fault protection	Yes	
	HV Restricted Earth fault protection	No	
	LV Restricted Earth fault protection	No	
	Transformer Biased Differential protection	No	
	Transformer Trips and alarms	Yes	
	11 kV Auto-reclose	Yes (if applicable)	
	Bank Intertrip	-	
	Bus Zone tripping	-	
	11 kV (and 132 kV if applicable) Trip Circuit Supervision	-	
	Sequential Switching Initiate	-	

Item	Detailed Information	Required	Offered
	HV Master trip	-	
	LV Master trip	-	
2.7.6	Number of CT Inputs	3 × DOC/OC, 1 × EF, 1 × SBEF (If applicable)	
2.7.7	Number of VT Inputs	3 × DOC	
2.7.8	Number of Binary Logic Inputs	Min as per Scheme Drawings	
2.7.9	Number of Output Contacts	Min as per Scheme Drawings	
2.7.10	Number of programmable LEDs	Min as per Scheme Drawings	
2.7.11	Do the protection setting characteristics of the IED comply with the specification?	Yes	
2.7.12	Does the IED have an LCD mimic?	As per Section C 3.2 and if not elsewhere	
2.7.13	Can the logic functionality depicted in the logic schematic drawings be implemented in the IED?	Yes	
2.7.14	Is Protection Engineering function implemented over Ethernet?	Yes	
2.7.15	Is a PICS for this IED submitted with the tender?	Yes	
2.7.16	Is a MICS for this IED submitted with the tender?	Yes	
2.7.17	Is a brochure and technical manual for this IED submitted with the tender?	Yes	
2.7.18	Type of coating to ensure long term stability in humid and corrosive environments	Conformal coating	

T2.2.25.2.8 Voltage Regulating IED (IED 3) For 132/11 kV Transformer Schemes

Item	Detailed Information	Required	Offered
2.8.1	IED Make And Model	-	
2.8.2	Specification to which the IED complies	IEC 61850	
2.8.3	Type of Ethernet Communication Port provided	100BaseFx	
2.8.4	Does the IED have a standard IRIG-B external time synchronising input?	-	
2.8.5	Number of CT Inputs	-	

Item	Detailed Information	Required	Offered
2.8.6	Number of VT Inputs	-	
2.8.7	Number of Binary Logic Inputs	Min as per Scheme Drawings	
2.8.8	Number of Output Contacts	Min as per Scheme Drawings	
2.8.9	Number of programmable LEDs	Min as per Scheme Drawings	
2.8.10	Can the Voltage Regulation functionality specified be implemented in the IED?	Yes	
2.8.11	Can the IED display a mimic to indicate transformer and busbar arrangement?	Yes	
2.8.12	Does the IED display voltage and tap position as default?	Yes	
2.8.13	Can the logic functionality depicted in the logic schematic drawings be implemented in the IED?	Yes	
2.8.14	Is IED Engineering function implemented over Ethernet?	Yes	
2.8.15	Is a PICS for this IED submitted with the tender?	Yes	
2.8.16	Is a MICS for this IED submitted with the tender?	Yes	
2.8.17	Is a brochure and technical manual for this IED submitted with the tender?	Yes	
2.8.18	Type of coating to ensure long term stability in humid and corrosive environments	Conformal coating	

T2.2.25.2.9 IED /s For 11 kV General Control Schemes

Item	Detailed Information	Required	Offered
2.9.1	Scheme Processor IED	- - -	
2.9.2	Specification to which the IED complies	IEC 61850	
2.9.3	Type of Ethernet Communication Port provided on IEC 61850 IED	100BaseFx	
2.9.4	Does the IEC 61850 IED have a standard IRIG-B external time synchronising input?	-	
2.9.5	Number of High Impedance Inputs	-	
2.9.6	Are the High Impedance Inputs current (with resistors) or voltage inputs	-	

Item	Detailed Information	Required	Offered
2.9.7	Number of Binary Logic Inputs	Min as per Scheme Drawings	
2.9.8	Number of Output Contacts	Min as per Scheme Drawings	
2.9.9	Number of programmable LEDs	Min as per Scheme Drawings	
2.9.10	Can the logic functionality depicted in the logic schematic drawings be implemented in the IED?	Yes	
2.9.11	Is Protection Engineering function implemented over Ethernet?	Yes	
2.9.12	Is a PICS for this IED submitted with the tender?	Yes	
2.9.13	Is a MICS for this IED submitted with the tender?	Yes	
2.9.14	Is a brochure and technical manual for this IED submitted with the tender?	Yes	
2.9.15	Type of coating to ensure long term stability in humid and corrosive environments	Conformal coating	

T2.2.25.2.10 Scheme Processor IED For Combined 132 kV Feeder And Transformer Feeder Schemes

Item	Detailed Information	Required	Offered
2.10.1	IED Make And Model	-	
2.10.2	Specification to which the IED complies	IEC 61850	
2.10.3	Type of Ethernet Communication Port provided	100BaseFx	
2.10.4	Does the IED have a standard IRIG-B external time synchronising input?	-	
2.10.5	Number of Binary Logic Inputs	-	
2.10.6	Number of Output Contacts	-	
2.10.7	Number of programmable LEDs	-	
2.10.8	Does the IED have an LCD mimic?	As per Section C 3.2	
2.10.9	Can the logic functionality depicted in the logic schematic drawings be implemented in the IED?	Yes	
2.10.10	Is IED Engineering function implemented over Ethernet?	Yes	
2.10.11	Is a PICS for this IED submitted with the tender?	Yes	
2.10.12	Is a MICS for this IED submitted with the tender?	Yes	

Item	Detailed Information	Required	Offered
2.10.13	Is a brochure and technical manual for this IED submitted with the tender?	Yes	
2.10.14	Type of coating to ensure long term stability in humid and corrosive environments	Conformal coating	

T2.2.25.2.11 Overcurrent And Earth Fault IED For Backup Protection Schemes For 132/11 kV Transformers

Item	Detailed Information	Required	Offered
2.11.1	IED Make And Model	-	
2.11.2	Specification to which the IED complies	IEC 61850	
2.11.3	Type of Ethernet Communication Port provided	100BaseFx	
2.11.4	Does the IED have a standard IRIG-B external time synchronising input?	-	
2.11.5	Number of CT Inputs	3 × O/C, 1 × E/F	
2.11.6	Number of Binary Logic Inputs	-	
2.11.7	Number of Output Contacts	Min as per Scheme Drawings	
2.11.8	Number of programmable LEDs	Min as per Scheme Drawings	
2.11.9	Do the protection setting ranges of the IED comply with the specification?	Yes	
2.11.10	Can the logic functionality depicted in the logic schematic drawings be implemented in the IED?	Yes	
2.11.11	Is Protection Engineering function implemented over Ethernet?	Yes	
2.11.12	Is a PICS for this IED submitted with the tender?	Yes	
2.11.13	Is a MICS for this IED submitted with the tender?	Yes	
2.11.14	Is a brochure and technical manual for this IED submitted with the tender?	Yes	
2.11.15	Type of coating to ensure long term stability in humid and corrosive environments	Conformal coating	

T2.2.25.2.12 Underfrequency Loadshedding IED

Item	Detailed Information	Required	Offered
2.12.1	IED Make And Model	-	

Item	Detailed Information	Required	Offered
2.12.2	Specification to which the IED complies	IEC 61850	
2.12.3	Type of Ethernet Communication Port provided	100BaseFx	
2.12.4	Does the IED have a standard IRIG-B external time synchronising input?	-	
2.12.5	Number of CT Inputs	-	
2.12.6	Number of VT Inputs	At least 2	
2.12.7	Number of Binary Logic Inputs	-	
2.12.8	Number of Output Contacts	As per 3.5 and 4.11 of the General Technical Specification	
2.12.9	Number of programmable LEDs	As per 3.5 and 4.11 of the General Technical Specification	
2.12.10	Do the setting ranges of the IED comply with the specification?	Yes	
2.12.11	Is Protection Engineering function implemented over Ethernet?	Yes	
2.12.12	Is a PICS for this IED submitted with the tender?	Yes	
2.12.13	Is a MICS for this IED submitted with the tender?	Yes	
2.12.14	Is a brochure and technical manual for this IED submitted with the tender?	Yes	
2.12.15	Type of coating to ensure long term stability in humid and corrosive environments	Conformal coating	

T2.2.25.3.0 Substation Automation System - General

Item	Detailed Information	Required	Offered
3.1	Will the bidder provide a substation automation scheme that integrates protection, SCADA, automatic control functions, interlocking, alarms, and event logging into a single system?	Yes	
3.2	Does the scheme integrate protection IEDs, a human machine interface (HMI), a SCADA gateway, and a time server over a high availability Local Area Network?	Yes	
3.3	Besides providing the normal protection functions, can the protection IEDs be used to accumulate status, alarms, measurements, and event records?	Yes	

Item	Detailed Information	Required	Offered
3.4	Will the information in Item 3.3 be made available to the HMI, SCADA, and associated IEDs in other bays?	Yes	
3.5	Will all remote control of the primary equipment shall be implemented via the protection IED?	Yes	
3.6	Does the HMI provide an indication of the status, alarms, measurements, and control of the primary equipment, and shall maintain a database of substation events?	Yes	
3.7	The IEDs, HMI, and SCADA gateway are to be linked by an Ethernet network and all communication between these devices shall be in accordance with the IEC 61850 specification?	Yes	
3.8	Can engineering configuration functions be carried out via the network in Item 3.7?	Yes	
3.9	Does the GPS clock provide an IRIG-B clock signal to the HMI and SCADA gateway?	Yes	
3.10	Can the SCADA gateway distribute time over the LAN to all network devices using the SNTP protocol?	Yes	
3.11	Can the HMI gateway serve as the backup SNTP time server?	Yes	
3.12	Will four sets of temperature and humidity sensors be installed within the HMI cabinet, Ethernet switch cabinet, and the control and switchgear rooms?	Yes	
3.13	Will data from the sensors in Item 3.12 be served to both the SCADA and HMI gateways (an interfacing controller may be used)?	Yes	
3.14	Is the data in Item 3.12 available on the HMI screen and to the Control Centre?	Yes	
3.15	All sensors and controllers to be powered by the substation d.c. supply?	Yes	
3.16	As part of the evaluation process, will the bidder be able to prepare a fully working display of the main components of the system, in order to demonstrate the system's functions and capabilities to representatives of eThekwini Electricity?	Yes	
3.18	Type of coating to ensure long term stability in humid and corrosive environments for devices indicated in Clause 2.1.9	Conformal coating	

Item	Detailed Information	Required	Offered
3.19	Do all the devices, as per Clause 2.1.10 of the general technical specifications, incorporate a watchdog alarm that monitors the health of the software application and the underlying hardware of which the device is composed?	Yes	

T2.2.25.4.0 HUMAN MACHINE INTERFACE (HMI) HARDWARE

Item	Description	Technical Details	
		Required	Offered
4.1	Does the HMI computer have a colour, flat display touch screen, which has sufficient touch sensitivity and resolution to allow accurate selection and interaction with substation visualisations as referred to in clauses 2.3.1 – 2.3.8 of the general technical specification?	Yes	
4.2	Is the screen in Item 4.1 of industrial grade?	Yes	
4.3	Size of screen in item 4.1	Minimum 21”	
4.4	Resolution of screen in Item 4.1	Minimum Full HD	
4.5	Does the HMI computer have a keyboard which has an integrated touchpad?	Yes	
4.6	Is the keyboard in Item 4.5 of an industrial grade?	Yes	
4.7	Is the HMI hardware (screen, KVM and associated equipment) housed in an IP52 lockable cabinet with suitable ventilation?	Yes	
4.8	Guarantee period for the HMI computer?	10 years	
4.9	Does the HMI have sufficient storage capacity to store analogue values over a seven-day period in non-volatile memory on a FIFO basis?	Yes	
4.10	Can the HMI equipment be powered from the substation d.c supply? (please see Section C 3.2 for substation d.c. voltage)	Yes	
4.11	Is the HMI touch-screen display, HMI/Supervisory selector switch, general alarm push-button, audible alarm and LED all mounted on the HMI panel?	Yes	
4.12	Will the licenses and installation disks be supplied for operating systems and software?	Yes	

Item	Description	Technical Details	
		Required	Offered
4.13	Will the documented procedures and recovery disks be provided to enable recovery from a hardware failure?	Yes	

T2.2.25.5.0 HMI SOFTWARE

Item	Description	Technical Details	
		Required	Offered
5.1	Software used to implement the functionality of the HMI	-	
5.2	Version of operating system for HMI	-	
5.3	Does the HMI provide overall substation, individual bay schematic and Underfrequency Load Shedding (UFLS) views?	Yes	
5.4	Does the overall substation view comprise of the following:		
5.4.1	Overall substation schematic diagram	Yes	
5.4.2	Status of all equipment	Yes	
5.4.3	Measured values	Yes	
5.4.4	General bay alarms	Yes	
5.4.5	Overall substation event record window with event description and timestamp	Yes	
5.5	Is the overall substation view the default home page and does the HMI revert to this view after a selectable time delay	Yes	
5.6	Is the individual bay view selectable from the overall substation view	Yes	
5.7	Does the individual bay view in Item 5.4 comprise the following:		
5.7.1	Single line diagram with appropriate symbols	Yes	
5.7.2	Status of all bay equipment	Yes	
5.7.3	Measured bay values	Yes	
5.7.4	Specific bay alarms	Yes	

Item	Description	Technical Details	
		Required	Offered
5.7.5	Event record window with description and timestamp	Yes	
5.7.6	Operating options button	Yes	
5.8	Is the UFLS view selectable from the overall substation view	Yes	
5.9	Does the UFLS view in Item 5.6 comprise of the following:		
5.9.1	Frequency range for the different stages	Yes	
5.9.2	Summary table of all the feeders indicating the current load, UFLS state, date and time of the last update	Yes	
5.9.3	UFLS state display to allow the local user to configure the UFLS stage	Yes	
5.9.4	Indication of target MVA for each stage	Yes	
5.9.5	Reset button for resetting all the feeder IEDs that have tripped on load shedding. This must only reset the load shedding trip flags only, and not the other protection functions flags. This shall also be resettable from SCADA	Yes	
5.9.6	Facility to allow for control of stage selection for each feeder bay remotely from SCADA	Yes	
5.9.7	UFLS report for the most recent under frequency event which shall include, the feeders, the relevant state assigned, the relevant stage to which it tripped and the current reading before trip	Yes	
5.9.8	Stage MVA to be shed and deviation from target which is calculated using the voltage measured by the UFLS IED and the current on each feeder	Yes	
5.10	Does the bay designation consist of user configurable text fields which shall be used for all views and event records? Should a bay designation require modification, it shall only be necessary to carry this out in one place.	Yes	
5.11	Does the bay view allow for operation of equipment as follows:		
5.11.1	Selection of bay to be operated	Yes	
5.11.2	Selection of appropriate operation button	Yes	

Item	Description	Technical Details	
		Required	Offered
5.11.3	Allow confirmation of the selected operation	Yes	
5.11.4	Show indication of unsuccessful operation, if applicable, and reason if known to the HMI	Yes	
5.12	Does the HMI controller allow for the operation of equipment and the viewing of events using the touch screen?	Yes	
5.13	Does the HMI maintain a database for all substation events with designations, event descriptions and time-stamps?	Yes	
5.14	Are those events in Item 5.11 graphically displayed on the HMI using a general event window?	Yes	
5.15	Are the events in Item 5.11 time-stamped with the time as recorded by the IED and listed in chronological order according to the time-stamp in general event window?	Yes	
5.16	Will each bay have an event window graphically representing its associated events?	Yes	
5.17	Will the event window for each bay represent the events in the following categories:		
5.17.1	Change of status of primary equipment	Yes	
5.17.2	Alarms	Yes	
5.17.3	Protection operations	Yes	
5.17.4	HMI and SCADA operation commands.	Yes	
5.18	Can the HMI be configured using a Substation Configuration Tool according to the IEC 61850 specification?	Yes	
5.19	Are the full details of the HMI submitted with the tender?	Yes	
5.20	Does the HMI support trending of analogue points?	Yes/No	
5.21	Does the HMI have sufficient storage capacity to store analogue values over a seven day period in non-volatile memory on a FIFO basis?	Yes/No	
5.22	Will valid licenses and installation disks be supplied for operating systems and software?	Yes/No	
5.23	Is the HMI software web-based?	Yes/No	

T2.2.25.6.0 SCADA Gateway

Item	Description	Technical Details	
		Required	**Offered**
6.1	Make and model of SCADA Gateway	-	
6.2	Will the SCADA gateway/s use DNP3 level 3 over TCP/IP protocol to communicate with the control centre?	Yes	
6.3	Will the SCADA gateway have an interface to eThekwini Electricity's Advanced Control Systems (ACS) SCADA front end processor and an interface to the control and protection IEDs	Yes	
6.4	Does the SCADA gateway maintain a database of individual DNP3.0 points which will be obtained from the control and protection IEDs using the IEC 61850 standard	Yes	
6.5	Will the events which occur between polls be lost or over-written at the SCADA gateway level	No	
6.6	Does timestamping of events occur at IED level	Yes	
6.7	Does the communication configuration of the SCADA gateway, which is in accordance with IEC 61850 standard, use the substation configuration tool?	Yes	
6.8	Does the gateway have a provision of a minimum of two Ethernet ports in a switch configuration?	Yes	
6.8	Will the contractor be responsible for the full commissioning of the SCADA gateway?	Yes	
6.9	Will the SCADA gateway be powered from the substation d.c. battery?	Yes	
6.10	Will the SCADA gateway be housed on the lower half of the HMI panel.	Yes/No	
6.11	Does the SCADA gateway allow for remote forcing of all DNP3 points?	Yes	
6.12	Will the SCADA gateway be remotely resettable?	Yes	
6.13	Will there be a functional demonstration of the IEC 61850 communication between at least one IED and the SCADA gateway and the DNP3 communication between the SCADA gateway and eThekwini Electricity's ACS SCADA front end processor, which is required as part of the demonstration evaluation.	Yes	
6.14	Does the HMI software reside on the SCADA gateway?	Yes	

Item	Description	Technical Details	
		Required	Offered
6.15	Will a redundant SCADA gateway be offered as part of the solution in a main/standby configuration?	Yes	
6.16	Will the fail-over between the two gateways in Item 6.15 be automatic?	Yes	
6.17	Will an option for manual failover between the two gateways in Item 6.15 be available?	Yes	
6.18	Will the fail-over between the redundant gateways be transparent to the master station i.e., no reconfiguration of IP/DNP3 addresses on the master station shall be required; the master station is be configured to communicate with only a single IP host for the substation?	Yes	
6.19	Does the stand-alone IEC61850 discrete IO proxy have 32 discrete inputs (wetting 48V or 24V), 12 double discrete outputs (12V) and 8 discrete analogue inputs (0-20mA)?	Yes	
6.20	Will the following signals be catered for in the scheme design:		
6.20.1	All the points indicated on the drawings included with this specification	Yes	
6.20.2	All mandatory data objects for Logical Nodes specified in Annexure A	Yes	
6.20.3	Device status of all networked devices	Yes	
6.20.4	All battery charger alarms (max 4) viz., a.c. fail, d.c. fail, minor/non-urgent alarm, major/urgent alarm, fuse fail, low voltage, high voltage, charger fail	Yes	
6.20.5	Real-time battery voltage (0-250V d.c.). Bidder to provide transducer.	Yes	
6.20.6	Temperature and humidity	Yes	
6.21	Will the DNP3 database include a minimum of all the signals mentioned in Section C3.1 and be sufficient for expansion to include an additional 30% of the commissioned scheme?	Yes	
6.22	The format of the database is to be subject to the approval of the Engineer	Yes	

T2.2.25.7.0 Communications Network

Item	Description	Technical Details	
		Required	Offered
7.1	Make and model of Ethernet switch	-	
7.2	Item 7.1 datasheet attached?	Yes	
7.5	Is Item 7.1 a Ruggedised Utility Grade Layer 2 IEC61850 Switch	Yes	
7.6	Is the Ruggedised Utility Grade Layer 2 IEC61850 Switch 19” rack mountable and 1U in height?	Yes	
7.7	Is the electronic printed circuit boards of the Ruggedised Utility Grade Layer 2 IEC61850 Switch conformally coated to prevent corrosion?	Yes	
7.8	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have a minimum rating of IP 30?	Yes	
7.9	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have an epoxy coated metal housing with ports on the front?	Yes	
7.10	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have LED status lights, on the front of the device, indicating link and activity status of each port?	Yes	
7.11	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have dual power supply of 110 V d.c nominal voltage with at least 20 % voltage range	Yes	
7.12	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have a minimum of 12 × 100baseFX Multimode optical ports?	Yes	
7.13	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have a minimum of 2 × 1000 BASE LX optical ports with multimode SFP’s?	Yes	
7.14	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have a minimum of 2 × 10/100 BASE T RJ45?	Yes	
7.15	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch comply with VLAN (802.1Q)?	Yes	
7.16	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch support Port rate limiting (Ingress and Egress)?	Yes	
7.17	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch support Flow control (IEEE 802.3)?	Yes	

Item	Description	Technical Details	
		Required	Offered
7.18	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch support RSTP (Rapid Spanning Tree Protocol) IEEE 802.1D?	Yes	
7.19	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch support MSTP 802.1Q-2005 (formerly 802.1s)?	Yes	
7.20	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch support Quality of service (802.1p)?	Yes	
7.21	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch support Port mirroring?	Yes	
7.22	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have IGMP snooping and multicast filtering?	Yes	
7.23	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have SNMP V1 and V2 Configuration?	Yes	
7.24	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have Remote Secure Access?	Yes	
7.25	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have SFP Diagnostics?	Yes	
7.26	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have Dynamic Host Configuration Protocol (DHCP) Client?	Yes	
7.27	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have Remote viewing of configuration through secure web browser (HTTPS)?	Yes	
7.28	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch comply with Authentication (IEEE 802.1x)?	Yes	
7.29	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have Mac address filtering?	Yes	
7.30	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have Local Logfile and Syslog reporting?	Yes	
7.31	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have Radius centralised password management?	Yes	
7.32	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch allow Disabling of ports?	Yes	
7.33	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have EMC hardened as per IEEE 1613.1?	Yes	

Item	Description	Technical Details	
		Required	Offered
7.34	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch comply with SANS 61850-3: Electric Utility Substations?	Yes	
7.35	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have able to withstand an extended temperature rating from -40 °C to +70°C continuous and humidity of 95%?	Yes	
7.36	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have a fan-less design?	Yes	
7.37	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch have a guarantee period of a minimum of 5 years from the date of handover to EE and is applicable to design and manufacturing related product defects as per clause T2.1.2.40?	Yes	
7.38	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch comply with Ethernet standards in accordance with all relevant parts of IEEE 802?	Yes	
7.39	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch support at minimum SNTP - Simple Network Time Protocol?	Yes	
7.40	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch support Remote configuration management for restoration and scheduled backups (e.g. TFTP or SSH)?	Yes	
7.41	Does the Ruggedised Utility Grade Layer 2 IEC61850 Switch support GOOSE Messaging?	Yes	

T2.2.25.8.0 Security on the Gateways and IEDs

Item	Description	Technical Details	
		Required	Offered
8.1	Can the IEDs, Communication switches, and SCADA gateways support role based access control?	Yes	
8.2	Do the IEDs, Communication switches, SCADA gateways and GPS clock have the ability to be password protected?	Yes	
8.3	Do all devices that have web servers support HTTPs (TLS v1.2 or greater?)	Yes	
8.4	Can the IEDs, communication switches, and SCADA gateways create time synchronised audit trails of security relevant user activities?	Yes	

Item	Description	Technical Details	
		Required	Offered
8.5	Can the IEDs, communication switches and SCADA gateways support the ability to redirect audit logs to a central security server.	Yes	
8.6	Can the IEDs, Communication switches, and SCADA gateways support role based access control?	Yes	
8.7	Do the IEDs, Communication Switches, SCADA gateways and GPS clock have the ability to be password protected?	Yes	

T2.2.25.9.0 Time Synchronisation

Item	Description	Technical Details	
		Required	Offered
9.2	Can the GPS clock serve NTP time to all networked devices on the substation LAN	Yes	
9.2	Can the GPS clock display the current date and time on the front face	Yes	
9.3	Can the GPS clock be powered from the substation d.c. supply (see section C 3.2)	Yes	

T2.2.25.10.0 General Information

Item	Description	Technical Details	
		Required	Offered
10.1	Name of organisation/personnel responsible for IEC 61850 Communications Configuration and Implementation	-	
10.2	Name of organisation/personnel responsible for Protection Scheme Design and Configuration	-	
10.3	Name of organisation/personnel responsible for HMI Configuration and Implementation	-	
10.4	Name of organisation/personnel responsible for SCADA Gateway Configuration and Implementation	-	

Item	Description	Technical Details	
		Required	**Offered**
10.5	Name of organisation/personnel responsible for Testing and Commissioning of Entire Substations	-	
10.6	Are details of the above organisations/personnel indicating their suitability and experience for performing the associated functions submitted with the tender?	Yes	
10.7	Does the contractor comply with CPG clause C1.2.3.4?	Yes	

Signed …… Date ……

Name of Signatory …… Position ……

Name of Tenderer ……

T2.2.26 DETAILS OF DRAWINGS ISSUED AS PART OF THIS SPECIFICATION AND DRAWINGS REQUIRED WITH TENDER

T2.2.26.1 DRAWINGS ISSUED WITH THIS SPECIFICATION

Drawings issued with this enquiry are in PDF format. Tenderers encountering problems viewing drawings are advised to contact the person listed under “Contact Persons” on the cover sheets of the tender enquiry for assistance. The original paper copies of the drawings are available for inspection at eThekwini Electricity’s HV Projects Branch.

Hard copies of the drawings will be issued to the successful tenderer after contract award.

Tenderers must note that the purpose of the drawings issued with this enquiry is to clarify the requirements of the specification. The issue of these does not absolve the successful contractor from their normal responsibilities of ensuring that the arrangement and the circuitry meet the requirements of this specification or of submitting proposal drawings for approval by the Engineer.

Tenderers must note that the schematic drawings issued with this specification show simplified circuits and the wire ferrule numbering may have to be modified from that shown on the drawings issued to suit the equipment to be supplied. However, in the interests of system and numbering standardisation, changes must be kept to a minimum and are subject to approval.

The drawings listed below show the proposed a.c. and d.c. Protection and Control, and Logic schematic requirements.

132 kV Double Busbar S/S: 132 kV Schematic Diagram	TD41 Rev 1
132 kV Double Busbar S/S: 132 kV 3 Zone Busbar Protection & Control Logic Diagram	TD42 Rev 1
132 kV Double Busbar S/S: DC Schematic for 132 kV 3 Zone Busbar Protection	TD43
132 kV Double Busbar S/S: AC Schematic for 132 kV Busbar Protection	TD44
132 kV Double Busbar S/S: AC & DC Schematic for 132 kV Current Differential Feeder	TD45 Rev 1
132 kV Double Busbar S/S: Protection & Control Logic for 132 kV Current Differential Feeder	TD46 Rev 1
132 kV Double Busbar S/S: AC & DC Schematic for 132 kV Bus Section	TD47 Rev 1
132 kV Double Busbar S/S: Protection & Control Logic for 132 kV Bus Section	TD48
132 kV Double Busbar S/S: Protection & Control Logic for 132 kV Bus Coupler	TD49
132 kV Double Busbar S/S: AC & DC Schematic for 132 kV Bus Coupler	TD50 Rev 1
132 kV Double Busbar S/S: Protection & Control Logic for 132 kV Distance Feeder	TD51
132 kV Double Busbar S/S: AC & DC Schematic for 132 kV Distance Feeder	TD52
132 kV Single Busbar S/S: Protection & Control Logic for 132 kV Feeder with Auto-Reclosing	TD54
132 kV Single Busbar S/S: AC & DC Schematic for 132 kV Feeder with Auto-Reclosing	TD55 Rev 1
132 kV Single Busbar S/S: 132 kV Schematic Diagram	TD56 Rev 1
132 kV Substation with Separated 132 kV Feeders and Transformer Feeders: Schematic Diagram	TD53 Rev 1
132 kV Substation with Separated 132 kV Feeders and Transformer Feeders: AC Schematic for 132 kV Busbar Protection	TD57
132 kV Substation with Separated 132 kV Feeders and Transformer Feeders: Protection & Control Logic for 132 kV Feeder	TD58 Rev 1

132 kV Substation with Separated 132 kV Feeders and Transformer Feeders: AC & DC Schematic for 132 kV Feeder	TD59 Rev 1
132 kV Substation with Separated 132 kV Feeders and Transformer Feeders: AC & DC Schematic for 132/11 kV Transformer	TD60.1 Sheets 1&2
132 kV Substation with Separated 132 kV Feeders and Transformer Feeders: Protection & Control Logic for 132/11 kV Transformer (Fixed Pattern)	TD76.1
132/11 kV with 132 kV GIS: 132/11 kV Schematic	TD61 Rev 1
132/11 kV with 132 kV GIS: 132/11 kV Schematic (without transformer feeders/Jericho scheme)	TD79 Rev 1
132 kV Substation with GIS: AC Schematic for 132 kV Busbar Protection	TD62 Rev 1
132 kV Substation with GIS: AC Schematic for 132 kV Busbar Protection (without transformer feeders/Jericho scheme)	TD83
132 kV Substation with GIS: Protection & Control Logic for 132 kV Feeder	TD63 Rev 1
132 kV Substation with GIS : AC & DC Schematic for 132 kV Feeder	TD64 Rev 1
132 kV Substation with GIS: AC & DC Schematic for 132 kV Transformer Feeder	TD65 Rev 1
132 kV Substation with GIS: AC & DC Schematic for 132 kV Transformer Feeder (without the Jericho Scheme)	TD80 Rev 2
132 kV Substation with GIS: Protection & Control Logic for 132 kV Transformer Feeder	TD66
132 kV Substation with GIS: AC & DC Schematic for 132 kV Bus Section	TD67 Rev 1
132 kV Substation with GIS: Protection & Control Logic for 132 kV Bus Section	TD68
132 kV Substation with GIS: AC & DC Schematic for 132/11 kV Transformer	TD69 Rev 1
132 kV Substation with GIS (without transformer feeders/Jericho scheme): AC & DC Schematic for 132/11 kV Transformer (Fixed pattern)	TD69.1 Sheets 1&2
132 kV Substation with GIS: : Protection & Control Logic for 132/11 kV Transformer	TD70 Rev 1
132 kV Substation with GIS: Protection & Control Logic for 132/11 kV Transformer (Fixed Pattern)	TD70.1
132 kV Substation with Combined 132 kV Feeders and Transformer Feeders: 132 kV & 11 kV Schematic Layout	TD71
132 kV Substation with Combined 132 kV Feeders and Transformer Feeders: AC & DC Schematic for 132 kV Protection & Control	TD72 Rev 1
132 kV Substation with Combined 132 kV Feeders and Transformer Feeders: Protection & Control Logic for 132 kV Protection & Control	TD73 Rev 1
132 kV Substation with Combined 132 kV Feeders and Transformer Feeders: AC & DC Schematic for 132/11 kV Transformer (Fixed Pattern)	TD74.1
132 kV Substation with Combined 132 kV Feeders and Transformer Feeders: Protection & Control Logic for 132/11 kV Transformer (Fixed Pattern)	TD75.1
Protection & Control Logic for 132 kV Feeder without Auto-Reclosing	TD22 Rev 1
AC & DC Schematic for 132 kV Feeder without Auto-Reclosing	TD23 Rev 1
Protection & Control Logic for 132 kV Bus Section	TD24
AC & DC Schematic for 132 kV Bus Section	TD25 Rev 1
132 kV 2 Zone Busbar Protection & Control Logic Diagram	TD26 Rev 1

DC Schematic for 132 kV 2 Zone Busbar Protection	TD27 Rev 1
AC Schematic for 132 kV Busbar Protection	TD28 Rev 1
Protection & Control Logic for 132 kV Protection	TD29
AC & DC Schematic for 132 kV Protection	TD30
AC & DC Schematic for 11 kV Feeder	TD33.1
Protection & Control Logic for 11 kV Feeder	TD34.1
DC Schematic for 11 kV Bus Coupler and Bus Sections	TD35 Rev 1
Protection & Control Logic for 11 kV Bus Coupler and Bus Sections	TD36 Rev 1
AC & DC Schematic and Protection & Control Logic for 132/11 kV Transformer backup protection	TD38
Proposed Communication Network Arrangement	TD39 Rev 1
Proposed Interlocking Logic Between 11 kV and 132 kV	TD85

T2.2.26.2 WORKING DRAWINGS

All drawings issued by the contractor shall comply with the requirements of the Technical Specification.

T2.2.27 TESTING REQUIRED

T2.2.27.1 ROUTINE AND TYPE TESTS

Type Test certificates for all the IEDs shall be carried out in accordance with IEC 60255 and submitted with the tender.

Routine tests for IEDs shall be performed in accordance with IEC 60255.

The costs of these routine and type tests shall be included in the cost of the IEDs.

T2.2.27.2 FACTORY TESTS

T2.2.27.2.1 IEDs Installed In Primary Plant Supplied By Others

Testing of the indication, measured values and control commands of the IEDs are required to be included in the factory testing of the primary plant at the manufacturer's premises. To achieve this, the Contractor for this contract will be required to program the IEDs to be installed in the primary equipment to facilitate testing of the indication, measured values and control commands in the factory test environment and shall be present at the tests.

The costs of these factory tests shall be included in the cost of the IEDs.

T2.2.27.2.2 Factory Tests Of Equipment Supplied On This Contract

Factory testing of all equipment supplied on this contract which is not installed on primary plant to be supplied by others is required.

The factory test environment shall be achieved as follows:

a) Connecting all equipment to the various communication networks;
b) Providing bridge pieces to simulate the various voltage free contacts on primary plant;
c) Providing monitoring of all output contacts from IEDs;
d) Providing a means of monitoring the SCADA Gateway database; and
e) Any other necessary equipment to carry out the tests below.

Tests shall be carried out to:

a) Simulate all input conditions from primary plant and verify correct indication on the IED, HMI and SCADA Gateway as applicable.
b) Simulate all output commands from the IED, HMI and SCADA Gateway as applicable and verify correct operation of output contacts of the IEDs.
c) Secondary inject all protection elements and verify correct measurement and protection operation indication on the IED, HMI and SCADA Gateway as applicable and correct output contact operation.

The costs of these factory tests shall be included in the cost of the equipment.

T2.2.27.3 SITE TESTS

T2.2.27.3.1 11 kV Switchboard

Visual Checks

a) All equipment labelled
b) Busbar shutter painted red for withdrawable switchgear
c) Cable shutters painted yellow for withdrawable switchgear
d) Position of labels for all positions of the circuit breaker truck for withdrawable switchgear

Mechanical checks

a) All switchgear and control panels bolted together, bolted to the floor and correctly earthed.
b) Operation of position selector for the circuit breaker truck
c) Lockable feature for shutters for withdrawable switchgear.

d) Operation of appropriate shutters when circuit breaker racking in or out for withdrawable switchgear.
e) Mechanical operation, interlocks and indication of circuit breaker for fixed pattern switchgear.
f) Mechanical operation, interlocks, and indication of disconnecting circuit breaker for fixed pattern switchgear.
g) Mechanical interlocks for accessing cable compartment for fixed pattern switchgear.

Electrical tests

a) Supply voltage to all IEDs
b) Operation and non-operation of circuit breaker from all points of operation in all permutations of mode selection (Local/Remote/HMI/Supervisory)
c) Non-operation of Trip Circuit Supervision for all circuit breaker permutations
d) Operation of Trip Circuit Supervision for break in trip circuit for all circuit breaker service position permutations
e) Operation of anti-pumping feature
f) Operation of spring charge mechanisms and indication
g) Operation and non-operation of tripping circuits with and without trip fuse and link
h) For circuit breaker with SF_6 interrupters, operation of low gas trip and lockout
i) Continuity test on busbars
j) Wiring of current transformer circuits, including single point earthing
k) Primary injection of current transformers
l) Mag curve test of current transformers
m) Secondary injecting of IEDs via CT test blocks, including pick-up and operation times of over-current and earth fault elements at 2,3 and 4 times setting, pick-up and operation of sensitive earth fault element (if applicable) and stability and operation of bus-zone protection
n) VT circuits, including only white phase earthed, neutral earth link removed and HV/LV fuses continuous
o) LED/Flag indication on panels and IEDs
p) Sequential switching feature
q) Contact resistance of busbars and circuit breakers
r) a.c. pressure test of switchgear
s) Electrical interlocks

T2.2.27.3.2 132/11 kV Transformers

Mechanical checks

a) Tap Changer operation and indication

Electrical Tests

a) Vector Group at nominal tap
b) Voltage Ratio on all taps including confirmation of no open circuiting between taps
c) Transformer 5 kV insulation test
d) Oil dielectric strength test from all sampling points
e) Winding and oil temperature thermocouple tests
f) Cooling equipment initiation and operation
g) NER resistance
h) Transformer/NER initiated trips
i) Transformer/NER initiated alarms
j) Tap changer operation and non-operation from all points of operation in all permutations of mode selection (Local/Remote/HMI/Supervisory)
k) Tap changer position BCD signals
l) Voltage regulation and parallel operation of Voltage Regulation IED
m) Wiring of current transformer circuits, including single point earthing
n) Primary injection of current transformers
o) Mag curve test of current transformers
p) Secondary injecting of IEDs via CT test blocks, including pick-up and operation times of directional over-current, over-current and earth fault elements at 2, 3 and 4 times setting, transformer differential, HV and LV restricted earth fault, standby earth fault and neutral check (if applicable)
q) LED/Flag indication on panels and IEDs
r) Correct marshalling of protection elements to HV and or LV Master Trip.
s) Electrical interlocks

132 kV Switchgear

Visual Checks

a) All equipment labelled
b) Earth blades painted

Mechanical checks

a) Operation of all isolators and earth switches
b) Padlocks fitted to all isolators and earth switches
c) Mechanical interlocks
d) Mechanical operation and indication of circuit breaker

Electrical tests

a) Supply voltage to all IEDs
b) Operation and non-operation of circuit breaker and motorised isolators from all points of operation in all permutations of mode selection (Local/Remote/HMI/Supervisory)
c) Operation of Trip Circuit Supervision for break in trip circuit for circuit breaker open and closed
d) Operation of anti-pumping feature
e) Operation of spring charge mechanisms and indication
f) Operation and non-operation of tripping circuits with and without trip fuse and link
g) Spring charge, low gas alarm, low gas lockout alarms and interlocks
h) Wiring of current transformer circuits, including single point earthing
i) Primary injection of current transformers
j) Mag curve test of current transformers
k) Secondary injecting of IEDs via CT test blocks, including pick-up and operation times of over-current and earth fault elements at 2, 3 and 4 times setting, pick-up and operation of sensitive earth fault element, operation of primary protection IED and stability and operation of bus-zone/breaker-fail protection, as applicable
l) Master trip IED trips circuit breaker in local and remote selection
m) VT circuits
n) LED/Flag indication on panels, IEDs and mimic as applicable
o) Contact resistance of busbars, circuit breakers and isolators
p) Speed test of circuit breakers
q) Electrical interlocks

T2.2.27.3.4 Human Machine Interface

a) Display of all permutations of status of all equipment
b) Display of all measured values by secondary injection
c) Display of all alarms from all equipment
d) Operation and non-operation of circuit breakers, tap changers and motorised isolators from HMI in all permutations of mode selection (Local/Remote/HMI/Supervisory)
e) Display of event records from all equipment and all IEDs

T2.2.27.3.5 SCADA Gateway

a) Indication of all permutations of status of all equipment
b) Indication of all measured values by secondary injection
c) Indication of all alarms from all equipment
d) Operation and non-operation of circuit breakers and tap changers from supervisory in all permutations of mode selection (Local/Remote/HMI/Supervisory)
e) Indication of event records from all equipment and all IEDs

T2.2.28 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)

T2.2.29 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)

T2.2.30 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)

T2.2.31 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)

T2.2.32 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

*Delete that which is not applicable

NAME :..... (Block Capitals)

SIGNATURE : ……..……..…… DATE: .....

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

T2.2.32 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)

T2.2.33 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)

T2.2.34 GUARANTEE PERIOD

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

The Bidder confirms that the IEDs and SCADA gateways shall have a guarantee period of 10 years from Certificate of Completion date to the eThekwini Engineer. The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have a guarantee period of a minimum of 5 years (10 years preferred) from Certificate of Completion date to the eThekwini Engineer. The guarantee of the IEDs, SCADA gateways and the Ruggedised Utility Grade Layer 2 IEC61850 Switch is applicable to design and manufacturing related product defects for hardware and software (firmware).

The Bidder also confirms that all other equipment offered shall carry a minimum 2 year guarantee from Certificate of Completion date to the eThekwini Engineer.

Any equipment failing within the guarantee period shall be replaced with new units. All costs related to guarantee process (investigation, transport cost, replacement parts, etc) shall be covered by the Bidder during the Defects Liability Period. The turnaround time to replace units shall be 4 – 6 weeks.

NAME :..... (Block Capitals)

SIGNATURE : ……..……..…… DATE: .....

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

T2.2.35 PRODUCT LIFECYCLE

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

The bidder confirms that they shall not provide ICAP equipment (IEDs, SCADA Gateways and Ruggedised Utility Grade Layer 2 IEC61850 Switches) that have been declared nearing its end of life or obsolete. The equipment shall have a minimum support life of 10 years from the date of purchase. In the event that an equipment malfunctions and its support life has been discontinued the bidder shall provide replacement equipment that has a minimum support life of 10 years at no extra cost to eThekwini Municipality. In the event that the equipment malfunctions and is declared obsolete within the guarantee period, the bidder shall provide replacement equipment that is equivalent or better with a minimum support life of 10 years at no extra cost to eThekwini Municipality.

NAME :..... (Block Capitals)

SIGNATURE : ……..……..…… DATE: .....

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

T2.2.36 DISCLOSURE BY IED MANUFACTURERS

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

1. The manufacturer shall disclose the information below for all the software offered in this bid. Should the bid be accepted, the Manufacturer shall send any technical bulletins published thereafter, directly to eThekwini Electricity on both of the following email addresses: Darin.Naidoo@durban.gov.za and Kribashen.Naidoo@durban.gov.za. Alternatively, the technical bulletins can be posted to:

   eThekwini Electricity
   P O Box 147
   Durban
   Republic of South Africa
   4000
   Attention: Senior Manager: Protection & Test

Software Name	Software Version	Date Released

Attach additional pages if more space is required

MANUFACTURER NAME:..... (Block Capitals)

NAME OF THE SIGNATORY:……

CAPACITY OF THE SIGNATORY: ……

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

T2.2.36 DISCLOSURE BY IED MANUFACTURERS (Continued)

2. The Manufacturer shall disclose the information below for every IED that is offered in this bid. Should the bid be accepted, the Manufacturer shall send any technical bulletins published thereafter to the addresses provided above.

IED Model	Firmware Version	Technical Bulletins Previously Issued (If Applicable)	Date Until IED will be Supported for Repairs	Turnaround Time for Replacements of IEDs Under Guarantee	Turnaround Time for IED Repairs

Attach additional pages if more space is required

MANUFACTURER NAME :..... (Block Capitals)

NAME OF THE SIGNATORY:……

CAPACITY OF THE SIGNATORY: ……

SIGNATURE : ……..……..…… DATE: .....

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

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: **36503-5E**

Contract Title: **SUPPLY, DELIVERY, OFF-LOADING, INSTALLATION AND TESTING OF PROTECTION AND CONTROL EQUIPMENT AND TE TESTING AND COMMISSIONING OF ASSOCIATED ELECTRICAL PLANT 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 **5 years**.

1.1.1.14 The **time for achieving Practical Completion**, from the Commencement Date is **32 Weeks per order for new substations and 48 Weeks per order for existing substations within the 36 months period, subject to outage availability**. 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: Electricity Unit, 1 Jelf Taylor Crescent, DURBAN, 4001
Postal: Electricity Unit, P O Box 147, DURBAN, 4000
Telephone: 031 311 9008 (t)
Fax: 031 311 9010 (f)
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 The address of the Employer' Agent is:
Physical: Electricity Unit, 1 Jelf Taylor Crescent, DURBAN, 4001
Postal: Electricity Unit, P O Box 147, DURBAN, 4000
Telephone: 031 311 9628 (t)
Fax: 031 311 9010 (f)
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 **20%** 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 **14 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".

5.13.1 The **penalty for delay** in failing to complete the Works is R 1000 to R 2000 (per day) depending on the value of the order.

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.

5.14.5.1 The performance guarantee is required until the expiry of the Defect Liability Period, hence delete the words "14 days" and replace with the words "14 days of the expiry of the Defects Liability Period".

5.14.5.3 The retention money shall be released after the issue of the Certificate of Completion, hence delete the words "half in terms of Clause 6.10.5" and replace with the words "zero within 30 days of issue of the Certificate of Completion".

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

For this contract the 5% or 10% Guarantee shall be per order and shall be submitted as and when the orders are placed.

6.8.2 Application of Contract Price Adjustment Factor is allowed.

Delete the words "calculated according to the formula and the conditions set out in the Contract Price Adjustment Schedule" and replace with "calculated as per instructions in the Pricing Data"

The value of the certificates issued shall be adjusted in accordance with the Contract Price Adjustment factor.

6.10.3 **Retention Money:** The percentage retention on the amounts due to the Contractor is 10%. The limit of "retention money" is 10% of the material 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: **NIL**.

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

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 3 000 000**.

8.6.1.4 **Ground Support Insurance**:

- Minimum amount for any one occurrence, unlimited as to the number of occurrences, against any claim for damages or loss caused by vibration and / or removal of lateral support: **R 500 000**.
- Maximum first excess: **R 10 000**.

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 5 000 000**.
- 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: **R20 000**.

Principal's own surrounding Property Insurance

- Minimum amount for any one occurrence unlimited as to the number of occurrences against any claim for damage which may occur to the Council's own surrounding property: **R5 000 000**.
- Maximum first excess: **R 20 000**.

Insurance of Works

- Minimum amount for additional removal of debris (no damage): **Nil** .
- Minimum amount for temporary storage of materials off site, excluding Contractor's own premises: **R 3 000 000**.
- Minimum amount for transit of materials to site: **Full value of materials**.

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:

……

C1.2.3 ADDITIONAL CONDITIONS OF CONTRACT

C1.2.3.1 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.

C1.2.3.2 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 Municipality 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 Completion Certificate and on any one contract more than one Handing Over Certificate may be issued.

C1.2.3.3 COMPLETION CERTIFICATE

A Completion Certificate will 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 guarantee/warranty and maintenance periods.

C1.2.3.4 SUB-CONTRACTING CONTRACTOR PARTICIPATION GOAL

It is a condition of contract that the contractor must allow for a minimum of **4%** 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.

C1.2.3.5 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.

C1.2.3.6 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.

C1.2.3.7 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.

C1.2.3.8 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.

C1.2.3.9 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.

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 C.1.2 of the Tender Data).

C2.1.2 QUANTITIES REFLECTED 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 PRICING OF THE BILL OF QUANTITIES

C2.1.3.1 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.

C2.1.3.2 Each item shall be priced and extended to the "Total" column by the Tenderer. 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.

C2.1.3.3 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.

C2.1.3.4 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.

C2.1.3.5 The items described in "Outline Description" shall include all the accessories required in terms of the Technical Specification.

C2.1.3.6 The installation work described in "Outline Description" shall include all off loading, moving to position and securing to the floor of all control panels and all other work necessary for the successful completion of the installation and as detailed in the Technical Specification and in Section C3.2 (System Parameters and Particulars of Equipment Required).

C2.1.3.7 Quantities marked "*" are estimates and will be re-measured after installation. Payment for both supply and installation will only be made for the quantities installed.

C2.1.3.8 Secondary cables, glands, lugs, ferrules, tape, etc. are to be supplied as part of this contract. Payment for the supply of secondary cables, glands and accessories will be made for installed quantities only. The contractor shall be responsible for managing the cable orders and excess for each project accordingly.

C2.1.3.9 Tender prices submitted on the Bill of Quantities are to be exclusive of Value Added Tax. Prices shall be submitted even if estimated quantities are 0. The total carried forward to the pricing summary form is the sum of the sub totals at the bottom each table.

C2.1.3.10 Where the contractor is required by the

employer to work during Saturdays and Sundays due to operational constraints, the contractor shall claim the installation rates for the work performed as per the BOQ plus:

1) 0,5 times the labour rates in Section 9 of the BOQ for work performed on Saturdays and
2) 1 times the labour rates in Section 9 of the BOQ for work done 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.

C2.1.4 CONTRACT PRICE ADJUSTMENTS

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 inthe 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

C2.1.5 RATE OF EXCHANGE VARIATION

C2.1.5.1 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 also notify the Municipality as soon as possible thereafter regarding the rate which has been fixed on such forward exchange.

C2.1.5.2 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.

C2.1.5.3 Any increase or decrease between the basic rate of exchange as at a date seven days prior to the date of closing of Bids 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.

C2.1.6 FREIGHT, DUTY, LANDING CHARGES

C2.1.6.1 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.

C2.1.6.2 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.

C2.1.6.3 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.

C2.1.6.4 The Contractor shall:
1) Submit documentary proof of the freight rates, duty and landing charges paid by him, and
2) When an adjustment is claimed in terms of this Clause, submit documentary proof to the satisfaction of the Municipality in support of such claim.

C2.1.6.5 In the absence of such proof, no claim by the Contractor for any increase will be entertained.

C2.1.7 PAYMENT

C2.1.7.1 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.

C2.1.7.2 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.

C2.1.8 NUMBER OF CONTRACTORS AND ORDER QUANTITIES

C2.1.8.1 The Employer reserves the right to accept more than one technically and contractually compliant bid for part or the whole of the contract and to place orders on the basis of price, resources, capability and availability.

C2.1.8.2 Bidders shall not bind the Employer to any minimum quantity within this Contract.

C2.1.8.3 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.

C2.2: RATE OF EXCHANGE

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

Base rates of exchange (As published by SARB for the specific currency at 12:00 on the date of advertisement of the bid – proof of rate used to be attached to bid documents)	

Item	Currency applicable	FOB price

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)

C2.3: CONTRACT PRICE ADJUSTMENT DECLARATION

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.

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

C2.4: WORK AT TIME AND MATERIAL RATES

Percentage to be added to Certified Nett Cost of Materials and services of subcontractors if authorised by the Engineer:-

Note: No mark up will be applied to the unit rates quoted previously in this Bill of Quantities.

Material per cent to be added to certified actual material cost as follows:

1) 10 % if cost is R 100 000 or below
2) 7.5 % if cost is between R 100 000 and R 200 000
3) 5% if cost is R 200 000 or above

Services from Sub Contractors per cent to be added to certified actual material and service cost as follows:

1) 10 % if cost is R 100 000 or below
2) 7.5 % if cost is between R 100 000 and R 200 000
3) 5% if cost is R 200 000 or above

MINIMUM WAGE RATES

Do you comply with the minimum wage rates laid down by your industry? YES/NO*

* Delete that which is not applicable.

NAME :..... (Block Capitals)

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

C2.5: BILL OF QUANTITIES

The Bill of Quantities follows and comprises of 34 pages. The pages are numbered 133 to 167.

C2.5.1: PRICING SUMMARY FORM

Item	Description	Price Excl. VAT (R)	Price Incl. VAT (R)
1	Section 1: 132/11 kV Single Busbar Switchyard		
2	Section 2: 132 kV Double Busbar Switchyard		
3	Section 3: 132/11 kV Substation with 132 kV GIS		
4	Section 4: 132/11 kV Substation with Separated 132 kV Feeders and Transformer Feeders		
5	Section 5: 132 kV Substation with Combined 132 kV Feeders and Transformer Feeders		
6	Section 6: Testing and Decommissioning of Individual Bays		
7	Section 7: Training		
8	Section 8: Spares		
9	Section 9: Labour Rates		
GRAND TOTAL			

SECTION 1: 132 kV SINGLE BUSBAR SWITCHYARD (Refer to Section C 3.2 - System Parameters and Particulars of Equipment Required, for description of the following items)

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5**	**Col. 6**	**Col. 7**	**Col. 8 = (Col. 3 + Col. 4) × Col. 7**	**Col. 9 = Col. 5 × Col. 7**	**Col. 10 = Col. 6 × Col. 7**
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
1.1	a) 132 kV Current Differential Feeder Scheme with differential IED to match new remote end (1 × Single mode interface as per Clause 3.3.21 of the General Technical Specification)					2			
	b) 132 kV Current Differential Feeder Scheme with differential IED to match new remote end (2 × Single mode interface as per Clause 3.3.21 of the General Technical Specification)					1			
	c) 132 kV Current Differential Feeder Scheme with differential IED to match new remote end (1 × Single mode and 1 × multimode interface as per Clause 3.3.21 of the General Technical Specification)					1			
1.2	132 kV Bus-Section Scheme					1			
1.3	132 kV Busbar Protection Scheme (2 zone with Check zone)					1			
1.4	Human Machine Interface					1			
1.5	SCADA Gateway					1			
						SUBTOTAL CARRIED FORWARD			

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8 = (Col. 3 + Col. 4) × Col. 7	Col. 9 = Col. 5 × Col. 7	Col. 10 = Col. 6 × Col. 7
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
					SUBTOTAL BROUGHT FORWARD				
1.6	Communication Network Ethernet Switch Panel including Ethernet Switch/s and GPS clock					1			
1.7	Supply and installation of secondary cable tray including support brackets (re-measurable on site). a) 150 mm wide					5 m*			
	b) 300 mm wide					1 m*			
	b) 450 mm wide					1 m*			
1.8	Ethernet Network Fibre Optic Cable (ruggedised multi-mode pair)					400 m*			
1.9	Termination of Ethernet Network Fibre Optic Cable with ST type Connector per single end					80 ends*			
1.10	Galvanised lay-in wiring duct system for communication cables: a) Straight length (3000 mm)					50			
	b) Horizontal elbow radius bend					60			
	c) T-piece radius bend					60			
	d) External elbow radius bend					60			
					SUBTOTAL CARRIED FORWARD				

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8 = (Col. 3 + Col. 4) × Col. 7	Col. 9 = Col. 5 × Col. 7	Col. 10 = Col. 6 × Col. 7
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
						SUBTOTAL BROUGHT FORWARD			
	e) Internal elbow radius bend					60			
	f) Cross over radius bend					20			
	g) Distribution outlet					60			
1.11	Communication Cable for IRIG-B clock synchronising network including terminations					10 m*			
1.12	Secondary cable termination per end a) 4 core 16 mm²					10 ends*			
	b) 2 core 16 mm²					10 ends*			
	c) 27 core 2,5 mm² or 1,5mm² or 4 mm²					10 ends*			
	d) 24 core 1,5 mm² or 2,5 mm² or 4 mm²					10 ends*			
	e) 19 core 1,5 mm² or 2,5 mm² or 4 mm²					50 ends*			
	f) 14 core 1,5 mm² or 2,5 mm² or 4 mm²					50 ends*			
	g) 12 core 1,5 mm² or 2,5 mm² or 2,5 mm² or 4 mm²					40 ends*			
	h) 7 core 1,5 mm² or 2,5 mm² or 4 mm²					60 ends*			
	i) 4 core 1,5 mm² or 2,5 mm² or 4 mm² or 6mm²					120 ends*			
	j) 2 core 1,5 mm² or 2,5 mm² or 4 mm²					80 ends*			
						SUBTOTAL CARRIED FORWARD			

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8 = (Col. 3 + Col. 4) × Col. 7	Col. 9 = Col. 5 × Col. 7	Col. 10 = Col. 6 × Col. 7
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
						SUBTOTAL BROUGHT FORWARD			
1.13	Secondary cable supply and laying* (rate per metre) (**C2.1.4**) a) 12 core 1,5 mm²					10 m*			
	b) 24 core 1,5 mm²					10 m*			
	c) 2 core 2,5 mm²					500 m*			
	d) 4 core 2,5 mm²					3533 m*			
	e) 7 core 2,5 mm²					720 m*			
	f) 14 core 2,5 mm²					1133 m*			
	g) 19 core 2,5 mm²					2569 m*			
	h) 2 core 4 mm²					500 m*			
	i) 4 core 4 mm²					500 m*			
	j) 4 core 6 mm²					10 m*			
	k) 4 core 16 mm²					10 m*			
1.14	Fire retardant secondary cable supply and laying* (rate per metre) (**C2.1.4**) a) 12 core 1,5 mm²					10 m*			
	b) 24 core 1,5 mm²					10 m*			
	c) 2 core 2,5 mm²					500 m*			
						SUBTOTAL CARRIED FORWARD			

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8 = (Col. 3 + Col. 4) × Col. 7	Col. 9 = Col. 5 × Col. 7	Col. 10 = Col. 6 × Col. 7
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
						SUBTOTAL BROUGHT FORWARD			
	d) 4 core 2,5 mm²					3533 m*			
	e) 7 core 2,5 mm²					720 m*			
	f) 14 core 2,5 mm²					1133 m*			
	g) 19 core 2,5 mm²					2569 m*			
	h) 2 core 4 mm²					500 m*			
	i) 4 core 4 mm²					500 m*			
	j) 4 core 6 mm²					10 m*			
	k) 4 core 16 mm²					10 m*			
1.15	Trenching and backfilling (hand pickable soil)					10 m^{3}*			
1.16	Testing of complete substation as described in Section C 3.2 and the Technical Specification					Lot 1 Sub			
1.17	Daily rate for Demonstration Of Testing as described in the Technical Specification					5 days			
1.18	Yard Marshalling Kiosks					4			
1.19	Dismantling of existing yard marshalling kiosks, including transport approximately 30 km for scrapping					4			
						TOTAL PRICE (COL8+COL9+COL10) (EXCL VAT) CARRIED FORWARD TO ITEM 1 IN THE PRICING SUMMARY FORM: PROTECTION AND CONTROL EQUIPMENT FOR 132 kVZ SINGLE BUSBAR SWITCHYARD			

SECTION 2: 132 kV DOUBLE BUSBAR SWITCHYARD (Refer to Section C 3.2 - System Parameters and Particulars of Equipment Required, for description of following items)

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8 = (Col. 3 + Col. 4) × Col. 7	Col. 9 = Col. 5 × Col. 7	Col. 10 = Col. 6 × Col. 7
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
2.1	a) 132 kV Current Differential Feeder Scheme with differential IED to match new remote end (1 × Single mode interface as per Clause 3.3.21 of the General Technical Specification)					24			
	b) 132 kV Current Differential Feeder Scheme with differential IED to match new remote end (2 × Single mode interface as per Clause 3.3.21 of the General Technical Specification)					4			
	c) 132 kV Current Differential Feeder Scheme with differential IED to match new remote end (1 × Single mode and 1 × multimode interface as per Clause 3.3.21 of the General Technical Specification)					4			
	d) 132 kV Current Differential Scheme (3-Terminal) with differential IED to match new 3-Terminal Scheme remote ends					4			
2.2	132 kV Distance Feeder Scheme					4			
2.3	132 kV Bus-Section Scheme					10			
2.4	132 kV Bus-Coupler Scheme					4			
2.5	132 kV Busbar Protection Scheme (3 zone with Check zone)					4			
					SUBTOTAL CARRIED FORWARD				

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5**	**Col. 6**	**Col. 7**	**Col. 8 = (Col. 3 + Col. 4) × Col. 7**	**Col. 9 = Col. 5 × Col. 7**	**Col. 10 = Col. 6 × Col. 7**
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
					SUBTOTAL BROUGHT FORWARD				
2.6	132 kV Busbar Protection Scheme (4 zone with Check zone) when required					4			
2.7	Human Machine Interface					3			
2.8	SCADA Gateway					3			
2.9	Communication Network Ethernet Switch Panel including Ethernet Switch/s and GPS clock					3			
2.10	Re-engineered Current Differential Scheme for remote end A (incl IED)					10			
2.11	Re-engineered 3-Terminal Current Differential Scheme remote end B (incl IED)					4			
2.12	Supply and installation of secondary cable tray including support brackets (re-measurable on site). a) 150 mm wide					25 m*			
	b) 300 mm wide					25 m*			
	c) 450 mm wide					25 m*			
2.13	Ethernet Network Fibre Optic Cable (ruggedised multi-mode pair)					900 m*			
2.14	Termination of Ethernet Network Fibre Optic Cable with ST type Connector per single end					220 ends*			
					SUBTOTAL CARRIED FORWARD				

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8 = (Col. 3 + Col. 4) × Col. 7	Col. 9 = Col. 5 × Col. 7	Col. 10 = Col. 6 × Col. 7
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
					SUBTOTAL BROUGHT FORWARD				
2.15	Galvanised lay-in wiring duct system for communication cables: a) Straight length (3000 mm)					130			
	b) Horizontal elbow radius bend					160			
	c) T-piece radius bend					160			
	d) External elbow radius bend					160			
	e) Internal elbow radius bend					160			
	f) Cross over radius bend					40			
	g) Distribution outlet					160			
2.16	Secondary cable termination per end a) 4 core 16 mm²					60 ends*			
	b) 2 core 16 mm²					60 ends*			
	c) 27 core 2,5 mm² or 1,5 mm² or 4 mm²					60 ends*			
	d) 24 core 1,5 mm² or 2,5 mm² or 4 mm²					60 ends*			
	e) 19 core 1,5 mm² or 2,5 mm² or 4 mm²					220 ends*			
	f) 14 core 1,5 mm² or 2,5 mm² or 4 mm²					330 ends*			
	g) 12 core 1,5 mm² or 2,5 mm² or 2,5 mm² or 4 mm²					170 ends*			
	h) 7 core 1,5 mm² or 2,5 mm² or 4 mm²					550 ends*			
					SUBTOTAL CARRIED FORWARD				

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8 = (Col. 3 + Col. 4) × Col. 7	Col. 9 = Col. 5 × Col. 7	Col. 10 = Col. 6 × Col. 7
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
	SUBTOTAL BROUGHT FORWARD								
	i) 4 core 1,5 mm² or 2,5 mm² or 4 mm² or 6mm²					660 ends*			
	j) 2 core 1,5 mm² or 2,5 mm² or 4 mm²					550 ends*			
2.17	Secondary cable supply and laying* (rate per metre) (**C2.1.4**) a) 12 core 1,5 mm²					60 m*			
	b) 24 core 1,5 mm²					60 m*			
	c) 2 core 2,5 mm²					3 300 m*			
	d) 4 core 2,5 mm²					10 598 m*			
	e) 7 core 2,5 mm²					3 300 m*			
	f) 14 core 2,5 mm²					4 000 m*			
	g) 19 core 2,5 mm²					8 800 m*			
	h) 2 core 4 mm²					3 300 m*			
	i) 4 core 4 mm²					3 300 m*			
	j) 4 core 6 mm²					60 m*			
	k) 4 core 16 mm²					60 m*			
	SUBTOTAL CARRIED FORWARD								

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8 = (Col. 3 + Col. 4) × Col. 7	Col. 9 = Col. 5 × Col. 7	Col. 10 = Col. 6 × Col. 7
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
					SUBTOTAL BROUGHT FORWARD				
2.18	Fire retardant Secondary cable supply and laying* (rate per metre) (**C2.1.4**) a) 12 core 1,5 mm²					60 m*			
	b) 24 core 1,5 mm²					60 m*			
	c) 2 core 2,5 mm²					3 300 m*			
	d) 4 core 2,5 mm²					10 598 m*			
	e) 7 core 2,5 mm²					3 300 m*			
	f) 14 core 2,5 mm²					4 000 m*			
	g) 19 core 2,5 mm²					8 800 m*			
	h) 2 core 4 mm²					3 300 m*			
	i) 4 core 4 mm²					3 300 m*			
	j) 4 core 6 mm²					60 m*			
	k) 4 core 16 mm²					60 m*			
2.19	Trenching and backfilling (hand pickable soil)					220 m^3*			
2.20	Testing of complete substation as described in Section C 3.2 and the Technical Specification					Lot 3 Subs			
					SUBTOTAL CARRIED FORWARD				

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8 = (Col. 3 + Col. 4) × Col. 7	Col. 9 = Col. 5 × Col. 7	Col. 10 = Col. 6 × Col. 7
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
	SUBTOTAL BROUGHT FORWARD								
2.21	Daily rate for Demonstration of Testing as described in the Technical Specification					5 days			
2.22	Yard Marshalling Kiosks					10			
2.24	Dismantling of existing yard marshalling kiosks, including transport approximately 30 km for scrapping					10			
	TOTAL PRICE (COL8+COL9+COL10) (EXCL VAT) CARRIED FORWARD TO ITEM 2 IN THE PRICING SUMMARY FORM: PROTECTION AND CONTROL EQUIPMENT FOR 132 kV DOUBLE BUSBAR SWITCHYARD								

SECTION 3: 132/11 kV SUBSTATION WITH 132 kV GIS (Refer to Section C 3.2- System Parameters and Particulars of Equipment Required, for description of following items)

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8 = (Col. 3 + Col. 4) × Col. 7	Col. 9 = Col. 5 × Col. 7	Col. 10 = Col. 6 × Col. 7
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB. Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
3.1	a) 132 kV Current Differential Feeder Scheme with differential IED to match new remote end (1 x Single mode interface as per Clause 3.3.21 of the General Technical Specification)					14			
	b) 132 kV Current Differential Feeder Scheme with differential IED to match new remote end (2 x Single mode interface as per Clause 3.3.21 of the General Technical Specification)					2			
	c) 132 kV Current Differential Feeder Scheme with differential IED to match new remote end (1 x Single mode and 1 x multimode interface as per Clause 3.3.21 of the General Technical Specification)					2			
3.2	132 kV Transformer Feeder Scheme (Jericho/banked transformers)					5			
3.3	132 kV Bus-Section Scheme					8			
3.4	132 kV Busbar Protection Scheme (2 zone & check with test blocks)					8			
					SUBTOTAL CARRIED FORWARD				

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5**	**Col. 6**	**Col. 7**	**Col. 8 = (Col. 3 + Col. 4) × Col. 7**	**Col. 9 = Col. 5 × Col. 7**	**Col. 10 = Col. 6 × Col. 7**
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB. Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
						SUBTOTAL BROUGHT FORWARD			
3.5	a) Cable differential IED for 11 kV Feeder Scheme					100			
	b) Overcurrent, Earth Fault and Sensitive Earth Fault IED for 11 kV Feeder Scheme					100			
3.6	132/11 kV Transformer Scheme (Jericho/banked transformers)					10			
3.7	132/11 kV Transformer Scheme (non-Jericho)					15			
3.8	11 kV General Control Scheme					8			
3.9	Human Machine Interface					8			
3.10	SCADA Gateway					8			
3.11	Communication Network Ethernet Switch Panel including Ethernet Switch/s and GPS clock					8			
3.12	Re-engineered Current Differential Scheme for remote ends (incl. IED)					2			
						SUBTOTAL CARRIED FORWARD			

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5**	**Col. 6**	**Col. 7**	**Col. 8 = (Col. 3 + Col. 4) × Col. 7**	**Col. 9 = Col. 5 × Col. 7**	**Col. 10 = Col. 6 × Col. 7**
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB. Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
					SUBTOTAL BROUGHT FORWARD				
3.13	Supply and installation of secondary cable tray including support brackets (re-measurable on site). a) 150 mm wide					100 m*			
	b) 300 mm wide					500 m*			
	b) 450 mm wide					500 m*			
3.14	Ethernet Network Fibre Optic Cable (ruggedised multi-mode pair)					10 000 m*			
3.15	Termination of Ethernet Network Fibre Optic Cable with ST type Connector per single end					1 600 ends*			
3.16	Galvanised lay-in wiring duct system for communication cables: a) Straight length (3000 mm)					330			
	b) Horizontal elbow radius bend					410			
	c) T-piece radius bend					410			
	d) External elbow radius bend					410			
	e) Internal elbow radius bend					410			
	f) Cross over radius bend					90			
	g) Distribution outlet					410			
					SUBTOTAL CARRIED FORWARD				

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5**	**Col. 6**	**Col. 7**	**Col. 8 = (Col. 3 + Col. 4) × Col. 7**	**Col. 9 = Col. 5 × Col. 7**	**Col. 10 = Col. 6 × Col. 7**
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB. Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
					SUBTOTAL BROUGHT FORWARD				
3.17	Communication Cable for IRIG-B clock synchronising network including terminations					130 m*			
3.18	Secondary cable termination per end a) 4 core 16 mm²					80 ends*			
	b) 2 core 16 mm²					80 ends*			
	c) 27 core 2,5 mm² or 1,5 mm² or 4 mm²					80 ends*			
	d) 24 core 1,5 mm² or 2,5 mm² or 4 mm²					80 ends*			
	e) 19 core 1,5 mm² or 2,5 mm² or 4 mm²					330 ends*			
	f) 14 core 1,5 mm² or 2,5 mm² or 4 mm²					330 ends*			
	g) 12 core 1,5 mm² or 2,5 mm² or 2,5 mm² or 4 mm²					170 ends*			
	h) 7 core 1,5 mm² or 2,5 mm² or 4 mm²					220 ends*			
	i) 4 core 1,5 mm² or 2,5 mm² or 4 mm² or 6mm² or 16 mm²					2 200 ends*			
	j) 2 core 1,5 mm² or 2,5 mm² or 4 mm²					1 600 ends*			
					SUBTOTAL BROUGHT FORWARD				

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5**	**Col. 6**	**Col. 7**	**Col. 8 = (Col. 3 + Col. 4) × Col. 7**	**Col. 9 = Col. 5 × Col. 7**	**Col. 10 = Col. 6 × Col. 7**
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB. Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
	SUBTOTAL CARRIED FORWARD								
3.19	Secondary cable supply and laying* (rate per metre) (**C2.1.4**) a) 12 core 1,5 mm²					60 m*			
	b) 24 core 1,5 mm²					60 m*			
	c) 2 core 2,5 mm²					2 200 m*			
	d) 4 core 2,5 mm²					14 130 m*			
	e) 7 core 2,5 mm²					2 200 m*			
	f) 14 core 2,5 mm²					5 500 m*			
	g) 19 core 2,5 mm²					10 300 m*			
	h) 2 core 4 mm²					2 200 m*			
	i) 4 core 4 mm²					2 200 m*			
	j) 4 core 6 mm²					60 m*			
	k) 4 core 16 mm²					60 m*			
	SUBTOTAL CARRIED FORWARD								

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5**	**Col. 6**	**Col. 7**	**Col. 8 = (Col. 3 + Col. 4) × Col. 7**	**Col. 9 = Col. 5 × Col. 7**	**Col. 10 = Col. 6 × Col. 7**
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB. Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
					SUBTOTAL BROUGHT FORWARD				
3.20	Fire retardant Secondary cable supply and laying* (rate per metre) (**C2.1.4**) a) 12 core 1,5 mm²					60 m*			
	b) 24 core 1,5 mm²					60 m*			
	c) 2 core 2,5 mm²					2 200 m*			
	d) 4 core 2,5 mm²					14 130 m*			
	e) 7 core 2,5 mm²					2 200 m*			
	f) 14 core 2,5 mm²					5 500 m*			
	g) 19 core 2,5 mm²					10 300 m*			
	h) 2 core 4 mm²					2 200 m*			
	i) 4 core 4 mm²					2 200 m*			
	j) 4 core 6 mm²					60 m*			
	k) 4 core 16 mm²					60 m*			
3.21	Trenching and backfilling (hand pickable soil)					60 m^3*			
					SUBTOTAL BROUGHT FORWARD				

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5**	**Col. 6**	**Col. 7**	**Col. 8 = (Col. 3 + Col. 4) × Col. 7**	**Col. 9 = Col. 5 × Col. 7**	**Col. 10 = Col. 6 × Col. 7**
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB. Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
SUBTOTAL CARRIED FORWARD									
3.22	Additional Terminals for 132 kV Scheme Panels to accommodate spare cores from GIS Local Control Cubicles					2 200			
3.23	Testing of complete substation as described in Section C 3.2 and the Technical Specification					Lot 8 subs			
3.24	Daily rate for Demonstration of Testing as described in the Technical Specification					15 days*			
3.25	UFLS scheme as per Clauses 3.5 and 4.11 of the General Technical Specification					8			
3.26	ULFS IED for ULFS scheme					8			
TOTAL PRICE (COL8+COL9+COL10) (EXCL VAT) CARRIED FORWARD TO ITEM 3 IN THE PRICING SUMMARY FORM: PROTECTION AND CONTROL EQUIPMENT FOR 132/11kV SUBSTATION WITH 132kV GIS									

SECTION 4: 132/11 kV SUBSTATION WITH SEPERATED 132 kV FEEDERS AND TRANSFORMER FEEDERS (Refer to Section C 3.2 - System Parameters and Particulars of Equipment Required, for description of following items)

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5**	**Col. 6**	**Col. 7**	**Col. 8 = (Col. 3 + Col. 4) × Col. 7**	**Col. 9 = Col. 5 × Col. 7**	**Col. 10 = Col. 6 × Col. 7**
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
4.1	a) 132 kV Current Differential Feeder Scheme with differential IED to match new remote end (1 × Single mode interface as per Clause 3.3.21 of the General Technical Specification)					18			
	b) 132 kV Current Differential Feeder Scheme with differential IED to match new remote end (2 × Single mode interface as per Clause 3.3.21 of the General Technical Specification)					1			
	c) 132 kV Current Differential Feeder Scheme with differential relay to match new remote end (1 × Single mode and 1 × multimode interface as per Clause 3.3.21 of the General Technical Specification)					1			
4.2	132 kV Bus-Section Scheme					10			
4.3	132 kV Busbar Protection Scheme (2 zone with test blocks)					8			
4.4	132/11 kV Transformer Scheme					20			
					SUBTOTAL CARRIED FORWARD				

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5**	**Col. 6**	**Col. 7**	**Col. 8 = (Col. 3 + Col. 4) × Col. 7**	**Col. 9 = Col. 5 × Col. 7**	**Col. 10 = Col. 6 × Col. 7**
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
						SUBTOTAL BROUGHT FORWARD			
4.5	a) Cable differential relay for 11 kV Feeder Scheme					131			
	b) Overcurrent, Earth Fault and Sensitive Earth Fault relay for 11 kV Feeder Scheme					131			
4.6	11 kV General Control Scheme					10			
4.7	Human Machine Interface					10			
4.8	SCADA Gateway					10			
4.9	Communication Network Ethernet Switch Panel including Ethernet Switch/s and GPS clock					10			
4.10	Supply and installation of secondary cable tray including support brackets (re-measurable on site). a) 150 mm wide					240 m*			
	b) 300 mm wide					600 m*			
	b) 450 mm wide					600 m*			
4.11	Ethernet Network Fibre Optic Cable (ruggedised multi-mode pair)					9000 m*			
4.12	Termination of Ethernet Network Fibre Optic Cable with ST type Connector per single end					1600 ends*			
						SUBTOTAL CARRIED FORWARD			

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5**	**Col. 6**	**Col. 7**	**Col. 8 = (Col. 3 + Col. 4) × Col. 7**	**Col. 9 = Col. 5 × Col. 7**	**Col. 10 = Col. 6 × Col. 7**
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
					SUBTOTAL BROUGHT FORWARD				
4.13	Galvanised lay-in wiring duct system for communication cables: a) Straight length (3000 mm)					410			
	b) Horizontal elbow radius bend					510			
	c) T-piece radius bend					510			
	d) External elbow radius bend					510			
	e) Internal elbow radius bend					510			
	f) Cross over radius bend					110			
	g) Distribution outlet					510			
4.14	Communication Cable for IRIG-B clock synchronising network including terminations					330 m*			
4.15	Secondary cable termination per end a) 4 core 16 mm²					220 ends*			
	b) 2 core 16 mm²					220 ends*			
	c) 27 core 2,5 mm² or 1,5 mm² or 4 mm²					220 ends*			
	d) 24 core 1,5 mm² or 2,5 mm² or 4 mm²					220 ends*			
					SUBTOTAL CARRIED FORWARD				

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5**	**Col. 6**	**Col. 7**	**Col. 8 = (Col. 3 + Col. 4) × Col. 7**	**Col. 9 = Col. 5 × Col. 7**	**Col. 10 = Col. 6 × Col. 7**
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
						SUBTOTAL BROUGHT FORWARD			
	e) 19 core 1,5 mm² or 2,5 mm² or 4 mm²					330 ends*			
	f) 14 core 1,5 mm² or 2,5 mm² or 4 mm²					330 ends*			
	g) 12 core 1,5 mm² or 2,5 mm² or 2,5 mm² or 4 mm²					220 ends*			
	h) 7 core 1,5 mm² or 2,5 mm² or 4 mm²					220 ends*			
	i) 4 core 1,5 mm² or 2,5 mm² or 4 mm² or 6mm²					800 ends*			
	j) 2 core 1,5 mm² or 2,5 mm² or 4 mm² or 6 mm²					800 ends*			
4.16	Secondary cable supply and laying* (rate per metre) (**C2.1.4**) a) 12 core 1,5 mm²					60 m*			
	b) 24 core 1,5 mm²					60 m*			
	c) 2 core 2,5 mm²					2 200 m*			
	d) 4 core 2,5 mm²					35 500 m*			
	e) 7 core 2,5 mm²					7 200 m*			
	f) 14 core 2,5 mm²					11 500 m*			
	g) 19 core 2,5 mm²					25 500 m*			
						SUBTOTAL CARRIED FORWARD			

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8 = (Col. 3 + Col. 4) × Col. 7	Col. 9 = Col. 5 × Col. 7	Col. 10 = Col. 6 × Col. 7
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
					SUBTOTAL BROUGHT FORWARD				
	h) 2 core 4 mm²					2 200 m*			
	i) 4 core 4 mm²					2 200 m*			
	j) 4 core 6 mm²					60 m*			
	k) 4 core 16 mm²					60 m*			
4.17	Fire retardant secondary cable supply and laying* (rate per metre) (**C2.1.4**) a) 12 core 1,5 mm²					60 m*			
	b) 24 core 1,5 mm²					60 m*			
	c) 2 core 2,5 mm²					2 200 m*			
	d) 4 core 2,5 mm²					35 500 m*			
	e) 7 core 2,5 mm²					7 200 m*			
	f) 14 core 2,5 mm²					11 500 m*			
	g) 19 core 2,5 mm²					25 500 m*			
	h) 2 core 4 mm²					2 200 m*			
	i) 4 core 4 mm²					2 200 m*			
	j) 4 core 6 mm²					60 m*			
	k) 4 core 16 mm²					60 m*			
					SUBTOTAL CARRIED FORWARD				

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8 = (Col. 3 + Col. 4) × Col. 7	Col. 9 = Col. 5 × Col. 7	Col. 10 = Col. 6 × Col. 7
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
						SUBTOTAL BROUGHT FORWARD			
4.18	Trenching and backfilling (hand pickable soil)					330 m³*			
4.19	Testing of complete substation as described in Section C 3.2 and the Technical Specification					Lot 10 Substations			
4.20	Daily rate for Demonstration Of Testing as described in the Technical Specification					10 days*			
4.21	UFLS scheme as per Clauses 3.5 and 4.11 of the General Technical Specification					10			
4.22	ULFS relay for ULFS scheme					10			
4.23	Yard Marshalling Kiosks					100			
4.24	Dismantling of existing yard marshalling kiosks, including transport approximately 30 km for scrapping					100			
TOTAL PRICE (COL8+COL9+COL10) (EXCL VAT) CARRIED FORWARD TO ITEM 4 IN THE PRICING SUMMARY FORM: PROTECTION AND CONTROL EQUIPMENT FOR 132/11kV SUBSTATION WITH SEPERATED TRANSFORMERS AND FEEDERS									

SECTION 5: 132/11 kV SUBSTATION WITH COMBINED 132 kV FEEDERS AND TRANSFORMER FEEDERS (Refer to Section C 3.2 - System Parameters and Particulars of Equipment Required, for description of following items)

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5**	**Col. 6**	**Col. 7**	**Col. 8 = (Col. 3 + Col. 4) × Col. 7**	**Col. 9 = Col. 5 × Col. 7**	**Col. 10 = Col. 6 × Col. 7**
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
5.1	a) Cable differential relay for 11 kV Feeder Scheme					60			
	b) Overcurrent, Earth Fault and Sensitive Earth Fault relay for 11 kV Feeder Scheme					60			
5.2	132/11 kV Transformer Scheme					12			
5.3	11 kV General Control Scheme					6			
5.4	Combined 132 kV Feeder and Transformer Feeder Scheme (with 3-Terminal Current Differential Relay)					8			
5.5	Backup Protection Scheme for 132/11 kV Transformers					1			
5.6	Human Machine Interface					6			
5.7	SCADA Gateway					6			
5.8	Communication Network Ethernet Switch Panel including Ethernet Switch/s and GPS clock					6			
						SUBTOTAL CARRIED FORWARD			

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8 = (Col. 3 + Col. 4) × Col. 7	Col. 9 = Col. 5 × Col. 7	Col. 10 = Col. 6 × Col. 7
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
						SUBTOTAL BROUGHT FORWARD			
5.9	Supply and installation of secondary cable tray including support brackets (re-measurable on site). a) 150 mm wide					50 m*			
	b) 300 mm wide					140 m*			
	b) 450 mm wide					140 m*			
5.10	Ethernet Network Fibre Optic Cable (ruggedised multi-mode pair)					2200 m*			
5.11	Termination of Ethernet Network Fibre Optic Cable with ST type Connector per single end					350 ends*			
5.12	Galvanised lay-in wiring duct system for communication cables: a) Straight length (3000 mm)					170			
	b) Horizontal elbow radius bend					210			
	c) T-piece radius bend					210			
	d) External elbow radius bend					210			
	e) Internal elbow radius bend					210			
	f) Cross over radius bend					50			
	g) Distribution outlet					210			
						SUBTOTAL CARRIED FORWARD			

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8 = (Col. 3 + Col. 4) × Col. 7	Col. 9 = Col. 5 × Col. 7	Col. 10 = Col. 6 × Col. 7
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
						SUBTOTAL BROUGHT FORWARD			
5.13	Communication Cable for IRIG-B clock synchronising network including terminations					60 m*			
5.14	Secondary cable termination per end a) 4 core 16 mm²					60 ends*			
	b) 2 core 16 mm²					60 ends*			
	c) 27 core 2,5 mm² or 1,5 mm² or 4 mm²					60 ends*			
	d) 24 core 1,5 mm² or 2,5 mm² or 4 mm²					60 ends*			
	e) 19 core 1,5 mm² or 2,5 mm² or 4 mm²					110 ends*			
	f) 14 core 1,5 mm² or 2,5 mm² or 4 mm²					110 ends*			
	g) 12 core 1,5 mm² or 2,5 mm² or 2,5 mm² or 4 mm²					60 ends*			
	h) 7 core 1,5 mm² or 2,5 mm² or 4 mm²					60 ends*			
	i) 4 core 1,5 mm² or 2,5 mm² or 4 mm² or 6 mm²					200 ends*			
	j) 2 core 1,5 mm² or 2,5 mm² or 4 mm²					200 ends*			
						SUBTOTAL CARRIED FORWARD			

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8 = (Col. 3 + Col. 4) × Col. 7	Col. 9 = Col. 5 × Col. 7	Col. 10 = Col. 6 × Col. 7
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
						SUBTOTAL BROUGHT FORWARD			
5.15	Secondary cable supply and laying* (rate per metre) (**C2.1.4**) a) 12 core 1,5 mm²					20 m*			
	b) 24 core 1,5 mm²					20 m*			
	c) 2 core 2,5 mm²					440 m*			
	d) 4 core 2,5 mm²					21 200 m*			
	e) 7 core 2,5 mm²					4 300 m*			
	f) 14 core 2,5 mm²					6 800 m*			
	g) 19 core 2,5 mm²					15 400 m*			
	h) 2 core 4 mm²					440 m*			
	i) 4 core 4 mm²					700 m*			
	j) 4 core 6 mm²					20 m*			
	k) 4 core 16 mm²					20 m*			
5.16	Fire retardant secondary cable supply and laying* (rate per metre) (**C2.1.4**) a) 12 core 1,5 mm²					20 m*			
	b) 24 core 1,5 mm²					20 m*			
	c) 2 core 2,5 mm²					440 m*			
						SUBTOTAL CARRIED FORWARD			

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8 = (Col. 3 + Col. 4) × Col. 7	Col. 9 = Col. 5 × Col. 7	Col. 10 = Col. 6 × Col. 7
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
						SUBTOTAL BROUGHT FORWARD			
	d) 4 core 2,5 mm²					21 200 m*			
	e) 7 core 2,5 mm²					4 300 m*			
	f) 14 core 2,5 mm²					6 800 m*			
	g) 19 core 2,5 mm²					15 400 m*			
	h) 2 core 4 mm²					440 m*			
	i) 4 core 4 mm²					700 m*			
	j) 4 core 6 mm²					20 m*			
	k) 4 core 16 mm²					20 m*			
5.17	Trenching and backfilling (hand pickable soil)					50 m^3*			
5.18	Testing of complete substation as described in Section C 3.2 and the Technical Specification					Lot 6 Subs			
5.19	Daily rate for Demonstration Of Testing as described in the Technical Specification					5 days*			
5.20	UFLS scheme as per Clauses 3.5 and 4.11 of the General Technical Specification					6			
5.21	ULFS relay for ULFS scheme					6			
5.22	Yard Marshalling Kiosks					16			
						SUBTOTAL CARRIED FORWARD			

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5**	**Col. 6**	**Col. 7**	**Col. 8 = (Col. 3 + Col. 4) × Col. 7**	**Col. 9 = Col. 5 × Col. 7**	**Col. 10 = Col. 6 × Col. 7**
Item	**Outline Description**	**Unit Supply Price Excl. Vat**		**Unit Transport Charges Excl. Vat**	**Unit Installation Price Excl. Vat**	**Estimated Quantity**	**Total Supply Price Excl. Vat**	**Total Transport Charges Excl. Vat**	**Total Installation Price Excl. Vat**
		FOB Value (SA Currency)	**Balance (SA Currency)**						
		R	R	R	R		R	R	R
SUBTOTAL BROUGHT FORWARD									
5.23	Dismantling of existing yard marshalling kiosks, including transport approximately 30 km for scrapping					16			
TOTAL PRICE (COL8+COL9+COL10) (EXCL VAT) CARRIED FORWARD TO ITEM 5 IN THE PRICING SUMMARY FORM: PROTECTION AND CONTROL EQUIPMENT FOR 132/11 kV SUBSTATION WITH COMBINED TRANSFORMERS AND FEEDERS									

SECTION 6: TESTING AND DECOMMISSIONING OF INDIVIDUAL BAYS (to be applied for projects with fewer bays than those described in the configurations detailed in Section C 3.2- System Parameters and Particulars of Equipment Required, and to be approved by the engineer at the time of order)

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5 = Col 3 × Col. 4**
Item	**Outline Description**	**Unit Price Excl. Vat R**	**Estimated Quantity**	**Total Price Excl. Vat R**
6.1	Testing of complete 132 kV current differential feeder protection and control scheme including the primary equipment as described in Section C 3.2 and the Technical Specification		4	
6.2	Testing of complete 132 kV distance feeder protection and control scheme including the primary equipment as described in Section C 3.2 and the Technical Specification		2	
6.3	Testing of complete 132 kV bus-section protection and control scheme including the primary equipment as described in Section C 3.2 and the Technical Specification		2	
6.4	Testing of complete 132 kV bus-coupler protection and control scheme including the primary equipment as described in Section C 3.2 and the Technical Specification		2	
6.5	Testing of complete 132 kV busbar protection and control scheme including the primary equipment as described in Section C 3.2 and the Technical Specification		2	
6.6	Testing of complete 132 kV transformer feeder protection and control scheme including the primary equipment as described in Section C 3.2 and the Technical Specification		2	
6.7	Testing of complete 11 kV feeder protection and control scheme including the primary equipment as described in Section C 3.2 and the Technical Specification		12	
6.8	Testing of complete 132/11 kV transformer protection and control scheme including the primary equipment as described in Section C 3.2 and the Technical Specification		2	
6.9	Testing of complete 11 kV general control scheme including the primary equipment as described in Section C 3.2 and the Technical Specification		2	
6.10	Testing of complete combined 132 kV feeder and transformer protection and control scheme including the primary equipment as described in Section C 3.2 and the Technical Specification		2	
6.11	Testing of complete backup protection scheme for 132/11 kV transformers including the primary equipment as described in Section C 3.2 and the Technical Specification		2	
6.12	Testing of complete 132/11 kV transformer protection and control scheme on a Jericho Scheme (excluding the 132 kV transformer feeder) including the primary equipment as described in Section C 3.2 and the Technical Specification		4	
			TOTAL CARRIED FORWARD	

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5 = Col 3 × Col. 4**
Item	**Outline Description**	**Unit Price Excl. Vat R**	**Estimated Quantity**	**Total Price Excl. Vat R**
			TOTAL BROUGHT FORWARD	
6.13	Decommission and remove existing transformer relay panel, remove all cables and transport within 30 km radius		10	
6.14	Decommission and remove existing tap change control panel, remove all cables and transport within 30 km radius		10	
6.15	Decommission existing 132 kV feeder scheme, remove all cables and transport panel and cables within 30 km radius		10	
6.16	Decommission existing 132 kV bus coupler scheme, remove all cables and transport panel and cables within 30 km radius		3	
6.17	Decommission existing 132 kV bus section scheme, remove all cables and transport panel and cables within 30 km radius		6	
6.18	Decommission existing 132 kV busbar protection, remove all cables and transport panel/s and cables within 30 km radius		2	
TOTAL PRICE (EXCL VAT) CARRIED FORWARD TO ITEM 6 IN THE PRICING SUMMARY FORM : TESTING AND DECOMMISSIONING OF INDIVIDUAL BAYS				

SECTION 7: TRAINING (Refer to the General Technical Specification for description of following items)

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5 = Col 3 × Col. 4
Item	**Outline Description**	**Unit Price Excl. Vat R**	**Quantity Required**	**Total Price Excl. Vat R**
7.1	Training Course on Protection Relays as described in the Technical Specification		5	
7.2	Training Course on Substation Automation System as described in the Technical Specification		5	
7.3	Supervision and training of eThekwini Staff commissioning the entire substation as described in the Technical Specification		2	
7.4	Supervision and training of eThekwini Staff commissioning the 132 kV bus section/bus coupler/feeder bays as described in the Technical Specification (including SCADA and Comms per bay – this is to be used to cover various schemes that are done in separate substations for the purposes of achieving a complete substation commissioning)		10 bays	
7.5	Supervision and training of eThekwini Staff commissioning the 132/11 kV transformer bays as described in the Technical Specification, (including SCADA and Comms per bay – this is to be used to cover various schemes that are done in separate substations for the purposes of achieving a complete substation commissioning)		8 bays	
7.6	Supervision and training of eThekwini Staff commissioning for 11 kV switchboard ICAP, as described in the Technical Specification (including SCADA and Comms – this is to be used to cover various schemes that are done in separate substations for the purposes of achieving a complete substation commissioning)		2	
TOTAL PRICE (EXCL VAT) CARRIED FORWARD TO ITEM 7 IN THE PRICING SUMMARY FORM : TRAINING				

SECTION 8: SPARES (Refer to the General Technical Specification for description of following items)

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5 = Col 3 × Col. 4
Item	**Outline Description**	**Unit Price Excl. Vat R**	**Estimated Quantity**	**Total Price Excl. Vat R**
8.1	One spare of each type of **module** used in IEDs with protection or scheme processing functions, each type of IED case and front face, each type of Ethernet switch and related modules and; each type of HMI and SCADA gateway modules and each type of IED. Tenderer to list **all** IEDs and **all** modules that can be procured individually (additional information can be provided on a separate sheet if necessary):		1 of each	
TOTAL PRICE (EXCL VAT) CARRIED FORWARD TO ITEM 8 IN THE PRICING SUMMARY FORM : SPARES				

SECTION 9: LABOUR RATES (applicable to ad hoc items not covered anywhere in the pricing schedule, and to be approved by the Engineer prior to the undertaking the work)

Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5 = Col 3 × Col. 4**
Item	**Outline Description**	**Per Hour Price Excl. Vat R**	**Estimated Quantity**	**Total Price Excl. Vat R**
9.1	Labour rates: a) Engineering		1000	
	b) Labourer		2 000	
	c) Site Supervisor		1000	
	d) Electrician/Artisan		2 000	
TOTAL PRICE (EXCL VAT) CARRIED FORWARD TO ITEM 9 IN THE PRICING SUMMARY FORM : LABOUR				

PART C3: SCOPE OF WORK

C3.1: GENERAL TECHNICAL SPECIFICATION

1.0 GENERAL CLAUSES

1.1 SCOPE

This specification covers the supply, delivery, off-loading, installation, testing and commissioning of protection and control equipment required for an integrated electrical substation protection and control system. This shall include protection panels, loose protection IEDs, human machine interface (HMI), SCADA gateway, configuration software, communication networks, Ethernet switch, secondary cabling of all substation equipment and the full functional and operational testing of the completed substation installation and remote ends where applicable to the requirements as set out in the following paragraphs and attached schedules.

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 topical finish to withstand the action of a humid salt laden atmosphere and airborne contaminants. The IED and SCADA gateway shall be capable of withstanding in-use operating temperature of 55 ^{o}C as per IEC 61850-3. The Ethernet switch shall comply with the temperature specified in Clause 2.5 of the Technical Specification.

1.2.2 All relevant or applicable clauses should comply with these clauses. The design, manufacture and testing of the equipment offered shall be strictly in accordance with this specification and the current editions of the following standards, except where amended herein.

Table 1.1 - Normative References

Ref	Description	Reference
1	Electrical IEDs	IEC 60255
2	Direct Acting Indicating Analogue Electrical Measuring Instruments and Accessories	IEC 60051
3	Communication Networks and Systems in Substations	IEC 61850
4	Material of insulated electric cable and flexible cords - Conductors.	SANS 1411-Part 1
5	Material of insulated electric cable and flexible cords - Polyvinyl Chloride (PVC).	SANS 1411-Part 2
6	Electric cables with extruded solid dielectric insulation for fixed installations (300/500 volt to 1 900/3 300 volt).	SANS 1507

Table 1.2 - Detailed Normative References for Communication Networks

Reference	Standard	Description
IEC 61000	IEC 61000-4-2	ESD
	IEC 61000-4-3	Radiated RFI
	IEC 61000-4-4	Burst (Fast Transient)
	IEC 61000-4-5	Surge
	IEC 61000-4-6	Induced (Conducted) RFI
	IEC 61000-4-8	Magnetic Field Enclosure ports
	IEC 61000-4-29	Voltage Dips and Interrupts DC
	IEC 61000-4-11	Voltage Dips and Interrupts AC
	IEC 61000-4-12	Damped Oscillatory
	IEC 61000-4-16	Mains Frequency Voltage
	IEC 61000-4-17	Ripple on D.C. Power Supply
	IEC 60255-5	Dielectric Strength
	IEC 60255-5	H.V. Impulse
IEEE 1613	IEEE C37.90.3	ESD
	IEEE C37.90.2	Radiated RFI Enclosure ports 35 V/m
	IEEE C37.90.1	Fast Transient
	IEEE C37.90	H.V. Impulse
	IEEE C37.90	Dielectric Strength
	IEEE C37.94	N times 64 kbps Optical Fiber Interfaces between Teleprotection and Multiplexer Equipment
Environmental	IEC 60068-2-1	Cold Temperature Test
	IEC 60068-2-2	Dry Heat Test
	IEC 60068-2-30	Humidity (Damp Heat, Cyclic)
	IEC 60255-21-1	Vibration
	IEC 60255-21-2	Shock
Ethernet Standards	IEEE 802.3	10BaseT

Reference	Standard	Description
	IEEE 802.3u	100BaseT(X) and 100Base FX
	IEEE 802.3ab	1000BaseT(X)
	IEEE 802.3z	1000BaseX
	IEEE 802.3x	Flow Control
	IEEE 802.1D-2004	Spanning Tree Protocol
	IEEE 802.1Q-2005	Multiple Spanning Tree Protocol
	IEEE 802.1w	Rapid STP
	IEEE 802.1Q	VLAN Tagging
	IEEE 802.1p	Class of Service (QOS)
	IEEE 802.1X	Port Authentication
Safety	UL 60950-1	Safety of information Technology Equipment
	FCC Part15 Subpart B Class A, EN 55022 Class A	EMI
	FDA/CRRH: 21 CFR Chapter 1	Laser Eye Safety
	UL-94	Test for Flammability of Plastic Materials for Parts in Devices and Appliances

1.2.3 The equipment shall be designed to include all possible provisions for the safety of those concerned in the operation and maintenance thereof.

1.3 STATUTORY REQUIREMENTS

Design and Layout of Equipment

1.3.1 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 (OHSA), No. 85 of 1993 and the latest amendments. Individual clauses of this specification or the standards (listed in Clause 1.2.2) may stipulate conditions more severe than those required by the said Regulations.

1.3.2 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.

1.3.3 Where special inspection and testing is required, the cost shall be included in the contract unit price for the equipment and the contractor shall be responsible for the arrangement of such inspection and testing.

1.4 ADDRESSES FOR DELIVERY

1.4.1 Addresses for delivery of all equipment and documentation shall be as specified in Section C 3.2.

1.4.2 Regardless of where the equipment is to be consigned, a copy of the delivery note and packing specification shall be sent to the address specified for documentation.

1.4.3 Costs for the delivery of loose equipment to the addresses specified shall be included in the unit transport price of the equipment in the Bill of Quantities.

1.5 OFF-LOADING

1.5.1 At least one week advance notice in writing shall be given to the Engineer of details of the intention to deliver and off-loading of equipment supplied on this contract.

1.5.2 All equipment and materials supplied on this contract shall be delivered and off-loaded by the Contractor. EThekwini Electricity does not provide off-loading facilities, equipment or assistance in off-loading transport vehicles.

1.5.3 Deliveries are only accepted from Monday to Friday between 09h00 and 15h00. Off-loading shall not commence unless the off-loading can be completely finished and the vehicle can leave the substation by 15h00. The Engineer reserves the right to stop the commencement of off-loading if it appears impossible to complete the off-loading within the prescribed hours.

1.5.4 When equipment and material is to be stored on site prior to erection, the Contractors shall take the necessary precautions to prevent theft.

1.6 SUPERVISION IN LIVE SUBSTATION

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 competent 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.

1.7 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.

2.0 SUBSTATION AUTOMATION SYSTEM

2.1 GENERAL

2.1.1 A substation automation scheme that integrates protection, SCADA, automatic control functions, interlocking, alarms and event logging into a single system is required. This scheme shall integrate protection IEDs, a human machine interface (HMI), a SCADA gateway, and a time server over a high availability Local Area Network.

2.1.2 Besides providing the normal protection functions, protection IEDs shall be used to accumulate status, alarms, measurements and event records. This information shall be made available to the HMI, SCADA and associated IEDs in other bays. All remote control of primary equipment shall be implemented via the IED.

2.1.3 The HMI shall provide indication of the status, alarms, measurements and control of the primary equipment and shall maintain a database of substation events.

2.1.4 The IEDs, HMI and SCADA Gateway shall be linked by an Ethernet network. All communication between these devices shall be in accordance with the IEC 61850 specification. Engineering configuration functions shall be carried out via this network.

2.1.5 A GPS clock shall provide SNTP (or NTP) time synchronisation to all networked devices on the substation LAN. The GPS clock shall have a front face time display.

2.1.6 A temperature and humidity sensor shall be installed within each of the following: the HMI cabinet, Ethernet switch cabinet, control room, switchgear room and battery room. This data shall be made available on the HMI screen and to the Control Centre.

2.1.7 All sensors and controllers shall be powered by the substation d.c. supply (See Section 3.2 - System Parameters and Particulars of Equipment Required.

2.1.8 Tenderers must be prepared to arrange a fully working display of the main components of the system to demonstrate the system's functions and capabilities to representatives of eThekwini Electricity prior to contract award. This demonstration will take place at the request of eThekwini Electricity.

2.1.9 Electronic circuit boards in the switches and IEDs shall be conformal coated.

2.1.10 The IEDs, gateways, switch and GPS clock shall incorporate a watchdog alarm that monitors the health of the software application and the underlying hardware which the device is composed of.

2.1.11 All naming for substation automation points shall follow an atomic and centralized approach. Point names shall be defined in a single source of truth (e.g., the SCL configuration or a centralized naming database), and any changes to these names shall automatically propagate across all relevant systems, including SCADA interfaces and gateway logic. Allowance can be made for some tree text within the alarm annunciator – subject to the approval of the SCADA Engineer during the Design Review process.

2.1.12 All control and automation logic developed within the substation gateway or RTU environment shall strictly reference these standardized names. Under no circumstances shall local or custom naming conventions be used within logic implementations, as this creates maintainability and traceability challenges. This requirement is to ensure consistency, ease of future updates (e.g., bay renaming), and adherence to IEC 61850 engineering best practices.

2.1.13 The Contractor shall submit all design proposals for the substation automation systems for reviews. The final designs shall be to the approval of the Engineer. No implementation shall proceed without the Engineer's approval. The approval of the designs by the eThekwini Engineers does absolve the Contractor from their normal responsibilities of ensuring that the designs are contractually, regulatory and technically compliant.

2.2 COMMUNICATION REQUIREMENTS OF PROTECTION IEDS

2.2.1 All IED communication required for the implementation of the Substation Automation System shall comply with IEC 61850. A Protocol Implementation Conformance Statement (PICS) and Model Implementation Conformance Statement (MICS) for each IED model shall be included in the tender submission.

2.2.2 Each of the IEDs shall have an Ethernet 100baseFX communication port accessible at the back of the IED for communication facilities. This port shall be used for IEC 61850 communication and protection engineering functions.

2.2.3 The input/output (I/O) and logic requirements of the IEDs are specified later.

2.2.4 Information to be reported by IEDs can be derived from the Protection and Control Logic Schematics issued with this specification.

2.2.5 All protection IEDs that have been specified (e.g., to match a remote end in the case of a current differential protection scheme) that are not IEC 61850 compliant shall interface with the associated IEC 61850 IED via hard-wired voltage-free contacts.

2.3 HUMAN MACHINE INTERFACE (HMI)

HMI SOFTWARE

2.3.1 The HMI shall provide overall substation, individual bay schematic and Underfrequency Load Shedding (UFLS) views.

2.3.2 The overall substation view shall comprise:

a) overall substation schematic diagram (single line diagram with appropriate symbols for circuit breakers, isolators, transformers, etc.);
b) status of all equipment (e.g., open/closed for circuit breakers and isolators, tap position for transformers, etc.);
c) measured values (e.g., currents and voltages);

d) general bay alarms; and
e) overall substation event record window (showing event description and time-stamp). Real time substation dc voltage

The overall substation view shall be the default home page view and this shall be reverted to after a selectable delay time.

2.3.3 Individual bay views shall be selected from the overall substation view and these shall comprise:

a) bay schematic diagram (single line diagram with appropriate symbols for circuit breakers, isolators, transformers, etc.);
b) status of all bay equipment (e.g., open/closed for circuit breakers and isolators, tap position for transformers, etc.);
c) measured bay values (e.g., currents and voltages);
d) specific bay alarms;
e) bay event record window (showing event description and time-stamp); and
f) operating option buttons.

2.3.4 UFLS view shall be selected from the overall substation view and this shall comprise:

a) frequency range for the different stages;
b) summary table of all the feeders indicating the UFLS state, date and time of the last update. The UFLS state display shall allow the local user to configure the UFLS stage;
c) a reset button for resetting all the feeder IEDs that have tripped on load shedding. This must only reset the load shedding trip flags only, and not the other protection functions flags. This shall also be resettable from SCADA; and
d) facility to allow for control of stage selection for each feeder bay remotely from SCADA.

2.3.5 Bay designations shall consist of user configurable text fields. These text fields shall be used for all views and event records. Should a bay designation require modification, it shall only be necessary to carry this out in one place.

2.3.6 Operation of equipment shall be possible from the bay view only and shall be performed as follows:

a) selection of bay to be operated on;
b) selection of appropriate operation button;
c) confirmation of the selected operation; and
d) indication of unsuccessful operation if applicable and reason if known to the HMI.

2.3.7 For HMI control, the operation of equipment and viewing of events shall be possible using the touch screen.

2.3.8 The HMI shall maintain a database of all substation events with bay designation, event description and time-stamp. Selectable event types shall be displayed in the event windows for overall and bay specific views and these shall typically include the following events:

a) change of status of primary equipment;

b) alarms;
c) protection operations; and
d) HMI and SCADA operation commands.

The above events shall be time-stamped with the time as recorded by the IED and shall be listed in chronological order according to the time-stamp.

2.3.9 The configuration of the HMI shall be according to IEC 61850, using the Substation Configuration Tool according to the IEC 61850 specification.

2.3.10 Full details of the HMI shall be submitted with the tender. The functionality of the HMI shall be subject to amendments by and approval of an eThekwini SCADA representative and shall be demonstrated during the design approval stage of the contract.

2.3.11 The support for the trending of analogue points on the HMI is preferable. The HMI must have sufficient storage capacity to store analogue values over a seven day period in non-volatile memory on a FIFO basis.

2.3.12 Valid licenses and installation disks shall be supplied for operating systems and software. Documented procedures and recovery disks shall be provided to enable recovery from a hardware failure.

2.3.13 It is preferred that the HMI software is web-based.

HMI Hardware

2.3.14 The HMI hardware solution shall support:

a) full HD with minimum 21” colour flat display industrial grade touch screen with sufficient touch sensitivity and resolution to allow accurate selection and interaction with substation visualisations (clauses 2.3.1-2.3.8) in order to prevent operator error. The design of the touch screen and HMI graphics layout shall be to the approval of the Engineer;
b) an industrial keyboard with integrated touchpad.

2.3.15 The HMI hardware (screen, KVM and associated equipment) shall be housed in an IP52 lockable cabinet with suitable ventilation. It is preferred that the cabinet is a 19” panel.

2.3.16 The HMI touch-screen display, HMI/Supervisory selector switch, general alarm push-button, audible alarm and LED shall be mounted on the HMI panel.

2.3.17 The HMI equipment shall be powered directly from the substation d.c. supply (see Section C 3.2 for substation d.c. voltage).

2.3.18 The arrangement of the HMI panel shall be to the approval of the Engineer.

2.4 SCADA GATEWAY

2.4.1 The protocol used for communication between the SCADA gateway/s and eThekwini's control centre is DNP3 level 3 over TCP/IP.

2.4.2 The SCADA gateway shall have an interface to eThekwini Electricity's Advanced Control Systems (ACS) SCADA front end processor and an interface to the control and protection IEDs.

2.4.3 The SCADA Gateway will maintain a database of individual DNP3.0 points which will be obtained from the control and protection IEDs using the IEC 61850 standard.

a) Events which occur between polls must not be lost or over-written at the SCADA Gateway level.

b) Timestamping of events shall be carried out at IED level.

c) The communication configuration of the SCADA Gateway for communication with substation devices shall be according to IEC 61850, using the Substation Configuration Tool.

2.4.5 A minimum of two ethernet ports shall be available on the SCADA gateway in a switch configuration

2.4.6 The contractor shall be responsible for the full commissioning of the SCADA Gateway.

2.4.7 The SCADA Gateway shall be powered from the substation d.c. battery.

2.4.8 The SCADA gateway shall allow for remote forcing of all DNP3 points.

2.4.9 The SCADA gateway shall be remotely resettable

2.4.10 A functional demonstration of the IEC 61850 communication between at least one IED and the SCADA Gateway and the DNP3 communication between the SCADA Gateway and eThekwini Electricity's ACS SCADA front end processor is required as part of the demonstration evaluation.

2.4.11 The HMI software shall reside on the SCADA gateway.

2.4.12 A redundant SCADA gateway shall be offered as part of the solution in a main/standby configuration.

a) The fail-over between the two gateways shall be automatic
b) An option for manual failover between the two gateways shall available
c) The fail-over between the redundant gateways shall be transparent to the master station i.e., no reconfiguration of IP/DNP3 addresses on the master station shall be required. The master station shall be configured to communicate with only a single IP and DNP3 host for the substation.

2.4.13 It is preferrable that the SCADA gateway be housed on the lower half of the HMI panel.

2.4.14 A stand-alone IEC61850 discrete IO proxy server shall be provided for general substation alarms with the following specifications:

a) 32 discrete inputs (wetting 48V or 24V)
b) 12 double discrete outputs (12V)
c) 8 discrete analogue inputs (0-20mA).

2.4.15 The following signals shall be catered for in the scheme design:

a) All the points indicated on the drawings included with this specification
b) All mandatory data objects for Logical Nodes specified in Annexure A
c) The device status of all networked devices
d) Battery charger alarms (max 4) viz., a.c. fail, d.c. fail, minor/non-urgent alarm, major/urgent alarm, fuse fail, low voltage, high voltage, charger fail
e) Real-time battery voltage (0-250V d.c.).
f) Temperature and humidity as required.

2.4.16 The DNP3 database shall include a minimum of all the signals mentioned in clause 2.4.15 and be sufficient for expansion to include an additional 30% of the commissioned scheme

a) The format of the database will be subject to the approval of the Engineer.

2.5 COMMUNICATION NETWORK

Ethernet Network

Ruggedised Utility Grade Layer 2 IEC61850 Switch

2.5.1 The IEDs, HMI and the SCADA Gateway will be connected using an Ethernet network comprising of Ethernet switches and primarily ruggedised multi-mode fibre optic to form an IEC 61850 station bus LAN.

2.5.2 Ethernet network configuration settings, IP addresses, subnet and gateway settings will be provided by the Engineer prior to commissioning.

2.5.3 The Ethernet switch shall be suitable for a substation environment and comply with the specification stated below. The Ethernet switch is required to be powered from the substation d.c. supply (see Section C 3.2 for substation d.c. voltage).

2.5.4 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall be 19” rack mountable and 1U in height.

2.5.5 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have electronic printed circuit boards conformal coated to prevent corrosion.

2.5.6 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have a minimum IP 30 ingress protection rating.

2.5.7 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have an epoxy coated metal housing with ports on the front.

2.5.8 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have LED status lights, on the front of the device, indicating link and activity status of each port.

2.5.9 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have dual power supply of 110 V d.c nominal voltage with at least 20 % voltage range (88 V d.c. to 250 V d.c. preferred).

2.5.10 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have a minimum of 12 × 100baseFX

Multimode optical ports.

2.5.11 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have a minimum of 2 × 1000 BASE LX optical ports with multimode SFP's.

2.5.12 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have a minimum of 2 × 10/100 BASE T RJ45.

2.5.13 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall comply with VLAN (802.1Q).

2.5.14 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall support Port rate limiting (Ingress and Egress).

2.5.15 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall support Flow control (IEEE 802.3).

2.5.16 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall support RSTP (Rapid Spanning Tree Protocol) IEEE 802.1D.

2.5.17 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall support MSTP 802.1Q-2005 (formerly 802.1s).

2.5.18 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall support Quality of service (802.1p).

2.5.19 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall support Port mirroring.

2.5.20 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have IGMP snooping and multicast filtering.

2.5.21 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have SNMP V1 and V2 Configuration.

2.5.22 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have Remote Secure Access.

2.5.23 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have SFP Diagnostics.

2.5.24 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have Dynamic Host Configuration Protocol (DHCP) Client.

2.5.25 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have Remote viewing of configuration through secure web browser (HTTPS).

2.5.26 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall comply with Authentication (IEEE 802.1x).

2.5.27 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have Mac address filtering.

2.5.28 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have Local Logfile and Syslog reporting.

2.5.29 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have Radius centralised password management.

2.5.30 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall allow Disabling of ports.

2.5.31 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have EMC hardened as per IEEE 1613.1.

2.5.32 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall comply with SANS 61850-3: Electric Utility Substations.

2.5.33 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have able to withstand an extended temperature rating from -40 °C to +70°C continuous and humidity of 95%.

2.5.34 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have a fan-less design.

2.5.35 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall have a guarantee period of a minimum of 5 years from the date of handover to EThekwini Electricity and is applicable to design and manufacturing related product defects as per Schedule T2.1.2.40.

2.5.36 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall comply with Ethernet standards in accordance with all relevant parts of IEEE 802.

2.5.37 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall support at minimum SNTP - Simple Network Time Protocol?

2.5.38 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall support Remote configuration management for restoration and scheduled backups (eg. TFTP or SSH).

2.5.39 The Ruggedised Utility Grade Layer 2 IEC61850 Switch shall support GOOSE Messaging.

Ethernet Switch Panel

2.5.40 The Ethernet Switches shall be housed in 19" rack-mounted panel.

2.5.41 The panel shall have a minimum IP 52 rating.

2.5.42 The panel shall accommodate top entry for fibre and copper cables and base gland plate entry for secondary cables.

2.5.42 To reduce any stress on the fibre optic connectors, there shall be a cable tray below each switch which facilitates patch cord routing, and which has evenly spaced bend radius limiters for a minimum bending radius of 50 mm.

2.5.43 All cover plates and doors shall be sealed against dust ingression.

2.5.44 A lockable metal door shall be provided at the rear of the panel.

2.5.45 A lockable glass door shall be provided on the front of the panel.

2.5.46 The arrangement of the Ethernet Switch panel shall be subject to the approval of the Engineer.

Fibre Optic Cables and Cable Management System

2.5.47 Fibre optic cable will be used to connect between the Ethernet Switch and all IEC 61850 IEDs.

2.5.48 Fibre optic cable shall be duplex 850 nm, multi-mode, 50/125 µm, glass fibre, ‘ruggedised’ as per Table 1 below.

Table 1 - Physical Characteristics and Testing of Multimode Optic Fibre Patch Lead Complying with IEC 60794-1-2

Item	Characteristic	Requirements
1.	Description	Duplex cables
2.	Jacket Ø	2,7 × 5,5 mm
3	Single fiber Ø	2,7 mm
4.	Tube Ø	0,9 mm

5.	Tensile strength during installation	400 N
6.	Tensile strength in service	2 × 200 N
7.	Min. bend radius during installation	50 mm
8.	Min. bend radius in service	30 mm
9.	Crush resistance short-term	1 000 N/cm
10.	Crush resistance long-term	200 N/cm
11.	Impact resistance Wp = 0,74 J, r = 25 mm	20 impacts
12.	Repeated bending r = 25 mm, weight = 0,5 kg	5 000 cycles
13	Torsion ±360°, length = 1 000 mm, F = 20 N	10 cycles
14.	Temperature range in service	-10 ºC to 70 ºC

2.5.49 The fibre optic cable shall be housed in a galvanized lay-in wiring duct mounted along the length of the top of the 11 kV switchboard (where applicable), between the 11 kV switchroom and the Control Room (where applicable) and along the top of all other control and protection panels. Only Fibre optic cable shall be housed in this galvanised lay-in wiring duct. The light duty cable tray shall be supported by cable tray between the 11 kV switchboard and the Control Room (where applicable) and between non-adjacent control and protection panels.

2.5.50 The minimum bending radius of any portion of the fibre optic cable route shall be 50 mm. Bends in the light duty cable tray shall have provision to ensure that the 50 mm bending radius cannot be reduced.

2.5.51 The dimensions of the light duty cable tray shall be of minimum 300 mm wide.

2.5.52 The Bidder shall provide necessary components for installations (joiner clamps, flush hold down saddles, clip on support channel, hanger, end clamp, splice, etc.).

2.5.53 Radiused accessories shall be used to accommodate the bending radius of fibre optic patch leads.

2.5.54 The light duty cable tray shall be supplied with covers

2.5.55 The prices for the all the necessary components of the galvanized lay-in-wiring duct shall be indicated in the BOQ.

2.5.56 The galvanised lay-in wiring ducts shall be subject to the Engineer's approval.

Network for Specified Non-IEC 61850 relays

2.5.57 All protection relays that have been specified (e.g., to match a remote end in the case of a current differential protection scheme) that are not IEC 61850 compliant shall be interfaced to a single RS232 to TCP/IP converters to be housed in the same panel as the relay. Each RS232 to TCP/IP converter shall have a ST connector fibre connection to the Ethernet switch. The RS232 to TCP/IP converters must be remotely manageable. The relevant software shall be provided for virtual COM port connection management.

Clock Synchronising Network

2.5.58 The GPS clock shall serve SNTP time to all networked devices on the substation LAN.

2.5.59 The GPS clock shall have a front face display to allow for viewing of current date time.

2.5.60 The GPS clock is required to be powered from the substation d.c. supply (see Section C 3.2 for substation d.c. voltage).

2.6 CYBER SECURITY REQUIREMENTS

2.6.1 The IEDs, communication switches, GPS clock and SCADA gateways shall support role based access control - Each device shall have the ability to assign a specific role to every user.

2.6.2 The IEDs, communication switches, GPS clock and SCADA gateways shall have the ability to be password protected.

2.6.3 HTTPS support - devices with web servers shall support HTTPS (TLS v1.2 or greater).

Audit Logs

2.6.4 The IEDs, communication switches, GPS clock and SCADA gateways shall create time schronised audit trails of security relevant user activities such as user login, user logout, change of parameter, and change of configuration.

2.6.5 The IEDs, communication switches, GPS clock and SCADA gateways Devices shall support the ability to redirect these logs to a central security server.

3.0 PROTECTION RELAYS

3.1 GENERAL

3.1.1 All protection IEDs shall be numerical type microprocessor based unless otherwise approved by the Engineer and shall comply with IEC 60255.

3.1.2 All protective IEDs shall be of the flush mounting, and shall be contained in dust-proof cases (at least IP30 rating from the front and IP1X rating from the rear) with an interior finish of aluminium or other approved corrosion resistant material. The IEDs shall be constructed in such a manner that facilitates a quick replacement of modules or the complete IED.

3.1.3 IED terminals shall accept standard ring type lugs, except where it is not possible to find a IED for a specific function that can accommodate ring terminals.

3.1.4 All d.c. operated IEDs shall operate in a voltage range of ±20% of the nominal battery voltage specified in Section C 3.2.

3.1.5 Preference will be given to IEDs with a modular architecture, where the individual modules can be replaced or additional modules added.

3.1.6 IEDs shall have a keypad and LCD type interface accessible from the front. This shall provide a facility

to amend settings manually from the keypad. All functions except the reset function shall be password protected.

3.1.7 IEDs shall have sufficient labelled LEDs to indicate the cause of trip and other status indications shown in drawings issued with this tender.

3.1.8 The IED LCD shall display text messages which shall default to the phase currents and voltages when the IED is in normal service.

If specified in Section C 3.2, IEDs shall be provided with an LCD mimic to indicate the status of switchgear and measured values in the feeder bay. In this case, the display shall default to the mimic.

3.1.9 Where tripping and closing contacts are required, these shall be adequately rated. IEDs shall have sufficient contacts to comply with this specification and drawings. Contacts shall be of silver, platinum or other approved material and shall be capable of repeated operation with the minimum of deterioration. A snubber circuit shall be wired across the IED contacts to mitigate against the tripping and closing contacts being exposed to higher than rated currents by any external factors.

3.1.10 Protection IEDs required to trip 132 kV or higher voltage circuit breakers shall be equipped with at least two sets of tripping contacts to enable simultaneous operation of the main and back-up trip coils of the circuit breakers.

3.1.11 It shall not be possible to operate any IEDs by hand to "trip" from the front face.

3.1.12 Multiple function IEDs shall have a sufficient number of inputs and output contacts to comply with drawings issued with this specification.

3.1.13 IEDs shall be provided with an alarm contact which closes when the IED fails.

3.2 LOGIC CAPABILITIES AND ENGINEERING FUNCTIONS

3.2.1 At least one IED associated with each bay (including MV switches) shall have an event configurable oscillographic recording capability for at least 8 events. The IED shall be overwriting (i.e. first in, first out) or programmable to select whether storage of recordings are non-overwriting or overwriting Oscillographic recordings shall be available in “COMTRADE” format.

3.2.2 It is preferable that at least one IED associated with each bay (including MV switches) be capable of recording and storing load current profiles. In the case of bays fitted with voltage transformers kVAh and kWh profiles shall also be stored. The integration period shall be selectable from 1 minute to 60 minutes.

At least 3 months’ worth of data shall be capable of being stored in the case of 30 minute integration periods.

3.2.3 The IEDs shall have programmable logic capabilities with sufficient gates, timers and variables capable of performing the logic functionality as shown on the drawings issued with this specification. Provision for spare capacity must be provided for future modification or upgrades to the IED.

3.2.4 All control logic functionality should be implemented within the IED. Where auxiliary contact copying IEDs and/or timers are required in protection schemes, these shall be protection class and the use of these shall be to the approval of the Engineer.

3.2.5 The IED shall be capable of accepting the changing of individual protection settings while in service.

3.2.6 Engineering functions and programming of the IED shall be possible using a PC via a UTP port on the Ethernet switch using software that shall operate on the latest version of Microsoft Windows. The software shall also be compatible with previous versions of Microsoft Windows. Three copies of engineering software shall be supplied on CD or USB or downloadable link. The price of this software and CDs or USBs shall be included in the price of the IEDs.

3.2.7 The IEDs shall preferably support either the test or maintenance mode features as specified within the IEC 61850 standard to allow for the testing of schemes within energised substations.

3.3 PROTECTION FUNCTIONS

Over-current and Earth Fault Protection

3.3.1 Where over-current, earth fault and sensitive earth fault (SEF) protection functions are required as back-up protection, these shall be implemented in a stand-alone IED and not as secondary functions of any other IED.

3.3.2 Over-current elements shall be of the programmable type with:

a) standard IEC operating characteristics;
b) selectable definite time option;
c) adjustable operating settings from 50% to 200% of the normal full load secondary current in 10% increments or smaller;
d) an adjustable time multiplier setting from 0,1 to 1 in increments of 0,05 or smaller; and
e) a high-set feature with an adjustable range of 1 to 20 times the over-current setting in increments of 1 or less and an adjustable definite time characteristic up to 500 ms in increments of 50 ms or less.

3.3.3 Earth fault elements shall be of the programmable type with:

a) standard IEC operating characteristics;
b) selectable definite time option;
c) adjustable operating settings from 10% to 80% of the normal full load secondary current;
d) an adjustable time multiplier setting from 0,1 to 1 in increments of 0,05 or smaller; and
e) a high-set feature with an adjustable range of 1 to 20 times the over-current setting in increments of 1 or less and an adjustable definite time characteristic up to 500 ms in increments of 50 ms or less.

3.3.4 SEF elements shall be of the programmable type with:

a) adjustable operating settings from 1% to 20% of the normal full load secondary current; and
b) an adjustable definite time delay between 1 and 10 seconds.

3.3.5 Where over-current and earth fault functions are incorporated into one IED all three phases and earth currents shall be monitored.

Directional Over-Current (DOC) Protection

3.3.6 Directional over-current elements shall be of the programmable type with:

a) standard IEC operating characteristics;
b) selectable definite time option with settable times in increments on 50 ms or less;
c) adjustable operating settings from 10% to 200% of the normal full load secondary current in 5% increments or smaller;
d) an adjustable time multiplier setting from 0,1 to 1 in increments of 0,05 or smaller;
e) the vector relationship between voltage and current inputs shall be selectable and configurable to cater for different VT winding arrangements;
f) VT fail detection; and
g) blocking of the DOC function in the event of VT failure.

High Impedance Protection (as applicable to Transformer Restricted Earth Fault and Busbar Protection schemes)

3.3.7 High impedance protection functions shall be carried out utilising either a Voltage Measuring element or a Current Measuring element with external series resistor. These IEDs shall be of the programmable type with voltage or current setting ranges suitable for the maximum fault levels and CT characteristics specified in Section C 3.2.

3.3.8 IEDs utilised in High Impedance Protection schemes shall be equipped with Metrosils (non-linear resistors).

3.3.9 Resistors used with Current Measuring IEDs in high impedance protection schemes shall be large gauge wire wound on a ceramic former at least 150 mm in length and 30 mm in diameter. They shall be epoxy coated with exposed strip for variable tapping and be wired such that if the full value is required, bypass loop can be removed easily without having to remove additional wiring. Resistor values and details shall be to the approval of the Engineer. The resistors shall be provided with a visible name plate showing the ratings of the resistor.

Transformer Biased Differential Protection

3.3.10 Transformer Biased Differential Protection shall be stable for magnetising inrush and through faults and additional biasing shall be employed to cater for tap position mismatch.

3.3.11 Current transformers for transformer biased differential protection will be connected in “star” formation. The IED shall be programmable for vector group and CT ratio. Zero sequence currents shall be capable of being eliminated in the IED for differential current calculation.

3.3.12 An additional unrestrained instantaneous high-set transformer differential function shall be provided.

3.3.13 Over-flux blocking shall be employed in the transformer differential function.

Transformer Protection Trip and Alarm Inputs

3.3.14 IEDs shall have the necessary provision for Transformer Trip and alarm input signals (e.g., Buchholz) as shown on the drawings issued with this specification. Trip Input signals associated with the HV Master trip shall be connected to inputs of two different IEDs. The standby earth fault (SBEF) function shall have definite time properties with, settable times in increments of 500 ms or less.

Current Differential Protection (Excluding 11 kV Feeder Cable Differential Protection)

3.3.15 The IEDs shall operate on the principle of current comparison via a communications medium in a two or three terminal application as specified in Section C 3.2.

3.3.16 The differential protection function shall be phase segregated and shall employ a settable dual slope percentage bias restraint characteristic to ensure stability for through faults.

3.3.17 Current transformer ratios shall be programmable. The IEDs shall be capable of CT matching at a minimum factor of 4 times.

3.3.18 The IEDs shall have over-current and earth fault functions that can be set to become active in the event of a communication failure. This feature shall have the same characteristics as those specified for over-current and earth fault functions elsewhere in this specification.

3.3.19 The IEDs shall have inherent transfer tripping and inter-tripping capabilities utilising the same communications medium as the differential protection.

3.3.20 The IEDs shall have a communication supervision facility that shall annunciate any communication failure. The differential function is to become inoperative under communication failure conditions.

3.3.21 IEDs that have not been specified to match remote ends shall have single mode fibre interface to allow connection to the remote end IEDs over distances of up to 30 km for differential protection. A single mode interface shall allow direct connection (no media converters) to eThekwini Electricity's fibre optic cable which follows the ITU-T G.652D specifications is required. There shall be an option to supply the IED with a redundant multimode differential protection communication module or interface (no media converters) supporting IEEE C37.94 or a redundant single mode interface where required. The fail over between the two interfaces shall be automatic. Independent alarms for each communications module shall be made available for reporting back to SCADA when each communication channel (main or redundant) has failed.

3.3.22 Relays/IEDs that have been specified to match remote ends shall have interfaces as specified in Section C 3.2.

3.3.23 Single mode optic fibre communications shall be at a wavelength of 1300 nm.

3.3.24 The optical budget for single mode end-to-end communications shall be appropriate for the optic link distance and shall include a reserve optical budget of 3 dB or more. Attenuators, if required, shall be included in the price of the IED.

Distance Protection

3.3.26 Distance protection elements shall have stepped zone, quadrilateral tripping characteristics which depend on the proximity to the fault. The distances covered by each zone and the trip delay (except Zone 1 which shall be instantaneous) shall be widely and independently variable. Four forward zones and one non-directional zone are required. The IED shall also be supplied with Mho tripping characteristics with reverse zones that can be selected as and when required depending on the application.

3.3.27 The protection function shall operate correctly under changing fault conditions or power swing and must provide stability for reverse faults in the first two zones.

3.3.28 The IED shall be suitable for remote signal tripping acceleration using impedance zone starts. The IED shall facilitate under-reaching and over-reaching schemes. These schemes shall employ configurable remote signal echoing and reverse fault signal echo blocking to cater for weak in-feeds.

3.3.29 The range of impedance settings shall suit relatively short lines/cables and shall be to the approval of the Engineer.

Trip Circuit Supervision

3.3.30 A trip circuit supervision feature shall be provided in at least one IEC 61850 IED per bay to monitor the continuity of the trip circuit and trip coil of the associated circuit breaker in both the open and closed condition. For 132 kV and higher circuit breakers, both main and back-up trip circuits and trip coils shall be supervised.

3.3.31 In the case of withdrawable 11 kV circuit breakers, this feature shall be disabled when the circuit breaker is racked out of the Service position.

3.3.32 Spurious discontinuity of the trip circuit during opening and closing of the circuit breaker and racking out of the breaker from the Service position shall be ignored by the use of an appropriate time delay feature.

Arc Protection for 11 kV Fixed Pattern Switchgear

3.3.33 The 11 kV switchboard arc protection will be supplied and commissioned by the switchboard manufacturer. The ICAP contractor shall make provision for integrating the arc protection devices with the HMI and the SCADA gateway via hard wired contacts. The arc protection scheme is expected to have four master IEDs in total, i.e., one on each incomer.

11 kV Feeder Cable Differential Protection

3.3.34 The IEDs for this function will either be free-issued to the ICAP contractor to install and commission or the ICAP contractor will be required to undertake the engineering for the differential protection and provide drawings for installing and cabling and, fit a blanking plate for future installation of the IED by others.

3.3.35 The cost for the installation and commissioning of the free-issued IED shall be indicated in the pricing

schedule. The free-issued IED is currently of the EASERGY P3. The IED type can change at any stage of this (ICAP) contract in which case the ICAP contractor will be expected to install and commission the new IED, as per the pricing schedule of this tender document.

3.4 VOLTAGE REGULATION

3.4.1 The voltage regulation function shall be carried out on a IED dedicated to and designed specifically for this function.

3.4.2 This IED shall preferably comply with IEC 61850 to achieve the indication and control philosophy indicated on the drawings issued with this specification. If this requirement is not met, the indication and control philosophy will be required to be implemented by means of contact inputs and outputs to an associated IEC 61850 IED. Tenderers shall include details of how this is to be achieved with their tender submission.

3.4.3 The voltage regulating IED will initiate tapping of the transformer by means of voltage free contacts for raise and lower operations. The IED shall have inputs to accept status information from the transformer which will have voltage free contacts, to indicate tap position, tap changer a.c. supply fail and tap change in progress. Tap position will be in 5 bit binary coded decimal (BCD) format.

3.4.4 External panel face mounted push buttons shall be provided to select Auto operation and Manual operation and to initiate Manual Raise and Manual Lower commands. These shall be inputs to the IED.

3.4.5 The IED shall display voltage and tap position.

3.4.6 VT and CT ratios shall be as specified in Section C 3.2. These ratios shall be configurable in the IED.

3.4.7 The IED shall implement over-current and under-voltage tap change blocking. Over-current and under-voltage blocking levels shall be programmable.

3.4.8 The IED shall initiate a tap change time-out alarm if the Tap Change In Progress contact is closed for longer than a programmable time. This shall inhibit Auto operation.

3.4.9 In Auto operation mode, the IED shall automatically regulate the secondary transformer voltage according to the following scheme:

a) No operation while voltage is within a band around a voltage set point. The set point and band width shall be programmable.
b) When the voltage deviates outside of the above bandwidth, the IED shall initiate a tap change command after a time period determined according to one of the following characteristics:

Definite Time Characteristic	- First tap change initiated after a programmable definite time - Successive tap change (if voltage subsequent to First tap still outside band width) initiated after a separately programmable definite time

Inverse Time Characteristic	- Tap changes initiated after a time period according to an inverse time/voltage deviation relationship with programmable time multiplier

3.4.10 In Auto operation mode, the IED shall detect if transformers are in parallel by means of transformer incomer, bus-section and bus-coupler switchgear position and status. The busbar arrangement shall be modelled in the IED according to the schematic drawing issued with this specification and the future busbar arrangement shall be catered for. The transformer and busbar arrangement shall be capable of being displayed on the IED.

3.4.11 Parallel Auto control shall be according to the Circulating Current ($\Delta I \sin\varphi$) method. There shall be a programmable limit for circulating current magnitude after which an Excessive Circulating Current alarm shall be initiated and further tap change operations shall be inhibited.

3.4.12 The IED shall implement a Line Drop Compensation feature with programmable resistance and reactance values.

3.5 UNDERFREQUENCY LOAD SHEDDING (UFLS)

3.5.1 A separate wall mounted UFLS panel to allow shedding of 11 kV feeders during an underfrequency event, shall be supplied. The panel shall comprise of an UFLS IED and a separate hard-wired switch to toggle between three separate states viz., TEST MODE, OFF and ON and a separate hard wired switch (Configuration Location Switch) to toggle between two states viz; HMI, SUP.

3.5.2 The operation of the three modes shall be as follows:

a) TEST MODE: The UFLS IED is able to pick up frequency changes and broadcast GOOSE trip messages. When in TEST MODE the UFLS IED shall configure all feeder IEDs to block UFLS tripping.
b) OFF MODE: The UFLS IED is not able to pick up frequency changes at its input, will not broadcast GOOSE trip messages and all feeder IEDs shall be configured to block UFLS tripping
c) ON MODE: The UFLS IED is able to pick up frequency changes at its input and broadcast GOOSE trip messages. The feeder IEDs shall be able to issue a trip when they receive stage trip events.

3.5.3 The operation of the Configuration Location Switch shall be as follows:

a) HMI: The feeder under frequency stages shall be configured from the HMI only.
b) SUP: The feeder under frequency stages shall be configured from the Control Centre only.

3.5.4 The UFLS IED shall have two voltage inputs with monitoring. The voltage inputs shall be wired from transformers fed from separate incoming circuits. The voltage inputs shall be paralleled with the VT supplies of the respective transformers to the approval of the Engineer. Should the IED detect a loss of voltage on the main input, it shall automatically fail-over to the backup input.

3.5.5 The IED shall comply with the general UFLS sensitivity requirements in Clause 3.5.6 and shall support IEC 61850 with GOOSE messaging.

3.5.6 The IED shall meet the following requirements:

a) Minimum pick up setting range shall be between 47,5 Hz to 50 Hz in steps of 0,1 Hz and shall have a minimum of 5 settable frequency stages.
b) Each element/stage shall have a separate settable definite time delay with a range of 0 s to 10 s in steps of 0,1 s.
c) The total system speed of operation, excluding tripping shall be less than 100 ms.
d) The accuracy of the frequency measurement shall be ±10 mHz minimum.
e) The reset time of the UFLS IED shall be less than 100 ms.
f) The device shall include settable undervoltage blocking of the frequency protection.

3.5.7 The feeder IEDs shall be configured to ensure that:
a) circuit breaker Close is blocked if any GOOSE message is received for a trip on stage 1, 2, 3 or 4 and will not allow a close if the frequency is still below the stage setting;
b) individual alarms are configured for each goose received (Stage 1 - 4 Trip); and
c) the IED display and LEDs are configured to display UFLS information.

3.5.8 The following alarms shall be enunciated:
a) the Stage Selection per Feeder bay
b) the UFLS Off Selection per Feeder bay
c) the UFLS Stage operation per Feeder bay
d) the UFLS Stage initiation per stage
e) the UFLS Test Mode Selection

3.5.9 Update to the DNP Master Station Map file shall include the following:
a) UFLS Stage Selection Control per Feeder bay
b) UFLS Stage Selection Indication per Feeder bay
c) UFLS OFF Control per Feeder bay
d) UFLS Global OFF Control for the system
e) UFLS Stage Summation Reading per stage
f) UFLS Target point Control per stage
g) UFLS Operation per stage per Feeder bay
h) UFLS initiation indication per stage

4.0 PROTECTION AND CONTROL SCHEMES

4.1 11 kV FEEDER SCHEME

4.1.1 The protection functions to be incorporated in an 11 kV feeder protection scheme are as follows:

a) Cable differential protection;
b) Over-current and Earth fault protection;
c) Sensitive Earth Fault protection (if specified in Section C 3.2) incorporated into Over-current/Earth Fault IED;
d) Arc protection (to be supplied by the switchboard manufacturer); and
e) Trip Circuit Supervision incorporated into Over-current/Earth Fault IED

The a.c. & d.c. Schematic and Protection and Control Logic drawings for the 11 kV feeder protection

scheme are included with this specification.

4.1.2 The control and status requirements for 11 kV feeders as specified in the drawings issued with this specification shall be incorporated in the same IED which is used for the Over-current and Earth fault protection function.

4.1.3 If Sensitive Earth Fault protection is specified in Section C 3.2, “On” and “Off” push button logic inputs shall be provided in the over current/earth fault IED to enable or disable the Sensitive Earth Fault function. The push buttons will be mounted on the front face of the 11 kV feeder panels by the 11 kV switchboard supplier.

4.1.4 The 11 kV feeder protection IED shall not be equipped with a latching function for over-current, earth fault or sensitive earth fault pick-ups.

4.1.5 IEDs and cases required for the above scheme shall be delivered directly to the switchgear manufacturer specified in Section C 3.2 for mounting on the front panel of the 11 kV feeder panels.

4.2 132/11 kV TRANSFORMER SCHEME

4.2.1 The protection functions to be incorporated in a 132/11 kV transformer protection and control scheme are as follows:

a) Directional Over-current protection (LV)
b) Over-current and Earth fault protection (LV)
c) 2 Stage Standby Earth fault protection (LV Neutral)
d) HV Restricted Earth fault protection
e) LV Restricted Earth fault protection
f) Transformer Biased Differential protection
g) Transformer Trips and alarms as specified in the drawings issued with this specification
h) An 11 kV Auto-reclose feature as specified in the drawings issued with this specification (if specified in Section C 3.2)

i) A Bank Intertrip feature as specified in the drawings issued with this specification (if specified in Section C 3.2)
j) Bus-zone tripping (bus wire input contact into Over-current/Earth-Fault IED signal from Bus-zone Protection IED)
k) 11 kV Trip Circuit Supervision
l) Sequential Switching Initiate

The above functions shall be implemented in at least two IEDs with duplication of certain functions in more than one IED as specified in the drawings issued with this specification.

In addition, the following protection functions shall be split into the two different IEDs as follows:

IED 1: Transformer Biased Differential protection
HV Restricted Earth Fault protection

LV Restricted Earth Fault protection

IED 2: Directional Over-current protection
Over-current and Earth Fault protection

HV and LV latching Master Trip functions shall be incorporated into one of the IEDs. These will be initiated by protection functions as indicated in the drawings issued with this specification. IEDs in which the latching master trip functions are not incorporated shall initiate the master trip in the relevant IED via GOOSE messages and also trip the appropriate circuit breakers directly.

Transformer pick-ups for through faults shall be latched, stored as an event and be indicated through a separate LED.

The a.c. & d.c. schematic and Protection and Control Logic drawings for the 132/11 kV transformer protection scheme are included with this specification.

4.2.2 A Voltage Regulation function in a dedicated relay/IED is required.

4.2.3 The control and status requirements for the 132/11 kV transformer scheme as specified in the drawings issued with this specification shall be shared between the IEDs to the approval of the Engineer.

4.2.4 If specified in Section C 3.2, one IED shall be provided with an LCD mimic to indicate the status of switchgear and measured values in the associated transformer feeder bay. This mimic shall be permanently displayed. A Trip-Neutral-Close switch shall be supplied for control of the 132 kV circuit breaker in this case.

4.2.5 Provision shall be made for up to three 3 phase miniature circuit breakers (MCBs) rated up to 30 A, in order to cater for the supply to the tap change control motor and the power circuit for the transformer marshalling Kiosk. The total number and rating of the MCBs shall be to the approval of the Engineer.

4.2.6 IEDs, LEDs, push-buttons, test blocks, fuses, links, etc., required for the above scheme shall be accommodated in a floor mounted control panel as specified later in this specification.

4.2 11 kV GENERAL CONTROL SCHEME

4.3.1 The control and status requirements for the 11 kV Bus-Sections, the 11 kV Bus-Coupler and 11 kV Earthing Panel as specified in the drawings issued with this specification shall be incorporated in a separate IED.

4.3.2 A Sequential Switching Scheme shall be provided to allow automatic closure of bus-sections and/or the bus-coupler in the event of a loss of supply to a busbar resulting from a transformer fault as specified in the drawings issued with this specification. This shall be incorporated into the same IED as in 4.3.1 above. A maximum of two IEDs shall be allowed for the general control scheme in a case where the number of inputs and outputs poses a challenge or where the 11 kV board is separated into two sections housed in separate switchrooms.

"On" and "Off" push button logic inputs shall be provided in the IED to enable or disable the Sequential Switching function. The push buttons will be mounted on the front face of the bus-coupler panel by the 11 kV switchboard supplier.

4.3.3 A General Alarm feature shall provide indication and an audible alarm contact in the event of any general substation alarm as specified in the drawings issued with this specification and shall be incorporated in the same IED as in 4.3.1.

4.3.4 The IED(s) and case(s) for the above scheme shall be delivered directly to the switchgear manufacturer specified in Section C 3.2 for mounting on the front panel of the 11 kV Bus-Coupler panel.

4.4 132 kV CURRENT DIFFERENTIAL FEEDER SCHEME

4.4.1 The protection functions to be incorporated in a 132 kV current differential feeder protection scheme are as follows:

a) Current differential protection;
b) Over-current, Earth Fault and Sensitive Earth Fault protection (separate IED to current differential protection);
c) Breaker Fail detection;
d) Bus Zone tripping (bus wire input to IED/s, signal from Bus Zone Protection IED);
e) Trip Circuit Supervision for two trip coils; and
f) Auto-Reclosing (where specified in Section C 3.2).

The a.c. & d.c. schematic and Protection & Control Logic drawings for the 132 kV current differential feeder protection scheme are included with this specification

4.4.2 The control and status requirements for the 132 kV current differential feeder scheme as specified in the drawings issued with this specification shall be shared between the IEDs to the approval of the Engineer.

4.4.3 Where the current differential relay/IED make and model is specified to match a remote end and is not IEC 61850 compliant, all control, status and logic requirements shall be incorporated in the over-current/earth fault relay. Appropriate inputs and outputs of the current differential relay/IED shall be wired to outputs and inputs of the over-current/earth fault IED as shown on the a.c. & d.c. schematic.

4.4.4 The Master Trip function shall be incorporated into one of the IEDs. This will be initiated by protection functions as indicated in the drawings issued with this specification. IEDs in which the latching master trip function is not incorporated shall initiate the master trip in the relevant IED via hardwired outputs/inputs and shall also trip the appropriate circuit breaker directly.

4.4.5 If specified in Section C 3.2, one IED shall be provided with an LCD mimic to indicate the status of switchgear and measured values in the feeder bay. This mimic shall be permanently displayed. A Trip-Neutral-Close switch shall be supplied for control of the 132 kV circuit breaker in this case.

4.4.6 IEDs, switches, test blocks, fuses, links, etc., required for the above scheme shall be accommodated in a floor mounted control panel as specified later in this specification.

4.5 132 kV DISTANCE FEEDER SCHEME

4.5.1 The protection functions to be incorporated in a 132 kV distance feeder protection scheme are as follows:

a) Distance protection;
b) Over-current, Earth Fault and Sensitive Earth Fault protection (separate IED to distance protection);
c) Breaker Fail detection;
d) Bus Zone tripping (bus wire input to IED(s), signal from Bus Zone Protection IED);
e) Trip Circuit Supervision for two trip coils; and
f) Auto-Reclosing

The a.c. & d.c. schematic and Protection and Control Logic drawings for the 132 kV distance feeder protection scheme are included with this specification

4.5.2 The control and status requirements for the 132 kV distance feeder scheme as specified in the drawings issued with this specification shall be shared between the IEDs to the approval of the Engineer.

4.5.3 The Master Trip function shall be incorporated into one of the IEDs. This will be initiated by protection functions as indicated in the drawings issued with this specification. IEDs in which the latching master trip function is not incorporated shall initiate the master trip in the relevant IED via hardwired outputs/inputs and shall also trip the appropriate circuit breaker directly.

4.5.4 If specified in Section C 3.2, one IED shall be provided with an LCD mimic to indicate the status of switchgear and measured values in the feeder bay.
This mimic shall be permanently displayed. A Trip-Neutral-Close switch shall be supplied for control of the 132 kV circuit breaker in this case.

4.5.5 IEDs, switches, test blocks, fuses, links, etc., required for the above scheme shall be accommodated in a floor mounted control panel as specified later in this specification.

4.6 132 kV TRANSFORMER FEEDER SCHEME

4.6.1 The protection functions to be incorporated in a 132 kV transformer feeder protection scheme are as follows:

a) Over-current, Earth Fault;
b) Breaker Fail detection;
c) Bus Zone tripping (bus wire input to IED(s), signal from Bus Zone Protection IED); and
d) Trip Circuit Supervision for two trip coils.

The a.c. & d.c schematic and Protection and Control Logic drawings for the 132 kV transformer feeder protection scheme are included with this specification

4.6.2 Where a 132 kV transformer feeder scheme is required to feed two banked transformers, two over-current, earth fault IEDs may be required and the control and status requirements for the 132 kV transformer feeder scheme as specified in the drawings issued with this specification shall be shared

between the IEDs to the approval of the Engineer.

4.6.3 The Master Trip function shall be incorporated into one of the IEDs. This will be initiated by protection functions as indicated in the drawings issued with this specification. IEDs in which the latching master trip function is not incorporated shall initiate the master trip in the relevant IED and shall also trip the appropriate circuit breaker directly.

4.6.4 If specified in Section C 3.2, IEDs shall be provided with an LCD mimic to indicate the status of switchgear and measured values in the feeder bay. This mimic shall be permanently displayed. A Trip-Neutral-Close switch shall be supplied for control of the 132 kV circuit breaker in this case.

4.6.5 IEDs, switches, test blocks, fuses, links, etc., required for the above scheme shall be accommodated in a floor mounted control panel as specified later in this specification.

4.7 132 kV BUS-SECTION/BUS-COUPLER SCHEMES

4.7.1 The protection functions to be incorporated in a 132 kV bus section and bus coupler protection schemes are as follows:

a) Over-current, Earth Fault;
b) Breaker Fail detection;
c) Bus Zone tripping (bus wire input to IED(s), signal from Bus Zone Protection IED); and
d) Trip Circuit Supervision for two trip coils.

The a.c. & d.c. schematic and Protection and Control Logic drawings for the 132 kV bus-section and bus-coupler protection schemes are included with this specification

4.7.2 If specified in Section C 3.2, IEDs shall be provided with an LCD mimic to indicate the status of switchgear and measured values in the bay. This mimic shall be permanently displayed. A Trip-Neutral-Close switch shall be supplied for control of the 132 kV circuit breaker in this case.

4.7.3 If specified in Section C 3.2, a General Alarm feature shall provide indication and an audible alarm contact in the event of any general substation alarm as specified in the drawings issued with this specification and shall be incorporated in the over-current and earth fault IED.

4.7.4 IEDs, switches, test blocks, fuses, links, etc., required for the above scheme shall be accommodated in a floor mounted control panel as specified later in this specification.

4.8 132 kV BUSBAR PROTECTION SCHEME

4.8.1 The protection functions to be incorporated in the 132 kV Busbar Protection scheme are as follows:

a) Phase segregated high impedance Busbar Protection for up to three zones and possibly a check zone (instantaneous); and
b) Phase segregated high impedance current transformer circuit supervision and shorting for up to four zones and possibly a check zone (delayed),

c) Each zone shall have its own independent IED.

4.8.2 A calculation to confirm the setting range based on the CT characteristics and system fault level provided in Section C 3.2 and the ultimate configuration of the 132 kV switchyard shall be submitted for approval.

4.8.3 The busbar protection scheme shall energise bus wires to initiate bus zone tripping on associated bays of the protected zone. Individual switches shall be provided to enable or disable the different protection zones.

4.8.4 The CT circuit supervision feature shall initiate an alarm and disable the bus-zone protection function after a settable time.

4.8.5 As indicated in drawings issued with this specification, CT test blocks shall be accommodated in the busbar protection panel and individual yard marshalling kiosks.

4.8.6 IEDs, switches, test blocks (where applicable), fuses, links, etc., required for the above scheme shall be accommodated in a floor mounted control panel as specified later in this specification.

4.9 COMBINED 132 kV FEEDER AND TRANSFORMER FEEDER SCHEME

4.9.1 The protection functions (if any) to be incorporated in this scheme will be specified in Section C 3.2 and the drawings issued with this specification.

4.9.2 The d.c. schematic and Logic drawings for this scheme are included with this specification.

4.9.3 The control and status requirements for the 132 kV switchgear (if any) are specified in the drawings issued with this specification and shall be incorporated in an IEC 61850 IED. If specified in Section C 3.2, the incorporation of the control and status requirements for more than one circuit into one IED will be allowed.

4.9.4 If specified in Section C 3.2, IEDs shall be provided with an LCD mimic to indicate the status of switchgear and measured values. This mimic shall be permanently displayed. Control switches shall be supplied for control of the 132 kV switchgear in this case.

4.9.5 IEDs, switches, fuses, links, etc., required for the above scheme shall be accommodated in a floor or wall mounted control panel (size specified in Section C 3.2) and as specified later in this specification.

4.10 BACKUP PROTECTION SCHEME FOR 132/11 kV TRANSFORMERS

4.10.1 The protection functions to be incorporated in a backup protection scheme for 132/11 kV transformers are as follows:
Over-current and Earth Fault protection (separate IED for each transformer, 2 or 4 as specified in Section C 3.2)

The a.c. & d.c. schematic and Protection and Control Logic drawings for the backup protection scheme for 132/11 kV transformers are included with this specification.

4.10.2 IEDs, test blocks, fuses, links, etc., required for the above scheme shall be accommodated in a wall mounted panel as specified later in this specification.

4.11 UNDERFREQUENCY LOAD SHEDDING (UFLS) SCHEME

4.11.1 A separate wall mounted UFLS panel to allow shedding of 11 kV feeders during an underfrequency event, shall be supplied as per Clause 3.5.

4.11.2 After an under frequency event, the system shall not automatically restore the feeders that tripped. The system shall prevent re-closing if the system frequency has not recovered above the first UFLS stage.

4.11.3 Any UFLS change made locally or remotely shall appear on the alarm page.

4.11.4 The UFLS operation shall not be disabled when the Substation Local/Supervisory switch or the UFLS Local/Supervisory Switch is in the local position.

4.11.5 When the Configuration Location switch is switched back to Supervisory, the state change made by the local user shall be retained until the next Master Station change.

5.0 CONTROL PANELS

5.1 GENERAL

5.1.1 Unless otherwise specified the control panels shall be floor mounted with dimensions of 600 × 600 × 2100 mm (W×D×H) fitted with suitable gland plate and internal cubicle lighting. All floor mounted panels shall be bolted to the floor. Adjacent control panels shall be bolted together and have a continuous and uniform appearance.

5.1.2 The IEDs shall be mounted on the front of the control panels not lower than 600 mm above floor level and not higher than 1800 mm above floor level.

5.1.3 Control panels shall be designed to be vermin proof.

5.1.4 The panels shall be fabricated of 3CR12 corrosion resistant steel or better material of at least 2 mm thickness. The panels shall be painted or powder coated as specified in Clause 5.2.

5.1.5 The panels shall be capable of being extended at either end by the addition of further panels.

5.1.6 Panels shall be designed to allow for all IEDs, push-buttons, switches, LEDs, etc., to be of the flush mounted type. All relay and IED cases shall be earthed.

5.1.7 Each cubicle shall be accessible from the rear through full height, removable, hinged doors fitted with switches for automatic cubicle lighting.

5.1.8 All current transformer circuits shall be provided with plug-in type test terminal blocks (with CT shorting feature when plug is withdrawn) which shall be mounted on the front of the protection panel. This shall include current transformer circuits where the IED is to be supplied on this contract but the current transformer is to be supplied by others.

5.1.9 All fuses and links with the exception of CT earthing shall be positioned on the front of the control panel unless otherwise approved. CT earthing links shall be of the screw/slider rail mounted terminal type to the approval of the Engineer.

5.1.10 All terminal blocks for current transformers and IED connections shall be neatly finished and readily accessible. All terminal connectors shall be of the spring-loaded type. Pinch type terminals in which the screw bears directly on the wire strand will not be accepted. Lugs and terminals shall incorporate a feature which prevents the lug(s) from being inadvertently withdrawn from the terminal even if the terminal screw has not been tightened regardless of the orientation of the lug(s). The width of the terminal shall not be less than 6 mm. Samples of all terminals to be used shall be submitted for approval prior to manufacture of control panels. Each end of each wire shall be fitted with the crimp lug/connector suited to the type of terminal provided.

5.1.11 Terminals at 110 V or 220 V a.c and d.c shall be segregated from other terminals and shrouded, with the voltage prominently marked on the shrouds. All terminations shall be clearly identified.

5.1.12 Panel mounted mimics will not normally be required as these will be provided on the IEDs. If these are specifically required in Section C 3.2, the panels shall have a clearly labelled mimic diagram marked thereon which shall indicate the state of all the yard equipment. The mimic diagram shall match from panel to panel to form a continuous schematic. Indicators shall be of the cluster LED type with a minimum diameter of 25 mm.

5.1.13 Trip-Neutral-Close switches shall be of the “Pistol Grip”, thumb push-button, double action, spring return to neutral, lockable type.

5.1.14 Auto-Reclose switches shall be of the “Pistol Grip”, thumb push-button, double action, lockable type.

5.1.15 Each panel shall have a facility to insert four threaded lifting lugs in the top corners. The minimum size shall be M20. Two sets of four lifting lugs shall be supplied with each set of panels (if more than one set of panels are required). The lugs shall be designed with a safety factor of 2,5.

5.1.16 Each panel shall be provided with a copper earth bar which shall be earthed using a flexible, green and yellow PVC insulated 70 mm^2 copper conductor bolted to the panel earth bar and control room earth bar (supplied and installed by others) by means of crimped lugs.

5.1.17 A 50 mm diameter hole shall be provided in the gland plate of each panel which has a IED with a fibre optic interface supplied to allow connection to the remote end.

5.1.18 Each panel shall be fitted with temperature sensors.

5.2 PAINTING

5.2.1 The prevention of corrosion is a major concern in the eThekwini area and all corrodible material shall be carefully painted or powder coated.

5.2.2 The material shall be completely shaped, cut, drilled, countersunk, welded, etc. before any paintwork commences. Before painting, the parts shall be thoroughly cleaned by sand or shot-blasting or metal brushes to remove all traces of rust, scale or grease. Immediately after cleaning all rough surfaces shall be filed and the priming coat of paint applied to all corrodible metal work.

5.2.3 The external surfaces of indoor control equipment shall receive a coat of an approved phosphate primer, an undercoat, and two coats of Eau de Nil colour enamel paint to SABS 1091.

5.2.4 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.

5.3 LABELS

5.3.1 Control cubicles shall be fitted with engraved labels on the front and back indicating the designation of circuits controlled, to the approval of the Engineer.

5.3.2 Each fuse, link, protection IED, control handle and indicator LED shall be fitted with engraved labels to indicate the function.

5.3.3 All d.c. cables shall be labelled and marked for point to point tracing according to the specification by the eThekwini Electricity's DC Systems Division. The labelling required includes for cables connected to the charger, the breaker feeding the charger in the a.c. DB, the fuses, etc.

5.3.4 All hardware components of the communication system shall be clearly labelled to indicate its purpose and designation.

5.3.5 All communication cables shall be labelled according to the specification by the eThekwini Electricity Communication Networks Branch.

5.3.6 The panels shall be fitted with labels indicating device IP addresses and the RESET procedure to be followed after the device operated.

5.4 PANEL WIRING

5.4.1 Panel wiring shall be accommodated in PVC trunking with removable covers.

5.4.2 Panel wiring between trunking and termination points shall be neatly cable tied.

5.4.3 Panel wiring shall comply with the drawings issued with this tender or other drawings approved by the engineer.

5.4.4 Wiring shall be coloured as follows unless otherwise approved:

a) Current and voltage transformer secondary wiring shall be red, white and blue corresponding to the respective phase.
b) Neutral connections shall be black.
c) Earth connections shall be green/yellow.
d) Other wiring shall be grey.

5.4.5 Panel wiring shall have a minimum conductor cross-sectional area of 2,5 mm^2, except where it is not possible to find a IED that can accommodate a minimum conductor cross-sectional area of 2,5 mm^2 for specific functions.

.5.4.6 Each end of each wire shall be provided with a ferrule bearing a number corresponding to that on the drawings.

5.4.7 Additional red ferrules marked 'T' in white, must also be fitted on all wires associated with trip circuits.

5.4.8 The wiring of current transformer circuits, a.c. voltage circuits and d.c. voltage circuits shall be kept separate as far as possible.

5.4.9 Wiring shall be fitted with appropriate lugs for connection to terminals and other termination points.

5.4.10 All bus wiring shall be installed prior to factory testing. Wiring shall be disconnected at one end only and removed to one of the panels for transportation, delivery and final termination on site.

5.4.11 All relay/IED cases shall be connected to the panel earth bar.

6.0 CONTROL CABLES AND SECONDARY WIRING

6.1 This contract includes the complete secondary wiring of all equipment installed in the substation.

6.2 All multicore and low voltage interconnecting cables, glands and accessories shall be supplied by the Contractor as part of this Contract at the unit rates tendered in Section C 2.5. Cables supplied shall be steel wire armoured to the relevant specification as stipulated in Clauses 6.15 to 6.21.

6.3 Payment for the supply of secondary cables, glands and accessories shall be made for installed quantities only. The Contractor shall be responsible for managing the cable orders and excess for each project accordingly.

6.4 The Contractor shall generate a secondary cable schedule and submit this prior to the commencement of the installation of the cabling for approval.

6.5 The laying rate quoted in Section C 2.5 shall include lifting of cable trench slabs, strapping to cable trays, etc. Excavation and reinstatement where necessary shall be at the unit rates tendered in Section C 2.5. The supply and laying rates shall be applied to the measured length of cable from gland to gland plus one metre (1 m) per end for terminating.

6.6 Cable tray and support structures shall be of suitable size and shall be galvanised.

6.7 Any unused secondary cable and stripped cable shall be removed by the Contractor.

6.8 The termination rates quoted in Section C 2.5 shall include glanding, stripping, marking of cores, crimping of terminal lugs, connecting and lacing.

6.9 All secondary cable 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.

6.10 All secondary cable between ground level and outdoor equipment shall be fully supported on a cable tray/rack to the approval of the Engineer. This shall be paid for at the rate for Cable Tray in Section C 2.5.

6.11 All cable ties used for strapping secondary cables outdoors shall be stainless steel.

6.12 a.c. circuits and d.c circuits are not to be included in the same multi-core cable.

6.13 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.

6.14 All wire armours or screens of cables shall be earthed.

Secondary Cables Specification

6.15 The cables shall to be suitable for use on 230/400 V, 50 Hz electrical distribution systems with earthed neutrals.

6.16 The conductor of the cable shall comply with Table 2 of SANS 1411: Part I.

6.17 The insulation material of the cable shall comply with SANS 1411: Part II and Table 8 of SANS1507.

6.18 The bedding material of the cable shall comply with SANS 1411: Part II and Table 13 of SANS 1507.

6.19 The armouring of the cable shall comply with Table 13 of SANS 1507.

6.20 The earth continuity conductor of the cable shall comply with Table 15 of SANS 1507

6.21 The sheath of the cable shall comply with SANS 1411: Part II and Table 12 of SANS 1507.

6.22 Should the secondary cables be required to be fire retardant; they shall comply with the following clauses:

6.22.1 The cables shall be insulated with flame-retardant reduced halogen emission PVC outer sheath in accordance with SANS 1411-2.

6.22.2 The cables shall comply with flame propagation tests in accordance with SANS 60332-1-1.

6.22.3 The cables shall be tested for flaming droplets/particles in accordance with SANS 60332-1-3. Flaming particles shall not fall off during or after the tests.

6.22.3 The cables shall be tested for smoke emission in accordance with SANS with SANS 61034-2.

Test Certificates

6.23 A test certificate shall be supplied for each drum length of cable used on this contract and shall include the following information:

a) Type of cable.
b) Factory length of cable.
c) Drum number.
d) Length of cable in metres.
e) Size and material of conductors.
f) Conductor resistance in ohms per kilometre at 20 ^{o}C.
g) Minimum insulation resistance in mega-ohms.
h) a.c. r.m.s test withstand voltage.

Marking of Cables

6.24 The outer PVC covering of the cable shall be indelibly embossed at regular intervals of one metre with the letters "EE".

6.25 The length of PVC cable shall be marked off in metres on the outer sheath of the cable. These markings shall start with zero from the inside of the drum and marked at one metre intervals for the total length of the drum. The hot foil print technique shall be used for this marking and the marks shall be white in appearance. Other methods of marking the cables may be considered provided full details are submitted with the tender.

7.0 DRAWINGS AND MANUALS

7.1 T2.2.26 lists the drawings issued with this tender. The issue of these drawings does not absolve the Contractor from the normal responsibilities of providing a satisfactory scheme or from submitting drawings of systems proposed for approval by the Engineer.

7.2 The purpose of the schematic drawings issued with this enquiry is to clarify the requirements detailed in this specification. Tenderers shall comply with the schematic drawings to ensure the successful implementation of the Substation Automation scheme.

7.3 The Contractor shall collate the schematic drawings issued by the manufacturers of all the primary equipment in the substation and ensure that the interfacing of the various types of equipment and the protection and control equipment will result in the successful commissioning of the complete substation in accordance with the requirements of this specification.

7.4 The Contractor shall produce a complete set of schematic drawings including the full schematics of the primary equipment for approval by the Engineer.

7.5 The Contractor shall issue approved schematic drawings to the 11 kV switchboard manufacturer for installation of protection and control wiring in the 11 kV switch panels. The Contractor shall liaise with the 11 kV switchboard manufacturer for the production of drawings showing the front panel face arrangement and cut-outs to accommodate IEDs, push buttons, etc.

7.6 Single page drawings of suitable size shall be produced for the a.c., d.c. and Logic schemes for each bay as well as the schematic diagram of the LAN and logical diagram of goose dependencies. The a.c. and d.c. schematic drawings shall be in AutoCad 2020 ".dwg" format. Approval and as-built drawings shall be provided both in paper format and in electronic format. The drawings shall be signed by the professionally registered Contractor's representative and shall indicate the correct TD drawing supplied in this contract that was used as reference in the scheme design.

7.7 Three paper copy sets of manuals for IEDs and associated equipment shall be provided to the Engineer as soon as possible after contract award but not later than submission of drawings for approval. In addition, electronic versions of manuals shall be provided on a USB memory stick.

8.0 TESTING AND COMMISSIONING

8.1 Routine, type, factory and site testing shall be carried out as specified in Section C 3.2 and T2.2.27.

8.2 The overall testing and commissioning of the substation shall be the responsibility of the Contractor. EThekwini Electricity reserves the right to observe the testing.

8.3 Details indicating the suitability of the personnel who will carry out testing on this contract are required to be submitted with the tender. These details must include experience in testing the type of equipment offered and experience in testing and commissioning fully integrated control and protection projects. Substitution of personnel after tender award shall be subject to the Engineer's approval.

8.4 The Contractor shall supply all necessary equipment for the testing carried out on this contract.

8.5 The primary equipment suppliers will carry out mechanical, electrical and functional testing of their equipment prior to handover. This testing shall be witnessed or repeated by the Contractor as agreed by the Engineer and the supplier of the primary equipment.

8.6 In the case of testing being repeated, the testing and commissioning shall only commence when the primary equipment has been handed over. Any faults shall be reported to the Engineer for rectification by the relevant supplier.

8.7 Details of mechanical, electrical and functional testing required are contained in T2.2.27. The contractor shall produce Test Sheets prior to the commencement of testing for the approval of the Engineer. EThekwini Electricity's standard tests will be made available to the Contractor to be used as a basis for the design of the Test Sheets but this does not absolve the Contractor of the responsibility to include all necessary tests. The Contractor shall complete and sign the Test Sheets as tests are successfully completed.

8.8 Should any faults become evident subsequent to testing, the Contractor shall rectify these at their own cost.

8.9 On completion of all tests, the contractor shall submit the following:

a) Two paper copy sets and one electronic copy set on CD (or USB memory stick) of test results and "as-commissioned" a.c., d.c. and Logic drawings in AutoCad format;
b) Handover of plant certificate;
c) Schematic diagram of the LAN (editable copy);
d) Logic diagram of GOOSE dependencies showing source and destination, application IDs and MAC addresses (editable copy);
e) IP address schedule (editable copy);
f) SCADA signal list; and
g) Ethernet physical connections - switches, routers, IP addresses, physical medium, ports used, DNS and router settings, VLANs diagram.
h) Contractors are to compile and complete a spreadsheet detailing the relevant devices' attributes upon completion of each project. The information that is to be included in this document shall be confirmed with the Project Engineer and shall be subject to change depending on the project

requirements.

i) Cable schedules

j) All IED logic, IED setting, .icd, .cid and .scd files

8.10 A demonstration of selected tests to confirm test results submitted shall be carried out. Details for the demonstration shall be as follows:

a) The Engineer will give at least two week advance notice in writing for the demonstration of tests.

b) All demonstrations under this contract will be witnessed by the Engineer's representative who will be available between 08h30 and 15h30 on weekdays unless otherwise agreed.

c) The Contractor shall supply all necessary equipment for the demonstration.

d) The Contractor shall quote a daily rate in Section C 2.5 for the carrying out of the test demonstration.

e) Should recorded test results be found to be incorrect, the entire project shall be re-tested to the satisfaction of the Engineer with no additional cost to eThekwini Electricity. EThekwini Electricity also reserves the right to insist on the replacement of the testing team should recorded test results be found to be incorrect and the cost for this new team shall be for the Contractor's account.

8.11 Invoices for testing will only be approved for payment after the final commissioning of the project.

8.12 The Contractor shall be present on site when eThekwini Electricity energises the plant tested under this contract. The Engineer will give at least one week advance notice in writing for the energising of the plant.

9.0 TRAINING

9.1 TRAINING ON PROTECTION IEDS

9.1.1 The Contractor shall provide a training course covering the programming and engineering of the protection IEDs supplied.

9.1.2 A training venue and computers for trainees shall be provided by the Contractor. The venue shall be in the eThekwini municipal area.

9.1.3 The contractor shall provide all training manuals, demonstration equipment, IEDs, network hardware, etc. A maximum of 10 candidates per training session shall be catered for.

9.1.4 The training course shall be designed to enable the trainees to become proficient in the following:

a) Functionality, configurability and setting of the IEDs;
b) Support software required to configure and apply settings to the IEDs; and
c) Interrogation of the IEDs for events and fault records.

The training shall be designed to cover the specific application of the IEDs as applied to this contract. Course content shall be to the approval of the Engineer.

9.1.5 At least four weeks' notice shall be given by the Engineer prior to the commencement of the training course. Dates shall be subject to availability of the delegates. The training shall take place prior to the onsite testing of the first substation.

9.2 TRAINING ON SUBSTATION AUTOMATION SYSTEM

9.2.1 This training shall cover the Substation Configuration Tool software, HMI configuration, SCADA Gateway configuration and Ethernet switch configuration.

9.2.2 A training venue and computers for trainees shall be provided by the Contractor.

9.2.3 The Contractor shall provide all training manuals, demonstration equipment, IEDs, network hardware, etc. A maximum of 10 candidates per training session shall be catered for.

9.2.4 The training course shall be designed to enable the trainees to become proficient in the following:

a) Configuration of the substation communication arrangement required for the Substation Automation System according to IEC 61850 using the Substation Configuration Tool;
b) Functionality and configuration of the HMI;
c) Support software required to configure the HMI;
d) Functionality and configuration of the SCADA Gateway; and
e) Support software required to configure the SCADA Gateway.
f) Functionality and configuration of the Ethernet switch; and
g) Support software required to configure the Ethernet switch.

9.2.5 The training shall be designed to cover the specific application of the Substation Configuration Tool, the HMI and the SCADA Gateway as applied to this contract. Course content shall be to the approval of the Engineer.

9.2.6 At least four weeks' notice shall be given by the Engineer prior to the commencement of the training course. Dates shall be subject to availability of the delegates. The training shall take place prior to the factory acceptance testing for the first substation.

9.3 SUPERVISION OF ETHEKWINI STAFF ON SUBSTATION COMMISSIONING

9.3.1 The contractor shall make available his resources to supervise and provide training to eThekwini Electricity's staff on testing and commissioning of a full substation as described in Clause 8 of the technical specification.

9.3.2 The substation(s) that will be commissioned by eThekwini Electricity's Staff under the supervision of the Contractor shall be identified at the time of order.

9.3.3 The training requirements for the EThekwini Staff under this contract are as follows:
a) Protection and Test (P&T) – at least 8 people need to at least commission each type of a bay.
b) SCADA – at least 2 people need to get through at least one IED type and each type of scheme configuration. The scope is for end-to-end testing from injection to annunciation on HMI & SCADA.
c) Comms – at least 2 people need to get through the communication wiring network configuration, switch configuration, IED comms setup for Ethernet, Diff protection configuration and offline testing.

10.0 SPARES

Preference will be given to modular IEDs as stated in Clause 3.1.5 and tenderers shall list and provide a price for all modules, IEDs, SCADA and comms devices that can be procured individually.

11.0 YARD MARSHALLING KIOSKS

11.1 The marshalling kiosks shall be fabricated of stainless steel of grade 304 or corrosion resistant steel CR12. 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.

11.2 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.

11.3 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.

11.4 The top shall be sloped to avoid accumulation of water and the base, while vermin proofed, shall be well ventilated.

11.5 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.

11.6 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 mm2 cable.

11.7 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.

11.8 Spring-loaded terminals shall be mounted on rails. The arrangement of these shall be to the approval of the Engineer.

11.9 The number of terminal blocks to be provided shall be a minimum of 150.

11.10 The cable gland plate shall be at least 400 mm above ground level and shall be made up of several separately removable gland plates for ease of drilling.

11.11 Drawings and specifications of the concrete base for the marshalling kiosks shall be submitted with the tender.

C3.2: SYSTEM PARAMETERS AND PARTICULARS OF EQUIPMENT REQUIRED

1.0 OUTLINE OF REQUIREMENTS

This enquiry covers the supply, delivery, off-loading and installation of protection and control equipment, supply and installation of secondary cabling and complete substation testing and commissioning of the following substations:

a) 132 kV Single Busbar Switchyard
b) 132 kV Double Busbar Switchyard
c) 132/11 kV Substation with 132 kV GIS
d) 132/11 kV Substation with Separated 132 kV Feeders and Transformer Feeders
e) 132/11 kV Substation with Combined 132 kV Feeders and Transformer Feeders

2.0 GENERAL DETAILS

2.1	Ambient temperature (maximum peak)	55 ℃
2.2	Climatic conditions	Tropical with high humidity and subject to salt deposit and heavy industrial pollution
2.3	Altitude	Sea Level
2.4	Isokeraunic level	4-5 ground flashes per km^2 per year
2.5	Construction supply available	400/230 V
2.6	Maximum substation fault level	40 kA at 132 kV
2.7	Substation battery voltages	110 V d.c. Nominal 145 V d.c. Maximum **OR** 220 V d.c. Nominal 250 V d.c. Maximum Depending on site. To be confirmed at the time of order
2.8	Access to site	Hardened road to site
2.9	Address for delivery:	
	Protection And Control Panels	Various sites within 40 km of central Durban
	Loose IEDs	Alstom Switchgear 2 Magnet Road, Knights Boksburg, 1413 **OR** Other address in South Africa as provided based on switchgear contract award
	Documentation	eThekwini Electricity HV Projects 1 Jelf Taylor Crescent, DURBAN, 4001

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3.1 DETAILED REQUIREMENTS: 132 kV SINGLE BUSBAR SWITCHYARD

General

An integrated control and protection system comprising the following elements in accordance with the specification issued with this tender is required (typical quantities and options are indicated in the sections which follow):

a) 132 kV Current Differential Feeder Schemes for 8 feeders
b) 132 kV Bus-Section Scheme
c) 132 kV Busbar Protection Scheme
d) Human Machine Interface
e) SCADA Gateway
f) Communication Network

Details for current transformers and voltage transformers to be supplied by others, where applicable, are given in Section 4 below.
Note: The d.c. system will be supplied, installed and tested by others.

3.1.1 132 kV Current Differential Feeder Scheme

Number of Schemes Required	Minimum 8		
Auto-Reclosing Required	All Feeders	-	No
Current Differential IEDs Required to match existing IEDs at remote ends	Feeders 1 & 2 Feeders 3 & 4 Feeders 5 & 6 Feeders 7 & 8	- - - -	New remote ends New remote ends New remote ends New remote ends
LCD Mimic and 132 kV Circuit Breaker Control Required	All Feeders	-	Yes
Drawings for this Scheme	TD 22 TD 23		

IEDs offered should have a K-Bus rear port for Engineering Network. IEDs offered should preferably have an IRIG-B input and consequently model number will differ from above.

3.1.2 132 kV Bus-Section Scheme

Number of Schemes Required	1
LCD Mimic and 132 kV Circuit Breaker Control Required	Yes
General Alarm Feature Required	Yes
Drawings for this Scheme	TD 24 TD 25

3.1.3 132 kV Busbar Protection Scheme

Number of Protection Zones	2 and a Check Zone
Check Zone Required	Yes
Position of Individual Feeder Bus-Zone Test Blocks	Yard Marshalling Kiosks
Drawings for this Scheme	TD 26 TD 27 TD 28

3.1.4 Human Machine Interface (HMI)

One HMI with functionality, hardware, operating system and panel, as specified in the technical specification and drawings issued with this tender, is required.

3.1.5 SCADA Gateway

Redundant SCADA Gateways, as specified in the technical specification and drawings issued with this tender, is required.

3.1.6 Communication Network

One Ethernet Network, Ethernet switch panel, fibre optic cables and IRIG-B Clock Synchronising Network as specified in the technical specification and drawings issued with this tender is required. A duplicate of these may be required at the remote ends and will be specified at the time of order.

3.1.7 Secondary Cabling

Supply, installation and termination of secondary cabling at the rates tendered in Section C 2.5 and according to the technical specification and drawings issued with this tender are required.

3.1.8 Testing

The following primary equipment supplied by others is to be tested in accordance with T2.2.27:

Equipment To Be Tested	**Quantity**
132 kV Outdoor Feeder Bay Comprising: 1 x Circuit Breaker* 2 x Manual Isolators* 1 x Manual Earth Switches 3 x Current Transformers	Minimum 8
132 kV Outdoor Bus-Section Bay Comprising: 1 x Circuit Breaker* 2 x Manual Isolators* 2 x Manual Earth Switches 3 x Current Transformers	1

*Note: Can exist as a disconnecting circuit breaker

All equipment supplied on this contract including its integration with all other plant is to be tested in accordance with T2.2.27 to a point where it is handed over for energising.

3.2 DETAILED REQUIREMENTS: 132 kV DOUBLE BUSBAR SWITCHYARD

General

An integrated control and protection system comprising the following elements in accordance with the specification issued with this tender is required (typical quantities and options are indicated in the sections which follow):

a) 132 kV Current Differential Feeder Schemes for 10 feeders
b) 132 kV Distance Feeder Schemes for 2 feeders
c) 132 kV Bus-Section Scheme
d) 132 kV Bus-Coupler Scheme
e) 132 kV Busbar Protection Scheme
f) Human Machine Interface
g) SCADA Gateway
h) Communication Network
i) Re-engineered 3-Terminal Current Differential Scheme for Feeders 2 & 4 remote ends
j) Re-engineered Current Differential Scheme for Feeders 1 & 3 remote ends

Details for current transformers and voltage transformers, where applicable, to be supplied by others are given in Section 4 below.
Note: The d.c. system will be supplied, installed and tested by others.

3.2.1 132 kV Current Differential Feeder Scheme

Number of Schemes Required	10
Auto-Reclosing Required	All Feeders
Type of Differential Scheme	Feeders 2 & 4 - 3-Terminal Others - 2-Terminal
Current Differential IEDs Required to match existing IEDs at remote ends	Feeders 2 & 4 - Re-engineered remote ends Others - Re-engineered remote ends
LCD Mimic and 132 kV Circuit Breaker Control Required	Yes
Drawings for this Scheme	TD45 TD46

3.2.2 132 kV Distance Feeder Scheme

Number of Schemes Required	Minimum 2
Auto-Reclosing Required	Yes
LCD Mimic and 132 kV Circuit Breaker Control Required	Yes
Drawings for this Scheme	TD51 TD52

3.2.3 132 kV Bus-Section Scheme

Number of Schemes Required	1
LCD Mimic and 132 kV Circuit Breaker Control Required	Yes
General Alarm Feature Required	Yes
Drawings for this Scheme	TD47 TD48

3.2.4 132 kV Bus-Coupler Scheme

Number of Schemes Required	1
LCD Mimic and 132 kV Circuit Breaker Control Required	Yes
General Alarm Feature Required	No
Drawings for this Scheme	TD49 TD50

3.2.5 132 kV Busbar Protection Scheme

Number of Protection Zones	3
Check Zone Required	Yes
Position of Individual Feeder Bus-Zone Test Blocks	Yard Marshalling Kiosks
Drawings for this Scheme	TD42 TD43 TD44

3.2.6 Human Machine Interface (HMI)

One HMI with functionality, hardware, operating system and panel as specified in the technical specification and drawings issued with this tender is required.

3.2.7 SCADA Gateway

Redundant SCADA Gateways as specified in the technical specification and drawings issued with this tender is required.

3.2.8 Communication Network

One Ethernet Network, Ethernet switch panel, fibre optic cables and IRIG-B Clock Synchronising Network as specified in the technical specification and drawings issued with this tender is required. A duplicate of these may be required at the remote ends and will be specified at the time of order.

3.2.9 Re-engineered 3-Terminal Current Differential Scheme for Feeders 2 & 4 Remote End Substation

Re-engineering of the 3-Terminal Current Differential Schemes at the Remote End Substation is required.

Two loose current differential IEDs to match those supplied for the Remote End/"T" feeders at the Switchyard are required to be supplied and installed in the existing panels at Remote End and any wiring modifications, etc., is to be carried out. Drawings of the existing panels at the Remote End will be issued to the successful tenderer.

3.2.10 Re-engineered Current Differential Scheme for Feeders 1& 3 Remote End Substation

Re-engineering of the Current Differential Schemes at the Remote End Substation is required.

Two loose current differential IEDs to match those supplied for the Remote End feeders at the Switchyard are required to be supplied and installed in the existing panels at Remote and any wiring modifications etc., is to be carried out. Drawings of the existing panels at The Remote End will be issued to the successful tenderer.

3.2.11 Secondary Cabling

Supply, installation and termination of secondary cabling at the rates tendered in Section C 2.5 and according to the technical specification and drawings issued with this tender are required.

3.2.12 Testing

The following primary equipment supplied by others is to be tested in accordance with T2.2.27:

Equipment To Be Tested	**Quantity**
132 kV Outdoor Feeder Bay Comprising: 1 × Circuit Breaker* 3 × Manual Isolators* 1 × Manual Earth Switches 3 × Current Transformers	10
132 kV Outdoor Bus-Section Bay Comprising: 1 × Circuit Breaker* 2 × Manual Isolators* 2 × Manual Earth Switches 6 × Current Transformers 6 × Voltage Transformers	1
132 kV Outdoor Bus-Coupler Bay Comprising: 1 × Circuit Breaker* 2 × Manual Isolators* 1 × Manual Earth Switches 6 × Current Transformers 3 × Voltage Transformers	1

*Note: Can exist as a disconnecting circuit breaker

All equipment supplied on this contract including at remote end substations and including its integration with all other plant is to be tested in accordance with T2.2.27 to a point where it is handed over for energising.

3.3 DETAILED REQUIREMENTS: 132/11 kV SUBSTATION WITH 132 kV GIS

General

An integrated control and protection system comprising the following elements in accordance with the specification issued with this tender are required (typical quantities and options are indicated in the sections which follow):

a) 132 kV Current Differential Feeder Schemes for 4 feeders
b) 132 kV Transformer Feeder Scheme for 2 transformer feeders
c) 132 kV Bus-Section Scheme
d) 132 kV Busbar Protection Scheme
e) 11 kV Feeder Schemes for at most 24 feeders (This may also be required to be applied to 33 kV switchboards)
f) 132/11 kV Transformer Schemes for 4 transformers
g) 11 kV General Control Scheme (This may also be required to be applied to 33 kV switchboards)
h) Human Machine Interface
i) SCADA Gateway
j) Communication Network
k) Re-engineered Current Differential Scheme for remote end Feeder 1
l) Re-engineered Current Differential Scheme for remote end Feeder 2
m) UFLS Scheme (To be specified at the time of order)

Details for current transformers and voltage transformers, where applicable, to be supplied by others are given in Section 4 below.

Note: The d.c. system will be supplied, installed and tested by others.

3.3.1 132 kV Current Differential Feeder Scheme

Number of Schemes Required	4		
Auto-Reclosing Required	All Feeders	-	No
Current Differential IEDs Required to match existing IEDs at remote ends	All Feeders	-	Re-engineered remote ends
LCD Mimic and 132 kV Circuit Breaker Control Required	All Feeders	-	No
Drawings for this Scheme	TD63 TD64		

Additional terminals are required in the panel to accommodate spare cores from the GIS Local Control Cubicle and shall be priced for in Section C 2.5.

3.3.2 132 kV Transformer Feeder Scheme

Number of Schemes Required	4		
Two Overcurrent IEDs Required Per Scheme For Banked Transformers	All Feeders	-	Yes
LCD Mimic and 132 kV Circuit Breaker Control Required	All Feeders	-	No

Drawings for this Scheme	TD65 TD66
Drawings for this Scheme (without the Jericho Scheme)	TD80

Additional terminals are required in the panel to accommodate spare cores from the GIS Local Control Cubicle and shall be priced for in Section C 2.5.

Transformer feeder schemes will not be required for non-Jericho configurations (i.e., without banked transformers) which will be specified at the time of order.

3.3.3 132 kV Bus-Section Scheme

Number of Schemes Required	1
LCD Mimic and 132 kV Circuit Breaker Control Required	No
General Alarm Feature Required	No
Drawings for this Scheme	TD67 TD68

Additional terminals are required in the panel to accommodate spare cores from the GIS Local Control Cubicle and shall be priced for in Section C 2.5.

3.3.4 132 kV Busbar Protection Scheme

Number of Protection Zones	2
Check Zone Required	Yes
Position of Individual Feeder Bus-Zone Test Blocks	In Busbar Protection Panel
Drawings for this Scheme	TD 62 or TD 83 TD 26 TD 27

3.3.5 11 kV Feeder Scheme

Number of Schemes Required	Maximum of 24
Sensitive Earth Fault Protection Required	Yes
Drawings for this Scheme	TD 33 TD 34

3.3.6 132/11 kV Transformer Scheme

Number of Schemes Required	4
11 kV Auto-Reclose Feature Required	No

Bank Intertripping Feature Required	Yes
LCD Mimic and 132 kV Circuit Breaker Control Required	No
Drawings for this Scheme (with transformer feeders)	TD 69 TD 70
Drawings for this Scheme (without transformer feeders)	TD 69.1 TD 70.1

3.3.7 11 kV General Control Scheme

An 11 kV General Control Scheme is required for an 11 kV double busbar switchboard comprising the following:

Number of 11 kV Feeders	Maximum of 24
Number of 11 kV Bus-Couplers	1
Number of 11 kV Bus-Sections	2
Number of 11 kV Incomers	4
Number of 11 kV Busbar Earthing Panels	1
Number of Arc Protection Master IEDs to be Supplied with the Switchboard	4
Drawings for this Scheme	TD 35 TD 36

3.3.8 Re-engineered Current Differential Scheme for Feeder 1 Remote End

Re-engineering of the Current Differential Scheme at remote end is required.
A loose current differential IED to match that supplied for Feeder 1, at the substation, is required to be supplied and installed in the existing panel at Feeder 1 remote end and any wiring modifications etc., is to be carried out. Drawings of the existing panel at Feeder 1 remote end will be issued to the successful tenderer.

3.3.9 Re-engineered Current Differential Scheme for Feeder 2 Remote End

Re-engineering of the Current Differential Scheme at Feeder 2 remote end is required.

A loose current differential IED to match that supplied for Feeder 2, at the substation, is required to be supplied and installed in the existing panel at Feeder 2 remote end and any wiring modifications etc., is to be carried out. Drawings of the existing panel at Feeder 2 remote end will be issued to the successful tenderer.

3.3.10 Human Machine Interface (HMI)

One HMI with functionality, hardware, operating system and panel as specified in the technical specification and drawings issued with this tender is required.

3.3.11 SCADA Gateway

Redundant SCADA Gateways as specified in the technical specification and drawings issued with this tender is required.

3.3.12 Communication Network

One Ethernet Network, Ethernet switch panel, fibre optic cables and IRIG-B Clock Synchronising Network as specified in the technical specification and drawings issued with this tender is required. A duplicate of these may be required at the remote ends and will be specified at the time of order.

3.3.13 Secondary Cabling

Supply, installation and termination of secondary cabling at the rates tendered in Section C 2.5 and according to the technical specification and drawings issued with this tender is required.

3.3.14 Testing

The following primary equipment supplied by others is to be tested in accordance with T2.2.27:

Equipment To Be Tested	Quantity
132 kV GIS Feeder Bay Comprising: 1 × Circuit Breaker 3 × Motorised Isolators 3 × Motorised Earth Switches 1 × 3-Phase Current Transformer Set 1 × 3-Phase Voltage Transformer Set	4
132 kV GIS Transformer Feeder Bay Comprising: 1 × Circuit Breaker 3 × Motorised Isolators 5 × Motorised Earth Switches 2 × 3-Phase Current Transformer Set	2
132 kV GIS Bus-Section Bay Comprising: 1 × Circuit Breaker 2 × Motorised Isolators 2 × Motorised Earth Switches 2 × 3-Phase Current Transformer Set	1
132/11 kV Transformer	4
11 kV Indoor Switchboard Comprising: 24 × Feeders 4 × Transformer Incomers 1 × Bus-Coupler 2 × Bus-Sections 1 × Busbar Earthing Panel	1

All equipment supplied on this contract including at remote end substations and including its integration with all other plant is to be tested in accordance with T2.2.27 to a point where it is handed over for energising.

3.4 DETAILED REQUIREMENTS: 132/11 kV SUBSTATION WITH SEPARATED 132 kV FEEDERS AND TRANSFORMERS FEEDERS

General

An integrated control and protection system comprising the following elements in accordance with the specification issued with this tender is required (typical quantities and options are indicated in the sections which follow):

a) 132 kV Current Differential Feeder Schemes for 2 feeders
b) 132 kV Busbar Protection Scheme
c) 11 kV Feeder Schemes for 24 feeders (This may also be required to be applied to 33 kV switchboards)
d) 132/11 kV Transformer Schemes for 4 transformers
e) 11 kV General Control Scheme (This may also be required to be applied to 33 kV switchboards)
f) Human Machine Interface
g) SCADA Gateway
h) Communication Network
i) UFLS Scheme (To be specified at the time of order)

Details for current transformers and voltage transformers, where applicable, to be supplied by others are given in Section 4 below.

Note: The d.c. system will be supplied, installed and tested by others.

3.4.1 132 kV Current Differential Feeder Scheme

Number of Schemes Required	2		
Auto-Reclosing Required	All Feeders	-	No
Current Differential IEDs Required to match existing IEDs at remote ends	All Feeders	-	New Remote Ends
LCD Mimic and 132 kV Circuit Breaker Control Required	All Feeders	-	Yes
Drawings for this Scheme	TD 58 TD 59		

3.4.2 132 kV Busbar Protection Scheme

Number Of Protection Zones	2
Check Zone Required	Yes
Position Of Individual Feeder Bus-Zone Test Blocks	Yard Marshalling Kiosks
Drawings for this Scheme	TD 57 TD 26 TD 27

3.4.3 11 kV Feeder Scheme

Number of Schemes Required	24
Sensitive Earth Fault Protection Required	Yes
Drawings for this Scheme	TD 33 TD 34

3.4.4 132/11 kV Transformer Scheme

Number of Schemes Required	4
11 kV Auto-Reclose Feature Required	No
Bank Intertripping Feature Required	No
LCD Mimic and 132 kV Circuit Breaker Control Required	Yes
Drawings for this Scheme	TD 60 TD 76

3.4.5 11 kV General Control Scheme

An 11 kV Busbar Protection and General Control Scheme is required for an 11 kV double busbar switchboard comprising the following:

Number of 11 kV Feeders	24
Number of 11 kV Bus-Couplers	1
Number of 11 kV Bus-Sections	2
Number of 11 kV Incomers	4
Number of 11 kV Busbar Earthing Panels	1
Number of Arc Protection Master IEDs to be Supplied with the Switchboard	4
Drawings for this Scheme	TD 35 TD 36

3.4.6 Human Machine Interface (HMI)

One HMI with functionality, hardware, operating system and panel as specified in the technical specification and drawings issued with this tender is required.

3.4.7 SCADA Gateway

Redundant SCADA Gateways as specified in the technical specification and drawings issued with this tender is required.

3.4.8 Communication Network

One Ethernet Network, Ethernet switch panel, fibre optic cables and IRIG-B Clock Synchronising Network as specified in the technical specification and drawings issued with this tender is required. A duplicate of these may be required at the remote ends and will be specified at the time of order.

3.4.9 Secondary Cabling

Supply, installation and termination of secondary cabling at the rates tendered in Section C 2.5 and according to the technical specification and drawings issued with this tender is required.

3.4.10 Testing

The following primary equipment supplied by others is to be tested in accordance with T2.2.27:

Equipment To Be Tested	**Quantity**
132 kV Outdoor Feeder Bay Comprising: 1 × Circuit Breaker* 2 × Manual Isolators* 2 × Manual Earth Switches 3 × Current Transformers	2
132 kV Transformer Bay Comprising: 1 × Circuit Breaker* 1 × Manual Isolators* 1 × Manual Earth Switches	4
11 kV Indoor Switchboard Comprising: 24 × Feeders 4 × Transformer Incomers 1 × Bus-Coupler 2 × Bus-Sections 1 × Busbar Earthing Panel	1

*Note: Can exist as a disconnecting circuit breaker

All equipment supplied on this contract including its integration with all other plant is to be tested in accordance with T2.2.27 to a point where it is handed over for energising.

3.5 DETAILED REQUIREMENTS: 132/11 kV SUBSTATION WITH COMBINED 132 kV FEEDERS AND TRANFORMER FEEDERS

General

An integrated control and protection system comprising the following elements in accordance with the specification issued with this tender is required (typical quantities and options are indicated in the sections which follow):

a) 11 kV Feeder Schemes for maximum of 24 feeders (This may also be required to be applied to 33 kV switchboards)
b) 132/11 kV Transformer Schemes for 4 transformers
c) 11 kV General Control Scheme (This may also be required to be applied to 33 kV switchboards)
d) Combined 132 kV Feeder and Transformer Feeder Schemes for 2 circuits
e) Backup Protection Scheme for 132/11 kV Transformers
f) Human Machine Interface
g) SCADA Gateway
h) Communication Network
i) UFLS Scheme (To be specified at the time of order)

Details for current transformers and voltage transformers, where applicable, to be supplied by others are given in Section 4 below.

Note: The d.c. system will be supplied, installed and tested by others.

3.5.1 11 kV Feeder Scheme

Number of Schemes Required	24
Sensitive Earth Fault Protection Required	Yes
Drawings for this Scheme	TD 33 TD 34

3.5.2 132/11 kV Transformer Scheme

Number of Schemes Required	4
11 kV Auto-Reclose Feature Required	Yes
Bank Intertripping Feature Required	Yes
LCD Mimic and 132 kV Circuit Breaker Control Required	No
Drawings for this Scheme	TD74 TD75

3.5.3 11 kV General Control Scheme

An 11 kV General Control Scheme is required for an 11 kV double busbar switchboard comprising the following:

	Initial Quantity	Maximum Quantity
11 kV Feeders	12	24
11 kV Bus-Couplers	1	1
11 kV Bus-Sections	2	2
11 kV Incomers	2	4
11 kV Busbar Earthing Panels	1	1
Number of Arc Protection Master IEDs to be Supplied with the Switchboard	4	4
Drawings for this Scheme	TD 35 TD 36	

3.5.4 Combined 132 kV Feeder and Transformer Feeder Scheme

Number of Schemes Required	2
Protection Functionality Required	Current Differential Protection (3 Terminal scheme with two remote end Substations)
Incorporation of Control and Status Requirements into One IEC 61850 IED Permitted	Yes
LCD Mimic and 132 kV Equipment Control Required	Yes, For 2 Incoming Circuits and Maximum 4 Transformers
Panel Configuration	One Floor Mounted Panel to Accommodate Both Schemes (Maximum 800 mm wide)
Drawings for this Scheme	TD 72 TD 73

3.5.5 Backup Protection Scheme for 132/11 kV Transformers

Number of Schemes Required	1
Number of Transformers to be Protected	2
Drawings for this Scheme	TD 38

3.5.6 Human Machine Interface (HMI)

One HMI with functionality, hardware, operating system and panel as specified in the technical specification and drawings issued with this tender is required.

3.5.7 SCADA Gateway

Redundant SCADA Gateways as specified in the technical specification and drawings issued with this tender is required.

3.5.8 Communication Network

One Ethernet Network, Ethernet switch panel, fibre optic cables and IRIG-B Clock Synchronising Network as specified in the technical specification and drawings issued with this tender is required. A duplicate of these may be required at the remote ends and will be specified at the time of order.

3.5.9 Secondary Cabling

Supply, installation and termination of secondary cabling at the rates tendered in Section C 2.5 and according to the technical specification and drawings issued with this tender is required.

3.5.10 Testing

The following primary equipment supplied by others is to be tested in accordance with T2.2.27:

Equipment To Be Tested	**Quantity**
132 kV Outdoor Bay Comprising: 1 × Circuit Breaker 1 × Manual Isolator 2 × Motorised Isolators 3 × Manual Earth Switches	2
132/11 kV Transformer	4
11 kV Indoor Switchboard Comprising: 24 × Feeders 2 × Transformer Incomers 1 × Bus-Coupler 2 × Bus-Sections 1 × Busbar Earthing Panel	1

All equipment supplied on this contract including its integration with all other plant is to be tested in accordance with T2.2.27 to a point where it is handed over for energising.

4.0 DETAILS OF CURRENT AND VOLTAGE TRANSFORMERS

4.1 132 kV Feeder - Current Transformers for 132 kV Single and Double Busbar Switchyards (To be confirmed for each order prior to design)

Core	Protection Function of CT	Ratio & Class	Min Knee Point Voltage on Lowest Ratio (V)	Secondary Resistance (Ω)	Max Exciting Current at Knee point Voltage (mA)
1	Main Protection	1600/1200/1000/800/600/500/400/300/150/1 Class X	150	6	100
2	Main Protection	1600/1200/1000/800/600/500/400/300/150/1 Class X	150	6	100
3	Overcurrent	1600/1200/1000/800/600/500/400/1 15VA 5P10			
4	Bus Zone	1600/1200/1000/800/600/500/400/300/150/1 Class X	150	6	100
5	Bus Zone	1600/1200/1000/800/600/500/400//300/150/1 Class X	150	6	100

132 kV Bus-Coupler/Bus Section - Current Transformers for 132 kV Single and Double Busbar Switchyards (To be confirmed for each order prior to design)

Core	Protection Function of CT	Ratio & Class	Min Knee Point Voltage on Lowest Ratio (V)	Secondary Resistance (Ω)	Max Exciting Current at Knee Point Voltage (mA)
1	Bus Zone	3200/2400/2 000/1600/1200/1000/800/2 Class X	400	9	100
2	Bus Zone	3200/2400/2000/1600/1200/1000/800/2 Class X	400	9	100
3	Overcurrent	4800/4000/3200/2400/2000/1600/1200/ 1000/800/2 15VA 5P10			

4.3 132 kV Voltage Transformer for 132 kV Double Busbar Switchyard

132 kV/110 V 200 VA Class 3P

4.3 132 kV Voltage Transformer for 132 kV Substation with 132 kV GIS

132 kV/110 V 100 VA Class 0,5

4.5 11 kV Switchboard Voltage Transformer

11 kV/110 V 200 VA Class 0,5

4.6 132 kV GIS: Current Transformers (To be confirmed for each order prior to design)

LOCATION	PROTECTION FUNCTION	CORE	No. Req	RATIO	CLASS	BURDEN (VA)	MIN V_{KP} @ LOWEST RATIO (V)	MAX I_{MAG} (mA)	R_{MAX} @ HIGHEST RATIO (Ω)
Incomers	Bus Zone (Main)	1	3	1600/800/400/1	X		300 V	100 mA	6.4 Ω
	Bus Zone (check)	2	3	1600/800/400/1	X		300 V	100 mA	6.4 Ω
	OC/EF	3	3	1600/1200/100/800/600/1	5P20	15 VA			
	Spare	4	3	1600/1200/100/800/600/1	X		400 V	100 mA	6.4 Ω
	Cable Diff	5	3	1600/1200/100/800/600/1	X		400 V	100 mA	6.4 Ω
Bus Section	Bus Zone (Main 1)	1	3	1600/800/400/1	X		300 V	100 mA	6.4 Ω
	OC/EF	2	3	1600/1200/100/800/600/1	5P20				
	Bus Zone (Main 2)	3	3	1600/800/400/1	X		300 V	100 mA	6.4 Ω
Transformers	Bus Zone (Main)	1	3	1600/800/400/1	X		300 V	100 mA	6.4 Ω
	Bus Zone (check)	2	3	1600/800/400/1	X		300 V	100 mA	6.4 Ω
	OC/EF	3	3	800/600/400/1	5P20	15 VA			
	Spare	4	3	1600/1200/100/800/600/1	X		400 V	100 mA	6.4 Ω
	HV REF	5	3	150/1	X		100 V	100 mA	0.7 Ω
	Transformer Differential	6	3	800/600/300/1	X		300 V	50 mA	1.6 Ω

4.7 132/11 kV Transformer - Current Transformers (To be confirmed for each order prior to design)

TYPE	LOCATION	CORE	PROTECTION FUNCTION	Nr OF CTs	RATIO	CLASS	BURDEN (VA)	MIN V_{KP} @ LOWEST RATIO (V)	MAX I_{MAG} (mA)	R_{MAX} @ HIGHEST RATIO (Ω)
132/11 kV 30 MVA Types 1, 2, 3 and 4	HV Bushing	1	Trfr Diff	3	300/1	X	-	300	50	1,2
		2	HV Buszone	3	1600/1200/800/400/1	X	-	400	100	6,4
		3	HV REF	3	150/1	X	-	150	50	0,3
		4	Overcurrent	3	800/400/1	5P15	10	-	-	-
		5	Cable Diff	3	800/400/1	X	-	400	50	3,2
	HV Neutral	1	Restricted E/F	1	150/1	X	-	150	50	0,3
		2	Neutral Check	1	150/1	5P15	10	-	-	-
	LV Bushing	1	WTI	As required						
		2	Line drop com	2	1575/5		10	-	-	-
	LV Neutral	1	Spare	1	800/400/1	X	-	200	100	1,6
		2	Standby E/F 1 & 2	1	800/5	5P10	10	-	-	-
		3	LV REF	1	1800/5	X	-	300	50	0,88

4.8 11 kV Switchboard - Current Transformers (To be confirmed for each order prior to design)

PANEL	PROTECTION FUNCTION	RATIO	CLASS	BURDEN (VA)	Min V_{KP} @ LOWEST RATIO (V)	MAX I_{MAG} (mA)	R_{MAX} @ HIGHEST RATIO (Ω)
Incomer 132/11 kV, 30 MVA Trfr	Trfr Diff	1800/1	X	-	250	50	7.2
	DOC, O/C & E/F	2000/1800/1600/1200/5	5P15	10	-	-	-
	REF	1800/5	X	-	300	50	0.8
	Spare	2000/1800/1600/1200/1	X	-	250	50	8
Incomer 33/11 kV, 25 MVA Trfr	Trfr Diff	1800/1	X	-	250	50	7.2
	DOC, O/C & E/F	2000/1800/1600/1200/5	5P20	10	-	-	-
	REF	1800/5	X	-	300	50	0.8
	Spare	2000/1800/1600/1200/1	X	-	250	50	8
Incomer 33/11 kV, 15 MVA Trfr	Trfr Diff	1800/1	X	-	250	50	7.2
	DOC, O/C & E/F	2000/1800/1600/1200/1	5P20	10	-	-	-
	REF	900/5	X	-	200	75	0.4
	Spare	2000/1800/1600/1200/1	X	-	250	50	8
Feeder	Cable Diff	500/1	X	-	250	100	2.0
	O/C, E/F & SE/F	500/1	5P20	10	-	-	-
	Spare	400/5	X	-	100	180	0.3

5.0 TRAINING

Training is required on Protection IEDs and the Substation Automation System as defined in the Technical Specification.

6.0 SPARES

One spare of each type of module used in IEDs with protection functions is required.

C3.3: GENERAL PROJECT SPECIFICATIONS

C3.3.1 MANAGEMENT OF THE ENVIRONMENT

The Contractor shall pay special attention to the following:

C3.3.1.1 Fires

The Contractor shall comply with the statutory and local fire regulations. He shall also take all necessary precautions to prevent any fires. In the event of fire the Contractor shall take active steps to limit and extinguish the fire and shall accept full responsibility for damages and claims resulting from such fires which may have been caused by him or his employees.

C3.3.1.2 Environmental Management Plan

In addition to the above, all requirements according to the Environmental Management Plan as detailed in C3.4: Particular Specifications, shall be adhered to.

C3.3.2 OCCUPATIONAL HEALTH AND SAFETY

C3.3.2.1 General Statement

When considering the safety on site the Contractor's attention is drawn to the following:

Describe issues relating to OH&S and the Regulations

It is a requirement of this contract that the Contractor shall provide a safe and healthy working environment and to direct all his activities in such a manner that his employees and any other persons, who may be directly affected by his activities, are not exposed to hazards to their health and safety. To this end the Contractor shall assume full responsibility to conform to all the provisions of the Occupational Health and Safety Act No 85 and Amendment Act No 181 of 1993, and the OHSA 1993 Construction Regulations 2014 issued on 7 February 2014 by the Department of Labour.

For the purpose of this contract the Contractor is required to confirm his status as mandatory and employer in his own right for the execution of the contract by entering into an agreement with the Employer in terms of Section 37(2) of the Occupational Health and Safety Act.

C3.3.2.2 Health and Safety Specifications and Plans to be submitted at tender stage

C3.3.2.2.1 Employer's Health and Safety Specification

The Employer's Health and Safety Specification is included in Part C3.4: Particular Specifications.

C3.3.2.2.2 Tenderer's Health and Safety Plan

C3.3.2.2.2.1 It is a requirement of this contract, that a Safety Plan, in accordance with eThekwini Electricity's Safety Rules and the Occupational Health and Safety Act (ACT 85 OF 1993)

as amended, be submitted with the tender. The Safety Plan shall provide for the procedures and equipment necessary to undertake the scope of work specified in tender document, in all aspects. (Refer to **Returnable Schedules Part T2.1**).

C3.3.2.2.2.2 The Contractor shall provide and demonstrate to the Council a suitable and sufficiently documented health and safety plan, which will be applied from the date of commencement and for the duration of the construction work.

C3.3.2.2.2.3 The successful Tenderer's shall submit a detailed safety plan will take into consideration the site specific risks and must cover at least the following:

(a) A proper risk assessment of the works, risk items, work methods and procedures in terms of Regulation 9.
(b) Pro-active identification of potential hazards and unsafe working conditions.
(c) Provision of a safe working environment and equipment.
(d) Statements of methods to ensure the health and safety of subcontractors, employees and visitors to the site, including safety training in hazards and risk areas (Regulation 7).
(e) Monitoring health and safety on the site of works on a regular basis, and keeping of records and registers as provided for in the Construction Regulations.
(f) Details of the Construction Supervisor, the Construction Safety Officers and other competent persons he intends to appoint for the construction works in terms of Regulation 8 and other applicable regulations.
(g) Details of methods to ensure that his Health and Safety Plan is carried out effectively in accordance with the Construction Regulations 2014.

C3.3.2.2.2.4 The Contractor's Health and Safety Plan will be subject to approval by the Employer, or amended if necessary, before commencement of construction work. The Contractor will not be allowed to commence work, or his work will be suspended if he had already commenced work, before he has obtained the Employer's written approval of his Health and Safety Plan.

C3.3.2.2.2.5 Time lost due to delayed commencement or suspension of the work as a result of the Contractor's failure to obtain approval for his safety plan, shall not be used as a reason to claim for extension of time or standing time and related costs.

C3.4: PARTICULAR SPECIFICATIONS

In addition to the Standardized and Project Specifications the following Particular Specifications / Policies shall apply to this contract:

C3.4.1 ENVIRONMENTAL MANAGEMENT SPECIFICATIONS – ETHEKWINI MUNICIPALITY

C3.4.2 APPLICATION FOR ACCREDITATION ON SUPPLIER DATABASE

C3.4.3 36503-5E HEALTH AND SAFETY SPECIFICATION

C3.4.4 36503-5E COVID-19 HEALTH AND SAFETY SPECIFICATION

C3.4.5 36503-5E BASELINE RISK ASSESSMENT

C3.4.6 36503-5E SECTION 37.2 AGREEMENT

C3.4.1: ENVIRONMENTAL MANAGEMENT SPECIFICATIONS – ETHEKWINI MUNICIPALITY

(27 Pages)

C3.4.2: APPLICATION FOR ACCREDITATION ON SUPPLIER DATABASE

(27 Pages)

C3.4.3: 36503-5E 37.2 HEALTH AND SAFETY SPECIFICATION

(37 Pages)

C3.4.4: 36503-5E COVID-19 HEALTH AND SAFETY SPECIFICATION

(6 Pages)

C3.4.5: 36503-5E BASELINE RISK ASSESSMENT

(19 pages)

C3.4.6: 36503-5E SECTION 37.2 AGREEMENT

(5 pages)

C3.5: ANNEXURES

ANNEXURE A: MANDATORY LOGICAL NODES

ANNEXURE B: TENDER DRAWINGS