KOUGA
local municipality
Good Governance through Service Excellence

Tender

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

BID NO.: 118/2024

VOLUME 1

(RETURNABLE DOCUMENT)

SERVICE PROVIDER		
TELEPHONE / FACSIMILE		
CLOSING DATE	**27 JUNE 2024 at 12:00**	

KOUGA LOCAL MUNICIPALITY

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

GENERAL TENDER INFORMATION

TENDERS INVITED	:	27 MAY 2024
ESTIMATED CIDB CONTRACTOR GRADING	:	6EP or higher
CLARIFICATION MEETING	:	A compulsory Virtual clarification meeting will be held on Wednesday 5 JUNE 2024 at 14h00pm.
VENUE FOR SITE VISIT / CLARIFICATION MEETING	:	Virtual on-line clarification meeting
CLOSING DATE	:	Thursday, 27 JUNE 2024
CLOSING TIME	:	12:00:00 PM
CLOSING VENUE	:	Tender Box at the Municipal Office, Room 122 16 Woltemade Street (front) / 21 St. Croix Street (back), Jeffreys Bay, 6330
VALIDITY PERIOD OF TENDER	:	90 days
TENDER BOX		The Tender Documents (which includes the Form of Offer and Acceptance) completed in all respects, plus any additional supporting documentation required, must be submitted in a sealed envelope with the name and address of the tenderer, the tender No. and title and the closing date indicated on the envelope. The sealed envelope must be inserted into the appropriate official tender box before closing time. The onus remains with the tenderer to ensure that the tender is placed in the correct tender box.

KOUGA LOCAL MUNICIPALITY

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

BID NO.: 118/2024

PARTICULARS OF BIDDER

Name of Bidder	
Contact Person:	
Postal Address	
Street Address	
Telephone Number	Code: Number:
Cellphone Number	
Facsimile Number	Code: Number:
E-Mail Address	
CSD Supplier Number (National Treasury)	
CIDB CRS Number	
Vat Registration Number	

KOUGA MUNICIPALITY

DIRECTORATE: ELECTROMECHANICAL SERVICES

TENDER NUMBER: 118/2024

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

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KOUGA MUNICIPALITY

DIRECTORATE: ELECTROMECHANICAL SERVICES

TENDER NUMBER: 118/2024

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

Part T: The Tender

The Tender (Part T)

KOUGA MUNICIPALITY

DIRECTORATE: ELECTROMECHANICAL SERVICES

TENDER NUMBER: 118/2024

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

Part T1: Tender Procedure

Part T1.1: Tender Notice and Invitation to Tender

KOUGA LOCAL MUNICIPALITY (EC108)
DIRECTORATE: ELECTRO-MECHANICAL ENGINEERING
NOTICE NO: 118/2024
UPGRADE OF OCEANVIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

Suitably Qualified, Capable and Experienced Professional Service Providers are hereby invited to submit tenders for the Upgrade of Oceanview substation switchgear for Kouga Municipality.

Tenders

An electronic copy of the tender document will be available on E-Tender portal www.etender.gov.za or the municipal website www.kouga.gov.za as from Monday, 27 May 2024. After downloading the tender document from the website each prospective bidder **MUST** send a request to tenders@kouga.gov.za and copied to mmangembe@kouga.gov.za.

The link will also be available on the municipal website.

A compulsory virtual clarification session will be arranged for the **Wednesday, 05 June 2024 @10h00am. Prospective bidders can use the very same link below which is direct from this advert, it will link them directly to the meeting.**

Join zoom meeting:

https://kouga-gov-za.zoom.us/j/98236063956?pwd=MndJcWpZU3F2WEthSGRCNE45dHZwZz09

Meeting ID: 982 3606 3956
Passcode: 596401

Please note:

- Telegraphic, telephonic, telex, facsimile, email or late tenders will not be accepted.
- This contract will be evaluated on the 80 (price)
- The specific goals would be for a maximum of 20 points. To claim for specific goals prospective bidders MUST submit proof/required documents.
- **An electronic copy of the completed tender document with returnable documents must be submitted with tender submission saved a in a flash drive or CD. Failure to submit AN ORIGINAL HARD COPY AND A COPY ON EITHER USB or CD will deem the bid non-responsive.**

- **An estimated contractor CIDB grading of 6EP or higher is required.**
- **A minimum functional score of 70% will apply to this tender.**
- A valid Tax compliance Status pin must be submitted.
- Prospective Service Providers must register on Kouga Municipality's Supplier database as per the registration requirements.
- The National Treasury Central Supplier Database Summary report must be submitted.
- The Council reserves the right to accept any tender and, or part thereof, appoint more than one contractor, and does not bind itself to accept the lowest or any tender. The Council reserves the right to appoint any contractor.
- The validity period for submission will be 90 days from the closing date.
- Tenders that are deposited in the incorrect box or delivered to any other venue will not be considered.

Any inquiries relating to this tender must be submitted in writing via e-mail to tenders@kouga.gov.za and copied to mmangembe@kouga.gov.za.

Completed documents in a sealed envelope endorsed "**NOTICE NO: 118/2024: "UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY"**, must be placed in the Tender Box 21 St Croix Street (back entrance) or 16 Woltemade Street (front entrance), Jeffrey's Bay, Room 122 on or before **THURSDAY, 27 JUNE 2024 at 12:00.**

C. DU PLESSIS

MUNICIPAL MANAGER

P.O. Box 21

JEFFREYS BAY
6330

For Placement: Herald – 27 May 2024
Municipal Website/ Municipal Notice Boards in all offices/areas – 27 May 2024

KOUGA MUNICIPALITY

DIRECTORATE: ELECTROMECHANICAL SERVICES

TENDER NUMBER: 118/2024

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

Part T1.2: Tender Data

The conditions of tender are the Standard Conditions of Tender as contained in Annex C of the Construction Industry Development Board (CIDB) Standard for Uniformity in Engineering and Construction Works Contracts as published in Department of Public Works Notice 423 of 2019 No. 42622 Government Gazette 8 August 2019. (See www.cidb.org.za).

The Standard Conditions of Tender make several references to the Tender Data for details that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the standard conditions of tender. Each item of data given below is cross-referenced to the clause in the Standard Conditions of Tender to which it mainly applies.

The following variations, amendments and additions to the Standard Conditions of Tender as set out in the Tender Data below shall apply to this tender:

Clause number	The conditions of Tender are the **Standard Conditions of Tender** as contained in the Construction Industry Development Board (CIDB) Standard for Uniformity in Engineering and Construction Works Contracts, August 2019 (See www.cidb.org.za). The Standard Conditions of Tender for Procurements make several references to the Tender Data for details that apply specifically to this Tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the standard conditions of Tender. 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 is Kouga Municipality
C.1.2	**Tender Documents**
	The documents issued by the employer for the purpose of a tender offer are listed in the tender data. **Part T: The Tender Data** Part T1.1 Tender notice and invitation to tender Part T1.2 Tender data **Part T2 Returnable Documents** Part T2.1 List of returnable documents Part T2.1 Returnable schedules Part T2.2 Other documents required for tender evaluation purposes T2.3. Returnable schedules that will be incorporated in the contract **Part C: The Contract** **Part C1: Agreement and contract data** Part C1.1 Form of offer and acceptance Part C1.2 Contract and data conditions Part C1.3 Objections and Complainants form **Part C2: Pricing data**

	Part C2.1 Pricing instructions Part C2.2 Bill of Quantities (BoQ) **Part C3: Scope of Works** Part C3.1 Description of works **Part C4: Health and Safety Specification** **Part C5: Site Information** **Part C6: Annexures**
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/quote.
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 able 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 utilized 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. The Employer's Agent is: Name: CVW Consulting Engineers (Pty)Ltd Address: 24 Bland Street, Mossel Bay, 6500 Tel: 044-6912074 Fax: 044-6912075 E-mail: jb.cvw@cvw-e.com Any inquiries relating to this tender must be submitted in writing via e-mail to tenders@kouga.gov.za.
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; or 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**
C.1.6.2	The Competitive Negotiation Procedure will not be followed.
C.1.6.3	The proposal procedure using the two-stage system will not be followed.
C.2	**Tenderer's obligations**
C.2.1	**Eligibility** Only those tenderers who satisfy the following criteria are eligible to submit tenders: 1. The tenderer must have experience of having successfully completed; supply, deliver, installation, testing and commissioning of power transformers exceeding minimum of 1MVA including terminations and earthing. 2. The tenderer must have experience of having successfully completed; supply, deliver, installation, testing, supervision and commissioning high voltage switchgear in substations including terminations and earthing. Experience in outdoor high voltage switchgear will be preferable. 3. The tenderer must have experience of having successfully completed; supply, deliver, installation/construction, testing, supervision and commissioning of overhead power lines on no less than 11kV level. Experience in overhead non-insulated conductor, terminations and working on heights in substations will be required. 4. A minimum CIDB contractor grading designation of 6EP or higher is required and must be registered on the Central Supplier Database (CSD). The Contractor's grading must, however, be in accordance with the total sum awarded to that Contractor. 5. A Tenderer that is registered as an Electrical Contractor with the Department of Labour and which shall remain valid for the duration of the contract. 6. The tenderer shall provide details of contactable referees to verify experience of completed project and Practical Completion Certificates signed by the Client or their Agent.
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 comply 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**

	An electronic copy of the tender document will be available on E-Tender portal www.etender.gov.za or the municipal website www.kouga.gov.za as from Monday, 27 May 2024. After downloading the tender document from the website each prospective bidder **MUST** send a request to tenders@kouga.gov.za and copied to mmangembe@kouga.gov.za. The link will also be available on the municipal website. A compulsory virtual clarification session will be arranged for the **Wednesday, 05 June 2024 @10h00am. Prospective bidders can use the very same link below which is direct from this advert, it will link them directly to the meeting.** Join zoom meeting: https://kouga-gov-za.zoom.us/j/98236063956?pwd=MndJcWpZU3F2WEthSGRCNE45dHZwZz09 Meeting ID: 982 3606 3956 Passcode: 596401 Bidders should be represented at the compulsory virtual session and compulsory site visit meeting by a **technical employee from the prospective bidder** who is suitably qualified and experienced to comprehend the implications of the work involved.
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	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.2.17	**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 Specific Goals; 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 and Specific Goals. 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 bases on a procurement system that satisfies the following system requirements: **Requirement** — **Qualitative interpretation of goal** 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**
	Points will be awarded to Tenderers who are eligible for preferences in terms of the Preference Points Claim Form in terms of the Preferential Procurement Regulations, 2017, which is included in Part T2.2. The terms and conditions of the Preference Points Claim Form shall apply in all respects to the tender evaluation process and any subsequent contract.
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**
	Tender offers will only be accepted if: a) the tenderer submits a tax compliance status certificate issued by the South African Revenue Services or has made arrangements to meet outstanding tax obligations; b) the tenderer submits a letter of intent from an approved insurer undertaking to provide the Performance Bond to the format included in Part T2.2 of this procurement document c) the tenderer is registered with the Construction Industry Development Board in an appropriate contractor grading designation; d) the tenderer or any of its directors/shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector; 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 tenderer has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process and persons in the employ of the state are permitted to submit tenders or participate in the contract; g) the tenderer is registered and in good standing with the compensation fund or with a licensed compensation insurer; h) 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. i) the Tenderer has not failed to perform on any previous contracts and has not been given written notice to the effect. j) the Tenderer is not in arrears for more than 30 days with municipal rates and taxes and service charges.
	The appointment of a Contractor will be subject to the availability of funding. The Employer reserves the right to accept a tender in whole or in parts with certain items being added, or in whole with the provision that certain items of work may be omitted at a later date.
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**
	The number of paper copies of the signed contract to be provided by the employer is one (1).
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.

B-BBEE certificates submitted with the tender documents MUST be a VALID ORIGINAL B-BBEE CERTIFICATE or VALID CERTIFIED COPY OF THE B-BBEE CERTIFICATE.

In the case of a Trust, Consortium or Joint Venture, they will qualify for points for their B-BBEE status level as a legal entity, provided that the entity submits their B-BBEE status level certificate.

MBD 1

TAX COMPLIANCE INFORMATION (PART A)

Tax Compliance Status	TCS Pin:		**or**	CSD No:	
B-BBEE Status Level Verification Certificate [Tick Applicable Box]	☐ Yes ☐ No		B-BBEE Status Level Sworn Affidavit	☐ Yes ☐ No	
[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE / SWORN AFFIDAVIT (FORM EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]					
Are You The Accredited Representative **In South Africa For The Goods / Services / Works Offered?**	☐ Yes ☐ No [If Yes, Enclose Proof]		Are You A Foreign Based Supplier For **The Goods / Services / Works Offered?**	☐ Yes ☐ No [If Yes, Answer Part 2.]	
Signature of Bidder	……..…		Date	……..	

TERMS AND CONDITIONS FOR BIDDING (PART B)

1. TAX COMPLIANCE REQUIREMENTS

1.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.

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

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

1.4 FOREIGN SUPPLIERS MUST COMPLETE THE PRE-AWARD QUESTIONNAIRE IN PART B2.

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

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

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

2. QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS [Tick Applicable Box]		
2.1 Is the entity a resident of the Republic of South Africa (RSA)?	YES	NO
2.2 Does the entity have a branch in the RSA?	YES	NO
2.3 Does the entity have a permanent establishment in the RSA?	YES	NO
2.4 Does the entity have any source of income in the RSA?	YES	NO
2.5 Is the entity liable in the RSA for any form of taxation?	YES	NO
IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 1.3 ABOVE.		

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

Signature of Bidder: ……..……..……..

Capacity Under Which This Bid Is Signed: ……..……..……..

Date: ……

MBD 4

DECLARATION OF INTEREST

1.	No bid will be accepted from persons in the service of the state*.	
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 the service of the state, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority.	
3.	In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.	
3.1	Full Name of bidder or his / her representative: ……..	
3.2	Identity number: ……	
3.3	Position occupied in the Company (director, trustee, shareholder²): ……..	
3.4	Company Registration Number: …….	
3.5	Tax Reference Number: ……..	
3.6	VAT Registration Number: …….	
3.7	The names of all directors / trustees / shareholders / members, their individual identity numbers and state employee numbers (where applicable) must be indicated in paragraph 4 below.	
3.8	Are you presently in the service of the state?*	
3.8.1	If yes, furnish the following particulars: Name of person / director / trustee / shareholder member: …….. Name of state institution at which you or the person connected to the bidder is employed: …….. Position occupied in the state institution: …….. Any other particulars: ……. ……..	**YES / NO**

3.9 3.9.1	Have you been in the service of the state for the past twelve months? If so, furnish particulars. …….. ……..	**YES / NO**
3.10 3.10.1	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 the following particulars: Name of person: ……. Name of state institution at which you or the person connected to the bidder is employed: …….. Position occupied in the state institution: …….. Any other particulars: ……. ……..	**YES / NO**
3.11 3.11.1	Are you aware of any relationship (family, friend, other) between the bidder and any person in the service of the state who may be involved with the evaluation and or adjudication of this bid? If yes, furnish the following particulars: Name of person: ……. Name of state institution at which you or the person connected to the bidder is employed: …….. Position occupied in the state institution: …… Any other particulars: ……. ……...	**YES / NO**
3.12 3.12.1	Are any of the company's directors, managers, principal shareholders or stakeholders in the service of the state? If yes, furnish the following particulars: Name of person / director / trustee / shareholder / member:	**YES / NO**

	…… Name of state institution at which you or the person connected to the bidder is employed: …….. Position occupied in the state institution: …… Any other particulars: ……. ……..……..	
3.13 3.13.1	Is any spouse, child or parent of the company's directors, trustees, managers, principle shareholders or stakeholders in the service of the state? If yes, furnish the following particulars: Name of person / director / trustee / shareholder / member: …… Name of state institution at which you or the person connected to the bidder is employed: …….. Position occupied in the state institution: …… Any other particulars: ……. ……..……..	**YES / NO**
3.14 3.14.1	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. Full details of directors / trustees / members / shareholders:

THE FOLLOWING INFORMATION IS COMPULSORY TO COMPLETE:

Full Name	Identity Number	Individual Tax Number for each Director	State Employee Number (where applicable)

5.	**The contract will be automatically cancelled if there is a conflict of interest which is not disclosed by the bidder.**

Protection of Personal Information Act, 2013 (Act no.4 of 2013) (POPIA)

All parties agree that they will comply with Protection of Personal Information Act, 2013 (Act no.4 of 2013) (POPIA) and process all the information and/or personal data in respect of the goods and/or services being rendered in accordance with the said act and only for the purpose of providing the goods and/or services set out in the agreement to provide such goods and/or services.

The contract between the municipality and the service provider must ensure compliance with the Protection of Personal Information Act, 2013 (Act no.4 of 2013) (POPIA), in that the service provider establishes and maintains security measures to safeguard personal information being processed on behalf of the municipality. The service provider must notify the municipality immediately in an event where there are reasonable grounds to believe personal information has been accessed by an unauthorized person.

The contract with a service provider must ensure confidentiality of personal information processed on behalf of the municipality. A supply contract with a service provider must include standard clauses outlining joint responsibility in terms of the protection of personal information.

……..	……..……..
Signature	Date
……	…….
Capacity	Name of Bidder

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

(a) a member of –
  (i) any municipal council;
  (ii) any provincial legislature; or
  (iii) the National Assembly or the National Council of Provinces;
(b) a member of the board of directors of any municipal entity;
(c) an official or any Municipality or municipal entity;
(d) an employee of any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No. 1 of 1999);
(e) a member of the accounting authority of any national or provincial entity; or
(f) an employee of Parliament or a provincial legislature.

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

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:

1. 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.

……..…….

……

2. Do you have any outstanding undisputed commitments for ***YES / NO** 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?

2.1 If no, this serves to certify that the bidder has no undisputed commitments for municipal services toward 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 Has any contract been awarded to you by an organ of state ***YES / NO** during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract?

3.1 If yes, provide particulars.

……..…….

……

……..……

……

4 Will any portion of goods or services be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality / municipal entity is expected to be transferred out of the Republic? *__YES / NO__

4.1 If yes, furnish particulars.

……..……

……

……..……

……

CERTIFICATION

I, THE UNDERSIGNED (NAME) ……..……
CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS CORRECT. I ACCEPT THAT THE STATE MAY ACT AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

…….. ……..……..
Signature Date

…… …….
Position Name of Bidder

MBD 6.1

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022

This preference form must form part of all tenders invited. It contains general information and serves as a claim form for preference points for specific goals.

NB: BEFORE COMPLETING THIS FORM, TENDERERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF THE TENDER AND PREFERENTIAL PROCUREMENT REGULATIONS, 2022

---

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to invitations to tender:

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

1.2 To be completed by the organ of state

The applicable preference point system for this tender is the 80/20 preference point system.

1.3 Points for this tender (even in the case of a tender for income-generating contracts) shall be awarded for:

(a) Price;

(b) BBBEE; and

(c) Specific Goals.

1.4 To be completed by the organ of state:

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	80/90
BBBEE	10/5
SPECIFIC GOALS	10/5
Total points for PRICE and SPECIFIC GOALS	**100**

1.5 Failure on the part of a tenderer to submit proof or documentation required

in terms of this tender to claim points for specific goals with the tender will be interpreted to mean that preference points for specific goals are not claimed.

1.6 The organ of state reserves the right to require of a tenderer, either before a tender is adjudicated or at any time subsequently, to substantiate any claim regarding preferences, in any manner required by the organ of state.

2. DEFINITIONS

(a) **"tender"** means a written offer in the form determined by an organ of state in response to an invitation to provide goods or services through price quotations, competitive tendering process or any other method envisaged in legislation;

(b) **"price"** means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts;

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

(d) **"tender for income-generating contracts"** means a written offer in the form determined by an organ of state in response to an invitation for the origination of income-generating contracts through any method envisaged in legislation that will result in a legal agreement between the organ of state and a third party that produces revenue for the organ of state, and includes, but is not limited to, leasing and disposal of assets and concession contracts, excluding direct sales and disposal of assets through public auctions; and

(e) **"the Act"** means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

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

A maximum of 90 points is allocated for price on the following basis: 90/10

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

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

3.2. FORMULAE FOR DISPOSAL OR LEASING OF STATE ASSETS AND INCOME GENERATING PROCUREMENT

3.2.1. POINTS AWARDED FOR PRICE

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

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

$$Ps = 80\left(1 + \frac{Pt - P\,max}{P\,max}\right) \text{ or } \qquad Ps = 90\left(1 + \frac{Pt - P\,max}{P\,max}\right)$$

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmax = Price of highest acceptable tender

4. POINTS AWARDED FOR BBBEE AND SPECIFIC GOALS

4.1. In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goals stated in table 1 below as may be supported by proof/ documentation stated in the conditions of this tender:

4.1.1 Points awarded for B-BBEE Level of Contributor

In terms of the Specific Goals as per the Kouga Municipality Preferential Procurement Policy, preference points must be awarded to a tenderer for attaining the B-BBEE status level of contribution in accordance with the table below:

B-BBEE Status Level of Contributor	Number of Points for Preference (80/20)	Number of Points for Preference (90/10)
1	10	5
2	9	4.5
3	7	3
4	6	2.5
5	4	2
6	3	1.5
7	2	1
8	1	0.5
Non-compliant contributor	0	0

Bidder MUST submit a valid BBBEE certificate; failure to attach no points will be awarded for BBBEE points.

Bidder MUST submit proof of address (e.g., municipal account, rental/lease agreement, or affidavit) not older than three (3) months. Failure to attach proof will result in no points awarded for Specific Goals.

4.2. In cases where organs of state intend to use Regulation 3(2) of the Regulations,

which states that, if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of state must, in the tender documents, stipulate in the case of—

(a) an invitation for tender for income-generating contracts, that either the 80/20 or 90/10 preference point system will apply and that the highest acceptable tender will be used to determine the applicable preference point system; or

(b) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system,

Then the organ of state must indicate the points allocated for specific goals for both the 90/10 and 80/20 preference point system.

BID DECLARATION

Tenderers who claim points in respect of BBBEE must complete the following:

B-BBEE STATUS LEVEL OF CONTRIBUTOR CLAIMED IN TERMS OF PARAGRAPHS 4.1 AND 4.1.1

4.3.	**Contribution to BBBEE: ..... = ...……(maximum of 5 or 10 points)**

(Points claimed in respect of paragraph 5.1 must be in accordance with the table reflected in paragraph 4.1.1 and **must be substantiated by relevant proof of B-BBEE status level of contributor.**)

LOCALITY OF TENDERERS OFFICE CLAIMED IN TERMS OF PARAGRAPHS 4.1 AND 4.1.2

4.4.	**Contribution to specific Goals: ..... =.....……(maximum of 5 or 10 points)**

(Points claimed in respect of paragraph 5.2 must be in accordance with the table reflected in paragraph 4.1.2 and **must be substantiated by relevant proof of address of a company office.)**

DECLARATION WITH REGARD TO COMPANY/FIRM

4.5. Name of company/firm…….

4.6. Company registration number: ……...

4.7. TYPE OF COMPANY/ FIRM

- ☐ Partnership/Joint Venture / Consortium
- ☐ One-person business/sole propriety
- ☐ Close corporation
- ☐ Public Company
- ☐ Personal Liability Company

- ☐ (Pty) Limited
- ☐ Non-Profit Company
- ☐ State Owned Company

[TICK APPLICABLE BOX]

4.8. I, the undersigned, who is duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the specific goals as advised in the tender, qualifies the company/ firm for the preference(s) shown and I acknowledge that:

i) The information furnished is true and correct;
ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 5.1 and 5.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct;
iv) If the specific goals have been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have –
   (a) disqualify the person from the tendering process;
   (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
   (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
   (d) recommend that the tenderer or contractor, its shareholders, and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
   (e) forward the matter for criminal prosecution, if deemed necessary.

	…… SIGNATURE(S) OF TENDERER(S)
SURNAME AND NAME:	……..
DATE:	……
ADDRESS:	……
	……

IF ANY TENDERER DOES NOT HAVE AN EME CERTIFICATE FROM A RATING AGENCY ACCREDITED BY SANAS FOR BEP (BUILD ENVIRONMENT PROFESSIONAL) /CONTRACTOR/SUPPLIER OR A B-BBEE CERTIFICATE FROM A B-BBEE VERIFICATION PROFESSIONAL REGULATOR APPOINTED BY THE MINISTER OF TRADE AND INDUSTRY, THIS AFFIDAVIT FOR BEP/CONTRACTOR/SUPPLIER WILL BE COMPULSORY TO COMPLETE.

MBD 6.1(A)

B-BBEE EXEMPTED AFFIDAVIT FOR EXEMPTED MICRO ENTERPRISES
(ISSUED IN TERMS OF THE AMENDED CONSTRUCTION SECTOR CODE)
(Gazette Vol. 630 No. 41287)
Issued in terms of paragraph 3.6.2.4.1 (B)

I, the undersigned,

Full names and surname	
Identity number	

Hereby declare under oath as follows:

1. The contents of this statement are to the best of my knowledge a true reflection of the facts.
2. I am a Member / Director / Owner of the following enterprise and am duly authorized to act on its behalf:

Enterprise Name:			
Trading Name (If Applicable):			
Registration Number:			
Physical Address:			
Type of Entity (CC, (Pty) Ltd, Sole Prop etc.):			
Nature of Construction Business: ***Indicate the applicable category with a tick.***	**BEP** (Built Environment Professional)	**Contractor**	**Supplier**
Definition of "Black People"	As per the Broad-Based Black Economic Empowerment Act 53 of 2003 as Amended by Act No 46 of 2013 "Black People" is a generic term which means Africans, Coloureds, and Indians – who are citizens of the Republic of South Africa by birth or descent; or who became citizens of the Republic of South Africa by naturalization before 27 April 1994; or after 27 April 1994 and who would have been entitled to acquire citizenship by naturalization prior to that date;"		
Definition of "Black Designated Groups"	"Black Designated Groups" means: (a) unemployed black people not attending and not required by law to attend an educational institution and not awaiting admission to an educational institution; (b) Black people who are youth as defined in the National Youth Commission Act of 1996; (c) Black people who are persons with disabilities as defined in the Code of Good Practice on employment of people with disabilities issued under the Employment Equity Act; (d) Black people living in rural and under developed areas; (e) Black military veterans who qualifies to be called a military veteran in terms of the Military Veterans Act 18 of 2011;"		

3) I hereby declare under Oath that as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No

46 of 2013,

- The Enterprise is _____% Black Owned
- The Enterprise is _____% Black Female Owned
- The Enterprise is _____% Owned by Black Designated Group (provide Black Designated Group Breakdown below as per the definition in the table above)
    - Black Youth % _____%
    - Black Disabled % _____%
    - Black Unemployed % _____%
    - Black People living in Rural areas % _____%
    - Black Military Veterans % _____%

Construction Sector Affidavit

1. Based on the Financial Statements/Management Accounts and other information available on the latest financial year-end of _____, the annual Total Revenue was less than the applicable amount confirmed **by ticking the applicable box below.**

BEP	R1.8 million	
Contractor	R3.0 million	
Supplier	R3.0 million	

If the turnover exceeds the applicable amount in the table above then this affidavit is no longer applicable and an EME certificate must be obtained from a rating agency accredited by SANAS or when applicable a B-BBEE Verification Professional Regulator appointed by the Minister of Trade and Industry.

2. Please Confirm on the below table the B-BBEE Level Contributor, **by ticking the applicable box below.**

100% Black Owned	**Level One** (135% B-BBEE procurement recognition level)	
At least 51% Black Owned	**Level Two** (125% B-BBEE procurement recognition level)	
At least 30% Black Owned	**Level Four** (100% B-BBEE procurement recognition level)	
Less than 30% Black Owned	**Level Five** (80% B-BBEE procurement recognition level)	

3. I know and understand the contents of this affidavit and I have no objection to take the prescribed oath and consider the oath binding on my conscience and on the Owners of the Enterprise which I represent in this matter.

4. The sworn affidavit will be valid for a period of 12 months from the date signed by commissioner.

Deponent Signature: _____

Date: _____

_____

COMMISSIONER OF OATHS
SIGNATURE & STAMP

MBD 9

CERTIFICATE OF INDEPENDENT BID DETERMINATION

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

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

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

   3.1 take all reasonable steps to prevent such abuse;
   3.2 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
   3.3 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. This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.

5. In order to give effect to the above, the attached Certificate of Bid Determination (MBD9) must be completed and submitted with the bid:

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

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

MBD 9

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

_____
(Bid Number and Description)

in response to the invitation for the bid made by:

KOUGA MUNICIPALITY

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

I certify, on behalf of: _____ that:
(Name of Bidder)

6. I have read and I understand the contents of this Certificate;

7. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;

8. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;

9. 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;

10. 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:

    10.1 has been requested to submit a bid in response to this bid invitation;
    10.2 could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
    10.3 Provides the same goods and services as the bidder and/or is in the same line of business as the bidder.

MBD9

11 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.

12 In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

12.1 prices;
12.2 geographical area where product or service will be rendered (market allocation);
12.3 methods, factors or formulas used to calculate prices;
12.4 the intention or decision to submit or not to submit, a bid;
12.5 the submission of a bid which does not meet the specifications and conditions of the bid; or bidding with the intention not to win the bid.

13. 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.

14. 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.

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

…….…… ……
Signature Date

…… ……
Position Name of Bidder

[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.

CERTIFICATE FOR MUNICIPAL SERVICES (COMPULSORY TO COMPLETE)

Information required in terms of the Supply Chain Management Regulations, Regulation 28 (1) (c).

Tender Number: 118/2024

Name of the Bidder: _____

DETAILS OF THE BIDDER/S: Owner / Proprietor / Director(s) / Partner(s), etc:

Physical Business address of the Bidder	Municipal Account Number(s)

If there is not enough space for all the names, please attach the additional details to the Tender document.

Name of Director / Member / Partner	Identity Number	Physical **residential** address of Director / Member / Partner	Municipal Account number(s)

I, _____, the undersigned,
(full name in block letters)
certify that the information furnished on this declaration form is correct and that I/we have no undisputed commitments for municipal services towards a municipality or other service provider in respect of which payment if overdue for more than 30 days.

_____
Signature

THUS DONE AND SIGNED for and on behalf of the Bidder / Contractor

at _____ on the _____ day of _____ 2024

PLEASE NOTE:

MUNICIPAL ACCOUNTS FOR ALL PROPERTIES OWNED BY BIDDER/S MUST BE ATTACHED TO THE TENDER DOCUMENT!
Even if the requested information is not applicable to the Bidder, the table above should be endorsed NOT APPLICABLE with a reason and THIS DECLARATION MUST STILL BE COMPLETED AND SIGNED. In the event of leasing, a lease agreement MUST be attached to the tender document.

KOUGA MUNICIPALITY

DIRECTORATE: ELECTROMECHANICAL SERVICES

TENDER NUMBER: 118/2024

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

Part T2: Returnable Documents

Returnable Documents (Part T2)

(ALL Documents and Schedules MUST BE RETURNED for the TENDER to Qualify)

T2.1	List of Returnable Schedules Required for Tender Evaluation & Returnable Schedules
T2.2	Other documents that will be incorporated into the contract
T2.3	Returnable Schedules that will be incorporated in the contract

NOTE:

Although the documents under Part T2 is headed “Returnable Documents” in line with the CIDB model, these are not the only documents to be returned together with the Tender. **All** the documents indicated on document T1, must be completed and signed where applicable and submitted as a **complete set of documents**.

KOUGA MUNICIPALITY

DIRECTORATE: ELECTROMECHANICAL SERVICES

TENDER NUMBER: 118/2024

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

Part T2.1: List of Returnable Schedules Required for Tender Evaluation Purposes (T2.1)

2.1.1 GENERAL INFORMATION

1. Name of tender ingenuity: _____

2. Contact details

   Address : _____

   _____

   Tel no : (_____) _____

   Fax no : (_____) _____

   E-mail address : _____

3. Legal entity: Mark with an **X**.

Sole proprietor	
Partnership	
Close corporation	
Company (Pty) Ltd	
Joint venture	

In the case of a Joint venture, provide details on joint venture members:

Joint venture member	Type of entity (as defined above)

4. Income tax reference number:_____(in the case of a joint venture, provide for all joint venture members)

5. Regional services area where the enterprise is registered:_____(In the case of a joint venture, provide for all joint venture members)

6. Regional services levy registration number:_____ (In the case of a joint venture, provide for all joint venture members)

7. VAT registration number:_____ (In the case of a joint venture, provide for all joint venture members)

8. Company or closed corporation registration number:_____(In the case of a joint venture, provide for all joint venture members)

9. Details of proprietor, partners, closed corporation members, or company directors, indicating technical qualifications where applicable (Form on the next page).

9. For joint ventures the following must be attached (**COMPULSORY**):

- Written power of attorney for authorised signatory.
- **Pro-forma of the joint venture agreement.**
  *** If the Joint Venture Agreement is not attached, the tender will not be considered!**

DETAILS OF PROPRIETOR, PARTNERS, CLOSED CORPORATION MEMBERS OR COMPANY DIRECTORS

Name and Identity Number	Relevant qualifications and experience	Years of relevant experience

Name of Tendering Entity: _____

Signature: _____ **Date:** _____

2.1.2 AUTHORITY FOR SIGNATORY

Details of person responsible for Tender process

Name _____

Contact number ( ) _____

Address of office submitting the Tender _____

_____

_____

Telephone no ( ) _____

Fax no ( ) _____

E-mail address _____

Signatories for close corporations and companies shall confirm their authority by attaching to this form a **duly signed and dated original or certified copy** of the relevant resolution of their members or their board of directors, as the case may be.

"By resolution of the board of directors passed on *(date)*.....

Mr. .....

has been duly authorized to sign all documents in connection with the Tender for Contract Number ……and any Contract which may arise there from on behalf of

(BLOCK CAPITALS) .....

.....

SIGNED ON BEHALF OF THE COMPANY .....

IN HIS CAPACITY AS .....

DATE .....
:.....

FULL NAMES OF SIGNATORY .....

AS WITNESSES 1. ……...

2. ……...

2.1.3. Tender Functionality / Pre-Qualification

Previous experience

- The Tenderer must provide four (4) separate and project related contactable Referees. The Referees must each relate to one (1) separate successfully completed project over the last five (5) years.
- The reference projects must be for the supply, delivery, installation, testing and commissioning of power transformers, overhead high voltage powerlines, high voltage switchgear (preferably outdoor) or combination thereof.
- The Tenderer must arrange for the Referee to complete this form and the completed form must be submitted with the tender document.
- A Certificate of Practical Completion or Certificate of Completion signed by the Employer's. Agent must be attached for the project referenced herein.

- Tenders will be pre-evaluated on the criteria as set out below. Bidders that score less than **70 points** for this criterion will be regarded as non-responsive and will not be evaluated on price, B-BBEE Locality of supplier. Unclear, vague, fragmented or incomplete information provided will result in no points being allocated.
- Bidders must therefore ensure that relevant information is submitted. If information is not submitted or referred to as an attachment, no points will be awarded.
- The following criteria will be used to calculate points for the functionality of tenders and bidders should ensure that they submit all information in order to be pre-evaluated on the criteria mentioned below:

	CRITERIA	**MAXIMUM POINTS**	**BIDDER SCORE**
1	Company (or JV) Experience	**30**	
2	Key Site Staff & Personnel allocated/reserved for this Tender	**25**	
3	Plant, Equipment, Tools & Machinery allocated/reserved for this Tender	**30**	
TOTAL			

Functionality criteria are further divided as follows and points will be awarded as indicated below:

Criterion 1: Company (or JV) Experience

- A maximum of **30** points will be awarded to bidder's who met the pre-evaluation qualification and tender functionality information provided. Please note that this section refers to the Company's and its legacy firms on relevant past experience, and are not a duplication of Criterion of key staff and Personnel. Meaning this section takes into consideration that the company as an entity has gained relevant experience in the past in similar or relevant Scope of Works.

- Relevant experience is defined as the accumulation of knowledge or skill that results from direct participation in relevant/similar projects or activities and/or as determined by the Kouga Municipality and/or professional consulting engineer where applicable.

- Successfully completed OCEAN VIEW with a value exceeding OR equal to CIDB grading stated.

Experience required:	**Maximum points**	**Bidder Score**
1 – 2 projects successfully completed.	**15**	
2 – 4 projects successfully completed.	**20**	
5 or more projects successfully completed.	**30**	
Total		

- In order to claim points for the above, bidders must submit sufficient information as well as documentary proof of project completed successfully.

    - Points will only be awarded for relevant & completed experience obtained relevant to the Tender Scope of Works. To be able to gain points the Tenderer must submit proof that the company has obtained the relevant experience for this Tender's Scope of Works & Specifications, and not only parts thereof. If experience is listed, please ensure it is applicable and relevant to the whole of this Tender and not only to parts thereof, otherwise the Bidder will not be awarded the necessary points. Tenders to provide enough experience to score the total points as prescribed **(Attach Completion Certificate)**.

    - If no information is provided below or referred to as an additional attachment and no completion certificates provided, **NO POINTS WILL BE AWARDED**.

Employer/Client	**Nature of work**	**Value of Work (incl. VAT)**	**Start and completion date (month and year) Duration**
			Start:……... Completion:……... Duration:……
			Start:……... Completion:……... Duration:……
			Start:……... Completion:……... Duration:……
			Start:……... Completion:……... Duration:……
			Start:……... Completion:……... Duration:……
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			Start:……... Completion:……... Duration:……
			Start:……... Completion:……... Duration:……
			Start:……... Completion:……... Duration:……

Criterion 2: Site Staff & Personnel allocated / reserved for this Tender.

- A maximum of **25** points will be awarded at the sole discretion of the Municipality's Bid Evaluation Committee based on the information provided and will be split as follows. Points will only be award once for each staff/personnel allocated to this Tender, no multiple scoring per person.

- In order to claim points for the above bidders must submit detailed Curriculum Vitae (CV) of each key personnel to be used/ allocated for this Tender. The staff or personnel listed above must currently be employed by the Bidder company, if not then a letter stating such intent to employ this person, including this person's signature of willingness & acceptance for the intended duration of the project.

    - CV experience listed of key staff must be relevant, current and accompanied by certified qualifications and supporting documents. Points can only be allocated once, meaning one-person-one-score, no multiple scoring. Please note the staff allocated to this Tender must be on-site and used for this Tender. If the person is unavailable during time of execution, he/she must be replaced with someone of equal of better value and experience and proof as per CV submitted.

NB: Relevant experience is defined as the accumulation of knowledge or skill that results from direct participation in relevant similar events or activities and/or as determined by the **Kouga Municipality** and/or professional consulting engineer where applicable.

Site Staff & Personnel Required:	Max points	Name of Staff member	Bidder Score
Contract Manager Qualifications: Degree or National Diploma in Engineering (NQF6 min) • Must be suitably skilled and have CV verifiable experience managing Electrical projects. Is overall responsible for the execution of the works and all associated project management • Must manage all Municipal instructions and ensure execution of Tender specifications. Must inspect and approve all works. manage Payment Certificates • Must be computer literate, compile admin reports, proficient in the use of Excel Spread Sheets, capture data and quantities, daily communication electronically via email etc.	1-5y = 2 points 6-10y = 6 points More than 10y =10 points		
Foreman or Construction Manager & Supervisor **Qualifications: Trade test (Wireman's Licence) and ORHVS** • Must be suitably skilled and have CV verifiable experience as foreman on	1-5y = 2 points 6-10y = 6 points More than 10y =10 points		

Site Staff & Personnel Required:	Max points	Name of Staff member	Bidder Score
Electrical projects. • Must supervise the works full-time on site, the team / the workers and the correct use of all plant/machinery. • Must be able to work with local labour. • Must ensure all Codes & Standards specifications are met and carried out.			
Skilled Artisan **Qualifications: Trade test (Red seal) and wireman's license** • Must be suitably skilled and have CV verifiable experience working on Electrical projects. • Must be able to work on MV and LV networks	1-5y = 1 point 6-10y = 3 points More than 10y =5 points		
TOTAL			**25**

2.1.4. <u>Schedule of Infrastructure and Resources</u>

<u>Criterion 3: Plant / Tools / Equipment</u>

If the Bidder intends to use plant / tools / equipment other than those stipulated in the Tender Specifications the Bidder must qualify/declare this in their tender document, for the evaluation process. If nothing is qualified or declared, then those stipulated in the Tender Specifications are applicable to this Tender.

A maximum of **30** points will be awarded based on the information provided.

Equipment	Owned by Bidder	Intent to Rent / Hire	Bidder Score
1. LDV / Bakkie and a Trailer.	15	10	
2. Crane Truck 5 – 8 Ton (Tare 4535kg >)	15	10	
3. List all other Major tools/Equipment's for information purposes. 1) 2) 3) 4) 5)			
TOTAL	**30**	**20**	

The tenderer shall state below what plant / tools / equipment will be available specifically for this Contract. The tenderer shall differentiate, if applicable, between plant / tools / equipment immediately available plant / tools / equipment will be acquired or hired for the work should he be awarded the tender.

If no information is provided below or referred to an additional attachment **NO POINTS WILL BE AWARDED.**

If plant / tools / equipment, as stipulated above, will be rented, proof of the intention to lease it from the supplier or proof of ownership must be submitted with the tender document. **NO POINTS WILL BE AWARDED** if proof is not submitted.

Size of enterprise and current workload:

What was your turnover in the previous financial year? ----------

What is the estimated turnover for your current financial year? ----------

List your current contracts and obligations:

Description	Value ®	Start date	Duration	Expected completed date

Do you have the capacity to supply the goods and services described in this Tender, should the contract be awarded to you? YES / NO

Staffing Profile:

Provide information on the staff that you have available to execute this contract (attach a separate list if the space provided is insufficient)

Permanently employed staff: gender and race	Number of staff
Temporary staff to be employed for the project: gender and race	**Number of staff**

Name of Tendering Entity: _____

Signature: _____ **Date:** _____

2.1.6 SCHEDULE OF APPROACH AND METHODOLOGY/ WORK PLAN

Understanding the terms of reference / brief

1. Do you as the contractor understand what is required in terms of the project stated above?

Yes		No		(Tick Appropriate Block)

2. If you answered Yes to question 1 above, please explain briefly your understanding of the project in no more than 50 words.

3. Considering questions 1 and 2 above, please provide in summary, details of your proposed approach and work plan to the successful completion of the above project.

4. Briefly state if you have any innovative approach for this particular project mentioned above, that you feel will be unique but also economically superior to the normal workable approach at presently undertaken as the norm.

Name of Tendering Entity: _____

Signature: _____ **Date:** _____

2.1.7 SCHEDULE OF SUB-CONTRACTORS

The Bidder shall list below the sub-contractors he/she proposes to employ for part(s) of the work.

If any or all of the sub-contractor/s listed hereunder are not approved subsequent to acceptance of the Tender, it shall in no way invalidate the Tender or the Contract, and the Tendered unit rates for the respective items of work shall remain final and binding even if a sub-contractor/s not listed below is approved by the Employer.

Sub- Contractor's Name	Work Activities to be undertaken by the Sub-contractor	Work Recently Executed by Sub-contractor

2.1.8 FINANCIAL REFERENCES

FINANCIAL STATEMENTS

I/We agree, if required, to furnish an audited copy of the latest set of financial statements together with my/our Directors' and Auditors' report for consideration by the Employer.

DETAILS OF TENDERING ENTITY'S BANK

I/We hereby authorize the Employer/Engineer to approach all or any of the following banks for the purposes of obtaining a financial reference:

DESCRIPTION OF BANK DETAIL	BANK DETAILS APPLICABLE TO TENDERER 'S HEAD OFFICE
Name of bank	
Branch name	
Branch code	
Street address	
Postal address	
Name of manager	
Telephone number	( )
Fax number	( )
Account number	

KOUGA MUNICIPALITY

DIRECTORATE: ELECTROMECHANICAL SERVICES

TENDER NUMBER: 118/2024

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

Part T2.2: Other Documents Required For Tender Evaluation Purposes (Part T2.2)

Form 2.2.1 Certificate of Tenderer's Attendance at the Compulsory Information Session / Site Meeting

Form 2.2.2 Written Proof of Tenderers registration at the Construction Industry Development Board (CIDB)

2.2.1 CERTIFICATE OF TENDERER'S ATTENDANCE AT THE COMPULSORY CLARIFICATION MEETING

This is to certify that I, ... ,

Representative of (Tenderer) .....

.....

of (address) .....

.....

.....

Telephone number .....

Fax number .....

attended Clarification Meeting on Wednesday 05 June **2024 at 10:00** in the company of

(Kouga Municipality / Employer's Representative) .....

PLEASE NOTE:

Tenderers are requested to submit the minutes received at above-mentioned compulsory information session/meeting with their Tender documents. (Non-submission of this information may lead to rejection of this Tender)

TENDERER 'S REPRESENTATIVE: .....

KOUGA MUNICIPALITY / EMPLOYER'S REPRESENTATIVE: .....

2.2.2 PROOF OF REGISTRATION AT THE CONSTRUCTION INDUSTRY DEVELOPMENT BOARD (CIDB)

The Tenderer is to affix to this page:

- Written proof of Tenderers registration at the CIDB.

KOUGA MUNICIPALITY

DIRECTORATE: ELECTROMECHANICAL SERVICES

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UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

Part T2.3: Returnable Schedules that will be Incorporated in the Contract

Form 2.3.1 Record of Addenda to Tender Documents

2.3.1 Record Of Addenda To Tender Documents

We confirm that the following communications received from the Employer before the submission of this Tender offer, amending the Tender documents, have been taken into account in this Tender offer:

	Date	**Title or Details**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Attach additional pages if more space is required.

Signed: ……..…….. Date: ……

Name: ……..… Position: ……..

SIGNED ON BEHALF OF TENDERER: .....

1. Infrastructure and resources available

Evaluation of the following in terms of the size, nature and complexity of goods and/or services required:

- Physical facilities.
- Infrastructure and resources available for the contract owned by the Tenderer.
- Infrastructure and resources the Tenderer intends renting, should the contract be awarded to him.

2. Size of enterprise, and current workload

Evaluation of the Tenderer's position in terms of:

- Previous and expected current annual turnover
- Current contractual obligations
- Capacity to execute the contract

3. Staffing profile

Evaluation of the Tenderer's position in terms of:

- Staff available for this contract being Tendered for
- Qualifications and experience of key staff to be utilized on this contract.

4. Previous experience

Evaluation of the Tenderer's position in terms of his previous experience. Emphasis will be placed on the following:

- Experience in the relevant technical field
- Experience of contracts of similar size
- Some or all of the references will be contacted to obtain their input.

5. Financial ability to execute the contract

Evaluation of the Tenderer's financial ability to execute the contract. Emphasis will be placed on the following:

- Professional indemnity
- Contact the Tenderer's bank manager to assess the Tenderer's financial ability to execute the contract and the Tenderer hereby grants his consent for this purpose.

If the Tender does **not** meet the requirements contained in the Kouga Municipality Procurement Policy, and the mentioned framework, it will be rejected by the Council, and may not subsequently be made acceptable by correction or withdrawal of the non-conforming deviation or reservation.

6. Penalties

The Kouga Municipality will if upon investigation it is found that a preference in terms of the Act and these regulations has been obtained on a fraudulent basis, or any specified goals are not attained in the performance of the contract, on discretion of the Departmental Head, one or more of the following penalties will be imposed:

- Cancel the contract and recover all losses or damages incurred or sustained from the Tenderer.
- Impose a financial penalty of twice the theoretical financial preference associated with the claim, which was made in the Tender.

- Restrict the Tenderer, its shareholders and directors on obtaining any business from the Kouga Municipality for a period of 5 years.

Compliance with Employment Equity Act 55 of 1998

Attach a valid certificate from the Department of Labour, or a declaration (Refer to Equity Ownership Table) by the designated EMPLOYER, that the EMPLOYER complies with the relevant chapters of the Employment Equity Act.

A failure to comply with the above is sufficient ground for rejection of any offer to conclude an agreement or for cancellation of the agreement.

Definitions in terms of the last-mentioned Act.

"designated EMPLOYER means-

a) an EMPLOYER who employs 50 or more employees;
b) an EMPLOYER who employees fewer than 50 employees, but has a total annual turnover that is equal to or above the applicable annual turnover of a small business in terms of Schedule 4 to this Act."

"Schedule 4"

TURNOVER THRESHOLD APPLICABLE TO DESIGNATED EMPLOYERS

Sector or sub sector in accordance with the Standard Industrial Classification	Total annual turnover
Agriculture	R 2,00 m
Mining and Quarrying	R 7,50 m
Manufacturing	R 10,00 m
Electricity, Gas and Water	R 10,00 m
Construction	R 5,00 m
Retail and Motor Trade and Repair Services	R 15,00 m
Wholesale Trade, Commercial Agents and Allied Services	R 25,00 m
Catering, Accommodation and other Trade	R 5,00 m
Transport, Storage and Communications	R 10,00 m
Finance and Business Services	R 10,00 m
Community, Social and Personal Services	R 5,00 m

KOUGA MUNICIPALITY

DIRECTORATE: ELECTROMECHANICAL SERVICES

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UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

Part C: The Contract

The Contract (Part C)

Part C1	Agreement and Contract Data
Part C2	Pricing Data
Part C3	Scope of Works

KOUGA MUNICIPALITY

DIRECTORATE: ELECTROMECHANICAL SERVICES

TENDER NUMBER: 118/2024

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

Part C1: Agreement and Contract Data

Agreement And Contract Data (Part C1)

KOUGA MUNICIPALITY

DIRECTORATE: ELECTROMECHANICAL SERVICES

TENDER NUMBER: 118/2024

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

Part C1.1: Form of Offer and Acceptance

(AGREEMENT) OFFER

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

.....

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 apart of this Form of Offer and Acceptance, the Tenderer offers to perform all of the obligations and liabilities of the Service Provider 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:

.....

..... Rand (in words); R ..... (in figures),

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 Service Provider in the Conditions of Contract identified in the Contract Data.

Signature(s) _____

Name(s) _____

_____

Capacity

_____

(Name and address of organisation)

ACCEPTANCE

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

The terms of the contract are contained in

Part C1 Agreements and Contract Data
(which includes this Form of Offer and Acceptance)
Part C2 Pricing Data
Part C3 Scope of Work

and drawings and documents or parts thereof, which may be incorporated by reference into Parts C1 to C3 above.

The Tenderer shall within two weeks after receiving a completed copy of this Agreement, contact the Employer's representative (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. 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 working days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this Agreement, this Agreement shall constitute a binding contract between the parties.

Signature: _____

Name _____

Capacity _____

KOUGA MUNICIPALITY
33 DA GAMA STREET
JEFFREYS BAY

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:

Signature(s) _____

Name(s) _____

Capacity _____

_____
(Name and address of organisation)

FOR THE EMPLOYER:

Signature: _____

Name _____

Capacity _____

KOUGA MUNICIPALITY
33 DA GAMA STREET
JEFFREYS BAY

KOUGA MUNICIPALITY

DIRECTORATE: ELECTROMECHANICAL SERVICES

TENDER NUMBER: 118/2024

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

Part C1.2: Contract Data

C1.2 CONTRACT DATA

The General Conditions of Contract for Construction Works, Third Edition, 2015 published by the South African Institution of Civil Engineering, Private Bag X200, Halfway House, 1685, is applicable to this Contract and is obtainable from www.saice.org.za .

The Conditions of Contract are:

- the "General Conditions of Contract"

  as they appear in the commercially available publication "*General Conditions of Contract for Construction Works, Third Edition (2015)*", published by the South African Institution of Civil Engineering (SAICE) as the August 2015 print edition, hereinafter referred to as GCC 2015; and

- Specific data as contained in this Contract Data.

Each party to the Contract shall purchase its own copy of the GCC 2015, from a duly authorised commercial vendor or directly from the publisher:

South African Institution of Civil Engineering
Private Bag X200
Halfway House 1685
South Africa
Tel+27(0)11 8055947

PART 1: DATA PROVIDED BY THE EMPLOYER

The following contract specific data are applicable to this Contract:

Clause	Data
1.1.1.13	The Defects Liability Period is 12 months measured from the date of the Certificate of Completion.
1.1.1.14	The time for achieving Practical Completion includes the days referred to under Clause 5.3.2 and the non-working days but excludes the special non-working days (Clauses 5.1.1 and 5.8.1).
1.1.1.15	The name of the Employer is Kouga Municipality.
1.1.1.16	The name of the Employer's Agent is Clinkscales Maughan-Brown. Also referred to as the "Engineer" elsewhere in this document.
1.1.1.26	The Pricing Strategy is a Re-measurement Contract.
1.2.1.2	The address of the Employer is: Address (physical): 33 Da Gama Street Address (postal): PO Box 21, Jeffreys Bay, 6330 Telephone: (042) 200 2200 E-mail: tmadatt@kouga.gov.za
1.2.1.2	The address of the Employer's Agent is: Address (physical: 24 Bland Street, Mossel Bay Address (postal): PO BOX 281, Hartenbos, 6520 Telephone: 044-691-2074 e-mail: jb.cvw@cvw-e.com
3.2.3	The Employer's Agent shall obtain the specific approval of the Employer before carrying out any of his functions or duties according to the following Clauses of the General Conditions of Contract: None.
5.1.1	The non-working days are Sundays, with the exception of work which must be undertaken during scheduled outages planned for Sundays.
5.8.1	The special non-working days are: The public holidays. The year-end break commences on about 16 December and ending on about the first Monday of the subsequent year, or the days on which the Contractor grants the majority of his permanent workforce leave.
5.3.1	The documentation required before commencing with the Works are: • Health and Safety Plan (refer to Clause 4.3 of the GCC 2015 conditions). • Initial programme (refer to Clause 5.6). Security (refer to Clause 6.2). • Insurance (refer to Clause 8.6). • Occupational Health and Safety Agreement (refer to Part C1.4 hereof). • Letter of Good Standing from the Compensation Commissioner.
5.3.2	The time to submit the documentation required before commencement of the Works is 14 days.

Clause	Data
5.12.2.2	A delay caused by inclement weather conditions will be regarded as a delay only if, in the opinion of the Employer's Agent, all progress on an item or items of work on the critical path of the working programme of the Contractor has been brought to a halt. Delays on working days only (based on a five-day working week) will be taken into account for the extension of time, but the Contractor shall make provision in his programme of work for an expected delay of two (2) working days per month caused by normal rainy weather, for which he will not receive any extension of time. Extension of time during working days will be granted to the degree to which actual delays, as defined above, exceed the number of two (2) working days. It shall be further noted that where the critical path is not affected, no extension of time for abnormal climatic conditions or for any other reason will be entertained. Abnormal climatic conditions are conditions that occur less frequently than once in ten years.
5.13.1	The penalty for failing to complete a works instruction in the time as confirmed under Item 5.6.1 above is R 3 000.00 excl. VAT per day. The Contractor must pay Delay Liquidated Damages in the amount equal to [0.1% of the Contract Price per day] from the Scheduled Date for Works Completion to the earlier of the Works Completion Date and the date this Contract is terminated up to a limit of [5% of the Contract Price].
5.14.1	The requirements for achieving Practical Completion are that the Works must be in a state of readiness, fit for the intended purpose and occupation without danger or undue inconvenience to the Employer.
5.16.3	The latent defects period is five (5) years.
6.5.1.2.3	The percentage allowance on the net cost of materials actually used in the completed Works is 10%, unless specifically tendered otherwise in the Pricing Schedules. The percentage allowance on the gross remuneration of the workmen and foremen actually engaged is 10%, unless specifically tendered otherwise in the Pricing Schedules.
6.8.2	Contract Price Adjustment (CPA) will be allowed. Price adjustment shall be increased or decreased by applying a "Contract Price Adjustment Factor" calculated according to the formula and the conditions set out in the Contract Price Adjustment Schedule.
6.8.3	Price adjustments for variations in the costs of special materials are allowed. The price of each special material specified in the Contract Data shall increased or decreased by the net amount of any variation incurred after the date of tender on the basis set out in the Contract Data, provided that any claim for the adjustment in terms hereof shall be substantiated by the submission acceptable invoices and any other supporting documents that the employer's Agent consider necessary for the purpose, and provided also no further adjustment be permitted price of "special material" after the Due Completion Date unless such material form part of any additional work or variation ordered to be carried out after the date.
6.10.1.5	The percentage advance on materials not yet built into the Permanent Works is 80%. The percentage advance on Plant not yet supplied to Site is 80%. Documentary evidence of ownership and an indemnity against claims in respect of the plant and or materials shall be provided, and items shall be clearly marked and identified as being the property of the Employer. A Certificate of Ownership of Plant / Materials as per Part C1.5 shall be submitted to the Employer's Agent together with the claim for payment.

Clause	Data
6.10.3	Retention of 10% will be withheld on progress payment, up to the limit of retention money which is 5% of the Contract Sum. A guarantee in lieu of retention is not permitted.
6.11	Failing agreement, between the Contractor and the Employer's Agent, both the Preliminary and General Fixed Charge and Time Related Items shall be adjusted on a pro-rata basis.
8.6.1.1.2	The value of Plant and material supplied by the Employer to be included in the insurance sum is R Nil
8.6.1.3	The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is 5% of the contract sum.
10.3.2	The limit of indemnity for liability insurance is R10 million.
10.5.3	Amicable settlement in terms of Clause 10.4 shall be contemplated for all disputes prior to referring any dispute to adjudication or arbitration.
10.7.1	The number of Adjudication Board Members to be appointed is one (1). The determination of disputes which are unresolved in terms of Clause 10.4.2 shall be by arbitration.

PART 2: DATA PROVIDED BY THE SERVICE PROVIDER

<table>
<tr><td>Clause</td><td colspan="2">Data</td></tr>
<tr><td>1.1.1.9</td><td colspan="2">The name of the Contractor is ……...</td></tr>
<tr><td>1.2.1.2</td><td colspan="2">The address of the Contractor is:
Address (physical): ……
Address (postal):
……..
Telephone: ……
E-mail: ……</td></tr>
<tr><td>1.1.1.14</td><td colspan="2">The time for achieving Practical Completion measured from the Contract Commencement Date is …….…….. working weeks.</td></tr>
<tr><td rowspan="4">6.2.1</td><td colspan="2">The security to be provided by the Contractor shall be one of the following:</td></tr>
<tr><td>Type of security
Contractor’s (Value Added Tax is excluded from the Contract Sum and the value of the Works for calculating the percentages)</td><td>Contractor’s Choice (Indicate “Yes” or “No”)</td></tr>
<tr><td>Cash deposit of 10% of the Contract Sum plus retention of 5% of the value of the Works</td><td>……</td></tr>
<tr><td>Performance guarantee of 10% of the contract sum plus retention of 5% of the value of the Works.</td><td>……</td></tr>
<tr><td></td><td>Variable Performance guarantee of 10% of the Contract Sum for the first period and 5% of the Contract Sum for the second period plus retention of 5% of the value of the Works.</td><td>NO</td></tr>
</table>

KOUGA MUNICIPALITY

DIRECTORATE: ELECTROMECHANICAL SERVICES

TENDER NUMBER: 118/2024

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

Part C1.4: Form of Performance Guarantee

C1.4.1 PRO FORMA PERFORMANCE GUARANTEE

For use with the General Conditions of Contract for Construction Works, Third Edition (2015)

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means: ……

Physical Address: ……

"Employer" means: ……

"Contractor" means: ……

"Employer's Agent" means: ……

"Works" means: ……

"Site" means: ……

"Contract" means: The Agreement made in terms of the Form of Offer and Acceptance and such amendments or additions to the Contract as may be agreed in writing between the parties.

"Contract Sum" means: The accepted amount inclusive of tax of R……...

Amount in words: ……

"Guaranteed Sum" means: The maximum aggregate amount of R …….

Amount in words:……

Type of Performance Guarantee: …… (Insert Variable or Fixed) "Expiry Date" means: …… (Give date) or any other later date set by the Contractor and/or Employer provided such instruction is received prior to the Expiry Date as indicated here.

1. VARIABLE PERFORMANCE GUARANTEE

1.1 Where a Variable Performance Guarantee has been selected, the Guarantor's liability shall be limited during the following periods to diminishing amounts of the Guaranteed Sum as follows:

1.1.1 From and including the date of signing the Performance Guarantee up to and including the date of the interim payment certificate certifying, for the first time, more than 50% of the Contract Sum: R …… (Amount in words) ……

1.1.2 From the day following the date of the said interim payment certificate up to and including the Expiry date, or the date of issue by the Employer's Agent of the Certificate of Completion of the Works, whichever occurs first:
R …… (Amount in words) ……

1.2 The Employer's Agent and/or the Employer shall advise the Guarantor in writing of the date on which the interim payment certificate certifying, for the first time, more than 50% of the Contract Sum, has been issued and the date on which the Certificate of Completion of the Works has been issued.

2**. FIXED PERFORMANCE GUARANTEE**

2.1. Where a Fixed Performance Guarantee has been selected, the Guarantor's liability shall be limited to the amount of the Guaranteed Sum.

2.2. The Guarantor's period of liability shall be from and including the date on which the Performance Guarantee is signed, up to and including the Expiry Date, or the date of issue by the Employer's Agent of the Certificate of Completion of the Works, or the date of payment in full of the guaranteed Sum, whichever occurs first.

2.3 The Employer's Agent and/or the Employer shall advise the Guarantor in writing of the date on which the Certificate of Completion of the Works has been issued.

3. CONDITIONS APPLICABLE TO VARIABLE AND FIXED PERFORMANCE GUARANTEES

3.1 The Guarantor hereby acknowledges that:

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

3.1.2 Its obligation under this Performance Guarantee is restricted to the payment of money.

3.2 Subject to the Guarantor's maximum liability referred to in 1.1 or 2.1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 3.2.1 to 3.2.3:

3.2.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Employer's Agent in an Interim of Final Payment Certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 3.2.2;

3.2.2 A first written demand issued by the Employer to the Guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) days has elapsed since the first written demand in terms of 3.2.1 and the sum certified has still not been paid;

3.2.3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum certified in 3.2.

3.3 Subject to the Guarantor's maximum liability referred to in 1.1 or 2.1, the Guarantor undertakes to pay to the Employer the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand from the Employer to the Guarantor at the Guarantor's physical address calling up this Performance Guarantee, such demand stating that:

3.3.1 The Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 3.3; or

3.3.2 A provisional or final sequestration or liquidation court order has been granted against the Contractor and that the Performance Guarantee is called up in terms of 3.3; and

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

3.4 It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 3.2 and 3.3 shall not exceed the Guarantor's maximum liability in terms of 1.1 or 2.1.

3.5 Where the Guarantor has made payment in terms of 3.3, the Employer shall upon the date of issue of the Final Payment Certificate submit an expense account to the Guarantor showing how all monies received in terms of this Performance Guarantee have been expended and shall refund to the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Performance Guarantee shall bear interest at the prime C1.3.3 overdraft rate of the Employer's bank compounded monthly and calculated from the date payment was made by the Guarantor to the Employer until the date of refund.

3.6 Payment by the Guarantor in terms of 3.2 or 3.3 shall be made within seven (7) calendar days upon receipt of the first written demand to the Guarantor.

3.7 Payment by the Guarantor in terms of 3.3 will only be made against the return of the original Performance Guarantee by the Employer.

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

3.9 The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.

3.10 This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 1.1.2 or 2.2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.

3.11 This Performance Guarantee, with the required demand notices in terms of 3.2 or 3.3, shall be regarded as a liquid document for the purposes of obtaining a court order.

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

Signed at …….....

Date …….....

Guarantor's signatory (1) ……..……...

Capacity …….....

Guarantor's signatory (2) ……...

Capacity …….....

Witness signatory (1) ……

Witness signatory (2) ……

KOUGA MUNICIPALITY

DIRECTORATE: ELECTROMECHANICAL SERVICES

TENDER NUMBER: 118/2024

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

Part C2: Pricing Data

C2.1 Pricing Instructions

C2.2 Bill of Quantity

KOUGA MUNICIPALITY

DIRECTORATE: ELECTROMECHANICAL SERVICES

TENDER NUMBER: 118/2024

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

Part C2.1: Pricing Instructions

BILL (SCHEDULE) OF QUANTITIES

GENERAL REFERENCES

1. The work scheduled below is described in more detail in the specifications and drawings. Where certain items are referred to the GCC or Specification or a certain drawing number for more information, the Tenderer is referred to the complete GCC, Specification and Drawings and it must not be presumed that the references are complete.

2. Arithmetical errors will be corrected. See T 1.1: Tender Data: Annexe F: F 3.9 of this Tender Document.

3. The price quoted in the Rate Column next to each item shall be assumed **the all- inclusive price** for the work to be executed as referred to in the item.

4. The prices as tendered in the Bill of Quantities shall be taken as being valid for the full duration of the Tender, unless otherwise stated in C 1.2: Contract Data: Part 1: Clause F.2.10.1 of this Tender Document. For the other years **CPA (SEIFSA)** will be applicable.

5. Should **no rate** be tendered, "**Included Elsewhere**" or "**Nil**" must be written in the Amount Column. A price or rate is to be entered against each item in the Bill of Quantities, whether the quantities are stated or not. An item against which no price is entered will be considered to be covered by the other prices or rates in the Bill.

   Where an item is priced "**Included Elsewhere**" or "**NIL**" it will be taken that **no remuneration** is payable or will be paid, **regardless of** if the final quantity differs from the quantity measured in the tender document at the time of handing in of the tender. The Client will thus make **no** additional compensation for these items, regardless of the final quantities for that item.

6. No deviation that may be requested by the Tenderer from the above, or from the GCC, Specification, Bill of Quantities, Tender form and conditions, shall be considered, unless clearly indicated in Part 2:

Returnable Documents: Schedule 3 of this Tender Document when the Tender Document is submitted.

7. The costs to comply with all the conditions, obligations and liabilities and as described in the GCC and Specifications, shall be assumed as being all inclusive in this Bill of Quantities, except if indicated differently in Part 2: Returnable Documents: Schedule 3 of this Tender Document.

8. The Bill of Quantities must be completed in **BLACK INK** and must not be removed from the bound set of documents.

9. **No** correction fluid may be used.

10. The time of completion, as specified by the Tenderer, must be written into the Quantity Column in accordance with C 1.2: Contract Data: Part 2 of this Tender document.

11. Descriptions in the Bill of Quantities are abbreviated and comply generally with those in the Standardised Specifications. Clause 8 of each standardised specification, read together with the relevant clauses of the Scope of Work, set out what ancillary or associated activities are included in the rates for the operations specified. Should any requirements of the measurement and payment clause of the applicable Standardised Specification, or the Scope of Work, conflict with the terms of the Bill, the requirements of the Standardised Specification or Scope of Work, as applicable, shall prevail.

    Reference shall be made, inter alia, to the Drawings, Standard Specifications, Project Specifications, General Conditions of Contract and Special Conditions of Contract for more detailed information regarding the extent of the work entailed under each item.

12. The quantities set out in the Bill of Quantities are the estimated quantities of the Contract Works, but the Contractor will be required to undertake whatever quantities the Engineer may direct from time to time. The Contract Price for the completed contract shall be computed from the actual quantities of work done, valued at the relevant unit rates and prices.

13. The prices and rates to be inserted in the Bill of Quantities are to be the full inclusive prices for the work described under the several items. Such prices and rates shall cover all costs and expenses that may be required in and for the execution of the work described, and shall cover the cost of all general risks, liabilities and obligations set forth or implied in the documents on which the tender is based, as well as overhead charges and profit. Reasonable prices shall be inserted, as these will be used as basis for assessment of payment for additional works that may have to be carried out.

14. Except where rates only are required, insert all amounts to be included in the total tendered price in the "Amount" column and show the corresponding total tendered price.

15. The unit of measurement described in the Bill of Quantities are metric units. Abbreviations used in the Bill of Quantities are as follows:

mm	=	millimetre
m	=	metre
km	=	kilometre
m²	=	square metre: cable size / cross-sectional area
kV	=	kilo volt
Cu	=	copper
Al	=	aluminium
kW	=	kilowatt
BCC	=	Bare copper conductor
CPA	=	Contract Price Adjustment (SEIFSA)

$$P = P_o\left[\left(\left(L \times \frac{EI}{SI}\right) + \left(S \times \frac{EI}{SI}\right)\right)\right]$$

- P – Escalated or New price
- P0 – Base price
- L – Labour percentage
- S – Steel percentage
- EI – Relevant index at the end of the escalation period
- SI – Relevant index at the start of the escalation period

16. For the purpose of this Bill of Quantities, the following words shall have the meanings hereby assigned to them:

Unit:	The unit of measurement for each item of work as defined in the specifications.
Quantity:	The number of units of work for each item.

Rate: The payment per unit measurement at which the Tenderer tenders to do the work.

Amount: The product of the quantity and the rate tendered for an item.

Lump Sum: An amount tendered for an item, the extent of which is described in the Bill of Quantities, the Specifications or elsewhere, but the quantity of work of which is not measured in any units.

17. This Bill of Quantities forms an integral part of the contract documents.

    The validity of the contract shall in no way be affected by differences between the quantities in the Bill of Quantities and the quantities finally certified for payment. Work shall be valued at the rates or lump sums tendered, subject only to the provisions of the General Conditions of Contract.

18. Rates and lump sums shall be comprehensive. Full compensation for completing and maintaining, during the maintenance period, all the work shown on the drawings and specified in the specifications, and for all the risks, obligations and responsibilities specified in the General Conditions of Contract, Special Conditions of Contract and specifications shall be considered as provided for collectively in the items of payment given in the Bill of Quantities, except in so far as the quantities given in the Bill of Quantities are only approximate.

19. The stating of quantities of material or amount of work in the Bill of Quantities shall not be regarded as authorization for the Contractor to order material or to execute work. The Contractor shall obtain the Engineer's detailed instructions for all work before ordering any materials for or executing work or making arrangements in this regard.

20. Reference shall be made to Clause 36 of the General Conditions of Contract regarding provisional sums and prime cost sums.

21. All rates and sums of money quoted in the Bill of Quantities shall be in Rands and whole cents. Fractions of a cent shall be discarded.

22. Final quantities will be calculated to the first decimal point (1 digit)

Part C2.2: Bill of Quantity

Bill of Quantities:

BILL A: MW SUBSTATION WORK										
ITEM	REFER TO	DESCRIPTION	UNIT	QTY MAT	QTY LAB	UNIT RATE MAT	UNIT RATE LAB	TOTAL PRICE MAT	TOTAL PRICE LAB	TOTAL AMOUNT
1		**SUBSTATIION CHIPSTONE**								
1,1		New chip stone layer - 28/38 mm Chip stone layer c/w weedkiller - (100mm top layer)	m^3	56	56					
2	SANS 1200:GA	**FOUNDATION, PLINTHS**								
		Supply, design, material and erect all foundations and plinths according to the drawings and specifications.								
2,1		Modification of existing plinth to 5MVA size.	each	3	3					
2,2		Foundation for 5m separation wall (double layer)	each	3	3					
3	PS PTC	**POWER TRANSFORMER**								
		Supply and install, test and commission the following 22/11kV equipment								
3,1	SANS 780-IEC 60076-5	5 MVA 22/11 kV Transformer - DYN11 ONAN (Coastal) - open bushings	each	3	3					
3,2		Transport - Offloading and rigging	each	3	3					
3,3		Commissioning - Cold Test/not connected	each	3	3					
3,4		Oil Sample - Test for deration, contamination, moisture	each	3	3					
3,5		MV&LV Surge arrestors (Set = 3x MV + 3x LV Surge Arrestors)	set	3	3					
TOTAL CARRIED FORWARD										

BILL A: MW SUBSTATION WORK										
ITEM	REFER TO	DESCRIPTION	UNIT	QTY MAT	QTY LAB	UNIT RATE MAT	UNIT RATE LAB	TOTAL PRICE MAT	TOTAL PRICE LAB	TOTAL AMOUNT
		Brought Forward								
3,6		FAT Testing at Port Elizabeth SA - Cost is for Contractor staff only and hosting the event. No additional cost will be allowed for the client.	PC			10 000,00		10 000,00		10 000,00
3,7		Earthing of Transformer	each	3	3					
4	NRS 036-1	**AUTO-RECLOSER**								
		Supply and install, test and commission the following								
4,1		25kV Automatic Circuit Recloser - Outdoor Switching Module control and protection x6 combined current and voltage sensors built-in, including mounting cradle and sundries	each	8	8					
4,2		RC5_3 Control cubicle - IP65 - Complete with battery backup and smart charger, AUX transformer 22kV, control cables and mounting brackets	each	8	8					
4,3		RC5_3 Control cubicle - IP65 - Complete with battery backup and smart charger, AUX transformer 11kV, control cables and mounting brackets	each	8	8					
4,4		Recloser control cubicle - Software programming and commissioning	each	8	8					
5	SANS 754	**WOODEN POLES**								
		Supply all the labour and material for the erection of the following Line Hardware								
5,1		9m 180-199 top wooden poles	each	8	8					
TOTAL CARRIED FORWARD										

BILL A: MW SUBSTATION WORK										
ITEM	REFER TO	DESCRIPTION	UNIT	QTY MAT	QTY LAB	UNIT RATE MAT	UNIT RATE LAB	TOTAL PRICE MAT	TOTAL PRICE LAB	TOTAL AMOUNT
		Brought Forward								
5,2		6m 180-199 top wooden poles	each	8	8					
6	PS PXB	**POLE & STAY HOLES (DRILLING)**								
6,1		6m Pole - 1.2m	each	8	8					
6,2		9m Pole - 1.5m	each	8	8					
7	PS PAA	**All Aluminum Alloy Conductor**								
7,1	SANS 182	AAAC- OAK	m	300	300					
7,2		Non-Tension joint (AAAC - OAK)	each	24	24					
7,3		Tee-Off Connector (AAAC-OAK)	each	24	24					
7,4		AAAC-OAK Lugs (term to Auto Recloser/Bypass switch)	each	81	81					
8	SANS 1200: GA	**CIVIL**								
		Supply all the labour and material, install test and commission the following								
8,1		5m Separation wall (double layer) - 4.5m high	each	3	3					
9		**OUTDOOR CIRCUIT BREAKER**								
		Supply all the labour and material, install test and commission the following								
9,1		ACTOM CTB36 Circuit breaker (type 3) including VT, CT, Circuit Breaker, Control Box pole mounted with control panel. (**Or equally approved**)	each	1	1					
TOTAL CARRIED FORWARD										

BILL B: EXCAVATION WORK										
ITEM	REFER TO	DESCRIPTION	UNIT	QTY MAT	QTY LAB	UNIT RATE MAT	UNIT RATE LAB	TOTAL PRICE MAT	TOTAL PRICE LAB	TOTAL AMOUNT
1	SANS 2001-DP6: 2012	The tariffs below include the digging of trenches and holes, the separation of stone, rock and sand and the backfilling, compacting and repair of all surfaces to the original finish:								
1,1		a) Soft material	m³	1	1					
1,2		b) Intermediate excavations	m³	1	1					
1,3		c) Hard rock	m³	1	1					
1,4		d) Import sand including handling cost	m³	1	1					
1,5		e) Remove surplus material including handling cost	m³	1	1					
2	SANS 2001-DP6: 2012	The following will be applicable where other services exist:								
		a) Excavation by hand to expose the following services crossing the trench:								
2,1		(i) Pipes	m	1	1					
2,2		(ii) Cables	m	1	1					
2,3		(iii) Concrete structures	m	1	1					
		b) Excavation next to the following:								
2,4		(i) Pipes	m	1	1					
2,5		(ii) Cables	m	1	1					
3	SANS 1200M	Repair to surfaces. Standard trench width will be measured:								
3,1	SANS 1200MH	a) Concrete or brick paving	m²	1	1					
3,2		b) Concrete with a minimum thickness of 75 mm	m²	1	1					
3,3		c) Tarred road to SABS standards	m²	1	1					
TOTAL CARRIED FORWARD										

BILL C: PROVISIONAL AND GENERAL										
ITEM	REFER TO	DESCRIPTION	UNIT	QTY MAT	QTY LAB	UNIT RATE MAT	UNIT RATE LAB	TOTAL PRICE MAT	TOTAL PRICE LAB	TOTAL AMOUNT
1		Erection and removal of standard notice board	sum	1	1					
2	SANS 1200 A Par.8.2.1	Fixed-charge and Value related items								
		a) Contractual requirements	sum	1	1					
		b) Erection of facilities on site	sum	1	1					
		c) Removal of facilities from site	sum	1	1					
3	SANS 1200 A Par.8.2.2	Time related items								
		a) Contractual requirements	sum	1	1					
		b) Usage and maintenance of facilities on site	sum	1	1					
		c) Supervision	sum	1	1					
		d) Company and Head Office overhead costs	sum	1	1					
TOTAL CARRIED FORWARD										

BILL D: PROJECT SUMMARY

ITEM	REFER TO	DESCRIPTION	UNIT	QTY MAT	QTY LAB	UNIT RATE MAT	UNIT RATE LAB	TOTAL PRICE MAT	TOTAL PRICE LAB	TOTAL AMOUNT
1		BILL A: MW SUBSTATION WORK								
2		BILL B: EXCAVATION WORK								
3		BILL C: PROVISIONAL AND GENERAL								
4		NETT TOTAL OF TENDER								
5		TOTAL								
6		15 % VAT								
		GROSS TOTAL OF TENDER INCLUDING VAT CARRIED FORWARD TO FORM OF TENDER								
7		..... SIGNATURE OF TENDERER							**GRAND TOTAL**	
		DATE								

KOUGA MUNICIPALITY

DIRECTORATE: ELECTROMECHANICAL SERVICES

TENDER NUMBER: 118/2024

UPGRADE OF OCEAN VIEW SUBSTATION SWITCHGEAR FOR KOUGA MUNICIPALITY

Part C3: Scope of Works

C 3.1 DESCRIPTIONS OF WORKS

Part C 3.1: Descriptions Of Works

Scope of Work

PROJECT SPECIFICATION

SCOPE

The project scope will be summarized as follow:

1. Construction of separation walls between transformers.
2. Supply, deliver, install, testing and commissioning of new complete 5MVA 22/11kV power transformer with manufacture specified plinth, terminations, surge arrestors and sundries.
3. Supply, deliver, install, testing and commissioning of eight new complete 22kV Auto Reclosers with manufacture specified mounting, terminations, control unit, cables and sundries.
4. Supply, deliver, install required chipstone layer for substation yard.
5. Supply, deliver, install, testing and commissioning of new complete 22kV outdoor circuit breaker complete with plinth, CT, VT, outdoor control panel + box to manufacture specifications.

Section 1 contains a general description of the project, available facilities and the conditions with which the works have to comply.

Section 2 consists of variations to the standardised and particular specifications applicable to this contract.

The specification and drawings show the general nature of the work and not all details are shown. The responsibility lies with the contractor to provide for all materials and installation in order to furnish a complete functional installation.

CONTRACTOR'S RESPONSIBILITY

The work consists of the supply, installation, testing, commissioning and free maintenance during the guarantee period of the installation detailed in this Specification and on the accompanying drawings.

The Contractor shall provide all materials, equipment, labour and services necessary for the complete, safe and efficient installation and operation of the electrical installation in accordance with the intent of this Specification and the Drawings. The tendered prices shall include all costs incurred in meeting these requirements.

STATUTORY REQUIREMENTS AND STANDARDS

The activities shall comply with the statutory requirements and relevant guidelines, inter alia the Occupational Health and Safety Act 85 of 1993 as amended, Municipal bylaws and regulations and any special requirements of the supply authority, the relevant standards and codes of practice, whether NRS, SABS or BS.

SAFETY PROCEDURE

Any switching of existing power supplies shall be arranged beforehand with the Responsible Person of the Municipality.

The Contractor shall not perform work on any portion of a network until such portion has been isolated and earthed.

The Contractor shall request a written Work Permit from the Responsible Person, which shall be completed in duplicate. The original Work Permit shall be retained by the Contractor until completion of his work. Upon completion of the work, the Contractor shall sign a statement to this effect. He shall hand this statement, as well as the used Work Permit to the Responsible Person, to enable the latter to re-energise the relevant portion/portions of the network.

CONFLICT BETWEEN SPECIFICATIONS AND DRAWINGS

Should there be conflict between the Specification and the Drawings then sections shall be considered in the following order of priority:

Project Specification
Standard Technical Specifications
Schedule of Quantities
Drawings

Should the Contractor note an inconsistency between the Specification and Drawings, he shall be responsible for notifying the Engineer and obtaining clarification or instructions prior to ordering or installing equipment.

SECTION 1: THE WORKS

PS 1 DESCRIPTION OF THE WORK

The project consists of the following:

THIS PROJECT WILL BE A YEAR PROJECT, SUBJECT TO THE AVAILABILITY OF FUNDS AND SUBJECT TO THE BUDGET BEING APPROVED BY COUNCIL.

Oceanview Substation outdoor switchgear installation on behalf of the Kouga Municipality will comprise of the following:

PART 1:

(a) 3 x 5MVA 22/11kV POWER TRANSFORMER
(b) CONSTRUCTION OF THREE SEPATATION WALLS BETWEEN TRANSFORMERS
(c) 8 x 22 kV AUTO-RECLOSERS
(d) CHIPSTONE LAYERING OF SUBSTATION YARD
(e) 1 x OUTDOOR CIRCUIT BREAKER “DOGBOX” WITH CT&VT + CONTROL PANEL + OUTDOOR CONTROL BOX.

PS 2 LOCALITY AND ACCESS

All drawings will be available at the start of the contract period.

PS 3 NATURE OF STRATA AND MATERIAL ON SITE

The ground appears to be a mixture of clay and rock. It is the Contractor’s responsibility to acquaint himself with the site conditions.

PS 4 OPERATING CONDITIONS AND PARAMETERS

All the material and equipment supplied in terms of this Contract shall be suitable for continuous operation at the total specified output or capacity under the following conditions:

Climatic Conditions:

Altitude	:	0 - 300 m above sea level
<u>Temperatures:</u>		
Utmost maximum	:	40°C
Utmost minimum	:	-10°C
<u>Relative humidity:</u>		
Utmost maximum	:	95%
Utmost minimum	:	5%
Atmosphere	:	Coastal climate with severe corrosive conditions
Lightning	:	Medium
Thermal resistivity of soil	:	1,2°C m/W
Average soil temperature	:	25°C

System Details:

System nominal voltage	:	400 / 231 V
System highest voltage	:	440 / 254 V
Neutral earthing	:	Solid
Nominal system frequency	:	50 Hz
Number of phases	:	3

PS 5 DETAILS OF CONTRACT: PART 1

The Contractor shall carry out in a logical sequence the various components of the project work.

PS 5.1 OUTDOOR MEDIUM VOLTAGE SWITCHGEAR

Autor-reclosers will be installed as per particular specifications PXA / PXB.

Auot Reclosers will be single pole applications mounted inline with the transformer bay

PS 5.2 WORK TO BE EXECUTED BY OTHERS

All work to be carried out by the Electrical Contractor.

PS 6 DETAILS OF CONTRACT:

The Contractor shall carry out in a logical sequence the various components of the project work.

C 3.2 PARTICULAR SPECIFICATIONS

INDEX

PARTICULAR SPECIFICATION

PAF: GENERAL QUALITY & TECHNICAL SPECIFICATION

(a) GENERAL

This part relates to the Quality and Technical Specification for equipment, material, and work to be supplied and installed. The other Particular Specifications shall be read in conjunction with this Specification. Where trade names and trademarks are mentioned, it relates to type and quality of manufacture, but does not exclude equal and similar products of other manufacturers.

(b) QUALITY AND STANDARDS

All material and equipment supplied and installed under this Contract shall be new and the best of their respective kinds. Workmanship shall be of the highest standard through-out and to the satisfaction of the Engineer and must comply with the Occupational Health and Safety Act (Act 85/1993).

All equipment or plant whether electrical or mechanical shall be erected and installed in strict accordance with these specifications and/or relevant SANS or NRS or BS or IEC Specifications and/or with the manufacturer's installation and testing instructions.

All material and equipment shall comply with the requirements laid down in the latest editions amendments of the relevant SANS, SANS, NRS, BS and IEC Specification. Material with the SANS mark will receive preference.

All materials shall, where applicable, comply with the following specifications and amendments except where otherwise specified:

Topic	Document
Aerial Bundled Conductor	SANS 1418, Parts 1 to 3, DTS 015(NRS 018)
Arrestors - Surge	BS EN 60099-1
Bolts and Nuts	SANS 1700
Bolts, Eye	SANS 1700
Bus bar	SANS 1195 & BS 159
Bushings	SANS 60137 & BS 223
CNE	SABS 1268:1979, NRS 016:1991
Cables, installation of electric	SANS 10198: Part 1-14
Cables, low voltage	SANS 1507: Part 2-6
Cables, medium voltage	SANS 97 & NRS 013:1991
Cable (house service split concentric)	DTS 0084 (NRS 017)
Cable Glands	SANS 808
Cable Ties	DTS 0086 (NRS 020)
Cables, XLPE	SANS 1339 & IEC 502
Paper	SANS 97
Insulated Electric PVC & Flexible Cords	SANS 1574

Clamps (strain for split concentric)	NRS 018
(Suspension .....)	NRS 018
Clamps Strain	SANS 61284
Clevis Tongue Adaptor (twisted)	SANS 61284
Clips for Wiring	
Circuit Breakers, Moulded Case	SANS 156
Circuit Breakers, Oil	BS 116 & IEC 56
Circuit Breakers, HV Alternating	IEC 60056
Coatings, Anodic on Aluminium	BS 1615
Conductors, Aluminium	SANS 182, Part 2
Conductors, Aluminium with Steel Reinforcing	SANS 182, Part 3
Contactors	BS 775
Enamel, High Glass	SANS 630
Earth Spikes	SANS 1063
Filling Compounds	SANS 317
Fuses	BS 88
Insulating	SANS 317
Insulators	SANS 60168, SANS 60273, SANS 60305, SANS 60383, SANS 60471, SANS 60720
Instruments	BS 89
Insulators, High Voltage Post	BS 3297
Luminaires, Floodlighting	SANS 475
Luminaires, Street lighting	SANS 10098
Meters, Electricity	BS 37 & IEC 43
-Prepayment	NRS 009
Overhead Power Lines	SANS 61284
Overhead Lines	SAIEE Code of Practise
Poles	SANS 753
Pole Top Service Box	NRS 032
Ready Boards	NRS 019
Relays, Electrical Protective	BS 142
Substations, Miniature	SANS 1029
Switchgear	BS 162 & IEC 62271
Switchgear, HV Metal enclosed & Control Gear	IEC 62271
Transformers, LV Insulting	SANS 780
Transformers, LV small	SANS 780
Transformers, Self-protecting	NRS 027
Transformers, Power	SANS 780, BS 171 & IEC 60076
Transformers	SANS 780
Transformers, Current	BS 3938
Transformers, Voltage	BS 3938
Testing Techniques, High Voltage	IEC 60
Zinc Coatings, Hot Dip (galvanised)	SANS 14713
Zinc Spraying	BS 2569

(c) **TESTING**

(a) Tests on completion shall be carried out on site in the presence of the Engineer, and the test results properly recorded and submitted in triplicate.

(b) On each completed section of laid and jointed cable, the insulated resistance shall be tested to approval, with an Approved type instrument of not less than 5000 Volts for MV and 1000 Volts for LV cables. LV has reference to 1000 Volts and less while MV has reference to more than 1000 Volts.

(c) On each completed section of laid and jointed H.T. cable a high voltage test shall be carried out. The test shall be performed in the same manner as that described in Clause 8-3 of SANS 97, but alternating or direct current may be used at the following voltage values:

CABLE VOLTAGE RATING (volts)	**CABLE TEST VOLTAGE (VOLTS)**			
	Between Conductors		**Conductors to Sheath**	
	AC	DC	AC	DC
11 000	20 000	30 000	11 500	17 500

All MV and LV Switchboards shall be tested to approval after erection and installation on site, using the applicable test voltages and instruments.

NOTE: Direct current tests should **NOT** be applied on **XLPE** cables. All cables shall be discharged immediately after each and every test.

(d) **SETTING OF PROTECTIVE DEVICES**

All protective devices throughout shall be correctly set by the Contractor to the approval of the Engineer before any circuit is energized, and the Contractor is required to obtain all necessary data for ensuring the correctness of the settings.

(e) **INSPECT SITE**

The Tenderer shall visit the site of the Works and satisfy himself as to the circumstances and conditions under which the work has to be done, the nature of the materials to be excavated and all matters which may in any way influence his tender, as no claims related to the above will be considered after allocation of the Contract.

(f) **ACCOMMODATION OF TRAFFIC**

During the period of construction and maintenance, the Contractor shall ensure that access to premises is maintained safely at all times ' and that traffic on public roads is accommodated without inconvenience. He shall provide the necessary temporary works to this end including all barricade signs, lights, etc., to the satisfaction of the Engineer.

Minimum clear ways shall be 1,00 metre for pedestrians and 3,40 metre for vehicles.

The Contractor shall provide and maintain any temporary fencing necessary for the protection of the Works and the public, also temporary bridges, crossings, etc., for all streets, driveways or footways intersected by the Works. Temporary crossings for footways shall be composed of stout timber and shall be not less than 1 meter wide and shall be fenced adequately on both sides.

The Contractor will be held responsible for any damage or accident to persons or property due to the inadequacy of any protective measure mentioned in this clause or in the Conditions of Contract.

(g) **PROTECTION OF PROPERTY PEGS**

The Contractor shall execute all possible care not to disturb land survey pegs. Any land survey pegs found to be missing shall be brought to the attention of the Engineer and shall be recorded, because, after the works has been handed back at the completion of the Contract, all pegs found to be disturbed will be replaced by an approved Land Surveyor at the cost of the Contractor.

(h) **EXISTING SERVICES**

The Contractor shall make himself acquainted with the position of all existing services such as storm water drains, water mains and connections, electric cables, telephone cables, electricity or telephone poles, water meter and stopcock boxes, etc., before any excavation is started, and should include in his prices for proper protection thereof.

Should any of these be damaged or interfered with, either during the progress of the Works or during the period of maintenance, the Contractor shall at once notify the Department or persons affected by such damage or interference, so as to enable the necessary repairs to be carried out in accordance with the regulations of such department. The cost of any such repairs shall be borne by the Contractor or may be deducted from any money due to him under this Contract. Where, in the opinion of the Engineer, it is impossible to carry out the new work without interference with any of these services, the cost of restoration and repair will be paid by the Client.

(i) **DUST AND NOISE**

The Contractor shall take all necessary precautions to control dust and noise.

(j) **SPOIL**

Excavated material deposited on the sides of trenches shall be kept trimmed up as closely as possible to the trench so as to cause the least possible obstruction to traffic.

In depositing spoil, care must be taken not to damage adjoining fences or buildings and care must be taken that a free waterway in gutters or otherwise is maintained as far as possible.

Should-any claims arise out of damage to or flooding of private or public property or completed construction works, due to the careless deposition of spoil, then the Contractor must settle same and repair any damage at his own expense.

(k) **OBSTRUCTION OF FOOTPATHS AND CARRIAGEWAYS**

The Contractor shall not deposit earth, rubbish or other materials of any kind so as to hinder unnecessarily, obstruct or annoy any person using or wishing to use the footpaths or carriageways. Free access to all properties and works must be maintained at all times. The Engineer reserves the right to have any obstructing deposits removed by the Contractor.

The Contractor must obtain the consent of the Council in writing before closing any made road to vehicular traffic and in any case a footway must be kept clear.

(l) **RUBBISH AND CLEARING OF SITE ON COMPLETION**

The Contractor shall keep the site and surroundings free from rubbish, clearing from time to time as required and shall clear away all plant and surplus material within fourteen days from the completion of the work, failing which the Engineer shall have the power to have the site cleared, deducting the cost from any monies due to the Contractor.

Walls and fences, etc., shall be repaired and thoroughly cleaned and renovated where affected by the work.

(m) **CLIENT MAY EXECUTE OTHER WORKS OR URGENT REPAIRS**

The Client or any other appointed by it may execute and carry out any other work in the area of this Contract and the Contractor shall afford all reasonable facilities for so doing, but he will not be held responsible for loss of time should such work impede him in his progress. The time so lost shall be allowed over and above the time stipulated for the completion of the Works provided that the Contractor shall make a claim to be allowed such extra time at the time the impediment or interruption exists and the Engineer is satisfied that such works are really retarding him in his progress, but beyond allowing time, the Municipality will not be liable for any other-claim that may be made in respect of this Clause.

In the event of any accident to property which demands immediate attention during the absence of the Contractor or his men or should the Contractor neglect or fail to execute any necessary repairs, the Engineer may have the work done and deduct the cost of same from monies due to the Contractor.

(n) **WATER IN TRENCHES**

The Contractor shall keep the trenches free from water during the progress of the Works, doing all sub-draining, pumping, bailing out, excavating for and diverting any water as may be required. Cables etc. shall be laid within two weeks from date of trenching and all trenches shall be completely re-instated within this period, to ensure that damage due to possible floods will be kept to a minimum.

(o) BARRICADING, WATCHING AND LIGHTING

The Contractor shall employ competent watchmen and guard the Works both day and night and shall fence, barricade and protect all parts of the work in such a manner as to provide adequately for the safety of the public or property.

When a road or street is partly closed to traffic, notice boards shall be placed at the ends and on both sides of the work to warn the public.

At night between sunset and sunrise at least two red lights shall be placed at each end of the trenches and on each side, in or near a roadway or footpath.

White lights shall be hung at a minimum distance of eight (8) meter apart. The Contractor shall also light and, if necessary, barricade all materials of any description obstructing pavements and 'streets as a consequence of his operations. The presence of an electric streetlight shall not relieve the Contractor of placing such lights and barricades.

The Contractor shall exonerate the Client from all claims that may arise in this connection.

(p) LATRINES

The Contractor must provide, maintain, move to positions required and finally remove proper latrines. Latrines shall be properly secluded from public observation and their use shall be strictly enforced.

The Contractor shall arrange for removals when necessary and pay all charges in connection with same. The number of latrines to be provided shall be based on the requirements of one latrine to every fifteen persons.

(q) COMMENCEMENT AND ORDER OF WORK

The Contractor, on receiving written order from the Engineer to proceed with the work, shall arrange to do so within seven days from the date of such order, and will be required to commence the Works in one or more places at such points as the Engineer may direct and shall keep each section continually in progress until completed.

(r) MEASURING UP WORK FOR MONTHLY OR FINAL CERTIFICATES

In accordance with the General Conditions of Contract, the Contractor shall furnish the Engineer with a detailed statement at the end of each month showing the work executed by him during the month and details of all extra work performed and also a final account on completion of the Work.

For the purpose of preparing his statements the Contractor shall in conjunction with the Engineer or his representative measure up the work carried out, care being taken that no work or materials are covered up either in whole or in part before the quantity of such work or materials to be charged for has been duly certified as correct by the Engineer or his

representatives. The above specifically refers to cable joints, cable tees, etc.

The Contractor will be required to give all assistance and provide the necessary labour for measuring up the work. The work executed will be paid for according to the rates submitted in the Schedule of Quantities and adjusted where necessary in accordance with Clause 2.02.

(s) **CLIENT'S EQUIPMENT**

The use or hire of Client's equipment for transport, cable laying or the erection of street lighting equipment will not be permitted.

The Contractor shall provide all ladders, tower ladders, cable rollers and cable drum trailers required for the execution of the Contract.

(t) **SHEDS**

The Contractor shall supply on site, his own sheds for the use of his men and/or materials. The Contractor shall place offices, camps, sheds and plant only on sites approved by the Engineer.

If the Contractors land belonging to the Client, he shall keep it clean and on completion of the Work, shall leave the area restored to the satisfaction of the Engineer. This applies particularly to concrete floors and bases which shall be broken up and disposed of to the satisfaction, of the Engineer.

(u) **PROJECT NAME BOARD**

The Contractor shall supply and erect in position where directed, within two months from date of appointment as Contractor, a strongly made and the municipality name board conforming to the design approved by the South African Association of Consulting Engineers.

PARTICULAR SPECIFICATION

PL: PROTECTION

1. SCOPE:

This specification comprises the supply, delivery, installation and commissioning of protection relays and schemes as well as measuring instruments.

2. INTERPRETATION:

The following documents must be read with this specification. Where discrepancies occur between documents, this specification will take preference:

IEC-55	:	Protection relays
SANS-01	:	Testing of electricity meters
SANS-1299	:	Direct acting indicating electrical measuring implements and the accessories.
CKS-454	:	General purpose battery charges
CKS-455	:	Sealed rechargeable batteries

Any variations to the particular specification as applicable on this contract, are shown in the variations to particular specifications in Part 2 of the project specification and shall meet the data sheets in part 6 of the document.

3. MATERIAL

2.1 General:

Complete information of how the equipment offered compare with the specification, must be submitted by the tenderer. Before construction starts, complete key diagrams and other construction drawings must be submitted to the Engineer. The complete secondary circuits with all terminal and wiring numbers or codes as well as winding ratios and polarities of current, voltage, and power transformers must be shown on these drawings.

3.2 Panels:

Relays and control panels must be equipped with all indication meters, relays, control switches, push buttons, or indication lights and alarms only on the front thereof. The relay and control panels must have access from the front or rear with hinged doors and/or swing frame panels. No relay shall be mounted higher than 2500 mm or lower than 300 mm above floor level.

3.3 Wiring:

All wiring leaving the panel shall be terminated onto spring loaded, screw-thread spade lug, identifiable terminal blocks. Secondary current transformer wiring to each panel shall make use of test blocks so that the current can be measured by insertion of a split plug or test plug without disconnecting protection relays or other instruments from the circuit. Split or test plugs for this purpose shall be provided with each protection panel or relay equipped with such test blocks.

All wiring shall be numbered at both ends with corresponding numbers with approved plastic ferrules. All such numbers shall be clearly indicated on drawings. It is important that all wiring to and from all instruments shall be shown on construction drawings. All wiring shall be terminated with pin, spade or ring lugs approved by the Engineer.

3.4 Relays:

Electro-mechanical as well as electronic relays are acceptable. Complete type test certificates according to IEC 55 shall be submitted to the Engineer for approval of all relays.

All relays shall be of the flush-mounted withdraw able dust-proof type with static-free container.

All relays shall be supplied with enough voltage-free contacts independent of one another, for the control of the circuit as needed. One set of voltage-free normally open contacts for alarm shall be available on all relays. Relay contacts shall be capable of repeated use without wear.

High speed trip contacts shall be of the self-latching type. All circuit with trip or closing coils shall have auxiliary contracts in series. If specified in the project specification these relays shall be equipped with a second coil to provide for supervisory resetting of the latched relays.

All DC relays shall be suited for supply voltage that vary between minus 20 % and plus 20 % of the nominal battery output voltage. Where no other means of alarm for voltage fluctuations exceeding these limits exist, provision must be made for an option to trip the protection.

All relays shall be clearly marked according to its function. All relay alarms or flags shall be numbered. A schedule of these numbers shall be submitted to the Engineer.

It may be required that new or additional relays be identical to existing relays or that its operation must match existing protection schemes. In such cases these requirements will be stated in the project specification.

3.5 Direct Current Power Supplies:

Except where specified differently in the project specifications, all close, trip, control and alarm circuits shall be supplied with 110 V DC. This supply shall exist of a battery charger and batteries. The battery charger shall have both normal and boost charge modes and be equipped with control circuits to protect the batteries and charger against over voltage and overcurrent conditions.

Automatic regulating of battery charging current and voltage shall be incorporated.

Batteries shall be of the NI-Cad type, except where otherwise specified in the Project Specification.

The ampere-hour rating of batteries shall be adequate to trip all circuit breakers twice and to close them once. It shall also be capable to carry the full load of the protection and control circuits of the substations for at least eight days, except where an auxiliary supply as described below, is installed. The auxiliary supply shall be included in all schemes where electronic protection relays are used. It shall exist of an AC to DC converter connected in parallel with the battery charger and batteries. The batteries shall be protected with diodes to ensure that it is not charges from the AC to DC converter.

The percentage alternating current supply superimposed from the batteries and AC to DC converter, shall be small enough that it shall not affect the protection or control circuits negatively.

All DC circuits shall be protected with fuses at the positive and negative supply rails. Individual feeds to different control, protection alarm or metering circuits shall each be protected with dual fuses to minimize any effects of faults on the DC circuits. DC fail alarm facilities, as specified in the project specification, shall be provided.

3.6 Current Transformers Secondary Circuits:

All current transformer secondary circuits, shall be earthed through a removable earth link at one point only.

Where more than one winding ratio exits, the alternative connection diagrams shall be clearly indicated. Test windings shall be clearly identified.

All windings not used except test windings, shall be link to earth to form a short circuit.

Current transformer secondary circuit wiring shall have adequate current rating and low enough impedance that it shall not place a significant burden on current transformers. The secondary resistance, magnetising current, and kneepoint voltage of all current transformers as well as resistance of relays and wiring to secondary windings of current transformers expressed in VA or ohm shall be supplied to the Engineer.

3.7 Over-current and Earth Fault Relays:

These relays shall have the time curves and setting range as specified in the project specification. Deviations from standard curves or setting ranges shall be brought to the attention of the Engineer for approval. All relays shall have suitable current measuring and test facilities.

3.8 Unit Protection:

This type of protection includes all types of current differential protection. All unit protection shall operate without any time delay except if 50 specified in the project specification.

Restricted earth fault protection shall be of the high impedance type and shall be stable under transient and through fault conditions.

Where pilot cable protection schemes are specified to match existing schemes, detail information shall be supplied in the project specification.

Inter-tripping shall be possible by short circuiting the pilot cable. Systems based on the open circuit operation of pilot cables shall not be accepted.

Transformer differential protection shall be equipped with harmonic and through fault restraint coils.

Pilot cable inter-tripping relays shall be equipped with low pass fillers to prevent incorrect operation due to induced AC voltages up to 5 kV on the pilot cable. Because common pair pilot

wires are used for send and receive signals, contracts of the local inter-tripping send relay shall be wired to open the local receive relay. The master trip relay may be used to send inter-tripping signals.

Bus zone protection schemes shall be of the high impedance type, except where specified differently. Test blocks for the measuring of current in all secondary circuits of current transformers shall be installed on the buszone panel.

3.9 Distance Protection:

Distance protection shall be non-switched or switched as specified in the project specification. It shall have a step zone trip characteristic affect by the position of faults. The distance covered and tripping time delay of each zone shall be independently adjustable with a wide distance and time reach.

Carrier wave or optical fibre communication shall be supplied if and as specified in the project specification.

The protection system shall operate correct under hanging fault conditions such as the remote operation of a fault thrower or power swing conditions and shall be stable for reverse faults in the first two zones.

The third zone and back-up protection shall have omni-directional protection with adjustable time delay.

The relay shall be switchable for repeating of signals for trip acceleration. The range of impedance setting shall be suitable for the application and shall be submitted to the Engineer for approval. With the protection of overhead lines, high speed earth fault relays shall be coordinated with distance protection to ensure that reclosing only occur for single phase to earth faults.

3.10 Metering and Instrumentation:

All measuring instruments shall be of the industrial switchboard type suitable for flush mounting. Construction and accuracy shall be in accordance with BS 89-1954 for first grade instruments.

Instruments shall be protected against through faults in the primary circuit of current transformers. Measuring instruments connected into protection circuits shall be protected with saturation current transformers.

The thermal element of ampere-meters shall have a time delay of 30 minutes with a red maximum indicator. All ampere-meters shall be supplied with different face plates to match all available current transformer ratios. The full load limit of each circuit shall be marked with a red line on the face plate of the ampere meter.

Voltmeters shall be of the suppressed zero type suitable for flush mounting. Voltmeter ratios shall be as indicated in the project specification and be marked according to colour or nameplate to shown the relevant phase. Voltmeters shall be protected with high rupturing capacity fuses.

Selector switches for ampere meters are not acceptable. Voltmeters shall be equipped with rotating type selector switch unless otherwise specified.

4. CONSTRUCTION EQUIPMENT

A complete set of all special test plugs, test plugs, leads and/or test instruments needed for testing of specific relays shall be supplied with relays. Detail of such equipment shall be provided to the Engineer for approval.

5. INSTALLATION

Not applicable.

6. TOLERANCES

Not applicable

7. TESTS

The following tests shall be performed by the Contractor on site in the presence of the Engineer or his representative.

a) Visual inspection of wiring;
b) Polarity tests of current transformers;

c) Primary injection of all circuits for through faults and in zone faults;
d) Secondary injection of relays;
e) Insulation tests of circuits;
f) Functional tests of circuits;
g) Live tests.

The Contractor shall submit to the Engineer a commissioning program indicating when abovementioned tests shall be erected.

Type tests a factory tests according to IEC 255 shall be conducted and test certificates shall be submitted to the Engineer.

All electronic relays shall comply with the requirements of IEC255 as follows:

i.) Insulation test voltage: 2 kV, 50 Hz, 60 seconds;
ii.) Impulse tests: 5 kV, 1,2/50 microseconds, 0,5 joule;
iii.) High frequency: Common mode 2,5 kV, 1 MHz Transverse mode 1 kV, 1 MHz.

The rated temperature limits for compliance with the relevant performance specification is -25 °C to + 55 °C.

8. MEASUREMENT AND PAYMENT

Not applicable.

PARTICULAR SPECIFICATION

PXB: TRENCHES & EXCAVATIONS

GENERAL

(a) This specification covers the broad outlines and classifications of the requirements relative to the:

i) trenching for underground electric cables

ii) hole excavations for planting of poles and stays

iii) excavations for manholes or building foundations

iv) and similar requirements

(b) Where approvals are noted, this shall mean by the Employer's Engineer and shall include his delegated nominee but all shall be within the limits of authority as set from time to time, unless otherwise specifically noted.

MATERIAL CLASSIFICATION

(a) Materials will generally be classified as specified in Part D 1982 of SANS.

(b) The Contractor may use any method he chooses to excavate any class of material but his chosen method of excavation shall not determine the classification of the excavation. The Engineer will decide on the classification of the materials.

(c) In the first instance the classification will be based on inspection of the materials to be excavated and on the criteria given in Clauses 3, 4 and 5. All equipment specified in Clauses 3, 4 and 5 shall be in good mechanical condition.

(d) "Efficiently" as used in Clauses 3, 4 and 5 shall be taken to mean "in manner than can reasonably be expected of a Contractor" having regard to the production achieved.

(e) In the event of a disagreement between the contractor and the Engineer it shall be the responsibility of the Contractor, if required and subject to the terms of 4.1, of SANS 1200 Section D, to make available at his own expense such mechanical equipment as is specified in Clauses 3, 4 and 5 in order to assess the reasonable removability or otherwise of the material. The decision of the Engineer on the classification shall then, subject to the provision of the Contract, be final and binding.

(f) Should the Contractor consider that any material encountered in the excavations is either "hard material" or "rock", he shall immediately notify the Clerk of Works. Failing such notification, the excavation shall be taken to be "ordinary material".

(g) Where a percentage of a trench is ordinary/hard/rock the Clerk of Works on notification, will classify accordingly and binding.

SOFT EXCAVATION (ORDINARY MATERIAL)

(a) Soft excavation, other than in restricted excavation, shall be excavation in material that can be efficiently removed or loaded, without prior ripping by any of the following plant:

i) A bulldozer of mass (including mass of a ripper if fitted) approx. 22t and flywheel power approximately 145 kW, or

ii) A tractor-scraper unit of total mass approximately 28t and flywheel power approximately 245kW, pushed during loading by a bulldozer equivalent to the specified in above Clause 4(a) below, or

iii) A track type front-end loader of mass approximately 22t and flywheel power approximately 145kW.

(b) In the case of restricted excavation, soft excavation shall be excavation in material that can be efficiently removed by a back-acting excavator of flywheel power approximately 0.10kW for each millimetre of tined-bucket width, without the assistance of pneumatic tools such as paving breakers.

INTERMEDIATE EXCAVATION (HARD MATERIAL)

(a) Intermediate excavation, other than in restricted excavation, shall be excavation (excl. soft excavation) in material that can be efficiently ripped by a bulldozer of mass approximately 35t, fitted with a singleton ripper suitable for heavy ripping, and of flywheel power approximately 220kW.

(b) In the case of restricted excavation, intermediate excavation shall be excavation (excl. soft excavation) in material that requires a back-acting excavation of flywheel power exceeding 0.10kW for each millimetre of tined-bucket width or the use of pneumatic tools before removal of equipment to that specified in Clause 3(a) (ii) above.

(c) See Clause 5(f) and 5 (g).

HARD ROCK EXCAVATION (ROCK)

(a) Hard rock excavation, other than in restricted excavation, shall be excavation (excluding boulder excavation) in material that cannot be efficiently ripped by a bulldozer equivalent to that specified in Clause 4 (a) above before removal.

NOTE: Such excavation generally includes material such as formation of un-weathered rock that can be removed only after blasting.

(b) In the case of restricted excavation, hard rock excavation shall be excavation in material (excluding boulder excavation) that cannot be efficiently removed without blasting or without wedging and splitting.

(c) Boulder excavation Class A shall be excavation in material containing more than 40% by volume of boulders or size between 0.03 m^3 and 20 m^3 in a matrix of soft material or smaller lumps of hard dolomite. Excavation of solid boulders or lumps of size exceeding 20 m^3 will be classed as hard rock excavation. Excavation of solid boulders or lump of size exceeding 20m^3 will be classed as hard rock excavation. Excavation of solid boulders or lumps of size exceeding 20 m^3 will be classed as hard rock excavation. Excavation of fissured or fractured rock will not be classed as boulder excavation but as hard rock or intermediate excavation according to the nature of the material.

(d) Boulder excavation class B shall be excavation of boulders only in a material containing 40% or less by volume of boulders ranging in size between 0.03m^3 and 20m^3 in a matrix of soft material or smaller boulders.

(e) Those boulders requiring individual drilling and blasting in order to be loaded by a track type front-end loader or back-acting excavator, as the case may be, as specified in clause 3(a) or 3(b) above, will each be separately measured as boulder excavation Class B.

(f) The excavations of the rest of the material will be classed as soft or intermediate excavation according to the nature of the material.

(g) The Contractor shall observe and comply with the provisions of the Explosives Act No. 26 of 1956 or any amendment thereof or regulations framed thereunder.

(h) The rates shown on the Bill of Quantities shall include for the removal of all unusable hard material or rock to a point not more than 3 km from the Black Township, unless itemised separately on the Bill of Quantities.

(i) The rates shall also include for the supply and delivery of suitable backfilling material to adequately fill the trenches where rock and hard material could not be used, unless itemised separately on the Bill of Quantities.

TRENCHING

(a) The Contractor will be required to attend the site inspection in order to satisfy himself on the soil and topographical conditions which may be encountered on the site, during trenching operations.

(b) Due allowance must be made for slower hand trenching in the rates quoted, if topographical conditions will not permit machine trenching, and due cognizance must be taken of the total contract period required. Additional time cannot be considered for this work except in very special circumstances.

(c) If the contractor considers it necessary, he shall be granted permission and he shall arrange for test holes to be dug. He shall base his various rates of material classification

on his various rates of material classification on his findings, as not extra claims will be considered once tenders have been awarded.

(d) Prior to commencement of machine trenching, all existing services shown on the service drawings, must be exposed by hand digging by labourers adequately trained in this work.

(e) Prior to commencement of the trenching, the proposed trenching line shall be clearly marked with the use of lime or similar material.

(f) Trenches shall be in a straight line one (1) metre from the property boundary line unless detailed otherwise on the drawing.

(g) Where the road and property line is curved, the trench shall follow the contour of the property line.

(h) The trench shall be excavated to the minimum widths and depths as detailed in the Bill of Quantities.

(i) The base of the trench shall be suitably levelled off and trimmed to suit the number of cables to be installed.

(j) Deviations at large manholes or similar obstructions of other services are permitted subject to the approval of the Clerk of Works. Details of such deviations to be shown on drawings.

(k) Trenching in areas with a large sand or gravel content may require suitable shoring to achieve uniform and correct cable depth. Due allowance for this must be made in the rates quoted. (See clause 6(a).

(l) Unless detailed otherwise on the drawings the following depths are required to underside of cables or services.

Electrical cables 11 000 Volt	900 mm
Electrical cables 600/1 000 Volt	750 mm
Telkom	600 mm

(m) The width of trenches shall be in accordance with the Bill of Quantities. If the contractor chooses to excavate wider than specified, he may do so at his own cost entirely including backfilling, etc.

BEDDING AND CABLES

(a) Bedding of cables is required to protect the cable from sharp projections or alternatively to achieve max current carrying capacity of cables or both.

(b) Material considered suitable for bedding is sand, earth, loam and in certain instances certain types of soft clay.

(c) Where the spoil removed is suitable for bedding, but contains a percentage of stones or pebbles, then it may be used for bedding if it is first put through a sieve not exceeding 25 mm square. Irrespective of their size, stones with sharp edges will not be permitted.

(d) Where sand is specifically required, it shall be shown as such on the Bill of Quantities and required by the Clerk of Works. Otherwise, the cheapest bedding available can be used.

(e) In the event of clay or chalky soils or gavel being found, then HV cables will be bedded using sand.

(f) Normal bedding requirements for electric cables will be as follows:

CONDITION	UNDER	OVER
11 kV PILC and L.V. cables in earth	nil	nil
11 kV PILC in other conditions	150 mm sand	150 mm sand
11 kV in gravel/hard/ rock	150 mm sand/earth	100 mm earth/sand
1000V kiosk feeders in gravel/hard/rock	"	"
1000 V for house services in gravel/hard/rock	"	"

(g) The final decision as to whether bedding may be omitted or not, shall rest with the "Employer's" Clerk of Works.

(h) Cable bedding requirements shall be detailed separately on the Bill of Quantities and shall be based on a linear rate per trench. The contractor shall make due allowance in his rates quoted for

i.) possible wind age losses for bedding material like sand.

ii.) losses at dumping points.

iii.) transport to and on the site of bedding material.

iv.) purchase cost of the bedding material, if not available on site.

v.) the number of cables in the trench.

(i) No claims for extras on bedding will be entertained after the contract has been awarded, unless very special circumstances dictate otherwise.

TELKOM

(a) Special conditions are required by Telkom and these must be studied carefully and complied with fully.

(b) The minimum clearance allowable between electric power cables and telecommunication cables in ground without special protection is 600 mm even if latter are installed in pitch fibre or other pipes (Road crossings excluded).

(c) Where the separation of cables is between 300 to 600 mm then a cement slab shall be placed over the electrical cable.

(d) Where the separation of cables is less than 300 mm then a cement slab shall be placed over the electrical cable and a cement slab shall be placed between the two cables.

(e) Contractors shall quote for the supply of good second hand cement slabs (small cracks permitted) and for the laying of same as per the Bill of Quantities.

(f) Cement slabs shall be placed on 100mm bedding on top of cables and not directly on the cable itself.

(g) At road crossings, where cables come together to enter pipe sleeves, suitable protection for electric cables shall be provided as per (d) above.

Table 1

CLEARANCE	PROTECTION REQUIRED
More than 600mm	No further protection required
500mm or less	Cover tiles used or cables installed in pipe
Less than 300 mm	Concrete slabs or similar permanent separator required plus cover tiles

(ii) OTHER SERVICES INCLUDING PEGS/BEACONS

(a) Prior to commencement of trenching, all services shown as "existing" on the service drawings must be exposed by means of hand digging, by labourers suitably skilled for this work.

(b) Particular care must be exercised and labourers shall be fully warned especially where "alive" electric cables are to be exposed.

(c) Any damage to existing services shall be reported to the Clerk of Works, without delay, irrespective whether shown on drawings or not.

(d) Repairs to "known" existing services shall be for the contractors account and shall be repaired with new materials and in accordance with acceptable and correct repair procedures.

(e) Particular care must be exercised not to undermine other services when excavating in close proximity, since electrical contractor shall be responsible for subsequent loss and damage.

(f) Where other services must be removed by the Electrical Contractor, prior written consent of the Engineer is required. Every care shall be taken not to damage services removed. Damage shall be reported to the Clerk of Works, when note.

(g) Other services shall be replaced by the competent authority or contractor.

(h) Trigonometrical and other survey beacons or pegs may not be removed, altered or replaced by the Electrical Contractor.

(i) Where this is unavoidably necessary, the Engineer/Clerk of Works shall be advised in writing and appropriate action shall be taken.

(j) Beacons or pegs lost, removed or altered shall be replaced at the contractors expense excluding (i) above.

(iii) PIPE DUCTS AT ROAD CROSSINGS

(a) In general, all pipe ducts will be supplied and installed by the civil contractor, as per the requirements of the electrical planner.

(b) Ducts shall be laid straight across a road at depth of approximately 800 mm from the top of the duct to the finished surface of the road.

(c) Ducts for 11kV cables shall be laid in a straight line with the proposed trench approximately 1m from the property line.

(d) Low tension cable ducts will be adjacent to the HV cable ducts but towards the splay of the road.

(e) In certain positions, at least one pipe duct may be used by Telkom and the drawings must be checked before cables are drawn in.

(f) As the civil contract may be completed some months or years before the electrical contract is commenced, the electrical contractor will have to search for pipe duct ends, and due allowance must be made for this in the rates quoted for trenching.

(g) Duct positions will be according to drawing ± 1000mm and not exceeding 1250 mm in depth.

(h) No excavations for searching for ducts must exceeds the above requirements without electrical Clerk of Works prior approval and noting, since the additional costs for searching shall be noted for payment by the civil contractor.

(i) Some additional ducts may have to be laid by the electrical contractor. Compaction over roads or walkways shall require final approval by civil section of the "Employer" and shall be approximately 98 % Mod. AASHTO Density.

(j) All ducts must be cleared by pulling through a loose fitting mandrel prior to the installing of cables. Ducts which are blocked must be inspected by the electrical Clerk of Works for a claim against the Civil Contractor.

(k) All ducts shall end approximately 1000 mm behind the kerb face. Adequate precautions must be taken to ensure correct compaction in layers of 150 mm thick maximum and to avoid undermining of road or kerb.

(l) As general rule, 11kV, and L.V. cables shall not be drawn into the same duct. Also two (2) H.V. cables shall not be drawn into a single duct. The ducts provided shall be as follows:

HV cables (11 000 Volt)	:	1 Duct × 150 mm each
LV Feeder Cables 120 mm or large	:	1 Duct × 150 mm each
LV Feeder Cables 95mm smaller	:	1 Duct × 100mm each
House Service Cable 16mm²or smaller	:	1 Duct 100mm for 4 cables

(m) Pipes suitable for ducting shall be 100mm x 150 mm asbestos cement with rubber sleeves unless otherwise noted on the Bill of Quantities.

(n) After pipe ducts have been installed by the civil contractor, he shall leave a No. 10 gauge galvanised draw wire in the duct.

(o) All pipe ducts, after installation by the civil contractor, shall be suitably sealed to prevent ingress of soil, small stones, sand etc.

(iv) BACKFILLING

(a) Prior to backfilling, the drawings shall be checked to ensure that all cables are laid in the trench, as required.

(b) All loose stones or any other materials likely to cause damage to cables shall be removed from trenches, before backfilling commences.

(c) Backfilling shall not commence without prior inspection, measurement and approval of the Electrical Clerk of Works.

(d) Backfilling of trenches in road reserves shall be in layers not exceeding 300 mm and the use of a suitable compacting machine is essential in order to achieve an approximate 98 & Mod. AASHTO Density.

(e) Where large boulders and rock have been removed during the trenching, these shall not be used as backfilling work must be shown on the Bill of Quantities as m³/km.

(f) Backfilling across properties shall be in layers of 300mm with the use of correct facilities. Careful removal and prompt replacement of plants, shrubs, grass, etc. including care of subject matter until growth is re-established is essential and must be allowed for in rates quoted.

(g) Prior to handover, all cable trenches shall be checked for settling and repaired as necessary.

(h) Prior to payment of final retention monies, all cable trenches shall be checked for settling and repaired as necessary.

(v) **CABLE MARKER TAPE**

(a) All cables shall be marked by means of a continuous tough, brightly coloured PVC sheet known as "Cable Marker Tape" of 800 gauge thickness.

(b) Cable marker tape shall be laid approximately 300 mm from finished ground level.

(c) Wording on cable marker tape shall be in three languages:

"DANGER GEVAAR INGOZI" with skull and crossbones.

(d) Cable marker tape requirements shall be shown on the Bill of Quantities and the following principle shall be followed:

One Cable	1 × 150 mm
Two Cables	2 × 150 mm or 1 × 300 mm
Three Cables	3 × 150 mm or 1 × 300 mm + 1 × 150 mm etc.

(e) Where a narrow trench is only possible, and the cables are laid one above the other, then the HV cable shall be underneath with its cable marker tape and the LV cable above with its own marker tape.

(f) In general practice, all HV cables as well as LV kiosk feeder cables shall be separately by 150 mm. However, house service cables can be laid adjacent to each other, or separated by 75 mm and then the Clerk of Works will indicate the cable marker requirements.

(vi) JOINT HOLES

(a) Joint holes shall be excavated to a sufficient size to permit correct and efficient jointing to be performed.

(b) Special precaution must be taken at joints to ensure correct and secure support below cables and joint as well as subsequent backfilling over.

(vii) **CABLE MARKERS**

(a) Pyramid concrete cable markers for cable position and joint markers shall be supplied in accordance with the Bill of Quantities and Drawing No.

(b) Cable route markers shall be placed at

i.) every change of direction

ii.) approximately every 30 m on a straight run

(c) Where the cable trench is in line with the light poles being fed, then cable route markers may be omitted.

(d) Cable route markers shall be placed for all 11000 Volt cables and all kiosk feeder cables.

(e) Cable route markers shall be omitted on all house service cables.

(f) Cable route markers shall be marked,

i.) "HV Cable" for 11 000 Volt cables, cable size and type.

ii.) "LV Cable" for 600/1 000 Volt cables, cable size and type.

(g) Cable joint markers hall be placed above all cable joints for LV and HV joints.

(h) Cable joint markers shall be marked as follows:

i.) "HV Joint" for 11 000 Volt Cable Joints, cable size and type.
ii.) "LV Joint" for 600/1 000 Volt Cable Joints, cable size and type.
Cable route and joint markers shall be placed level with ground level in that area in order to cause no obstruction.

(viii) **RANDOM CHECK OF EXCAVATIONS**

(a) The "Employer's" Engineer reserves the right to request random check holes to check cable depth, bedding, material classification, danger tape, etc.

(b) The Contractor shall supply the necessary labour and facilities to fulfil this requirement, to an extent not exceeding one hole per 500 metres or part thereof, as laid.

(c) Due allowance for this shall be made in the rates quoted for excavation.

(ix) PROTECTION

(a) The Contractor shall take all necessary precautions to prevent trenching work in any way being a hazard to the public.

(b) The Contractor shall safeguard all structures, roads, railways, other services, properties, etc. from any risk of subsidence and damage.

(c) Trenches in from of occupied properties shall be closed by nightfall as far as possible and suitable safe access provided for residents.

(x) HANDOVER

(a) On completion of the trenching, prior to handover, any subsidence of trenches shall be made good.

(b) Where trenches are across or in a permanent walkway, pavement, or gravel road etc. the final topping shall similar material to the existing material.

PARTICULAR SPECIFICATION

PAA: MEDIUM VOLTAGE OVERHEAD POWER LINES

1. GENERAL

1.1 COMPLIANCE

The installation shall comply with the SAIEE Code of Practice on overhead lines for conditions prevailing in Southern Africa and with Occupational Health and Safety Act (Act 85 of 1993 as amended to date).

Any further requirements laid down by various statutory bodies such as the Telkom, Transnet, etc., shall also be observed when applicable.

1.2 EVERYTHING NECESSARY

All plant, labour, materials and equipment required in adhering to the various standards, acts and regulations mentioned above, although not necessarily detailed in the specification shall nevertheless be provided for under this contract and shall be to the approval of the Engineer.

1.3 DANGER NOTICE AND PHASE IDENTIFICATION DISCS

Danger notes shall be fitted at all structures fitted with transformers, remote mechanically operated switchgear or cable or other apparatus, and at other positions as may be decided by the Engineer. They should be written in the appropriate official languages of the Region.

Danger notices shall be fitted at a height approximately 3 metres above ground level.

Phase identification discs corresponding to the colour of the phases shall be fitted at all terminal or tee-off structures.

2. SURVEYING AND PEGGING

The routes of the overhead power lines are shown on the drawings and where applicable the necessary wayleaves or servitudes will be obtained by the Employer.

The Contractor will be responsible for ensuring that the route is accurately followed and that the best locations are selected for poles, taking into account topographical conditions, road crossings, telephone crossings, buildings, gates etc. The drawings show the layout generally after extensive on-site investigation and the pole positions indicated take into account the above requirements within the limits of scale.

Where the contractor is in any doubt regarding routing or pole location he shall, after having obtained the approval of the Engineer, employ the services of a registered Surveyor to obtain the correct locations. Reimbursement for the cost of such services will, subject to granting of

approval, be made from the Provisional Sum included for this purpose. Any major deviation considered necessary must be approved by the Engineer.

The Contractor may not enter private property without the owner's consent. Where such consent is withheld the Engineer is to be immediately notified.

3. BUSH CLEARANCE

This Contract is to include for the removal of all trees and bush within 5,0 m of the centerline of the line and for the lopping of branches encroaching within this area. Trees beyond these limits are also to be removed where they constitute a danger to the line or as necessary for construction. The extent of such clearance is to be checked on site prior to tendering, as no extra payment will be made due to lack of knowledge in this regard. All material cleared is to be removed from the site. However, the Contractor shall not be deemed to have ownership of any such material.

4. POLES AND SUPPORTS

4.1 Wood poles shall be used unless otherwise specified, the various constructional arrangements being indicated on the drawings.

4.2 Wooden poles shall be capable of withstanding a minimum fibre stress of 55 MPa and shall conform the SABS 753, 754 - 1982 and subsequent amendments. Poles with a top diameter less than the values specified in table SF. 22 shall only be considered if these are capable of withstanding a fibre stress greater than 55 MPa such that the equivalent strength requirements are maintained. Nevertheless the use of poles having a smaller top diameter than those mentioned in Table 22 shall be subject to the approval of the Engineer.

4.3 All wood poles are to be bound approximately 25 mm below the top with 3 turns of 3 mm dia. galvanised steel wire wrapped tightly around the pole, fixed with galvanised staples.

4.4 All poles shall have pole caps firmly fixed to the pole. These may either be in the form of P.V.C. caps or comprise minimum 1 mm thick conical galvanised steel caps attached with clout nails to champhered tops.

4.5 A template shall be used for marking off holes required for securing insulator brackets, supports, bolts, cross arms, cradle supports, etc. All drilling of wood poles and wood structures shall be done prior to erection and all drilled holes, cut surfaces, and pole tops, etc. shall be coasted with a creosote/tar mixture.

5. POLE HOLES

It is preferred that pole holes be auger drilled wherever this is possible.

Where pole holes are hand-excavated the material is to be set aside in layers to ensure that during back-filling the material is replaced in its original strata. Compaction is to comply with the

requirements set out under "Compaction" elsewhere in this Specification.

When calculating the cubic capacity of hand excavated pole and stay holes for payment purposes, the following measurements will be applied:

9,0 m Poles	:	1,2 × 0,62 × 1,7 m deep
10,0 m Poles	:	1,2 × 0,62 × 1,8 m deep
11,0 m Poles	:	1,2 × 0,62 × 1,8 m deep
12,0 m Poles	:	1,2 × 0,62 × 2,0 m deep
13,0 m Poles	:	1,2 × 0,62 × 2,2 m deep
Stays	:	1,2 × 0,62 × 1,8 m deep

6. WOOD CROSS ARMS

These shall be of suitable lengths and diameter for their purpose or as further detailed elsewhere in this Specification (See Table 23).

7. STEEL CROSS ARMS

These shall be hot dipped galvanised rolled steel channel section not less than 100 mm x 50 mm x 6 mm unless otherwise specified and of suitable length for the particular purpose.

8. CROSS ARM FIXING

Contact between cross arm and pole surfaces shall be such as to ensure no possible movement of cross arm, either longitudinal or rotational. Where necessary, suitable braces shall stabilize cross arms.

Cross arms supporting strain insulators or cradles shall be mounted so that they pull towards the pole, no tension being taken by the attachment bolts.

9. INSULATORS

9.1 Unless otherwise specified H.V. strain insulators shall be composite/silicon and H.V. pin insulators composite/silicon, both complying with IEC 471 16L and SANS IEC 60383 PART 1 respectively. H.V. pin insulators shall be mounted on suitable swan neck spindles or vertical spindles as appropriate.

9.2 L.V. insulators shall be white glazed porcelain complying with SABS 161 / SANS 121 / NRS 022. L.V. strain insulators shall be type S.05 mounted in S.05/MD brackets, L.V. intermediate insulators being either S.05 insulators mounted on the side of poles in a vertical formation or P.05 insulators on P.05/M vertical spindle in a horizontal formation. Type S.05 insulators shall be provided with felt washers.

9.3 All spindles shall be correctly sized for the cross arms used.

9.4 All spindles mounted on wooden poles or cross arms are to be bonded with 3 x 3.35

1100MPa bonding wire.

9.5 The type of construction, method of insulator supports, details of brackets, spacing, etc., together with details of voltages are specified in detail elsewhere in this Specification.

10. POLE WASHERS

All bolts used in wood pole construction, all "D" bracket fixing bolts, "A" frame fixing bolts, crossarm bolts and swan neck insulator brackets are to be fitted with suitable heavy duty galvanised pole washers below the nut. These washers are to be equal to type VC37 (GALV) as manufactured my Messrs Electrical Line Components.

11. CONDUCTORS

11.1 Full details of the conductors required are given elsewhere in this Specification. All conductors shall comply with SANS 182 as appropriate.

11.2 Stringing of conductors shall be carried out in accordance with the Manufacturer's sag and tension charts. Before making off the conductors shall be strained to the initial sag of tension for the given temperature as specified by the Manufacturer.

11.3 Binding-in at intermediate H.V. insulators shall be carried out using approved type proprietary binders similar to PLP. The binding-in shall be done strictly in accordance with the Manufacturer's instructions. Care shall be taken to ensure that the binder is correctly sized for both the insulator and conductor. Binding-in at L.V. intermediate supports shall follow accepted good practice for the conductor used. For binding-in of aluminium conductor, armour rods shall always be used except where armouring is automatically provided by the use of the proprietary binder installed. In this case extreme care should be taken to ensure that all recommended conductor protection pads are properly in place.

Where slack spans are employed, care is to be taken to ensure that conductors are free of kinks, bends, etc. and that the span has a neat and tidy appearance.

12. MID SPAN JOINTS

Approved type proprietary mid-span joints similar to PLP shall be used for copper to copper or for aluminium to aluminium conductors. Such joints shall be made strictly in accordance with the Manufacturer's instruction by person trained in their use. Mid-span joints of dissimilar conductors will not be permitted. Mid-span joints will be installed no closer than 20m from the nearest structure.

13. CONNECTIONS AND JOINTS

13.1 Connections shall be suitable for the particular conductors, and shall comply with the conductor Manufacturer's recommendations.

13.2 For aluminium to aluminium to copper to copper non-voltage joints, these shall be parallel

groove clamp, double lines tap or compression sleeve joints made with an hydraulic tool. Extreme care shall be taken to ensure that only compatible materials are used for jointing aluminium conductors. Terminating lugs shall be of the cold compression type.

13.3 Where aluminium to copper connections are to be made, either from line to line or line to cable tail, these shall be made using sacrificial tails. These tails, which shall be of the same material as the line, shall be joined by means of bimetal connectors to prevent electrolytic corrosion occurring, and installed in accordance with the Manufacturer's recommendations. Where copper cables not larger than 25 mm² are to be connected to aluminium lines, grease tubes and aluminium line taps must be used. In all cases where joints are made between different metals, the copper conductor must be below the aluminium to reduce the risk of electrolytic corrosion. All aluminium to aluminium joints are to be coated with "Densal" paste regardless of the method of jointing, and are to be wrapped in "Denso" tape.

13.4 Any long tail or other connection is to be supported by stand-off pin insulators where likely to come into contact with any other line or earthed part of the installation. In all cases where connections exceed 1,5 m in length, a stand-off insulator must be used.

13.5 Any cable box made off to equipment or line supported by "H" pole construction shall be attached at the centre of a suitable crossarm such that it is directly below the centre phase. The cable is to follow a gradual sweep from one of the poles.

14. FITTINGS

All fittings shall be selected to ensure that their factor of safety is in compliance with the Code of Practice at the maximum design voltage. Pigtail hooks will not be accepted. All fittings such as clamps, tower hooks, spindle brackets, eye nuts, rods, nuts, washers, stay rods, turnbuckles, etc., shall be hot dip galvanised mild steel, the galvanising complying with the requirements elsewhere in this Specification.

15. STAYS

15.1 Stay wires shall be galvanised steel of 1100 MPa U.T.S. complying with SANS 182 and shall be 12 mm diameter 7 / 4 mm unless specified to the contrary elsewhere herein. Stays shall in all cases be looped twice around the pole at a point mid-way between the two bolts in the case of an "A" frame construction or at the level of the middle conductor in the case of a vertical construction. Where two stays are called for, these shall be between vertical conductors, or at top and bottom bolts of a "A" frame.

15.2 Stay rods shall be galvanised steel of 400/500 MPa U.T.S. of circular section with turnbuckle to SANS 1431 pattern 1. These shall have at least 30 % take up remaining after the line has been energised. Except where specified to the contrary elsewhere in this Specification stay rods shall be 20 mm diameter and 2,5 m long and base plates shall be 450 mm sq

15.3 Where H.V. and L.V. lines are supported on common poles, double stays shall be

employed. Double stays must be installed one above the other unless the Engineer approves otherwise.

15.4 All stays shall be fitted with stay insulators, those for 11 and 22 kV lines being type 21-0522 and for L.V. lines type 21-1075. These shall be located not less than 5 m above the ground. For other voltages, the type of insulator will be specified elsewhere in this Specification. The angel between stay wire an pole shall be 45° where possible but should not be less than 35°. Stays shall be provided as indicated on the drawings, and in any other placed necessary for proper stability.

15.5 PVC stay guards shall be fitted to all stays readily accessible to pedestrian or vehicular traffic. The guards shall be painted in alternate yellow and black cross stripes along their complete lengths. Stay protectors shall be fitted as per manufaturers specifications.

15.6 Flying stays shall be installed where necessary for proper stability where the use of props or stays are precluded, ineffective or unsightly.

15.7 Stays shall be accurately positioned to exert force in the correct direction.

16. PROPS (STRUTS)

Wood props shall be provided as indicated on the drawings, and as may be necessary for proper stability.

17. CRADLES AND CRADLE SUPPORTS

The cradles shall be in the form of two stringer wires of 16 mm² hard drawn solid copper, with cross-rungs of the same wire at 600 mm intervals. The cradle wire stringers shall be securely fixed to each crossarm and at shackle points. Two clamps per stringer wire shall be used for fixing.

Cradle supports shall be similar in construction to cross-arms or as detailed elsewhere in this specification.

Earth continuity of each cradle to its earthing point must be ensured.

18. BONDING OF STEELWORK

All steelwork on a pole is to be bonded using 3 / 3.35mm bonding wire. This requirement applies to cross arms, all insulator supports and any other hardware. Where equipment is also mounted on the pole, the bonded metal is to be earthed to an earth spike as elsewhere specified herein, using a 35 mm ² bare hard drawn copper conductor unless otherwise specified.

19. EXPULSION FUSES

19.1 Expulsion fuses, three units to a set, suitable for the voltage specified, shall be provided as shown on drawings. They shall be mounted on a steel crossarm firmly attached to the

pole so located that ease of operation is ensured and sufficient clear space for the isolated element is provided. The minimum ground clearance for live parts shall be 5 m. Where fuses are used to protect pole mounted transformers, extreme care shall be taken to obtain a neat and practical arrangement on the pole. Where such units are specified for use as links, they are to be fitted with solid copper links manufactured for the purpose.

19.2 Allowance shall be made for the supply of six fuses per set, three being spare. A maximum of 6 spare fuses or each size shall be provided, per installation. When specified, a link stick for the particular equipment provided with torch attachment is to be supplied under this contract.

20. GANG OPERATED LINKS

20.1 These are to comprise three phase off-load units, operated by means of a pole mounted handle. The unit is to be mounted on suitable steel cross arms on a "H" pole construction. The operating link mechanism, rods, handle, etc. shall be hot dip galvanised. The handle shall be lockable in both the "Open" and "Closed" position and a suitable padlock shall be provided as specified under "Padlocks" elsewhere in this part. The operating rod shall be fitted with an insulated section to prevent danger to the operator.

20.2 An earth electrode is to be installed 2 m from the isolator handle, on the opposite side of the pole and is to be connected to the pole top steelwork by means of a 35 mm² P.V.C. insulated earth conductor. An earth mat is to be provided at a depth not exceeding 150 mm deep at the operating position and is to be connected to the operating handle. Both spike and mat are to comply with the requirements under "Earthing" elsewhere in this Specification.

21. SURGE ARRESTORS

21.1 The arrestors shall, unless specified to the contrary elsewhere in this Specification, have a rate current of 5kA and rated voltage of 10 kV r.m.s. : minimum flash-over voltage of 17,5 kV r.m.s. at 50 Hz and 43 kV peak with a 1,2/50 wave form and peak discharge voltage with 8/20 us current wave of 37 kV at 5 kA.

21.2 A set shall comprise three units, complete with suitable steel crossarm mounting bracket.

Earthing shall be by means of a 35 mm² stranded bare copper conductor, to an earth spike, as specified under "Earthing" elsewhere in this Part. Where the arrestors have a connection of a metal not compatible with the earth conductor a sacrificial tail shall be used, generally as specified under "Overhead Line - Connections and Joints" elsewhere in this Specification.

22. TABLE OF MINIMUM DIAMETERS OF POLE TOPS CORRESPONDING TO POLES CAPABLE OF WITHSTANDING FIBRE STRESS OF 55 MPa

LENGTH m	MIN. TOP DIAMETER mm

9	160
10	160
11	180
12	180
13	180
14	180
16	180

23. TABLE OF MINIMUM DIAMETERS OF WOODEN CROSS ARMS

LENGTH m	MIN. TOP DIAMETER mm
1,2	140
2,0	140
2,5	140
3,0	140
3,5	160
4,5	160
6,0	160

PARTICULAR SPECIFICATION

PTD: ON LOAD TAP CHANGERS AND AUTOMATIC VOLTAGE CONTROL

1. GENERAL:

(v) On load tap changer(s) shall comply with IEC Publication 214 and the additional requirements of BS 4571 where applicable.

1.2 The tap changer(s) shall be suitable for on-load tap changing to vary the secondary voltage between the limits stated in the Project Specification.

1.3 The controls of the on-load tap changer shall be suitable for as many transformers operating in parallel as specified.

1.4 The following tap changer control facilities are required:

1.4.1 Manual operation at the tap changer drive mechanism;

1.4.2 Electrical operation by a manual control switch at the drive mechanism (local control) or at the control panel (remote control);

1.4.3 Automatic control by a voltage regulating relay at the remote-control panel.

2. TAP CHANGER:

2.1 The tap changer shall be of the high-speed resistor type comprising a set of oil immersed selection switches for selection of the required tapping plus a set of oil immersed load interrupting diverter switches.

2.2 In order to avoid contamination of the transformer winding insulating oil, the tap changer load breaking switches shall be housed in a compartment which is completely isolated from the main transformer tank and the insulating oil from the one compartment shall not under any circumstances communicate with that of the other compartment. A common conservator arrangement may be employed provided that an oil-proof barrier is used to prevent the mixing of the two insulating oils - an oil filter placed between the two oils will not be accepted.

2.3 For maintenance purposes the tap changer switches and switch contacts shall be readily accessible without having to disturb the tapping connections inside the mains transformer tank. The current breaking contacts of the diverter switches shall be readily replaceable. Drop down tanks which necessitate the provision of pits in the foundations will not be accepted.

2.4 The tap changer shall be capable of carrying the same short circuit current as the

transformer windings shall withstand the same impulse and di-electic tests.

2.5 The tap changer compartment shall be fitted with a pressure relief device and a Buchholtz surge relay or a pressure operated switch.

2.6 A tap changer nameplate shall be provided and displayed in a prominent position near the power transformer nameplate. The tap changer nameplate shall contain all the information which is necessary to fully specify the unit in accordance with the relevant specification, the nameplate shall also include the replacement part numbers of consumable items such as diverter switch contact, etc.

3. TAP CHANGER DRIVE MECHANISM :

3.1 The tap changer drive mechanism shall be enclosed in a weather-proof cabinet mounted on the transformer.

3.2 The tap changer electric drive motor shall be either a single or three phase 50 Hz unit operating at the rated voltage and shall have a continuously rated starting winding without centrifugal switches. The tap changing mechanism is to be so arranged that should the electricity supply to the drive motor fail during a tap changing operation, the contacts will not remain in an intermediate position.

3.3 The following accessories shall be provided on the drive mechanism:

3.3.1 A mechanical tap-position indicator, visible from the outside;

3.3.2 A non-resettable six digit operation counter;

3.3.3 Limit switches to prevent the mechanism over-running the end position;

3.3.4 Contacts or resistor chain for remote electrical tap position indication;

3.3.5 Short circuit and overload protection for the motor;

3.3.6 Fused heater and on/off switch for the mechanism box;

3.3.7 Auxiliary relays and contacts;

3.3.8 Where specified contacts for supervisory tap position indication.

3.4 The drive shall operate on the step-by-step principle which ensures one step per initiating action.

3.5 For emergency operation the tap change drive mechanism shall be provided with a readily available handle for manual operation. Adequate provision shall be made to prevent the tap changer contacts from being left in an intermediate position during manual operation. An electrical interlock shall be provided to prevent the

operation of the electric drive whilst the manual operating handle is engage.

3.6 A local/remote selector switch shall be provided at the drive mechanism. A raise/lower selector or pushbuttons shall be provided for local electrical control.

3.7 It shall not be possible to operate the tap change mechanism simultaneously from two control positions.

4. REMOTE TAP CHANGER CONTROL PANEL :

4.1 The transformer shall be supplied with a remote tap change control panel which shall be housed in the control room.

4.2 The tap changer control panel shall match up to and fit onto the rest of the panels in the control room.

4.3 The tap changer control panel shall consist of an independent, free standing, floor mounted unit with overall dimensions of approximately 600 mm H 600 mm H 2 000 mm high.

4.4 The tap changer control panel shall be mounted on a folded steel channel base over the cable trenches.

4.5 The control panel shall be of robust construction and to the Engineer's approval. All instruments, lamps and controls etc. shall be accommodated on the front of the cubicle.

4.6 The panel shall be painted in accordance with the requirements of this specification - the final interior colour shall be white and the final exterior colour shall be light grey high gloss enamel to colour G29 of SABS 1091.

4.7 The panel shall be dust-proof, vermin-proof and adequately ventilated to prevent the overheating of the equipment.

4.8 The control panel shall be of the bottom entry type and shall be provided with 3mm thick cadmium plated gland plates for cable terminations.

4.9 All the gland plates shall be electrically bonded together by means of a 200 mm H 6 mm copper earth bar running continuously through the cubicles. The cubicle earth bar shall be bonded to the main substation earth by means of 70 mm² stranded copper earthwires.

4.10 All switches, push buttons and controls, etc. shall be positioned for easy access by the operator. All meters, indicating instruments and lamps, etc. shall be easily read by the operator whilst manipulating the switches, pushbuttons and controls, etc. The positioning of all control panel equipment shall be approved by the Engineer.

4.11 The following equipment shall be provided on the remote tap changer control panel :

4.11.1 A calibrated voltage regulating relay with voltage setting adjustable between 90% to 110% of sensing voltage. The degree of insensitivity shall be calibrated and adjustable between 0.5 and 3%.

4.11.2 A calibrated adjustable time delay associated with the voltage regulating relay with a range of 15 to 90 seconds.

4.11.3 The voltage regulating relay shall be blocked for loss of sensing voltage or LV circuit breaker open. The loss of sensing voltage shall not, however, block the manual operation of the tapchanger.

4.11.4 If noted in the Project Specification, a line drop compensator shall be provided with separately adjustable R and X values.

4.11.5 A tap position indicator, 96 mm square, with the scale graduated with the relevant tap positions shall be provided. With the supply of the indicator shall return to the zero position.

4.11.6 Voltmeters shall be of the suppressed zero, 96 mm square, quadratic scale, flush mounted type and shall comply with the requirements of BS 89 Accuracy Class 2,5.

4.11.7 Auto/manual selector.

4.11.8 Raise/lower selector or pushbutton.

4.11.9 Tap change in progress lamp.

4.11.10 Lamp to indicate that the local/remote switch at the drive mechanism is in the local position.

4.11.11 Over-current blocking and tripping shall be provided so that, in the event of an overcurrent occurring, operation of the tap changer is blocked, and in the event of an overcurrent occurring during a tap change operation, a trip command shall be available to trip the LV circuit breaker. The current setting of this relay shall be adjustable and calibrated.

5. CURRENT AND VOLTAGE TRANSFORMERS :

5.1 Current and voltage transformers associated with the tap changer control shall comply with IEC 185 and IEC 186 respectively.

5.2 Current transformers for line drop compensation and overcurrent blocking shall be included in the transformer and shall have a VA rating compatible with the equipment offered.

5.3 A voltage transformer for voltage indication and the voltage regulating relay shall be included unless otherwise noted. The secondary voltage shall be 110 V.

5.4 A nameplate shall be provided for each inbuilt voltage and current transformer and shall include all information necessary to fully specify the devices. It shall be displayed in a prominent position near the power transformer nameplate.

6. INSPECTION AND TESTING :

6.1 During manufacture, before despatch and on site the tap changers and tap changer equipment may be inspected and subjected to such tests as the Engineer may consider necessary.

7. DRAWINGS :

7.1 A set of drawings on linen or plastic of the equipment “as built” shall be provided.

7.2 Three copies of erection, operating and maintenance instructions shall be supplied by the Electrical Contractor

.

8. GUARANTEE :

8.1 The tenderers shall give a 12 months guarantee to replace, free of charge, any portion of the tap changing gear and ancillary equipment in which any manufacturing defects may develop within that period. Such period will commence from the date on which the tap changing gear is taken over by the Client.

PARTICULAR SPECIFICATION

PTC: POWER TRANSFORMERS

1. GENERAL :

This specification comprises the manufacture, testing, delivery to site, offloading, placing in position, filling with oil, purifying, commissioning and guarantee of the undermentioned transformer(s).

The transformer (s) shall comply with the following standards :

IEC 76	:	Power transformers
IEC 354	:	Loading guide for oil immersed transformers
BS 3523	:	Silica gel, cobalt chloride impregnated
BS 4360	:	Weldable structural steels
IEC 137	:	Bushings for alternating voltages above 1000V
IEC 185	:	Current Transformers
IEC 186	:	Voltage Transformers
SANS 555	:	Insulating oils for transformers and switchgear
SANS 780	:	Distribution transformers
SANS 1804	:	Three phase induction motors
SANS 60137	:	Insulated bushings
SANS 1804-4	:	Single phase induction motors

1.2 Transformers complying with standards other than those specified may be considered provided it is clearly indicated in which respects the equipment differs from the requirements of the relevant recommendations or standards.

1.3 Unless otherwise stated all power transformers shall be designed to operate at a normal supply frequency of 50Hz, up to an altitude of 1 800 m, and shall be capable of withstanding overloads without damage or reduction in life expectancy in accordance with IEC 354.

2. CORE AND WINDINGS :

2.1 Where core laminations are divided into sections which are insulated from each other, the individual sections shall be electrically bonded together by means of tinned copper bridging straps.

2.2 The transformer magnetic circuit shall be earthed to the core clamping structure at one point only. The bonding shall be effected by means of a single removable tinned copper link which shall be made readily accessible through a removable inspection cover in the top of the transformer tank.

2.3 All electrical bonding straps shall be suitable proportioned so as to be able to withstand all likely fault currents without damage.

3. POWER TERMINALS :

3.1 Transformer power terminals shall be positioned and marked in accordance with the requirements of IEC 76. Terminal markings shall be of a permanent nature taking the form of relief characters of steel or brass welded or brazed to the tank.

3.2 All bushings shall comply with SABS 1035.

4. TANK :

4.1 Unless otherwise stated, constructional steel plate, bar and section shall comply with BS 4360.

4.2 The design of the transformer tank and components shall be such that water cannot be retained anywhere on the external surfaces.

4.3 The transformer tank and components shall have adequate mechanical strength and rigidity to permit the entire transformer, filled with oil, to be lifted, jacked, transported and hauled in any direction without sustaining structural damage.

4.4 The transformer tank and all components shall be capable of sustaining a full internal vacuum at sea level without suffering any permanent distortion.

4.5 The transformer tank compartment shall be fitted with at least two “oil maintenance” valves, the one valve shall be accessibly positioned at the lowest point of the compartment and the other shall be accessibly positioned diagonally opposite at the highest point of the compartment. Oil maintenance valves shall be adequately protected against all possible damage during transport, installation and in service.

4.6 All valve throats communicating directly with the atmosphere shall be suitably blanked off by means of gasketted blanking plates or screwed caps.

4.7 The transformer tank cover shall be so arranged that its removal may be effected without having to lift the core.

4.8 The interior and exterior surfaces of the tank, the tank cover and conservator, (when fitted) shall be suitably protected against corrosion.

5. CONSERVATOR :

5.1 If a conservator is required it shall comply with SANS 780.

5.2 Unless otherwise approved the oil level of each independent transformer compartment shall be maintained by its own oil conservator.

5.3 The conservator compartment is to be provided with an oil level indicator, a drain valve at its lowest point and a filling point, effectively sealed from the atmosphere when not in use. Each conservator outlet line shall be provided with an isolating valve attached by a bolted flanged joint.

5.4 Interconnecting pipework shall be adequately sized and made as direct as possible, elbow bends will not be accepted and joints shall be welded.

5.5 All conservators shall be provided with a set of potential free, normally open, low level alarm contacts operating at the minimum oil level.

6. ACCESSORIES :

6.1 Oil level indicators shall either be of the sight glass or dial type. Where "sight glass"indicators are employed, adequate protection shall be afforded to the tubes to prevent their breakage. Unprotected tubes will not be accepted. Unless specifically agreed with the Engineer, "sight glass" oil level indicators shall be manufactured from glass. Where dial type level indicators are employed they shall be of the magnetically operated type where breaking of the dial will not expose the insulating oil to the atmosphere.

6.2 If required the transformer(s) shall be provided with gas and oil actuated relays. The relay shall be positioned between the transformer tank and conservator such that there are at least five pipe diameters of straight pipe on the transformer side of the relay and three on the conservator side, furthermore, that the section of the pipe including the relay shall slope up to the conservator at an angle of 50. The gas and oil operated relay shall provide both alarm and trip signals for increasing amounts of gas and a trip signal for oil surges. All gas and oil operated relays shall be provided with trip testing facilities which operate directly on the float mechanisms.

6.3 The transformer(s) shall be fitted with a pressure relief device which is to prevent the rupturing of the transformer tank under internal fault conditions. The pressure relief device shall be capable of withstanding atmospheric sea level pressure whilst sustaining full vacuum inside the transformer tank. The pressure relief device shall be fitted with a set of electrical contacts which may be used to indicate that the device has operated.

6.4 Stainless steel thermometer pockets shall be provided for temperature sensing and they shall be fitted with covers or captive screw caps.

6.5 Where winding temperature thermometers and relays are required, they shall be supplied with the necessary current transformers, heaters, etc.

6.6 All rating and diagram plates shall be fabricated from stainless steel not less than 1,5 mm thick and shall be fixed in position by means of stainless steel rivets. The rating and diagram plates shall be fixed to a purpose made mounting pad displayed in a prominent position not more than 1,5 mm above ground level.

6.7 Information shall be recorded on the rating and diagram plates by deep engraving with the recessions contrasted with baked black paint or black anodizing.

7. TAPS :

7.1 The transformer(s) shall be provided with taps on the higher voltage windings to vary the secondary voltage at no load by +5%, +2,5%, 0, -2,5%, -5% unless otherwise noted and the transformer(s) shall be capable of delivering rated power in any tap position.

7.2 If on-load tap changing gear is required, it shall be provided as detailed in Section TD.

8. COOLING :

8.1 Cooling arrangements for the various categories of transformers shall be as follows :

8.1.1 ONAN for transformers up to 20 MVA continuous rating;

8.1.2 ONAN, ONAN/ONAF OFAN or OFAF for larger transformers.

Where mixed cooling is specified the naturally cooled rating of each of the main windings shall be 60% of the rated power.

8.2 The transformer oil to air heat exchanger shall consist of detachable radiator units. The radiators shall be provided with lifting lugs, vent plugs at their highest points and drain plugs at their lowest points. The radiators shall be attached to the transformer tank by means of bolted flanged joints and isolating valves shall be included in each of the transformer/radiator interconnecting lines.

8.3 Consideration must be given to the radiator/radiator and radiator/tank clearances with respect to maintenance operations such as painting and cleaning.

8.4 Separately mounted cooler units may be considered providing that the requirements for vent and drain plugs, flanged joints and isolating valves are observed. Further, approved expansion couplings shall be employed in the transformer/cooler connecting lines.

8.5 Where forced air cooling is employed fans shall be of the slow speed type. Fans and associated ducting shall be made from suitable corrosion resistant material and shall be designed to minimize noise and vibration. All fans shall be provided with galvanised wire-mesh guards. Fans shall not require concrete foundations.

8.6 Fan motors shall either be 3 phase 400 volt 50 Hz units or single phase 230 volt 50 Hz units with continuously rated start windings and no centrifugal switches, or as otherwise noted.

8.7 Motors shall comply with standard specification SABS 948 or SABS 1189 and shall be

provided with the necessary contactors, overloads and lockable isolators as approved by the Engineer.

8.8 Forced cooling shall be fully automatic and shall be controlled by the temperature of the transformer windings. The forced cooling control thermometer shall be provided with adjustable switch contacts - the range of adjustment shall be approved by the Engineer.

9. CURRENT AND VOLTAGE TRANSFORMERS :

9.1 The number of inbuilt current and voltage transformers, their ratios, classes and ratings shall be as enumerated in the Project Specification.

9.2 Unless otherwise specified, current transformers shall comply with IEC Publication 185 and voltage transformers with IEC Publication 186.

9.3 Current transformers shall preferably be of the bushing type. Where separately mounted current transformers are employed, they shall be mounted above the core and windings of the power transformer(s) and shall be easily removable.

9.4 A nameplate shall be provided for each and every inbuilt voltage and current transformer. The nameplates shall include all information necessary to fully specify the devices and shall be displayed in a prominent position near to the power transformer(s) nameplate.

10. AUXILIARY SUPPLIES, WIRING AND EQUIPMENT CUBICLES :

10.1 The auxiliary supply voltage will be three phase, 400 volt, 4 wire, 50 Hz a.c., or as otherwise noted.

10.2 The alarm and tripping circuits supply voltage will be 110 V d.c.

10.3 All transformer equipment such as voltage regulators, tap changer equipment, cooler controls etc. shall be accommodated in equipment cubicles. All transformer equipment such as gas and oil operated relays, pressure switches, temperature relays, etc. shall be wired to a central wiring cubicle.

10.4 Wiring and equipment cubicles shall be ventilated, dust-proof, weather-proof, vermin-proof and lockable. They shall be mounted in readily accessible positions and shall be fitted with separately fused 230 V a.c. anti-condensation heaters and separately fused 230 V interior lights switched by door operated micro-switches. Cubicles shall be adequately dimensioned so that work may be carried out in them unhindered.

10.5 All wiring and equipment cubicles shall be of the bottom entry type, and they shall each be provided with sufficient “terminal block rail” to accommodate sufficient screw-type spring-attached terminal blocks to cover 120% of the requirements of the box.

10.6 Circuit devices contained in the equipment cubicles shall be permanently marked in accordance with the wiring and schematic diagrams and schedules.

10.7 All wires in the wiring cubicles shall be permanently marked at each end in accordance with the wiring and schematic diagrams. The wiring shall be copper of minimum cross-sectional area of 2,5 mm² and shall be neatly run in closed wiring channels.

10.8 Not more than two wires shall be accommodated in each screw terminal block and each shall be terminated by means of a crimped hook or spade lug crimped in accordance with the manufacturers recommendations.

10.9 Interconnection between gas operated relays etc. and the central wiring cubicle shall be effected by means of armoured cable or wires in conduit, in either case, the minimum copper cross sectional area shall be 2,5 mm² . Cables and cores shall be permanently marked at each end in accordance with the wiring and schematic diagrams; likewise wires in conduit shall be permanently marked at each end. Cables and conduit shall be rigidly cleated along their lengths and shall have a neat appearance.

11. PROTECTION AGAINST CORROSION :

11.1 All transformer surfaces shall be suitably protected against corrosion in accordance with SABS 780.

11.2 The interior and exterior surfaces of all wiring and equipment cubicles fabricated from metal shall be corrosion proofed. The finished interior colour of all wiring and equipment cubicles shall be white.

12. EARTHING :

12.1 The transformer(s) shall be fitted with an earthing terminal near each corner of the tank and not more than 300 mm above the base. The earthing terminals shall be welded to the transformer tank and shall not obstruct or be damaged by jacking or hauling operations. The earthing terminals shall comply with SANS 780 and shall be heavily galvanized on the surfaces where electrical contact is required to be made. Electrical connection to the earthing terminal shall be effected by means of an approved clamping arrangement.

12.2 When the transformer(s)is installed the tank and any winding neutral shall be connected to the installation earth as directed by the Engineer.

13. INSULATING OIL :

13.1 The transformer manufacturer is to supply sufficient insulating oil complying with SANS 555 to fill the transformer, cooling system and tap changer compartment.

13.2 Insulating oils shall only communicate with the atmosphere by means of dehydrating breathers. The dehydrating breather shall employ cobalt impregnated silica gel complying with specification BS 3523. The breathers shall contain silica gel in the ratio of 1 kg per 3 000 litres of insulating oil. The maximum quantity

of desiccant contained by a single breather shall be limited to 12,5 kg. Breather shall be so designed that the desiccant is only in contact with the atmosphere whilst the transformer is actually breathing i.e an oil type seal or similar is to be employed.

13.3 For transformers with windings rated at 132 kV and above, the water content of oil samples taken from any part of the transformer shall not contain more than 10 parts per million at the time of handing over.

13.4 Where the transformer manufacturer requires that oil filling be effected under vacuum, such instruction shall be prominently displayed on the power transformer nameplate.

14. INSPECTION AND TESTING

14.1 The Engineers may inspect the transformer and equipment during manufacture and prior to delivery.

14.2 The Engineers may be present during testing and shall be notified in writing at least one week before testing commences.

14.3 The following test are required to be carried out:

14.3.1 Routine tests as specified in the IEC 76;

14.3.2 Routine tests as may be required by the Engineer on the tap changing and voltage control equipment.

14.4 Tenderers shall provide with the tender, evidence of having previously type tested a similar unit, failing which a price shall be quoted for each type test which, if required by the Engineer, will be added to the tender price.

15. INFORMATION TO BE SUPPLIED :

15.1 The Contractor is required to submit the following drawings to the Engineer for approval before commencing with the manufacture of the transformer(s).

General arrangement of the transformer(s) and cooling system.

Internal assembly of the transformer(s) showing core lamping, winding, clamping and connection arrangement.

Internal assembly of all equipment and wiring cubicles.

Schematic drawings of all protection, control and power circuits.

Wiring diagrams and schedules for all protection and control circuits.

Diagram and rating nameplate.

15.2 The Contractor is also required to hand over with the transformer, three copies of erection, operating and maintenance instructions.

16. GUARANTEE :

16.1 Tenderers shall give a 12 months guarantee to replace, free of charge, any portion of the transformer(s) and ancillary equipment in which any manufacturing defects may develop within that period. Such period will commence from the date on which the transformer(s) is put into commission.

17. CAPITALISATION OF TRANSFORMER LOSSES :

17.1 The adjudication of tenders will be influenced by the cost of capitalised losses over the life of the transformer.

17.2 The capitalisation of transformer losses shall be based on the following formula:

V = A + C
1 Po + C2 Pc
Where: V = Transformer
A = Cost of purchasing and installing transformer (R)
C^1 = Capitalised cost of no load losses
P^o = No load losses (kW)
C^2 = Capitalised cost of load losses
Pc = Load losses (kW)

PARTICULAR SPECIFICATION

PXA: 22kV POLE MOUNTING AUTO RECLOSER

Auto Reclosers will comply with the following required specifications:

Maximum rated voltage	27kV	Power-frequency withstand test voltage (1 min. dry)	60kV
Rated continuous current	630A	Power-frequency withstand test voltage (10 s. wet)	50kV
Peak Withstand current	31.5kA	Ambient temperature	-25°C to +55°C
Fault Break capacity	12.5kA	Degree of protection	IP65
Operating cycles	30 000	Short time current withstand, 4 seconds	12.5kA
Lightning impulse withstand test voltage	125kV / 150kV	Cable charging current	25A
Rated power-frequency	50Hz	Line charging current	5A

EQUIPMENT

The Auto recloser is to be of compact dimensions and suitable for outdoor pole mounting.

The circuit-breaker shall be supplied with an external earth terminal.

To ensure long trouble-free operation, the unit should use vacuum interrupter switching with oil as an insulation medium only.

Current / voltage sensing sensors will be embedded in the silicone bushings. They will be of suitable ratio output and accuracy as be manufacture specification and shall supply fault sensing information to the microprocessor-based control unit.

All metal components of the circuit-breaker shall be electrically bonded. The bonding method shall have a current carrying capability equivalent to that of 16 mm2, stranded, copper conductor.

The creepage distance will be a minimum of 744mm (31mm/kV).

The circuit-breaker shall be bi-directional.

The circuit-breaker shall be suitable for both single-pole and H-pole mounting, as typically illustrated in Figure 1. A universal mounting-bracket, which can be easily adopted on site for either a single- pole structure or an H-pole structure, shall be provided

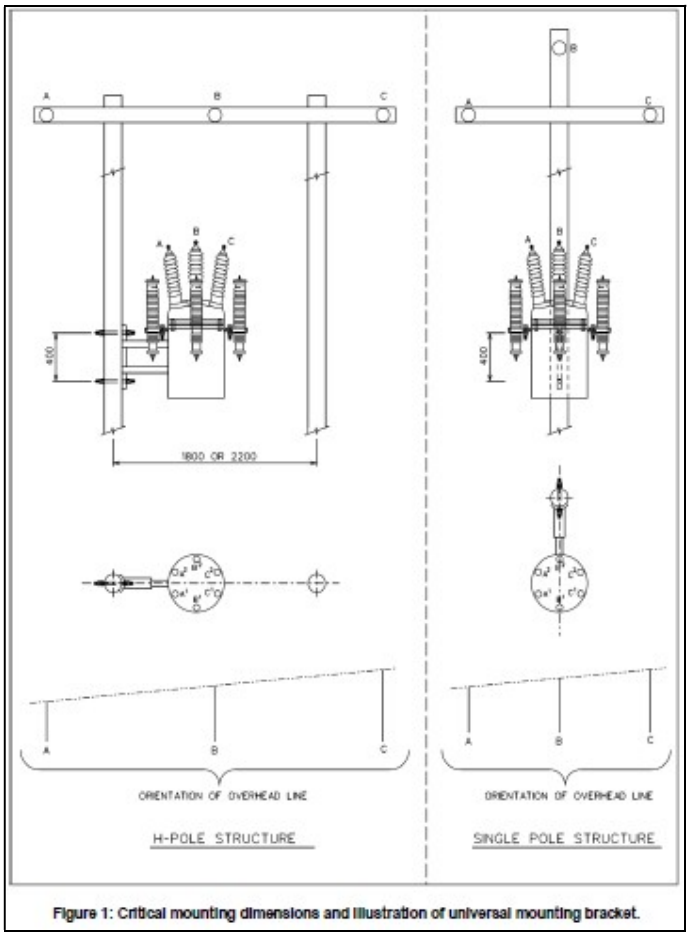

Figure 1: Critical mounting dimensions and illustration of universal mounting bracket.

System protection and control shall be by means of a microprocessor-based unit.

In addition to providing infinitely adjustable over-current, earth fault and sensitive earth fault protection, the control unit shall provide event recording, load profile monitoring, demand motoring data, trip test facilities. A data port is to be provided to enable the control to be reprogrammed in the field or the stored data downloaded to a handheld Data Reader or Lap Top P.C.

An auxiliary single phase 220/240 V AC 50 HZ supply shall be provided to maintain the voltage of the backup 12 V DC 26Ah battery built into the control unit.

Reference to Eskom document : *Pole mounted auot reclosers general and protection requirements standard – part 1 (unique identifier 240-71084644)*

PARTICULAR SPECIFICATION

PXB: 11kV POLE MOUNTING AUTO RECLOSER

Auto Reclosers will comply with the following required specifications:

Maximum rated voltage	15.5kV	Power-frequency withstand test voltage (1 min. dry)	50kV
Rated continuous current	630A	Power-frequency withstand test voltage (10 s. wet)	45kV
Peak Withstand current	40kA	Ambient temperature	-25°C to +55°C
Fault Break capacity	16kA	Degree of protection	IP65
Operating cycles	30 000	Short time current withstand, 4 seconds	16kA
Lightning impulse withstand test voltage	110kV	Cable charging current	10A
Rated power-frequency	50Hz	Line charging current	5A

EQUIPMENT

The Auto recloser is to be of compact dimensions and suitable for outdoor pole mounting.

The circuit-breaker shall be supplied with an external earth terminal.

To ensure long trouble-free operation, the unit should use vacuum interrupter switching with oil as an insulation medium only.

Current / voltage sensing sensors will be embedded in the silicone bushings. They will be of suitable ratio output and accuracy as be manufacture specification and shall supply fault sensing information to the microprocessor-based control unit.

All metal components of the circuit-breaker shall be electrically bonded. The bonding method shall have a current carrying capability equivalent to that of 16 mm2, stranded, copper conductor.

The creepage distance will be a minimum of 744mm (31mm/kV).

The circuit-breaker shall be bi-directional.

The circuit-breaker shall be suitable for both single-pole and H-pole mounting, as typically illustrated in Figure 1. A universal mounting-bracket, which can be easily adopted on site for either a single- pole structure or an H-pole structure, shall be provided

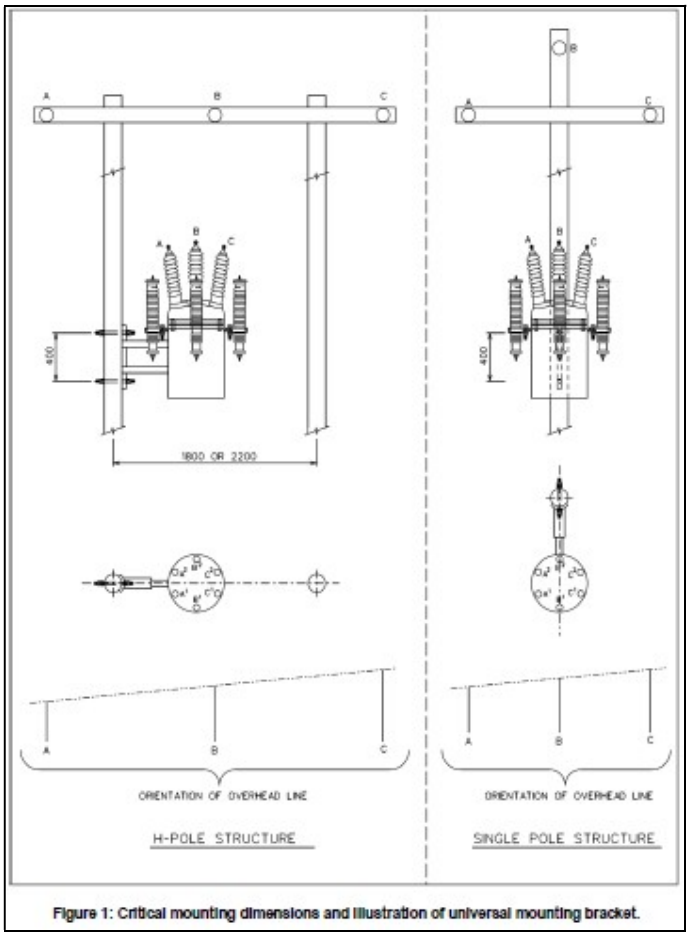

Figure 1: Critical mounting dimensions and illustration of universal mounting bracket.

System protection and control shall be by means of a microprocessor-based unit.

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Reference to Eskom document : *Pole mounted auot reclosers general and protection requirements standard – part 1 (unique identifier 240-71084644)*

PARTICULAR SPECIFICATION

PH: OUTDOOR HIGH VOLTAGE CIRCUIT BREAKERS

SCOPE

This specification covers the supply, delivery, installation and commissioning of outdoor circuit breakers for transmission voltages of 66 kV to 132 kV.

INTERPRETATION

Each circuit breaker shall be supplied with peripheral wiring, steelwork and auxiliary equipment to form a functional unit.

The following documents shall be read in conjunction with this specification. Should this specification be in conflict with these standardised specifications, this specification shall have preference.

IEC 62271-100	High voltage AC circuit breakers
IEC 60060-1	High voltage test techniques
IEC 60071:2024	Insulation coordination
IEC 62271-1	Common requirements for high voltage switchgear and control gear standards
SANS 121	Hot dipped galvanising

3. MATERIAL

3.1 Nameplate and Rating

Every circuit breaker shall be provided with a rating plate which shall be permanently fixed in a position where it can be easily read when the circuit breaker is installed.

3.2 Ratings

The circuit breaker shall be capable of interrupting all currents from zero to the full symmetrical and asymmetrical rated fault currents at maximum power system voltage and as stated in the technical lists.

3.3 Tripping Times

Tripping times shall be determined by conditions of lowest control voltage and, if applicable, operating pressure of the mechanism. Maximum break time shall be 100 ms for all system voltages and rated symmetrical breaking current.

3.4 Auto-reclosing

Where auto-reclosing is specified the circuit breaker shall be capable of tripping and reclosing the specified number of items. The phases shall operate independently or together according to the type of reclosing scheme.

A total of two trip and one closing action must be possible before mechanical action such as recharging of spring or compression of air or hydraulic fluid shall be required.

Where three independent phase mechanisms are provided the circuit breakers and their control units shall be suitable for the above-mentioned reclosing duty even though this might not be specified.

3.5 Interlocks

3.5.1 Sulphur Hexafluoride Circuit Breakers

SF 6 gas filled circuit breakers shall be provided with gas density switches which shall operate:

(d) when reaching the non-urgent alarm level, i.e. only gas replenishment is necessary;

(e) when reaching the urgent alarm level, i.e. circuit breaker to be taken out of service.

When reaching the levels the contacts of these switches shall operate relays which in turn shall perform the following functions:

(a) NON-URGENT ALARM LEVEL :

One set of electrically separate normally open and normally closed contracts shall be provided. The normally open contact shall be used for alarm indication.

(b) URGENT ALARM LEVEL :

Electrically separate normally open and normally closed contacts shall be provided. The normally closed contacts shall be wired into all trip and closing circuits to block operation while a single normally open contact shall be wired to terminals for indication of this condition.

3.5.2 Circuit Breakers with Pneumatic and Pneumatic-hydraulic Mechanisms

Independently adjustable pressure devices shall be provided, which shall operate on reaching the auto-reclosing, closing and tripping blocking pressure.

Each of these pressure devices shall initiate one set of electrically separate normally open and normally closed contacts. The normally open contacts will be used for blocking of operation reaching above conditions and the normally closed contacts shall be used to give indication of blocking of the relevant operational mode.

Pneumatic-hydraulic systems shall be capable of being pressurised and depressurised irrespective of the position of the main contacts and without causing a change of state to the circuit breaker main and auxiliary contacts.

3.5.3 Circuit Breakers with Spring Operated Mechanisms

Direct mechanical means to achieve the following functions shall be provided:

Closing of the circuit breaker shall be possible only when the closing springs are fully charged;

Closing springs can only be released when the circuit breaker is in the open state;

Protection against overcharging of springs.

In the case of certain motor winding arrangements, it may not be practical to provide direct mechanical blocking of spring overcharging in which case the solution proposed shall be subject to the Engineer’s approval.

One of the spare normally-open and one of the spare normally-closed spring rewind limit switches per mechanism will be used to block an electrical release operation and for indicating this condition.

3.6 Closing Devices

Electrically operated closing devices, including mechanism charging motors, shall be suitable for operating at any voltage between 110% and 80% of the nominal control voltage measured at the device terminals. The breaker shall close correctly when an electrical closing pulse of 100 milliseconds duration is applied to the closing coil.

The total power drawn by the circuit breaker operating coils when closing all phases simultaneously shall not exceed 750 watts.
Each closing coil shall be provided with a normally-closed auxiliary contact in series to allow closing only when the circuit breaker is open. For spring mechanisms an additional normally-open spring-drive limit switch in this circuit shall also be included to prevent overheating of the closing coil if a sustained closing pulse is applied when the closing springs are not fully charged.

3.7 Tripping Devices

Electrically operated tripping devices shall be suitable for operation at any voltage between 110% and 80% of the nominal voltages, measured at the device terminals. With the circuit breaker not carrying current, satisfactory tripping operation shall be possible down to 70% of the nominal supply voltage measured at the device terminals.

The power drawn by the circuit breaker operating coils of any one tripping system when tripping all phases simultaneously shall not exceed 750 watts.

Normally-open auxiliary contacts in series with the trip coils shall be provided to interrupt the trip coil circuit and prevent overheating impulse is sustained. Duplicate normally-open contacts in parallel per trip coil shall be provided.

Each circuit breaker shall be equipped with at least one shunt trip system per mechanism. If specified in data sheets an additional trip system identical to the other but electrically and mechanically separate shall be provided per mechanism. Neither coil shall influence the operation of the other if one is damaged. Coils shall not have a particular polarity nor affect operation when energised simultaneously.

3.8 Anti-pumping

All circuit breakers shall be equipped with anti-pumping circuitry. Anti-pumping arrangements shall be subject to the Engineer's approval and shall be demonstrated as part of the routine testing procedure.

3.9 Phase Discrepancy

The following is applicable only to circuit breakers with independent phase mechanisms with an electrical trip system.

The maximum time allowable to detect a phase discrepancy condition is 100 milliseconds.

The electrical detection of phase discrepancy shall immediately initiate a trip command to all phases. The timer and its associated circuitry shall also be provided and located in the remote control panel associated with the particular circuit breaker. The minimum setting of this timer recommended by the manufacturer shall be as stated in the data sheets.

3.10 Mechanism Motors

Mechanism motors shall be suitable for the control voltage specified.

Alternating current motors shall be controlled by contactors with thermal overload and one or more phase protection facilities. These devices shall comply with IEC-60947-4-1:2023 Utilization Category AC-3.

3.11 Enclosures

Circuit breaker mechanisms, local control facilities and all parts requiring lubrication shall be protected by

weatherproof enclosures.

Enclosures of control cubicles shall be equipped with ventilation holes covered with copper or brass gauze to be vermin proof.

Suitable heater elements shall be installed inside cubicles to prevent condensation. These heaters shall be connected to 220 volt AC and be protected with suitably rated fuses or MCB's.

3.12 Auxiliary Switches

Samples of auxiliary switches shall be submitted to the Engineer for approval. Auxiliary switches shall faithfully reproduce the main contact position.

In addition to the auxiliary contacts required for control and interlocking, the number and type of auxiliary contacts required mechanism shall be as specified. These contacts shall be independent (i.e. not changeover contacts) and preferably easily convertible from normally open to normally closed and vice versa. Auxiliary contacts timing shall permit adjustment. The use of auxiliary relays to multiply the number of auxiliary contacts required, is not acceptable.

3.13 Indicating Devices

A mechanical indicating device shall be provided in each mechanism to show whether the circuit breaker phases are open or closed and shall be clearly visible from outside the mechanism enclosure.

Spring condition (charged or released) shall be indicated by a mechanical device which is clearly visible from outside the mechanism enclosure. Symbols employed for this purpose shall be subject to the Engineer's approval.

Pressure gauges shall be clearly readable from outside the mechanism enclosure.

3.14 Terminals

All terminals for the termination of external wiring to panels, shall be of the clip-on type. At least 10% with minimum of two spare terminals shall be provided. The terminal strip will be placed so that provision shall be made for the coupling of control cables.

All terminals shall be suitable for use with crimped or compression-type terminations.

3.15 Wiring

All secondary wiring shall be stranded conductor having a minimum area equivalent to 2,5 mm² (7 strand). Smaller wiring shall only be used on approval. Secondary wiring shall be identified at both ends with ferruled numbers.

3.16 Fittings

Oil circuit breakers shall be provided with the following fittings:

(a) oil level gauge

(b) drain plug or valve

(c) filling facility

SF 6 gas-filled circuit breakers shall be provided with the following fittings:

(a) gas density or pressure manometer (a gas density manometer is the preferred arrangement, and

SF 6 gas density shall be expressed in kg/m³ or grams/litre)

(b) a common gas filling and evacuating point for the whole circuit breaker.

3.17 Insulators and Bushings

Outdoor insulators shall conform to IEC 60168.

Outdoor bushings shall conform to IEC 60137

Similar insulators as well as similar bushings shall be interchangeable.

4. CONSTRUCTION EQUIPMENT

4.1 GENERAL

Design of mechanisms shall be such that in the case of failure to latch or command to trip during a closing operation, the contract system shall open at normal operating speed and come to rest in the fully open position.

4.2 Motor Wound Spring

Automatic rewinding of closing springs shall be provided by means of an interlock arranged via a normally-closed spring rewind limit switch contract. At the Engineer's discretion a normally-open auxiliary switch contact will be included to permit this operation only when the circuit breaker is closed. To allow local rewinding of springs when the circuit breaker is open, a readily accessible pushbutton (coloured black) or spring return to "off" position switch in parallel with the normally-open auxiliary switch contact shall be provided in each mechanism. Facilities shall also be provided in each mechanism for remote rewinding of springs when the circuit breaker is open.

A means of manually tripping and closing the circuit breaker shall be provided.

A facility for manual recharging of spring mechanisms shall be provided. This facility shall preferably be integral with the mechanism (ie. an operating handle need only be inserted). When not in use, the operating handle shall be stored inside the mechanism. Manual recharging of springs shall be a one-man operation and shall not require undue physical effort nor an unreasonable length of time.

4.3 Pneumo-hydraulic Mechanisms

Pneumo-hydraulic mechanisms shall be complete with all control equipment.

Pressure shall be maintained automatically and a pressure gauge shall be provided to indicate the pressure available.

Motor running time shall be monitored and the motor shall be stopped if the normal maximum running time is exceeded. A potential free normally-open contact shall be provided to indicate this condition.

Hydraulic accumulators which are classified as pressure vessels shall be designed, manufactured and tested in accordance with a code of practice recognised under the requirements of the South African Occupational Health and Safety Act 85 of 1993 as amended to date.

Sufficient energy storage shall be provided to carry out the auto-reclose duty cycle specified or two make-break operations, whichever is greater. Loss detection of pre-charging gas pressure in accumulators shall be provided and in the event of excessive loss of gas all circuit breaker operations shall be electrically blocked. A potential free normally-open contact shall be provided to indicate this condition.

Hydraulic fluid reservoirs shall be provided with gauge glasses in an easily readable position.

An isolating switch shall be provided in the mechanism box for isolating the pump motor.

4.4 Pneumatic Mechanisms

Pneumatic mechanisms whether fed by central or unit air compressor plant shall be complete with all control equipment.

Air pressure shall be maintained automatically and a pressure gauge shall be provided to indicate the pressure available.

Compressor running time shall be monitored and a potential free normally-open contact (for alarm purposes) shall be provided to indicate excessive running time.

Sufficient energy shall be stored in the local air receivers to carry out the auto-reclose duty cycle specified or two make-break operations, whichever is greater.

The unit compressor plant shall be provided with an isolating switch in the compressor cubicle to isolate the compressor motor.

5. Installation

Erection of the circuit breaker includes the following:

Supply and deliver all installation equipment, structures and galvanised steel and completing all necessary commissioning test to proof the correct operation of the circuit break and associated plant. Structures shall be designed by the manufacturer of equipment.

6. Tolerances

Not applicable.

7. Tests

Test certificates of type tests shall be submitted to the Engineer for approval prior to delivery of equipment. The Engineer shall have the right to inspect the circuit breakers during manufacturing or to witness factory tests.

8. Measurement and Payment

Per unit as installed on site.

PARTICULAR SPECIFICATION

PE: EARTHING OF SWITCHGEAR AND EQUIPMENT

1. SCOPE

This specification covers the requirements for the earthing of the following:

Substations
MV Switchgear
Cable Networks
Overhead Line Networks
Service Connections
Streetlights and High Mast Lights
MV Yard Earth Mats
Substations Lightning Masts

Earth resistance tests shall be performed to determine the values of the high and low voltage earths. If the required values cannot be obtained with the proposed earthing methods, 16 mm diameter earth spikes, "Copperweld" or equivalent, shall be installed and connected to the earth conductors by means of "Cadweld" or equivalent jointing. The position of earth spikes will be determined by the Engineer.

The additional cost for the installation of supplementary earthing will be covered by contingencies.

2. APPLICABLE STANDARDS

The latest edition of the following publications, drawings and documents are applicable:

SANS 0142 : Wiring of Premises
AMEU : Code of Practice for the neutral earthing of low voltage distribution systems.
SANS 0199 : Earth electrodes, design and installation
NRS 016 : Code of practice for earthing of low voltage distribution systems
SANS 1063 : Earth bars (mechanical), couplers, clamps (mechanical)
Occupational Health and Safety Act (85 of 1993)

3. DEFINITIONS

The meaning of certain words or terms used in this Specification:

Earth Continuity Conductor: An electrical conductor, copper or other similar approved metal of sufficient cross sectional area to ensure the immediate safe discharge of electrical energy to the general mass of earth.

Earth Conductor, Earth Wire: Generally accepted terms for an earth continuity conductor.

Earth Point: The creation of a direct bond between the mass and the earthing network of a system to be earthed. This may consist of earth spike(s) or earth mat(s) or a combination

of both driven in or laid at a sufficient depth to make contact with earth formations of low resistivity in order to safely discharge electrical energy.

Earth Spike: A metal rod driven into the ground to create an earth point. An earth spike may also consist of a number of separate lengths mechanically coupled to form a unit.

Trench Earthing: A section of bare conductor buried in the ground at a minimum depth of 600 mm and of sufficient length to obtain the required resistance.

Earthing Electrode: A conductor buried or driven into the ground to make contact with the earth mass. This term includes earth spikes, mats and trench earthing.

Earth Bar: A length of copper or brass bar of suitable or specified dimensions and cross sectional area and having sufficient connection points for the mechanical connection of earth conductors by means of bolts, nuts or screws, as the case may be.

4. ABBREVIATIONS

The following abbreviations shall apply:

EC	:	Earth Conductor
EB	:	Earth Bar
ES	:	Earth Spike
ECC	:	Earth Continuity Conductor
BCEC	:	Bare Copper Earth Conductor

5. MATERIAL

5.1. Conductors

5.1.1. Underground Distribution Networks: Only materials manufactured from, or combined with, electrolytic copper shall be used on the earthing systems of underground reticulation and internal wiring. BCEC serving as trench earthing shall be hard drawn copper.

5.1.2. Overhead Distribution Systems: Where earth conductors of overhead systems are required to be of materials other than copper, they shall be manufactured in accordance with the Engineer's Specification. The materials may be steel reinforced aluminium alloy or galvanised steel wire.

5.2. Connections

Connections to earth studs or earth bars shall be made with brass bolts, nuts and washers, or alternatively with stainless steel accessories. Connections to equipment housed indoors may be made with cadmium plated accessories. However, cadmium plated accessories may not be used on equipment such as kiosks, mini substations etc.

5.3. Earth Spikes

5.3.1. Category and Type: Earth spikes shall be of the following types:

5.3.1.1. Solid copper

5.3.1.2. Solid stainless steel

5.3.1.3. A solid steel core covered with copper of minimum thickness of 200 microns, similar or equal to “Copperweld”. Earth spikes shall be round in cross-section and the total length shall be achieved by the joining of standard sections.

5.3.1.4.

Spikes shall have a nominal diameter of 16 mm, except where spikes are placed into pre-drilled holes in which case a nominal diameter of 12 mm will be accepted.

5.3.2. Earth spikes shall comply with the requirements of SANS 1063.

5.3.3. Couplings: The coupling of lengths shall be achieved by means of screw-on type couplings. The couplings shall be mechanically strong enough to allow the normal driving in of coupled lengths and shall provide sound electrical connections.

5.3.4. Clamps: Conductor clamps shall suit the type of earth spike, conductor material and size specified.

5.3.5. Driving caps or nuts: Driving caps of nuts shall be screwed onto the spike to protect to protect the spike end during driving.

6. INSTALLATION

6.1. General

6.1.1. Trench Earths: Trench earths shall consist of sections of hard drawn bare copper conductors laid in trenches with MV or LV cables or in separate trenches at a depth of 750 mm below finished ground level.

Trench earths shall be a minimum length of 25 m.

Where the distance between kiosks and other equipment is less than 50 m, the trench earth shall be installed from kiosk to kiosk.

Trench earths shall be installed in the trenches nearest to the substations.

The following standard earth conductor sizes shall be used in conjunctions with LV cables:

TABLE 6.1:

EARTH CONDUCTOR SIZE IN mm²	CABLES	
	AL	Cu
16	35, 50	10, 16
35	70, 95	25, 35, 50
70	120, 150, 185	70, 95, 120
120	240	150 plus

Trench earths shall be installed as earthing for the following installations:

- For neutral earthing of transformers
- Miniature Substations
- LV distribution boards in Substations
- Distribution- / Meter kiosks
- Service connections
- All electrical equipment with metal enclosures (streetlight poles, robot poles, etc.) installed in public places.
- Overhead line equipment (for example lightning arrestors).

6.1.2. Spike Earth: Spike earths shall consist of a single earth spike or coupled lengths of the total length to require the specified resistance. The spike shall be driven into the ground until the top end of the spike is at a depth of 600 mm below ground level.

6.1.3. The conductor clamp shall be suitable for clamping conductors with a total effective cross sectional area of up to 100 mm². All connections to earth spikes shall be clamped and then brazed. The connection shall be painted to an approved standard after all excess flux has been removed.

A marker or earthing manhole shall be placed above the earth spike if so required in the **Project Specification**. The earthing manhole shall have a removable concrete lid and shall be approximately 350 mm high, 460 mm long and 460 mm wide. In addition the Contractor shall supply and install a 110 mm outside diameter Class 4 PVC pipe, 300 mm long, over all earth spikes such that the connection to the earth spike is visible. The earthing manhole shall be installed over this pipe, flush with finished ground level.

Should hard rock formations be encountered, it may be necessary to drill holes to position earth spikes. The hole shall have a diameter large enough to accommodate the earth spike and coupling without the latter occupying more than 50% of the volume of the hole. The hole shall be filled with a carbon coke/soil mixture (50/50) during and after the

installation of the spike. The length of the spike and therefore the depth of the hole shall be as required by the Engineer.

6.1.4. Pole Base Earths: Pole base earths shall consist of hard drawn copper earth conductor installed against the pole, with the conductor coiled not less than four times around the buried section of the pole and stapled in position. The conductor shall be protected by a 32 mm inside diameter galvanised medium water pipe from 300 mm below ground level to 2 m above ground level. The pipe and conductor shall be fixed to the pole by means of stainless steel strapping spaced at 600 mm intervals.

The size of the earth conductor shall be 70 mm² for both MV and LV earth systems.

6.1.5. Ohmic values of earthing resistance: The required maximum ohmic values of the resistance to earth of earth points are as follows:

Transformer neutrals	:	1 to 2 ohm
MV Switchgear (indoor or outdoor)	:	2 ohm
MV Pole-mounted equipment and surge arresters	:	3 ohm
LV Distribution neutral at kiosks or on overhead lines (start and end points)	:	10 ohm
Customer installations	:	20 ohm

6.2. **Interconnection of Various Earth Systems**

6.2.1. Surge Arrestor Earths: The earth system of surge arrestors shall at all times be separated from any other system.

6.2.2. MV and LV Earth Systems: These systems shall only be interconnected if the individual earth resistance are in the order of 1 ohm or less.

6.3. **Substations**

6.3.1. Transformers on Bases or Poles, MV and LV Windings

6.3.1.1. *Earth Points*: Separate earth points shall be created for MV and LV systems, except where individual resistance to earth are found to be 1 ohm or less in which case only one earth point may be utilised. The earth point shall

consist of two separate 70 mm² trench earths, 750 mm deep with a minimum length of 25 m laid in opposite directions. MV and LV earth points shall be separated by a minimum distance of 6 m should both earth types be necessary.

6.3.1.2. *Connections*: All connections between equipment and earth points shall be done in 70 mm² green PVC insulated stranded copper. The connection between the transformer neutral and the neutral bar in the LV distribution kiosk or distribution board

shall be effected by means of the fourth core of the multi core cable connecting the transformer to the LV distribution system or by means of the neutral conductor where single core cables are employed.

A 70 mm² copper conductor shall connect the neutral bar to the earth bar in the distribution kiosk or distribution board.

Connections between the earth bar in the LV distribution kiosk or distribution board and to the neutral conductor of LV overhead installations shall be effected by means of 50 mm² green PVC insulated stranded copper conductors.

6.3.2. Mini Substations

The earthing of mini substations shall comply with the requirements for transformers on bases as stated above. All metal parts of the various compartments shall be bonded by means of 70 mm² bare copper conductors and connected to the MV earth system.

6.3.3. Fence Earths

6.3.3.1. *Earth Conductors and Spikes*: A 16 mm² copper earth conductor shall be buried at a depth of 750 mm and at a distance of 1 m outside the fence for the full circumference of the fence. Earth spikes shall be installed at each corner and connected to the abovementioned earth conductor.

6.3.3.2. *Installation*: Vertical earth conductors shall be installed on the fence at all corner and gate posts and at intervals of 20 m. These vertical conductors shall be solidly bonded to the straining and barbed wire by means of binding wire. 16mm² Copper conductors shall be used (or Mosquito aluminium conductor on aluminium fences).

6.3.3.3. *Connections*: The vertical copper conductors shall be connected to the surrounding trench earth by coiling them 4 times around the trench earth conductor before brazing. Aluminium conductors shall be connected by means of bi-metal clamps. Aluminium conductors shall not be buried and copper connectors shall be used to connect underground conductors to the aluminium conductors of the fence earths.

6.3.3.4. *Gates*: Gates shall be connected to the earth systems by means of braided copper wire, bolted to the gate frame and bonded to the vertical copper of aluminium fence earths.

6.4. MV Switchgear inside Control Buildings

6.4.1. Earth Grid: Two 70 mm² stranded bare copper conductors shall be installed right around the building in a 1000 mm deep × 500 mm wide trench.

The two conductors shall be separated by 300 mm and be bonded every 3 m to form an earth grid. Joints shall be brazed, exothermically welded ("Cadweld") or made by other means approved by the Engineer.

6.4.2. Earth Bar: A tinned pre-drilled copper bus bar (1000 mm × 40 mm × 5 mm) shall be mounted on isolators against the back wall of the concrete cable trench. All earth conductors from installed equipment and from earth

systems shall be connected to this bar by means of brass or stainless steel bolts and nuts. Where the switchgear has and its own continuous earth bar the earth bar may be omitted.

6.4.3. Connections: Connections between the equipment and the earth bar shall be by means of 120 mm² green PVC insulated copper connections with crimped cable lugs. A minimum of two connections to the earth bar shall be utilised per switchgear installation.

Connections between the earth grid and earth bar shall be by means of 3 separate 70 mm² stranded bare copper conductors connected to three equally spaced points on the earth grid.

6.5. **Cable Networks**

6.5.1. Armouring of LV Cables

The cable armouring shall be bonded to the earth bus bar or earth stud at all terminations. Where cables are terminated on gland plates, the plates shall be connected to the earth system and the cable armouring shall then be deemed to be earthed

Where cables are not terminated with glands, enough cable armouring wires shall be grouped together to fit tightly into a cable lug. After the lug has been crimped if shall be bolted to the earth system. A cable lug of 16 mm² minimum shall be used for cables up to 50 mm² and 25 mm² minimum for cables larger than 50 mm². At LV overhead line connections, the cable armouring shall be connected to the neutral conductor by means of a suitable clamp.

6.5.2. Meter and Distribution Kiosks:

Meter and distribution kiosks shall be supplied complete with a connection between the neutral bar and earth bar or stud. Earthing systems, whether spike or trench earths, shall be bolted to the earth stud or bar utilizing crimp lugs and stainless steel or brass nuts and washers.

6.6. **Overhead Networks**:

6.6.1. Earthing of the Neutral Conductor on LV Overhead Systems (Also Refer 6.3.1)

The neutral conductor of LV overhead systems shall be earthed at both ends of the line. The method of earthing shall be 70 mm² trench earthing unless otherwise specified in the **Project Specification**.

When MV earth systems appear on the same pole, the LV earth system shall be connected to the neutral conductor by means of green PVC insulated conductors and LV and MV earth system points shall be separated by a minimum of 6 m.

The connecting conductor size shall be a minimum of 50 mm² for PVC insulated conductors and 35 mm² the case of hard drawn copper conductors.

6.6.2. Earthing of MV Equipment on Overhead Networks

6.6.2.1. *General*: MV earthing shall be carried out with 70 mm² bare copper. Where MV and LV earthing appear on the same pole or poles, insulted conductors shall be used and LV and MV earth system points shall be separated by at least 6 m.

6.6.2.2. *Surge Arrestors*: Surge arrestors shall be connected to a dedicated 70 mm² trench earthing system point via a 70 mm² bare copper conductor. Only one conductor is required per set of surge arrestors.

6.6.2.3. *Operator Earths*: An earth mat shall be installed at the operating position of outdoor switchgear. The earth mat shall measure 1 m x 1 m and shall be manufactured of 10 mm diameter black copper rods to form a mesh size of 200 mm. Joints shall be brazed or exothermically welded. The mat shall be buried at a depth of 150 mm below the operating position and connected to the operating handle by means of two 70 mm² green PVC insulated conductors.

6.6.2.4. *Earth Connections*: All earth points of steel work of MV equipment including support steel work on MV poles, shall be bonded with 70 mm² conductor (refer 6.6.2.1) and connected to the MV earth system. Exceptions are surge arrestor earthing and operator earthing which are not connected to MV earth systems, but to the dedicated earth systems described above.

Any pole(s) bearing the following equipment or combination thereof shall be provided with a MV earth system.

- Transformer
- Instrument or measuring transformers
- Air break switches
- Single pole isolating links
- Drop out fuses
- MV cable ends
- Switchgear

6.6.3. Binding and Protection or Earth Conductors

Earth conductors shall be installed against poles in suitable size galvanised medium water pipe or Class 12 HDPE pipes in accordance with SANS 533, as specified in the **Project Specification**.

The pipe protection shall start 300 mm below finished ground level and end 2 m above ground level. The pipe with the conductor shall be strapped to the pole at intervals of 600 mm using stainless steel strapping. The Contractor shall ensure that earth systems are kept separate, and that MV and LV or MV and surge arrestor earths are not short-circuited by the strapping.

6.7. Service Connections

6.7.1. Trench Earths

Hard drawn bare copper earth conductors shall be installed in cable trenches together with service connection cables. The earth conductors shall have a size as indicated in Table 6.1 and a minimum length of 25 m, installed at a minimum depth of 750 mm. If the distance between

. the consumer supply point and distribution point is less than 25 m, the earth conductor shall be bonded to the main distribution's earth conductor.

6.7.2. Connections

Earth conductors installed with service connection cables shall generally be connected to the system neutral at the customer's supply point. The Contractor shall acquaint himself with the specific earthing system in use by the Supply Authority and do connections accordingly.

6.8. Streetlights And High Masts Lights

6.8.1. Streetlights

6.8.1.1. *Cable installations*: Where streetlights are supplied via underground cables, the armouring shall be connected to the streetlight earth terminal. The armouring of the various cable runs shall be bonded at all connection points to create a continuous earth. The armouring of cables shall be connected to LV earth systems at substations and distribution kiosks.

Where steel poles are employed, 16 mm² BC trench earth conductor shall be installed and connected to the streetlight pole earth terminal. The earth- and neutral terminals shall not be interconnected at streetlight poles.

6.8.1.2. *Overhead Networks*: The earth terminal of the streetlight fitting as well as the metal parts of the street light arm shall be connected to the neutral conductor by means of a separate 6 mm² bare copper earth conductor. The earth terminal and the neutral

terminal shall not be interconnected inside the light fitting. The same method shall be used where bundle conductor systems are employed.

6.8.2. High Mast Lighting

6.8.2.1. *Mast Earthing*: Unless stated otherwise in the **Project Specification**, at least 15 m of 70 mm² hard drawn bare copper earth conductor shall be placed at the bottom of the excavations for the high mast base. Prior to the earthing of the concrete base the earth conductor shall be covered with a 150 mm layer of soil to prevent the copper conductor from touching the concrete.

6.8.2.2. *Spike Earthing:* A 1200 mm long solid copper earth spike shall be provided in the ground adjacent to the high-mast base. The mast earth terminal and earth spike shall be interconnected with a 70 mm² bare stranded copper conductor. The connection to the earth spike shall be bolted and the connection to the mast shall be by means of an appropriate lug and a bolt.

Where an earth spike cannot be driven in due to rock, etc. a suitable trench earth shall be provided.

6.8.2.3. *Trench Earth:* Where a continuous trench earth (70 mm², 25 m long at 750 mm deep) is specified in the **Project Specification**, the earth spike may be omitted and the mast connected direct to the trench earth.

6.8.2.4. *Special Measures*: Due to the height of the masts and the increased possibility of a lightning strike, special earthing measures may be required by the Engineer and instructed on site.

6.9. MV Yard Earth Mats

Earth mats shall consist of 10 mm diameter annealed black copper rod buried 900 mm deep at 6 m intervals to form a 6 m x 6 m grid, unless otherwise specified in the Project Specification.

Joints shall be brazed, exothermically welded (“Cadweld”) or made by other means approved by the Engineer.

Earth bonds to structures shall be done with 50 mm x 4 mm copper strip connected to the earth mat. All structures shall be connected at two separate opposing points to the earth mat.

At each of the four corners of the square or rectangular grid forming the earth mat 1200 mm earth spikes shall be driven from 900 mm below finished ground level. The earth spikes shall be connected to the earth mat via 70 mm² BC earth conductors.

6.10. Substations Lightning Masts

6.10.1. Spike Earthing*:* A 1200 mm long solid copper earth spike shall be provided in the ground adjacent to the mast base. The mast earth terminal and earth spike shall be interconnected with a 70 mm² bare stranded copper conductor.

The connection to earth spike shall be bolted and the connection to the mast shall be by means of an appropriate lug and a bolt.

Where an earth spike cannot be driven in due to rock, etc. a suitable trench earth shall be provided.

6.10.2. Trench Earth*:* Where a continuous trench earth (70 mm², 25 m long at 750 mm deep) is specified in the **Project Specification**, the earth spike may be omitted and the mast connected direct to the trench earth.

7. MEASUREMENT OF EARTH RESISTANCE:

7.1. Measurement

Earth resistance shall be measured in accordance with the four electrode bridge method, i.e. according to the Schlumberger or Wenner principles. The Contractor shall provide the necessary test equipment and demonstrate the test methods to the Engineer so that the Engineer can satisfy himself that the tests are being conducted correctly.

7.2. Records

Resistance measurements shall be performed at all earth points, i.e. at any apparatus or equipment connected to the earthing systems. The Contractor shall record all measurements in detail and present these to the Engineer for approval. The Engineer reserves the right to have any 10% of measurements repeated without additional payment, in order to establish their authenticity.

8. TESTS

The Contractor shall measure the resistance to earth of each earth system with the earth bar or earth point as reference. The Engineer shall be notified if the specified minimum values of earth resistance are exceeded or cannot be obtained.

C 3.3 CONSTRUCTION HEALTH & SAFETY SPECIFICATION

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CONSTRUCTION HEALTH AND SAFETY SPECIFICATION

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1. INTRODUCTION AND BACKGROUND

1.1 Background to the Pre-construction Health and Safety Specification

The Construction Regulations 2014 place the onus on the client to prepare a pre-construction Health & Safety Specification, highlighting all risks not successfully eliminated during design.

1.2 Purpose of the Pre-construction Health and Safety Specification

To assist in achieving compliance with the Occupational Health & Safety Act 85/1993 and the Now promulgated Construction Regulations 2014 in order to reduce incidents and Injuries. This pre-construction specification shall act as the basis for the drafting of the Construction phase health &safety plan.

The pre-construction specification sets out the requirements to be followed by the Principal Contractor and other Contractors so that the health & Safety of all persons potentially at risk may receive the same priority as other facets of the project e.g. cost, programme, environment, etc.

1.3 Implementation of the Pre-construction Health and Safety Specification

This specification forms an integral part of the contract, and the Contractor is required to use it at pre-tender phase when drawing up its project-specific construction phase health & safety plan, to be **approved by the Client** or his appointed representative before commencement of construction work. The Principal contractor shall forward a copy of this specification to all Contractors at their bidding stage so that they can in turn prepare health & safety plans relating to their operations.

Note: It is still and will be the responsibility of every Professional consultant, contractor, sub contractor and services provider to make themselves conversant with the various Acts pertaining to their profession at all times. This document does not purport to be an exhaustive canvassing of all issues and duties imposed by the Occupational Health and Safety Act, Act 85 of 1993 of Regulations governing the duties and obligations of a contractor performing duties i.t.o. an agreement with the client. The various duties imposed on a contractor are more fully described in the OHS Act, Act 85 of 1993 and its regulations and the contractor should acquaint himself therewith before commencing with any work

2. PRE-CONSTRUCTION HEALTH AND SAFETY SPECIFICATION

2.1 Scope

This Specification covers the requirements of eliminating and mitigating incidents and injuries on the particular project. The scope also addresses legal compliance, hazard identification and risk assessment, risk control and promoting a health and safety culture amongst those working on the project. The specification also makes provision for the protection of those persons other than employees.

2.2 Interpretations

2.2.1 Application

This specification is a compliance document drawn up in terms of South African legislation and is therefore binding. It must be read in conjunction with the relevant legislation as noted previously.

2.2.2 Definitions

The definitions as listed in the Occupational Health & Safety Act 85/1993 and Construction Regulations 2014 shall apply.

2.3 Minimum Administrative Requirements

2.3.1 Notification of Intention to Commence Construction Work

The Principal Contractor shall notify the Provincial Director of the Department of Labour, (KOUGA), in writing on the prescribed form, before construction work commences. A copy of this notification shall be forwarded to the client on appointment.

2.3.2 Assignment of Contractor's Responsible Persons to Supervise Health and Safety on Site

The contractor shall submit supervisory appointments as well as any relevant appointments in writing (as stipulated by the OHS Act and Construction Regulations 2014), prior to commencement of work. Proof of competency must be included. See annexure B

2.3.3 Competency for Contractor's Appointed Competent Persons

Contractor's competent persons for the various risk management portfolios shall fulfil the criteria as stipulated under the definition of Competent in accordance with the Construction Regulations 2014. Proof of competence for the various appointments must be included in the health and safety plan.

2.3.4 Compensation of Occupational Injuries and Diseases Act 130 of 1993 (COIDA/ FEM)

The Principal Contractor shall submit a letter of good standing with its Compensation Insurer, to the client or his appointed representative, as proof of registration. Contractors

shall submit proof of registration to the Principal Contractor before they commence work on site.

2.3.5 Occupational Health and Safety Policy

The Principal Contractor and all Contractors shall submit a Health and Safety Policy signed by their Chief Executive Officer. The Policy must outline objectives and how they will be achieved and implemented by the Company / Contractor.

2.3.6 **Health and Safety Organogram**

The Principal Contractor and all Contractors shall submit an organogram, outlining the Health and Safety Site management Structure including the relevant appointments/competent persons and shareholders. In cases where appointments have not been made, the organogram shall reflect the intended positions. The organogram shall be updated when there are any changes in the Site Management Structure.

2.3.7 **Preliminary Hazard Identifications and Risk Assessment and Progress Hazard Identification and Risk assessment.**

The contractor shall cause a hazard identification to be performed by a competent person before commencement of construction work, and the assessed risks shall form part of the construction phase health and safety plan submitted for approval by the Client. The risk assessment must include;

a) A list of hazards identified as well as potentially hazardous tasks

b) A documented risk assessment based on the list of hazards and tasks

c) A set of safe working procedures (method statements) to eliminate, reduce and/or control the risks assessed

d) A monitoring and review procedure of the risks assessment as the risks change

The Principal Contractor shall ensure that all employees and or Contractors are informed, instructed and trained by a competent person regarding any hazards, risks and related safe work procedures before any work commences and thereafter at regular intervals as the risks change and as new risks develop.

The Principal Contractor shall be responsible for ensuring that all persons who could be negatively affected by its operations are informed and trained according to the hazards and risks and are conversant with the safe work procedures, control measures and other related rules (tool box talk strategy to be implemented). Posting appropriate signage regarding the dangers attached to the work and hazards identified must be posted at strategic places for everyone to see and be included in the method statement to be provided in the health and safety plan.

2.3.8 **Health and safety Representative(s) (applicable when 20 or more persons are employed)**

The Principal Contractor and all Contractors shall ensure that Health and Safety Representative(s) are appointed under consultation and trained to carry out their functions. The appointment must be in writing. The Health and Safety Representative shall carry out

regular inspections, keep records and report all findings to the Responsible Person forthwith and at health & safety meetings.

2.3.9 **Health and Safety committees (applicable when 50 or more persons are employed)**

The Principal Contractor shall ensure that project health and safety meetings are held monthly and minutes are kept on record Meetings must be organized and chaired by The Principal Contractor's Responsible Person. All Contractors Responsible Persons and Health & Safety Representatives shall attend the monthly health & safety committees in accordance with the OHS Act 85/1993 and minutes of their meetings shall be forwarded to the Principal Contractor on a monthly basis.

2.3.10 **Health and Safety Training**

2.3.10.1 **Introduction:**

The Principal Contractor shall ensure that all site personnel undergo a risk-specific health & safety induction training session before starting work. A record of attendance shall be kept in the health & safety file.

2.3.10.2 Awareness

The Principal Contractor shall ensure that, on site, periodic toolbox talk take place at least once per week. These talks should deal with risks relevant to the construction work at hand. A record of attendance shall be kept in the health & safety file. All Contractors have to comply with this minimum requirement.

2.3.10.3 All competent persons shall have the knowledge, experience, training, and qualifications specific to the work they have been appointed to supervise, control, carry out. This will have to be assessed on a regular basis e.g. periodic audits by the Client, progress meetings, etc. The Principal Contractor is responsible to ensure that Competent Contractors are appointed to carry out construction work.

2.3.11 General Record Keeping

The Principal Contractor and all Contractors shall keep and maintain Health and Safety (THE FILE) records to demonstrate compliance with this Specification, with the OHS Act 85/1993, Construction Regulations 2014 and any other legislation applicable on site. The Principal Contractor shall ensure that all records of incidents/accidents, training, inspections, audits, etc, are kept in a health & safety file held in the site office. The principal Contractor must ensure that every Contractor opens its own health & safety file, maintains the file and makes it available on request.

2.3.12 Health & Safety Audits, Monitoring and Reporting

The client will conduct at least, a once monthly Health & Safety audit of the work operations including a full audit of physical site activities as well as an audit of the administration of health & safety. The Principal Contractor is obligated to conduct similar audits or all contractors appointed by it. Detailed reports of the audit findings and results shall be reported on at all levels of project management meetings/forums. Copies of the Client audit reports shall be kept in the Primary Project Health & Safety

File while the Principal Contractor audit reports shall be kept in their File, a copy being forwarded to the Client. Contractors have to audit their sub-contractors and keep records of these audits in their health & safety files, available on request. These audits must be conducted by a competent person.

2.3.13 Emergency Procedures

The Principal Contractor shall submit a detailed Emergency Procedure for approval by the Client prior to commencement on site. The procedure shall detail the response plan including the following key elements:

- List of key competent personnel
- Details of emergency services
- Actions or steps to be taken in the event of the specific types of emergencies
- Information on hazardous material/situations
- Public and Road traffic control measures and signage
- Working close to, over or in water, river floods.

Emergency procedure(s) shall include, but shall not be limited to, fire, spills, accidents to employees, use of hazardous substance, bomb threats, major incidents/ accidents, working close to over or in water, river floods etc. The Principal Contractor shall advise the Client in writing forthwith of any emergencies, together with a record of action taken. A contact list of all service providers (Fire Department, Ambulance, Police, medical and Hospital, etc) must by maintained and available to site Personnel.

2.3.14 First Aid Boxes and First Aid Equipment

The Principal Contractor and all Contractors shall appoint in writing First Aider(s) as described in General Safety Regulations 3(4). The appointed First Aider(s) must be in possession of a valid certificate which are to be kept on site. The Principal Contractor shall provide an on-site First Aid Station with first aid facilities,

including first aid boxes adequately stocked at all times. All contractors with more than 5 employees shall supply their own first aid box. Contractors with more than 10 employees shall have a trained, certified first aider on sit at all times.

2.3.15 Accident / Incident Reporting and Investigation

Injuries are to be categorized into first aid; medical; disabling; and fatal. The Principal Contractor must stipulate in its construction phase health & safety plan how it will handle each of these categories. When reporting injuries to the Client, these categories shall be use. All injuries shall be investigated by the Principal Contractor, with a report being forwarded to the Client forthwith. All Contractors have to report on the 4 categories of injuries to the Principal Contractor at least monthly. The Principal Contractor must report all injuries to the Client in the form of a detailed injury report at least monthly.

2.3.16 Hazards and Potential Situations

The Principal Contractor shall immediately notify other Contractors as well as the Clients Agent of any hazardous or potentially hazardous situations that may arise during performance of construction activities. Hazards to be taken into account;

- Machine Hazards
- Energy Hazards
- Material Handling Hazards
- Work Practices Hazards
- Water Hazards
- Working at heights Hazards
- Moving Vehicle Hazards
- Hazardous Chemical Hazards

2.3.17 Personal Protective Equipment (PPE) and Clothing

The Principal Contractor shall ensure that all workers are issued and wear appropriate PPE e.i, hard hats, safe Footwear, gloves, ear/ eye protection and overalls etc. Keep a record of the PPE issued and which must be signed by employees. The Principal Contractor and all Contractors shall make provision and keep adequate quantities of SABS approved PPE on site at all times. The Principal Contractor shall clearly outline procedures to be taken when PPE or Clothing is:

- Lost or Stolen
- Worn out or damaged.

The above procedure applies to Contractors and their Sub-contractors, as they are all Employees in their own right.

2.3.18 Occupational health and Safety Signage

The Contractor shall provide adequate on-site OHS signage. Including but not limited to: 'Construction Site', 'no unauthorized entry', 'report to site office', 'site office', Road traffic signage as per Manual 13, etc. Signage shall be posted at all entrances to site as well as on site in strategic locations e.g. access routes, entrances to structures and buildings, and other potential risk areas/operations (where and if applicable on the specific site and as directed by Client/ representative).

2.3.19 Permits

Permits (PTW= Permit to Work) may include the following (as required and directed by Clients agent):

- Use of Explosives and Blasting
- Work for which a fall prevention plan is required
- Use of cradles
- Excavations, etc.

2.3.20 Contractors and Sub-contractors

The Principal Contractor shall ensure that all Contractors under its control comply with this Specification, the OHS Act of 1993, Construction Regulations 2014 and all other relevant legislation that may relate to the activities directly or indirectly. The Contractor, when appointing other Contractors as 'Sub-contractors', shall mutatis mutandis ensure compliance.

2.3.21 Incentives and Penalties

Certain incentives may be provided for on-going compliance to the provisions of the Construction phase health & safety plan submitted by the Principal Contractor. Penalties may be implemented for on-going non- compliance to the provisions of the Construction-phase health & safety plan as submitted by the Principal Contractor.

2.4 Physical Requirements

2.4.1 Demolition Work (If any is required)

Prior to any demolition work being carried out, the Principal Contractor shall submit a safe working procedure and a detailed engineering survey for approval by the Client. Acceptance will then be issued to the Principal Contractor to proceed with the demolition work. The Principal Contractor shall ensure that demolition work complies with the Construction Regulations 2014.

2.4.2 Excavations, Shoring, Dewatering or Drainage (where and when required)

The Principal Contractor and any relevant Contractors shall make provision in their tender for shoring, dewatering or drainage of any excavation as per this specification. The Contractor shall make sure that:

a) The excavations including shoring and bracing are inspected;

- before every shift,
- after every blasting operation,
- after an unexpected fall or collapse of ground,
- after substantial damage to supports,
- after rain or bad weather.
- and a record is kept, and

b) Safe work procedures have been communicated to the workers

c) The safe work procedures are enforced and maintained by the Contractor's Responsible Persons at all times

d) The requirements as per Regulation 13 of the Construction Regulations are adhered to

e) The required appointments are made in writing.

2.4.3 Edge Protection and Penetrations (where and when required - bridge in Beaufort West)

The Principal Contractor must ensure that all exposed edges and openings are guarded and demarcated at all times until permanent protection has been erected. The Principal Contractor's risk assessment must include these items. E.g. protection of decking edges, finished floor slab edges, stairways, floor penetrations, lift shafts, and all other openings and areas where a person may fall.

2.4.4 Explosives and Blasting (where and if required)

The Principal Contractor shall ensure that the use of explosives and blasting (where required) be undertaken by a competent Contractor. A safe Work Procedure (SWP) must be submitted to the Client for the approval before commencement of blasting work. The Client will issue a permit to authorize the operation.

2.4.5 Piling (where and if required)

The Contractor shall ensure that piling is undertaken by a competent Contractor. A SWP shall be submitted to the Client for approval before commencement of this work.

2.4.6 Stacking of materials

The Principal Contractor and other relevant contractors shall ensure that there is an appointed staking supervisor and all materials, all equipment is stacked and stored safely in a demarcated area.

2.4.7 Speed Restrictions, Signage and Protection

The Principal Contractor shall ensure that all persons in its employ, all Contractors, and all those that are visiting the site are aware and comply with the site speed restriction(s). Separate vehicle and pedestrian access routes shall be provided, maintained, controlled, and enforced. Signage shall be provided and should comply as per OHS Act and the South African Road Traffic legislation with specific reference to Manual 13.

2.4.8 Hazardous Chemical Substances (HCS)

The Principal Contractor and other relevant Contractors shall provide the necessary training and information regarding the use, transport, and storage of HCS. The Principal Contractor shall ensure that the use, transport, and storage of HCS is carried out as prescribed by the HCS Regulations. The Contractor shall ensure that all hazardous chemicals on site have a Material safety Data Sheet (MSDS) on site and the users are made aware of the hazards and precautions that need to be taken when using the chemicals. The First Aiders must be made aware of the MSDS and how to treat HCS incidents appropriately.

2.4.9 Asbestos

Not applicable

2.4.10 Areas subjected to flush floods, strong winds and working near water

The Contractor must constantly monitor the prevailing weather patterns of the work area, stop work, remove employees when the area becomes unsafe and keep a daily record of such. The Contractor shall not allow any work to carry on if it becomes unsafe when the river water reach the work area. No work shall be carried out in wind of a strength capable of making a person unsteady on his feet without special/adequate precautions being taken. No electrical powered tools and machinery to be used whilst working in water filled areas.

2.5 Plant and Machinery

2.5.1 Construction Plant

"Construction Plant" includes all types of plant including but not limited to, cranes, piling rigs, excavators, road vehicles, and all lifting equipment.
The Principal Contractor shall ensure that all such plant complies with the requirements of the OHS Act 85/1993, Driven Machinery Regulations and Construction Regulations 2014. The Principal Contractor and all relevant contractors shall inspect and keep records of inspections of the construction plant used on site. Only authorized/competent persons are to use machinery under proper supervision. Appropriate PPE and Clothing must be provided and maintained in good condition at all times.

2.5.2 Vessels under Pressure (VUP) and Gas Bottles

The Principal Contractor and all relevant Contractors shall comply with the Vessels under Pressure Regulations, including:

- Providing competency and awareness training to the operators
- Providing PPE or clothing
- Inspect equipment regularly and keep records of inspections
- Providing appropriate fire fighting equipment (Fire Extinguishers) on hand.

2.5.3 Fire Extinguishers and Fire Fighting Equipment

The Principal Contractor and relevant Contractors shall provide adequate, regularly serviced fire fighting equipment located at strategic points on site, specific to the classes of fire likely to occur. The appropriate notices and signs must be posted up as required.

2.5.4 Hired Plant and machinery

The Principal Contractor shall ensure that any hired plant and machinery used on site is safe for use. The necessary requirements as stipulated by the OHS Act 85/1993 and Construction Regulations 2014 shall apply. The Principal Contractor shall ensure that operators hired with machinery are competent and that certificates are kept on site in the health & safety file. All relevant Contractors must ensure the same.

2.5.5 Scaffolding / Working at Heights

Working at heights includes any work that takes place in an elevated position (**building of walkway next to bridge**). The Contractor must submit a **risk-specific fall prevention plan** in accordance with the Construction Regulations 2014 before this work is undertaken. The fall prevention plan must be approved by the Client before work may commence, and a permit to operate will be issued. Scaffolding used must comply with, erected and inspected by competent persons appointed in writing in accordance with SABS 085.

2.5.6 Formwork and Support work for Structures (where and if required)

The Principal Contractor shall ensure that the provisions of section 11 of the Construction Regulations 2014 are adhered to. These provisions must include but not limited to ensuring that all equipment used is examined for suitability before use; that all formwork and support work is inspected by a competent person immediately before, during en after placement of concrete or any other imposed load and thereafter on a daily basis until the formwork and support work has been removed. Records of all inspections must be kept in a register on site.

2.5.7 Lifting Machines and Tackle (where and if required)

The Principal Contractor and all Contractors shall ensure that lifting machinery and tackle is inspected before use and thereafter in accordance with the Driven Machinery Regulations and the Construction Regulations (section 20). A competent lifting machinery and tackle inspector need to be appointed in writing and must inspect the equipment daily or before use, taking into account that:

- All lifting machinery and tackle have a safe working load clearly indicated
- Regular inspection and servicing are carried out
- Records are kept of inspections and of service certificates
- There is a proper supervision in terms of guiding the loads that includes a trained banksman to direct lifting operations and check lifting tackle
- The tower crane bases have been approved by an engineer
- The operators are competent as well as physically and psychologically fit to work; and in possession of a medical certificate of fitness to be available on site.

2.5.8 Ladders and Ladder Work

The Principal Contractor shall ensure that all ladders are inspected monthly, are in good safe working order, are the correct height for the task, extend at least 1m above the landing, fastened and secured, and at a safe angle. Records of inspections must be kept in a register on site. Contractors using their own ladders must ensure the same. A safe work procedure to be included into the Health and Safety Plan.

2.5.9 General Machinery

The principal Contractor and relevant Contractors shall ensure compliance with the Driven Machinery Regulations, which include inspecting machinery regularly, appointing a competent person to inspect and ensure maintenance, issuing PPE or clothing, and training those who use machinery.

2.5.10 Portable Electrical Tools and Explosive Powered Tools

The Contractor shall ensure that use and storage of all explosive powered tools and portable electrical tools are in compliance with relevant legislation. The Contractor shall ensure that all electrical tools, electrical distribution boards, extension leads, and plugs are kept in safe working order. Regular inspections and toolbox talks must be conducted to make workers aware of the dangers and control measured to be implemented e.g. personal protection equipment, guards, etc. The Contractor shall consider the following:

- A competent person undertakes routine inspections and records are kept
- Only authorized trained persons use the tools
- The safe working procedures apply
- Awareness training is carried out and compliance is enforced at all times and
- PPE and clothing are provided and maintained
- A register indicating the issue and return of all explosive round
- Signs to be posted up in the areas where explosive powered tools are being used.

2.5.11 High Voltage Electrical Equipment, underground and Overhead power lines

Care shall be taken when working close to, over or under high voltage reticulation power lines or cables. Underground services to be identified beforehand and the layout of such to be include in the contractors Health and Safety Plan. A safe work procedure be drawn up and included into contractors Health and Safety Plan.

2.5.12 Public and Site Visitor Health & Safety

The Principal Contractor shall ensure that every person working on or visiting the site, as well as the public in general, shall be made aware of the dangers likely to arise from site activities, including the precautions to be taken to avoid or minimize those dangers. Appropriate health and safety notices and signs shall be posted up but shall not be the only measure taken. Both the Client and Principal Contractor have a duty in terms of the OHS Act 85/1993 to do all that is reasonably practicable to prevent members of the public and site visitors from being affected by the construction activities. Site visitors must be briefed on the hazards and risks they may be exposes to and what measures are in place or should be taken to control these hazards and risks. A record of these “inductions” must be kept on site in accordance with the Construction Regulations.

2.5.13 Night Work (where and if required)

The Principal Contractor must ensure that adequate lighting is provided to allow for work to be carried out safely. Permission to be obtained from the Client to work at night.

2.5.14 Transport of Workers

The Principal Contractor and other Contractors shall not:

- Transport persons together with goods or tools unless there is an appropriate area of section to store them and all loose tool and plant are tied down and secured
- Transport persons in a non-enclosed vehicle, e.g. truck; there must be a proper canopy (properly covering the back and top) with suitable sitting area. Workers shall not be permitted to stand or sit at the edge of the transporting vehicle
- Transport workers in bakkies unless they are closed/ covered and have the correct number of seats for the passengers.

2.6 Occupational Health

2.6.1 Occupational Hygiene

The contractor shall ensure that:

(a) suitable housekeeping is continuously implemented on each construction site, including provisions for the:

i) proper storage of materials and equipment; and

ii) removal of scrap, waste and debris at appropriate intervals

(b) loose materials required for use, are not placed or allowed to accumulate on the site so as to obstruct means of access to and egress from workplaces and passageways

(c) waste and debris are not disposed of from a high place with a chute, unless the chute complies with the requirements set out regulation 12(6); and

(d) construction sites in built–up areas, adjacent to a public way are suitably and sufficiently fenced off and provided with controlled access points to prevent the entry of unauthorised persons.

2.6.2 Welfare Facilities

(a) A contractor shall, depending on the number of workers and the duration of the work, provide at or within reasonable access of every construction site, the following clean and maintained facilities:

i) at least one shower facility for every 15 workers
ii) at least one sanitary facility for every 30 workers
iii) changing facilities for each sex; and
iv) sheltered eating areas.

(b) A contractor shall provide reasonable and suitable living accommodation for the workers at construction sites which are remote from their homes and where adequate transportation between the site and their homes, or other suitable living accommodation, is not available.

2.6.3 Alcohol and Other Drugs

i) An employer or a user, as the case may be, shall not permit any person who is or who appears to be under the influence of intoxicating liquor or drugs, to enter or remain at a workplace.

ii) No person at a workplace shall be under the influence of or have in his possession or partake of or offer any other person intoxicating liquor or drugs.

iii) An employer or user, as the case may be, shall in the case where a person is taking medicines, only allow such person to perform duties at the workplace if the side effects of such medicine do not institute a threat to the health or safety of the person concerned or other persons at such workplace.

2.7 Copy of the Act and Regulations

Every employer with five or more persons in his employ shall have a copy of the Act and the relevant regulations readily available at the work place: Provided that, where the total number of employees is less than five, the employer shall, on request of an employee, make a copy of the Act available to that employee.

2.8 Other Acts and Laws that may apply

The contractors attention is directed to the following Acts that may be applicable and must be adhered to at all times. It is the contractor's responsibility to become conversant with the requirements applicable in these laws:

Compensation for Occupational Injuries and Diseases ACT 130 of 1993,
Mineral Act No. 50 of 1991,
Water Act No. 54 of 1956, and
Atmospheric Pollution Prevention Act No. 45 of 1965,
Occupational Health and Safety Act No. 85 of 1993,
Environmental Conservation Act No. 73 of 1989.
Hazardous Substances Act No.15 of 1973,
National Building Regulations and Building Standards Act No.103 of 1977,
National Environmental Management Act No. 107 of 1998,
National Road Traffic Act No. 93 of 1996,
National Water Act No. 36 of 1998,
Relevant By-laws.

2.9 ACCEPTANCE OF CONDITIONS OF THESE SPECIFICATIONS

- **The contractor must provide a certified copy of his Public Liability insurance when signing this document.**

I, _____ the Contractor, do hereby

declare that my company, _____ acknowledge having read and understood the conditions contained in this legal document and furthermore we agree and accept to abide by the conditions and requirements of the act.

SIGNATURE CONTRACTOR: _____

DATE: _____

SIGNATURE WITNESS: _____

PRINT NAME: _____

AGENT ACTING ON BEHALF OF THE CLIENT:

NAME: _____

DATE: _____

SIGNATURE: _____

SIGNATURE WITNESS: _____

PRINT NAME: _____

2.10 INDEMNIFICATION

The Contractor hereby certifies that all contracting workmen recognize the inherent hazards that exist on the premises / property / site of _____ _____ (Client detail and site address) and that the Contractor;

■ enters the property entirely at his/her own risk and therefore the Contractor waives any claim of whatsoever nature against _____, (Client) its employees, agents and/or mandatories in respect of any loss, damage and/or injury whether same is the result of any negligent act or omission on the part of _____(contractor), it's employees, agents and/or mandatories or other independent Contractors or by a third person or by way of defective equipment or materials supplied by the company, and further the Contractor;

■ Hereby indemnifies _____(Client), its employees, agents and/or mandatories against any claims from the Contractor's employees and/or from any other person, arising and being caused in the manner set out above.

3 Annexure A

Proof of notification to be kept in Health and Safety File on site

ANNEXURE A

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993
Regulation 3 of the Construction Regulations, 2014

NOTIFICATION OF CONSTRUCTION WORK

1. (a) Name and postal address of principal contractor:

_____

_____

(b) Name and tel. no of principal contractor's contact person:

_____

_____

2. Principal contractor's compensation registration number:

_____

3. (a) Name and postal address of client:

_____

_____

_____

(b) Name and tel no of client's contact person or agent:

_____

_____

4. (a) Name and postal address of designer(s) for the project:

_____

_____

(b) Name and tel. no of designer(s) contact person:

_____

_____

5. Name and telephone number of principal contractor's construction supervisor on site appointed in terms of regulation 6.(1).

_____

_____

6. Name/s of principal contractor's sub-ordinate supervisors on site appointed in terms of regulation 6.(2)

_____

_____

7. Exact physical address of the construction site or site office:

_____

_____

8. Nature of the construction work:

_____

_____

_____

9. Expected commencement date: _____

10. Expected completion date: _____

11. Estimated maximum number of persons on the construction site: _____

12. Planned number of contractors on the construction site accountable to principal contractor:

_____

13. Name(s) of contractors already chosen.

_____

_____

_____

_____

_____

_____

_____ _____

Principal Contractor Date

_____ _____

Client Date

THIS DOCUMENT IS TO BE FORWARDED TO THE OFFICE OF THE DEPARTMENT OF LABOUR <u>PRIOR TO COMMENCEMENT</u> OF WORK ON SITE.

<u>ALL PRINCIPAL CONTRACTORS</u> THAT QUALIFY TO NOTIFY MUST DO SO EVEN IF ANOTHER PRINCIPAL CONTRACTOR ON THE SAME SITE HAD DONE SO PRIOR TO THE COMMENCEMENT OF WORK.

4 Annexure B

APPOINTMENT OF CONTACTOR
CONSTRUCTION WORK

CONSTRUCTION REGULATION 4(1) (c)

AGENT BEHALF OF: _____ (Name of Client)

PROJECT/SITE:_____ (Name & Address or Area)

_____

PROJECT PERIOD: from _____ to _____

AGREEMENT WITH MANDATARY IN TERMS OF SECTION 37(1) AND (2) OF OHS ACT 85 OF 1993

DEFINITION OF MANDATARY

- includes an agent, a contractor or a subcontractor for work, but without derogating from his status in his own right as an employer or a user.

DEFINITION OF AGENT

- means any person who acts as a representative for a client in the managing of the overall construction work.

SECTION 37(1)

(1) Whenever an employee does or omits to do any act which it would be an offence in terms of this Act for the employer of such employee or a user to do or omit to do, then, unless it is proved that-

(a) In doing or omitting to do that act, the employee was acting without the connivance or permission of the employer or any such user

(b) it was not under any condition or in any circumstance within the scope of the authority of the employee to do or omit to do an act, whether lawful or unlawful, of the character of the act or omission charged and

(c) all reasonable steps were taken by the employer or any such user to prevent any act or omission of the kind in question, the employer or any such user himself shall be

presumed to have done or omitted to do that act, and shall be liable to be convicted and sentenced in respect hereof; and the fact that he issued instructions forbidding any act or omission of the kind in question shall not, in itself, be accepted as sufficient proof that he took all reasonable steps to prevent the act or omission.

SECTION 37(2)

The provisions of subsection (1) shall mutates mutandis apply in the case of a mandatory of any employer or user, except if the parties have agreed in writing to the arrangements and procedures between them to ensure compliance by the mandatory with the provisions of this Act.

ACCEPTANCE BY MANDATARY

In terms of the provisions of Section 37(2) of the Occupational Health and Safety Act 1993, and Construction Regulation 4(1) (c),

I, _____(Appointed 16(2) person) acting for and on behalf of _____

_____(Company / Close Corporation/Enterprise/ Owner/User) undertake to ensure that the requirements and provisions of the Act and Regulations are complied with.

Print Name :_____.(Agent, Principal Contractor or Contractor)

Signature: _____at_____.

Designation: _____. Date: _____.

Mandatory- COIDA / Federated Employers Mutual No.: _____

Mandatory- Professional Indemnity Insurance no: _____

CLIENT

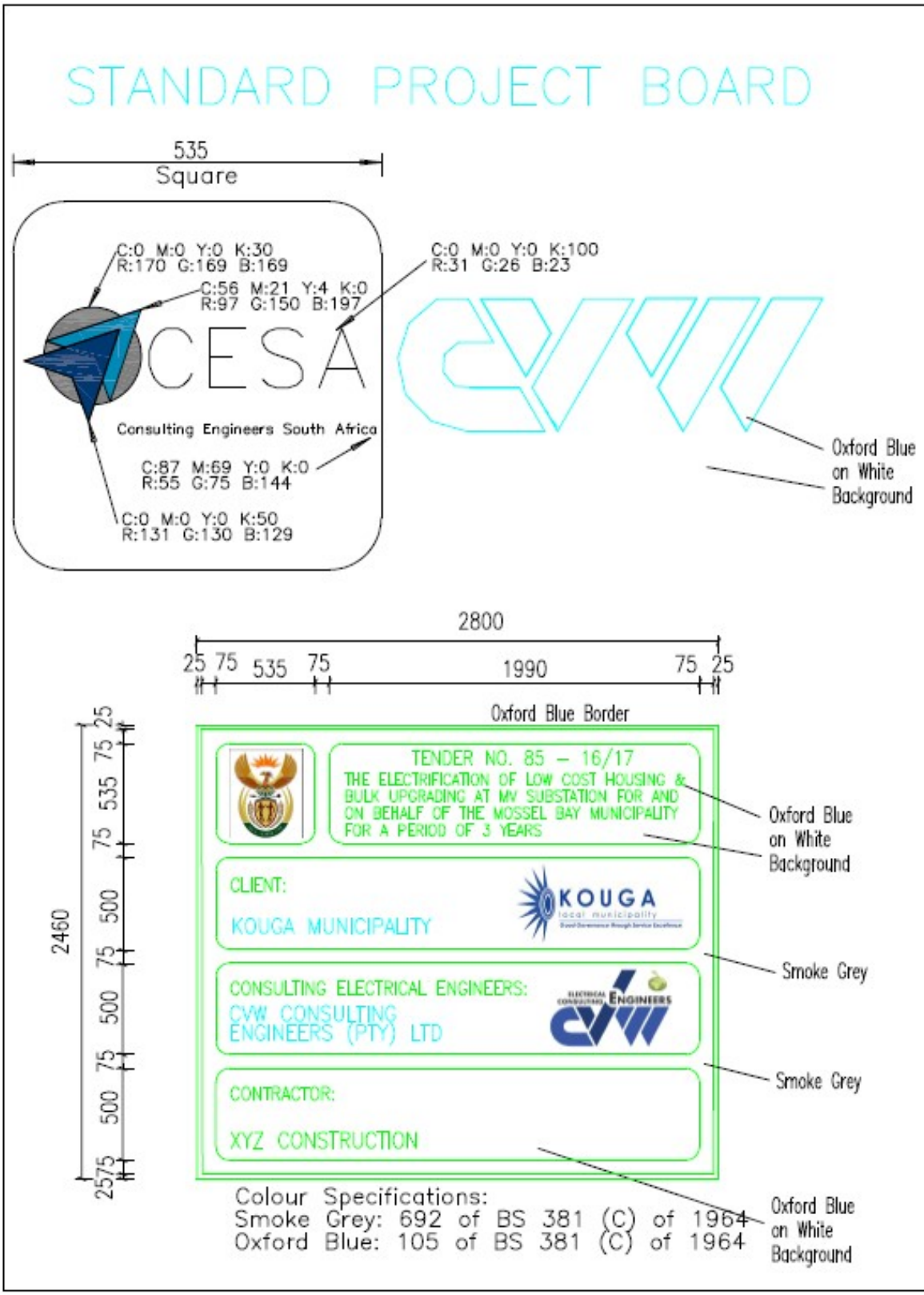
Print Name: _____. (Appointed 16(1) person/Client/Agent of Client or Principal Contractor)

Signature: _____ at _____

Designation: _____ Date: _____

ANNEXURE A: STANDARD PROJECT BOARD

STANDARD PROJECT BOARD



ANNEXURE B: OHS Specifications

OCCUPATIONAL HEALTH AND SAFETY SPECIFICATIONS

ANNEXURE C: MONTHLY CONTRACTOR FORMS

(MONTHLY FORMS TO BE COMPLETED BY THE CONTRACTOR)

DRAWINGS

ME 1590/19/1/0 OCEANVIEW SUBSTATION –YARD LAYOUT

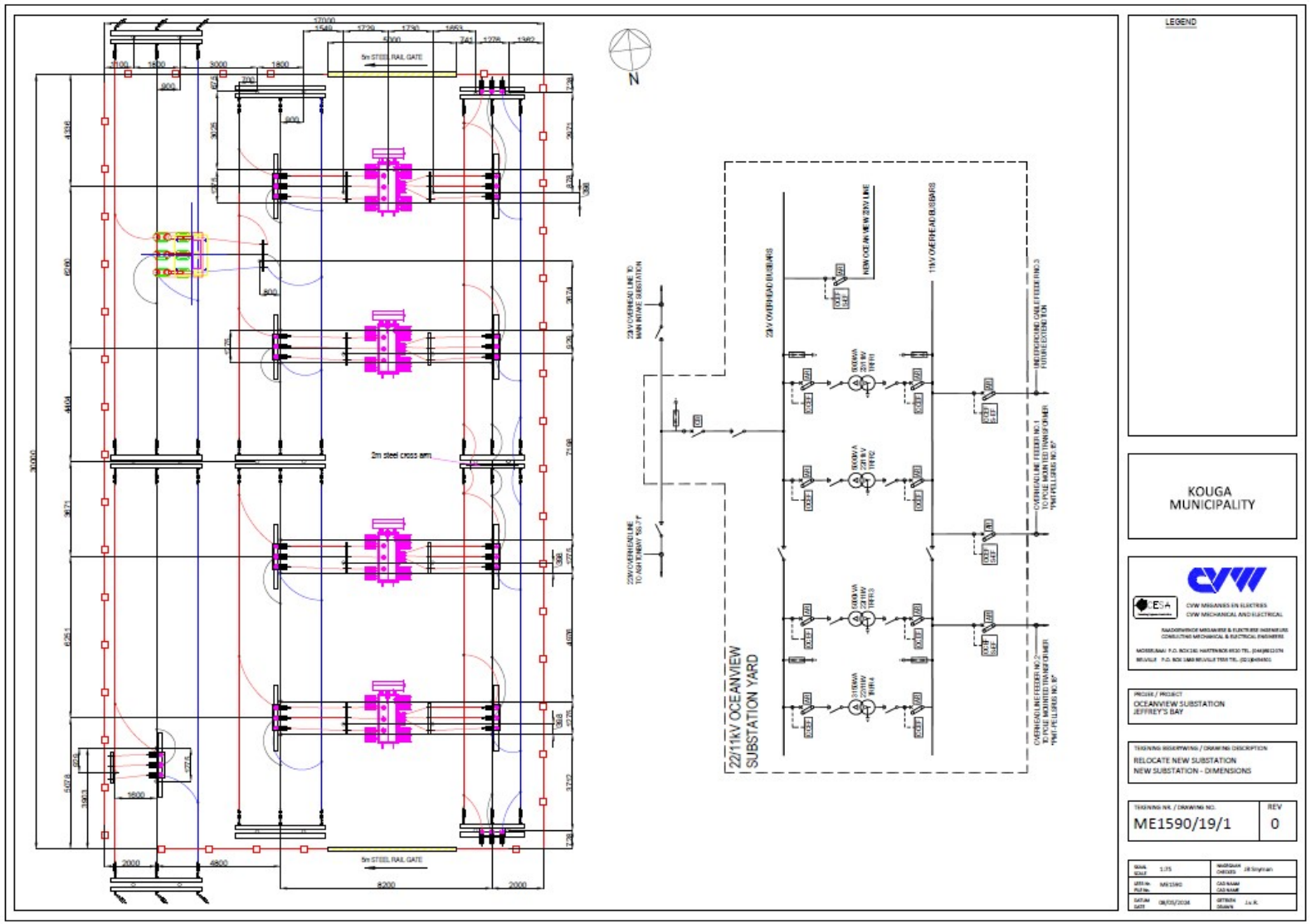
ME 1590/4/4/3OCEANVIEW SUBSTATION – PLINTH DETAIL

ME 1590/19/X/0 OCEANVIEW SUBSTATION –OUTDOOR CIRCUIT BREAKER

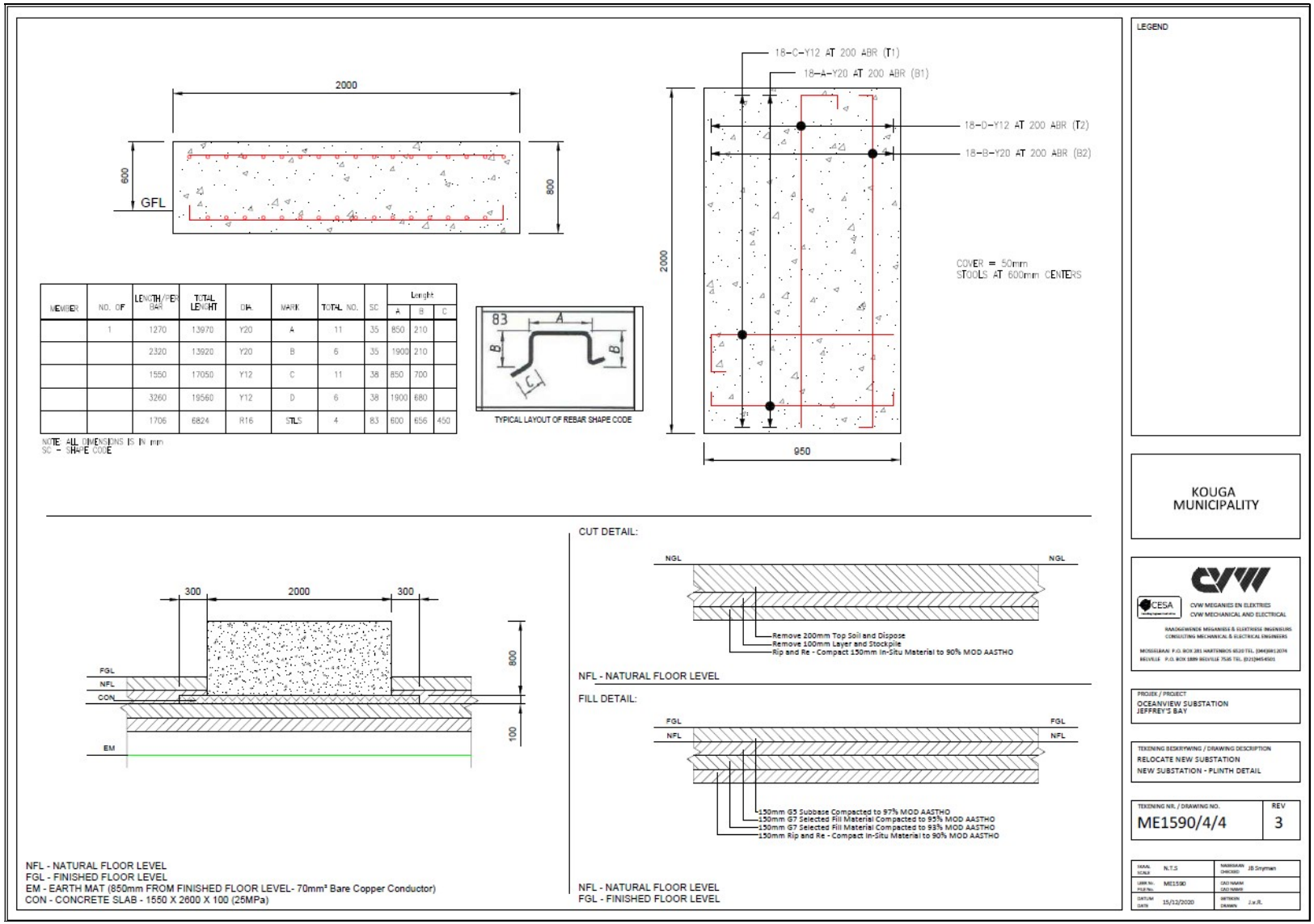
EXAMPLE

PICTURES:

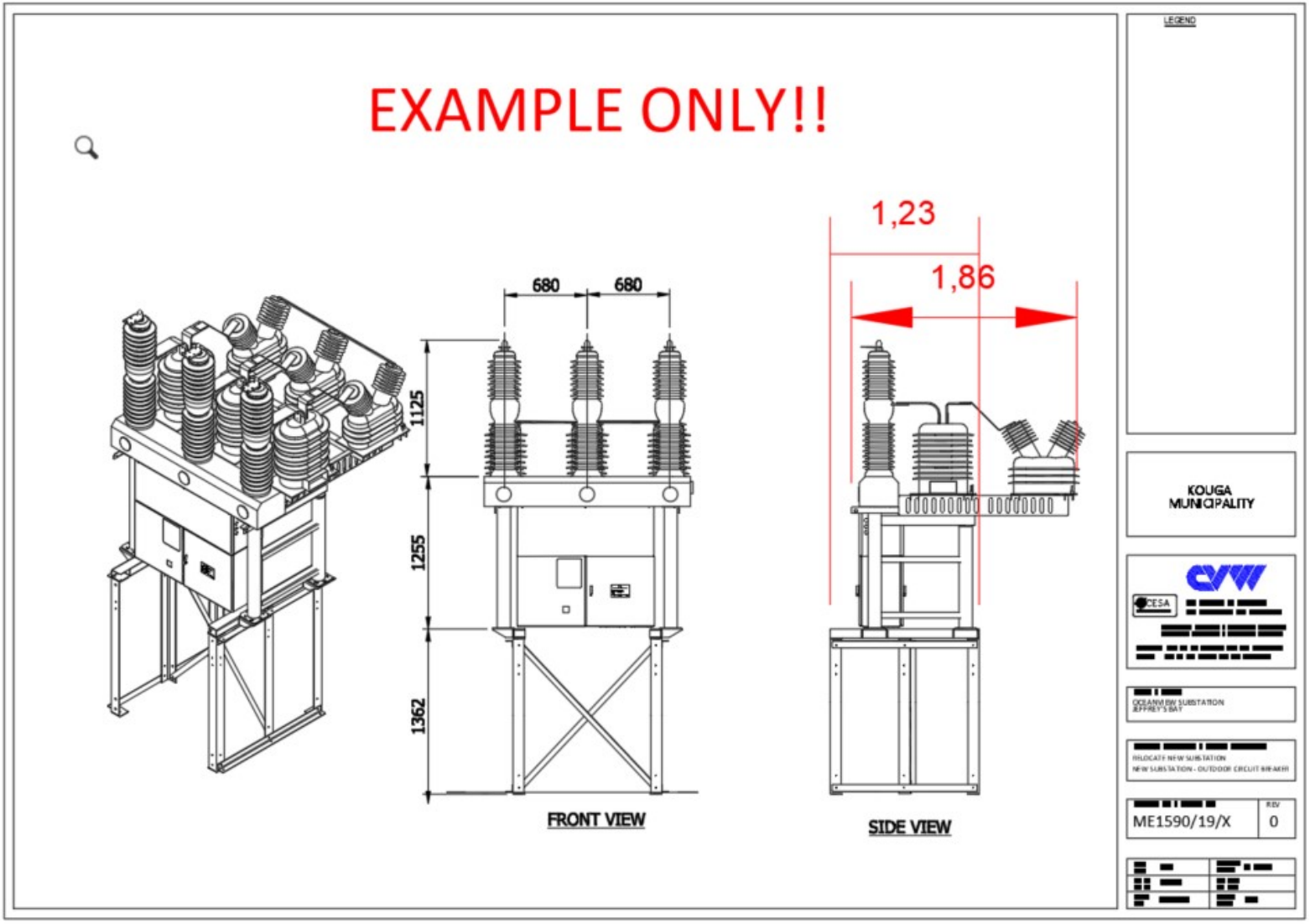
EXAMPLE: AUTO-RECLOSER



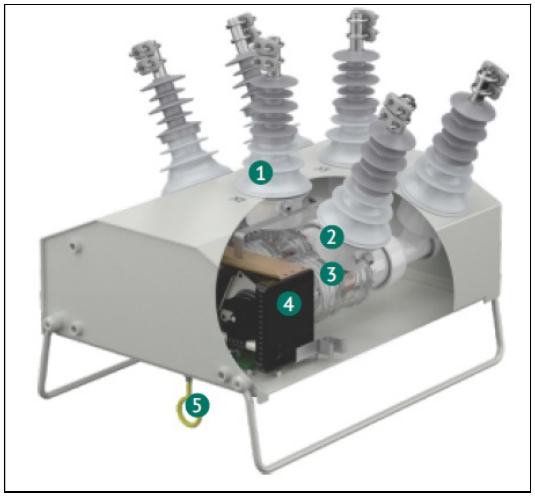
OCEANVIEW SUBSTATION –YARD LAYOUT



OCEANVIEW SUBSTATION – PLINTH DETAIL



OCEANVIEW SUBSTATION –OUTDOOR CIRCUIT BREAKER EXAMPLE



PICTURES: EXAMPLES: AUTO RECLOSER

PART 2: DATA PROVIDED BY THE CONTRACTOR