KOUGA MUNICIPALITY EC108

Notice No. 126/2023

ELECTRIFICATION OF 259 HOUSES AT KRUISFONTEIN IN HUMANSDORP (DMRE WORK 2023/24): SPECIFICATION NO. G/10599/E

PROCUREMENT DOCUMENT

(Based on GCC 2015)

June 2023

Issued by:

Kouga Municipality

Municipal Offices
16 Woltemade Street
Jeffreys Bay
6300

Prepared by:

Clinkscales Maughan-Brown South (Pty) Ltd

39 Victoria Street
P.O. Box 2551
GEORGE
6530

Contact:

Name: Mr. Theo Madatt

Telephone: 042 200 2200 Ext 2183

E-mail: tmadatt@kouga.gov.za

Mr. Stiaan Adams

044-874 1511

sadams@cmbgeorge.co.za

Name of Tenderer: .....

CLINKSCALES MAUGHAN-BROWN
CONSULTING MECHANICAL & ELECTRICAL ENGINEERS

KOUGA MUNICIPALITY EC108

Notice No. 126/2023

ELECTRIFICATION OF 259 HOUSES AT KRUISFONTEIN IN HUMANSDORP (DMRE WORK 2023/24): SPECIFICATION NO. G/10599/E

Contents

THE CONTRACT

Part C1: Agreements and Contract Data

Part C2: Pricing Data

Part C3: Scope of Work

TENDERER CONTACT DETAILS

This information shall be used for any correspondence or contact with the Tenderer.

Please indicate whether you prefer to receive any correspondence via e-mail or sent to your postal address by registered mail.

Name of Bidding Company: ……		**Mark choice of correspondence with an X**
Name of Contact Person: ……		
Postal Address:	.... Postal Code:	.....
E-mail Address:	.....	.....
Telephone No:	.....	.....
Cell No:	.....	.....
Fax No:	.....	.....

TENDER OFFER

The offered total of the prices inclusive of Value Added Tax, carried over from Part C1.1, Form of Offer and Acceptance, Page C1.1.1, is:

……..

…….…….…… Rand (in words)

R ……. (in figures).

KOUGA MUNICIPALITY

NOTICE NO. 126/2023

ELECTRIFICATION OF 259 HOUSES AT KRUISFONTEIN IN HUMANSDORP (DMRE WORK 2023/24): SPECIFICATION NO. G/10599/E

GENERAL TENDER INFORMATION

TENDER ADVERTISED	: 23 June 2023
COMPULSORY VIRTUAL CLARIFICATION SESSION DATE:	: Wednesday, 05 July 2023 at 12h00pm
COMPULSORY SITE VISIT MEETING DATE:	: Thursday, 06 July 2023 at 12h00pm
TENDER CLOSING DATE	: Monday, 24 July 2023
CLOSING TIME	: 12h00pm
LOCATION OF TENDER BOX	: **Tender Box** in Room 122 at 21 St. Croix Street (back entrance) or 16 Woltemade Street (front entrance), Jeffreys Bay

THE TENDER

PART T1 – TENDERING PROCEDURES

T1.1 TENDER NOTICE AND INVITATION TO TENDER

KOUGA LOCAL MUNICIPALITY (EC108)
DIRECTORATE: INFRASTRUCTURE & ENGINEERING
NOTICE NO: 126/2023: ELECTRIFICATION OF 259 HOUSES AT KRUISFONTEIN IN HUMANSDORP (DMRE WORK 2023/24): SPECIFICATION NO. G/10599/E

Suitably qualified, capable and experienced Contractors are hereby invited to submit tenders for the Electrification of 259 Houses at Kruisfontein in Humansdorp.

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 Friday, 23 June 2023. After downloading the tender document from the website each prospective bidder **MUST** ensure that all the pages of the tender document are printed.

A compulsory virtual clarification session will be arranged for the **Wednesday, 05 July 2023 @ 12h00pm. Prospective bidders can use the very same link below which is direct from this advert, it will link them directly to the meeting.**

The link will also be available on the municipal website.

Join Zoom Meeting
https://kouga-gov-za.zoom.us/j/96852034640?pwd=b3VoK0F3bmZGZmdWYzg4d2syQjhuQT09

Meeting ID: 968 5203 4640
Passcode: 529516

A compulsory site visit meeting with representatives of the Employer will be held on the site on **Thursday, 06 July 2023 @ 12h00pm.** There will be an attendance register that will need to be signed.

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.

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 4EP or higher is required.**
- **A minimum functional assessment score of 70 points will apply to this contract.**
- 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 tmadatt@kouga.gov.za

Completed documents in a sealed envelope endorsed "**NOTICE NO: 126 / 2023: "ELECTRIFICATION OF 259 HOUSES AT KRUISFONTEIN IN HUMANSDORP (DMRE WORK 2023/24): SPECIFICATION NO. G/10599/E"** 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 **MONDAY, 24 JULY 2023 at 12h00pm.**

C. DU PLESSIS
MUNICIPAL MANAGER
P.O. Box 21
JEFFREYS BAY
6330

For Placement:
Herald/Municipal Website/ Municipal Notice Boards in all offices/areas – 23 June 2023

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	Tender Data
C.1.1	The Employer is Kouga Municipality.
C.1.2	The Tender Documents issued by the Employer comprise the following documents: **THE TENDER** Part T1: Tendering procedures. Part T2: Returnable documents. **THE CONTRACT** Part C1: Agreements and Contract data Part C2: Pricing data. Part C3: Scope of work. Part C4: Site information Annexures
C.1.4	The Employer's Agent is : Name: Clinkscales Maughan-Brown (South) (Pty) Ltd Address: 39 Victoria Street, P.O. Box 2551, George, 6530 Tel: 044-8741511 Fax: 044-8741510 E-mail: sadams@cmbgeorge.co.za Any inquiries relating to this tender must be submitted in writing via e-mail to tenders@kouga.gov.za and copied to tmadatt@kouga.gov.za
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.2.1.1 Only those Tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a EP class of construction work, are eligible to have their tenders evaluated.

Joint ventures are eligible to submit tenders provided that:

1. every member of the joint venture is registered with the CIDB;
2. the lead partner has a contractor grading designation in the EP class of construction work; and
3. the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a EP class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.

C.2.1.1 Only Tenderers that meet the following pre-qualification conditions are eligible to have their tenders further evaluated. The qualifying criteria and the score in respect of each criteria is as follows. **A minimum of 70 points** out of a maximum total of 100 points is required for the tender to be evaluated further.

Should the Tenderer not complete the following column, no points will be awarded.
The Tenderer must provide sufficient proof, i.e. documentation, contact persons and contact numbers, etc. under Parts T2.2.3, T2.2.6 and T2.2.15 in this document for each of the following items stipulated. Unclear or incomplete information provided will result in no points being awarded.

Note:
In terms of Item 2 of Clause 3.2 of CIDB's Inform Practice Note #5, Tenderers may not provide additional information subsequent to the closing of the tender that may affect their competitive position. It is therefore very important that the Tenderer submit sufficient proof as requested above together with his/her tender.

Item	Description	Column to be completed by Tenderer	Points awarded by Employer
a)	Tenderer's relevant experience (track record) on previously completed projects of a similar nature, scope and complexity on Electrification of Households, i.e. Supply and installation of Medium Voltage (MV) and Low Voltage (LV) overhead reticulation and service connections, over the past five (5) years: 1 to 2 projects = 10 points 3 to 4 projects = 20 points 5 to 6 projects = 30 points More than 6 projects = 40 points (Maximum points = 40) Completion certificates of previously completed projects to be included with the tender. This requirement is compulsory in order to claim for points.	…….. ……..	…… ……

	b)	Compulsory minimum qualification/s, plus experience in number of years, of Tenderer's proposed Construction Manager: Compulsory Qualification/s: - Electrician Trade Certificate - Operating Regulations for High Voltage Systems (ORHVS) certificate Experience: 1 to 5 years = 5 points 6 to 10 years = 10 points 11 to 15 years = 15 points 16 years or more = 20 points (Maximum points = 20) A CV of the proposed Construction Manager, indicating experience in years, including copies of his/her relevant compulsory qualifications to be included with the tender. This requirement is compulsory in order to claim for points.	…….. ……..	…… ……
	c)	Compulsory minimum qualification/s, plus experience in number of years, of Tenderer's proposed Site Supervisor: Compulsory Qualification/s: - Electrician Trade Certificate - Operating Regulations for High Voltage Systems (ORHVS) certificate Experience: 1 to 5 years = 5 points 6 to 10 years = 8 points 11 to 15 years = 12 points 16 years or more = 15 points (Maximum points = 15) A CV of the proposed Site Supervisor, indicating experience in years, including copies of his/her relevant compulsory qualifications to be included with the tender. This requirement is compulsory in order to claim for points.	…….. ……..	…… ……

	d)	Locality. Location of a local office in relation to the Kouga Municipal Area: - Within the Kouga Municipal Area = 25 points - Within the Nelson Mandela Metropolitan or Sarah Baartman District Municipal Areas = 15 points - Within Eastern Cape Province = 10 points - Outside Eastern Cape Province = 5 points (Maximum points = 25) Proof of physical address by means of a municipal rates and taxes account and/or lease agreement if premises are rented to be included with the tender in order to claim points for a local office.	…….. ……..	…… ……
		Total points awarded out of 100	……	……
C.2.7	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 Friday, 23 June 2023. After downloading the tender document from the website each prospective bidder **MUST** ensure that all the pages of the tender document are printed. A compulsory virtual clarification session will be arranged for the **Wednesday, 05 July 2023 @ 12h00pm. Prospective bidders can use the very same link below which is direct from this advert, it will link them directly to the meeting.** The link will also be available on the municipal website. Join Zoom Meeting https://kouga-gov-za.zoom.us/j/96852034640?pwd=b3VoK0F3bmZGZmdWYzg4d2syQjhuQT09 Meeting ID: 968 5203 4640 Passcode: 529516 A compulsory site visit meeting with representatives of the Employer will be held on the site on **Thursday, 06 July 2023 @ 12h00pm.** There will be an attendance register that will need to be signed. 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.2.12	No alternative tender offers will be considered.		
C.2.13.3	The complete Tender Document shall be returned with the tender, including all Parts as listed in C.1.2 above (not to be separated). Parts of each tender offer communicated on paper shall be submitted as an original, plus Nil copies.		
C.2.13.5 C.2.15.1	The employer's details and address for delivery of tender offers and identification details that are to be shown on each tender offer package are: **Location of tender box:** Foyer of Municipal Building **Physical address:** 21 St. Croix Street (back entrance) or 16 Woltemade Street (front entrance), Jeffreys Bay **Identification details:** Bid reference number, Title and the closing date and time.		
C.2.13.9	Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted.		

C.2.15	The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender.
C.2.16	The tender offer validity period is 120 days.
C.2.20	The Tenderer is required to submit with his tender a letter of intent from an approved insurer undertaking to provide the Performance Bond to the format included in Part C1.3 of this procurement document. The form as per Part T2.2.12 can be used for this purpose.
C.2.23	The tenderer is required to submit with his tender the following: 1) an original Tax Clearance Certificate issued by the South African Revenue Services; 2) CIDB grading certificate; 3) Documents as listed in the List of Returnable Documents in Part T2.1.
C.3.4	Tenders will be opened immediately after the closing time for tenders at 12h05.
C.3.5	A two-envelope system will not be followed.
C.3.11.1	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.3.13	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.
C.3.13	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.3.17	The number of paper copies of the signed contract to be provided by the employer is one (1).

KOUGA MUNICIPALITY EC108

Notice No. 126/2023

ELECTRIFICATION OF 259 HOUSES AT KRUISFONTEIN IN HUMANSDORP (DMRE WORK 2023/24): SPECIFICATION NO. G/10599/E

T2.1 LIST OF RETURNABLE DOCUMENTS

Part No.	The tenderer must ensure that the following documents are completed and included with his tender.	Tenderer to confirm in this column by inserting a tick that document has been completed and returned.
	1. Returnable Schedules required for tender evaluation purposes:	
T1.2	Completed functionality schedule under Clause C.2.1.1.	
T2.2.1	Record of Addenda to Tender Documents	
T2.2.2	Schedule of Amendments and Qualifications by Tenderer	
T2.2.3	Schedule of Particulars / Information	
T2.2.4	Compulsory Enterprise Questionnaire	
T2.2.5	Certificate of Authority for Joint Ventures	
T2.2.6	Schedule of Tenderer's Experience	
T2.2.7	Schedule of Sub-Contractors	
T2.2.8	Schedule of Plant and Equipment	
T2.2.9	Undertaking to provide Performance Bond	
T2.2.10	Authority for Signatory	
T2.2.11	Preferencing Schedule: Broad Based Black Economic Empowerment	
T2.2.12	Compulsory Declaration	
T2.2.13	Municipal Declaration and Returnable Documents	
T2.2.14	Schedule of Reference for Tenderer	
	2. Other documents required for tender evaluation purposes:	
(a)	Valid Original Tax Clearance Certificate.	
(b)	Certified copy of Company Registration Certificate.	
(c)	Certificate of Contractor Registration issued by the Construction Industry Development Board.	
(d)	Certified copies of identities of the Directors and owners of tendering Entity.	
(e)	Proof that the Tenderer complies with the OHS Act and is registered for workmen compensation purposes.	
(f)	Original and valid B-BBEE status level verification certificate or a certified copy thereof.	
(g)	Certified copies of Tenderer's and those of its Directors' Municipal accounts for the month preceding the tender closing date.	
(h)	If the Tenderer rents premises, proof that the rental includes Municipal rates and taxes and municipal charges, and that rent is not in arrears.	
(i)	Company profile indicating the location of various Tenderer's offices / branches, as well as an organogram showing the structure of the organisation.	

Part No.	The tenderer must ensure that the following documents are completed and included with his tender.	Tenderer to confirm in this column by inserting a tick that document has been completed and returned.
(j)	Declaration of fulfilment of the Construction Regulations, 2014.	☐
(k)	Preliminary construction programme for this tender.	☐
(l)	Estimated monthly cash flow for duration of contract. Only pro-rata percentage of Gross Contract Value per month required.	☐
	3. Returnable Schedules that will be incorporated into the Contract:	
	All schedules as per Item 1 above.	☐
	4. Other documents that will be incorporated into the Contract:	
C1.1	Form of Offer and Acceptance	☐
C1.2	Contract Data	☐
C2.1	Pricing Instructions	☐
C2.2	Bill of Quantities	☐
C3	Scope of Work	☐
C4	Site information	☐
-	Annexures	☐

T2.2 RETURNABLE SCHEDULES

T2.2.1 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.			

Copies of Addenda received to be attached hereafter.

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

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

Tenderer .....

T2.2.2 SCHEDULE OF AMENDMENTS AND QUALIFICATIONS BY TENDERER

The Tenderer is required to give full details of any departure from the Specification and shall then sign this page officially. If there are no departures, the Tenderer must state NIL on this page and sign it. The Tender shall then be held to comply in all respect with the Specification. If the Tenderer does not indicate anything on this page, the Tenderer will also be held to comply in all respects with the Specification.

Should there be insufficient space, the Tenderer may include separate sheets arranged in the same manner as above. Mere reference to a covering letter will not be regarded as compliance with this requirement. Any amendments and / or qualifications stated in a covering letter will be regarded as null and void.

The Tenderer's attention is drawn to clause C.3.8 of the Standard Conditions of Tender referenced in the Tender Data regarding the Employer's handling of material deviations and qualifications.

Page	Clause or item	Proposal

Signed ---------- Date ----------

Name ---------- Position ----------

Tenderer ----------

T2.2.3 SCHEDULE OF PARTICULARS / INFORMATION

Note: 1. This schedule must be completed for all items offered, stating where appropriate, the size or capacity of equipment, type or catalogue no, country of origin and any other detail he considers necessary. Failure to comply with this requirement may render the tender invalid.

2. Information in amplification of that given below may be submitted in the form of published literature, technical sheets, etc. and must be attached immediately after this page, otherwise same will not be considered.

3. Acceptance of a Tender, with this Schedule complete, does not relieve the Tenderer of the responsibility of complying with the Specification for the items listed.

1.0 OVERHEAD LINE MATERIAL

(a) Supplier of poles: .....

(b) Do poles carry SABS mark? .....YES/NO

(c) Are the poles Pinus Radiata? .....YES/NO

(d) Manufacturer of:

(i) 22kV conductor: .....

(ii) LV bundled conductor: .....

(iii) Airdac conductor: .....

(iv) Fittings 22kV conductor: .....

(v) Fittings LV bundled conductor: .....

(vi) Fittings Airdac conductor: .....

(vii) Steel support structures: .....

(viii) Staywork: .....

(e) Is LV bundled conductor the French type: .....YES / NO

(f) Type and catalogue number:

(i) 22kV Line fittings:

- strain insulators: .....
- line post insulators: .....
- dead ends: .....
- twin ties: .....
- armoured road crossing twin ties: .....
- thimble clevis: .....

(ii) LV bundled conductor fittings:

- dead end clamp and bracket: .....
- suspension clamp and bracket: .....

(iii) Airdac fittings:

- dead end clamp and bracket: .....
- suspension clamp and bracket: .....

(iv) Staywork:

- pole top-make off: .....
- stay insulator: .....
- guy-grip: .....
- stay rod assembly: .....
- stay guard: ..... SOLID / SPLIT

(g) Delivery period for:

(i) Poles: .....weeks
(ii) 22kV conductors: ..... weeks
(iii) LV bundled conductors: .....weeks
(iv) Airdac: .....weeks
(v) 22kV Line fittings: ..... weeks
(vi) LV bundled conductor fittings: .....weeks
(vii) Steel support structures: .....weeks

2.0 22/0,4kV, 315kVA, POLE MOUNTED TRANSFORMER SUBSTATIONS

(a) Make: .....
(b) Transformer losses on principal tapping: .....Watts
(c) Copper losses at 75℃ on principal tapping: ... .Watts
(d) Impedance at 75℃ and rated frequency on princi pal tapping: .....%
(e) Windings copper for both MV and LV as specified? .....YES/NO
(f) Zinc metal sprayed as specified? .....YES/NO
(g) Make and type of:

(i) MCB's.....
(ii) CT's.....

(h) Finish: .....
(i) Mass: ……kg
(j) Dimensions: ……mm
(k) Delivery Period: ……weeks

3.0 22kV EXPULSION FUSES (D-FUSES)

(a) Manufacturer: .....
(b) Type: .....
(c) Current rating of fuse elements:.....amps
(d) Delivery period: .....weeks

4.0 22kV LIGHTNING ARRESTORS

(a) Manufacturer: .....

(b) Type: .....

(c) Flash through voltage: .....

(d) Delivery period: .....weeks

5.0 LV DISTRIBUTION BOARD

(a) Manufacturer: .....

(d) Delivery period: .....weeks

6.0 POLE MOUNTED CONSUMER SERVICE CONNECTION BOXES (CSCB's)

CSCB's with circuit breakers and prepayment kWh meters' Measurement and Control Units, i.e. MCU's:

(a) Make: .....

(b) Catalogue No: .....

Detailed description of enclosure, i.e. material type, thickness, etc:

.....

.....

(c) Manufacturer and catalogue no. of MCB's: .....

(d) Are 2,5m long insulated black conductors (colour coded for each phase) for connection to bundled conductor overhead line included? .....

YES/NO

(e) Is insulation of black conductors, for connection to bundled conductor overhead line, UV stable? ..... YES/NO

(f) Manufacturer, current rating and description of conductors for connection to bundled conductor: .....

(g) Does box carry SABS mark? .....YES/NO

(h) Delivery Period:.....weeks

7.0 SMALL POWER DISTRIBUTION UNITS (READY BOARDS)

Manufacturer: .....

(a) Type: .....

(b) Delivery period: .....weeks

8.0 PREPAID kWh METERS

Split prepaid kWh meter:

(a) Make: .....

(b) Catalogue No: .....

(c) Does it comply with SABS 1524-1: 1994 and NRS 009? .....YES/NO

(d) Does it have current limiting from 1A to 60A adjustable in 1A steps? .....YES/NO

(e) Does it have Voltage Surge Protection to SABS 171? .....YES/NO

(f) Does it comply with Eskom's Standard Transfer Specification (STS)? .....YES/NO

(g) Is it fitted with tamperproof protection? .....YES/NO

(h) Is it operated via a keypad? .....YES/NO

(i) Delivery period: .....weeks

9.0 EARTHING

(a) Make, type and size:

(i) Bare copper conductor: .....

(ii) Green PVC insulated down conductor: .....

(iii) Black PVC insulated down conductor: .....

(iv) Earth spikes: .....

(b) Delivery period:

(i) Bare copper conductor: .....weeks

(ii) Green PVC insulated down conductor: .....weeks

(iii) Black PVC insulated down conductor: .....weeks

(iv) Earth spikes: .....weeks

C. GENERAL

(a) Name and experience of Professional Land Surveyor the Tenderer intends using on this project:

.....
.....
.....
.....
.....

(b) Name and experience of Construction Manager the Tenderer intends using on this project:

.....
.....
.....
.....
.....

The Electrical Contractor shall not replace the Construction Manager nominated above without the prior written consent of the Engineer.

(c) Name and experience of the Site Supervisor the Tenderer intends using on this project:

.....
.....
.....
.....
.....
.....

The Electrical Contractor shall not replace the Site Supervisor nominated above without the prior written consent of the Engineer.

An organogram of the tendering company / entity shall be included with the tender submission, clearly indicating the positions of all nominated personnel for this tender.

(d) Organogram of tendering company / entity included: ..... YES/NO

(e) We undertake to provide the following documentation as required in terms of the Contract to the Engineer within a period of fourteen (14) days from the date of a letter of appointment being received:

(i) Performance Bond or Surety: ..... YES/NO

(ii) Proof of Third Party Insurance: ..... YES/NO

(iii) Construction programme for approval: ..... YES/NO

(iv) Proof of orders for major items of materials / equipment ..... YES/NO

SIGNATURE: .....
(for the Tenderer)

PRINT NAME: .....
(for the Tenderer)

DATE: .....

T.2.2.4 COMPULSORY ENTERPRISE QUESTIONNAIRE

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

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

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

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

Section 4: CSD number: . . . . . .

Section 5: Particulars of sole proprietors and partners in partnerships:

Name*	Identity number*	Personal income tax number*

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

Section 6: Particulars of companies and close corporations

Company registration number . . . . . .

Close corporation number . . . . . .

Tax reference number . . . . . .

Section 7: The MBD 4 form attached under Part T2.2.13 must be completed and be attached as a tender requirement.

Section 8: The MBD 6.1 form attached under Part T2.2.13 must be completed and be attached as a tender requirement.

Section 9: The MBD 8 form attached under Part T2.2.13 must be completed and be attached as a tender requirement.

Section 10: The MBD 9 form attached under Part T2.2.13 must be completed and be attached as a tender requirement.

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

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

ii) confirms that neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004;

iii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption;

iv) confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the Tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest;

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

Signed ---------- Date ----------

Name ---------- Position ----------

Enterprise name ----------

T2.2.5 CERTIFICATE OF AUTHORITY FOR JOINT VENTURES

This Returnable Schedule is to be completed by joint ventures.

We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorise Mr/Ms ……., authorised signatory of the company ……, acting in the capacity of lead partner, to sign all documents in connection with the tender offer and any contract resulting from it on our behalf.

NAME OF FIRM	**ADDRESS**	**DULY AUTHORISED SIGNATORY**
Lead partner CIDB registration no ……		Signature …….. Name …… Designation ……..
CIDB registration no ……		Signature …….. Name …… Designation ……..
CIDB registration no ……		Signature …….. Name …… Designation ……..
CIDB registration no ……		Signature …….. Name …… Designation ……..

T2.2.6 SCHEDULE OF TENDERER'S EXPERIENCE

The following is a statement of similar work successfully executed by myself / ourselves:			
Employer, contact person and telephone number.	**Description of contract**	**Value of work inclusive of VAT (Rand)**	**Date completed**

Attach additional pages if more space is required.

Signed ---------- Date ----------

Name ---------- Position ----------

Tenderer ----------

T2.2.7 SCHEDULE OF SUB-CONTRACTORS

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

If we are awarded a contract we agree that this notification does not change the requirement for us to submit the names of Sub-contractors in accordance with requirements in the contract for such appointments. If there are no such requirements in the contract, then your written acceptance of this list shall be binding between us. The following supporting documentation must be submitted for each of the Sub-Contractors:

- CV of the proposed Sub-Contractor/s.
- A valid B-BBEE status level verification certificate or sworn affidavit.

	Name and address of Sub-contractor	B-BBEE Status	Nature, extent and % of work to be sub-contracted	Previous experience with Sub-contractor.
1.				
2.				
3.				
4.				

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

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

Tenderer .....

T2.2.8 SCHEDULE OF PLANT AND EQUIPMENT

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

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

Quantity	**Description, size, capacity, etc.**

Attach additional pages if more space is required.

(b) Details of major equipment that will be hired, or acquired for this contract if my / our tender is accepted.

Quantity	**Description, size, capacity, etc.**

Attach additional pages if more space is required.

Signed _____ Date _____

Name _____ Position _____

Tenderer _____

T2.2.9 UNDERTAKING TO PROVIDE PERFORMANCE BOND

Having examined the Contract Data, the Scope of Work and the Bill of Quantities, and having reviewed our financial commitments, we have approached the Insurance company / bank named below for a Guarantee in the exact terms of the Pro Forma Guarantee provided in Part C1.3 hereof.

We hereby declare that the insurance company/bank named below is aware of our financial position and commitments in terms of this tender and any other tender offers made and is prepared to issue the Guarantee unconditionally, within the period called for in these tender documents, and until the issue of the Certificate of Completion.

Name of proposed Guarantee provider: ……
(Insurance Company/Bank)

Date: …….. Signed on behalf of the Tenderer: ……

Date: …….. Signed on behalf of the insurance company/bank: ……

In their capacity as ……

T2.2.10 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. ……

T2.2.11 PREFERENCING SCHEDULE: BROAD BASED BLACK ECONOMIC EMPOWERMENT STATUS

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

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

NB: BEFORE COMPLETING THIS FORM, 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

(*Delete whichever is not applicable for this tender*).

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

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

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

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**

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

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.

4.1.2 Points awarded for Specific Goals

In terms of the Specific Goals as per the Kouga Municipality Preferential Procurement Policy, preference points must be awarded to a Tenderer for Locality in accordance with the table below:

Locality of Tenderer's Office	Number of points (80/20 system)	Number of points (90/10 system)
Within the boundaries of Kouga Municipality	10	5
Within the boundaries of the Sarah Baartman District Municipality	6	3
Within the borders of the Eastern Cape	4	2
Outside the borders of the Eastern Cape	2	1

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.

5. 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

5.1.	**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

5.2.	**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

5.3. Name of company/firm……

5.4. Company registration number: ……..

5.5. 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]

5.6. 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: ……. …….

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

T2.2.12 COMPULSORY DECLARATION

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

Section 1: **Enterprise Details**

Name of enterprise:	
Contact person:	
Email:	
Telephone:	
Cell no	
Fax:	
Physical address	
Postal address	

Section 2: Particulars of companies and close corporations

Company / Close Corporation registration number	

Section 3: SARS Information

Tax reference number	
VAT registration number:	*State Not Registered if not registered for VAT*

Section 4: CIDB registration number

CIDB Registration number *(if applicable)*	

Section 5: National Treasury Central Supplier Database

Supplier number	
Unique registration reference number	

Section 6: Particulars of principals

principal: means a natural person who is a partner in a partnership, a sole proprietor, a director of a company established in terms of the Companies Act of 2008 (Act No. 71 of 2008) or a member of a close corporation registered in terms of the Close Corporation Act, 1984, (Act No. 69 of 1984).

Full name of principal	Identity number	Personal tax reference number

Attach separate page if necessary

Section 7: Record in the service of the state

Indicate by marking the relevant boxes with a cross, if any principal is currently or has been within the last 12 months in the service of any of the following:

- ☐ a member of any municipal council
- ☐ a member of any provincial legislature
- ☐ a member of the National Assembly or the National Council of Province
- ☐ a member of the board of directors of any municipal entity
- ☐ an official of any municipality or municipal entity
- ☐ an employee of any department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act of 1999 (Act No. 1 of 1999)
- ☐ a member of an accounting authority of any national or provincial public entity
- ☐ an employee of Parliament or a provincial legislature

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

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

*insert separate page if necessary

Section 8: Record of family member in the service of the state

family member: a person's spouse, whether in a marriage or in a customary union according to indigenous law, domestic partner in a civil union, or child, parent, brother, sister, whether such a relationship results from birth, marriage or adoption

Indicate by marking the relevant boxes with a cross, if any family member of a principal as defined in section 5 is currently or has been within the last 12 months been in the service of any of the following:

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

Name of family member	**Name of institution, public office, board or organ of state and position held**	**Status of service (tick appropriate column)**	
		Current	**Within last 12 months**

*insert separate page if necessary

Section 9: Record of termination of previous contracts with an organ of state

Was any contract between the tendering entity including any of its joint venture partners terminated during the past 5 years for reasons other than the employer no longer requiring such works or the employer failing to make payment in terms of the contract.

☐ Yes ☐ No (Tick appropriate box)

If yes, provide particulars (interest separate page if necessary)

Section 10: Declaration

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the tendering entity confirms that the contents of this Declaration are within my personal knowledge, and save where stated otherwise in an attachment hereto, are to the best of my belief both true and correct, and:

i) neither the name of the tendering entity or any of its principals appears on:

   a) the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004 (Act No. 12 of 2004)

   b) National Treasury's Database of Restricted Suppliers (see www.treasury.gov.za)

ii) neither the tendering entity of any of its principals has within the last five years been convicted of fraud or corruption by a court of law (including a court outside of the Republic of South Africa);

iii) any principal who is presently employed by the state has the necessary permission to undertake remunerative work outside such employment (attach permission to this declaration);

iv) the tendering entity is not associated, linked or involved with any other tendering entities submitting tender offers

v) has not engaged in any prohibited restrictive horizontal practices including consultation, communication, agreement, or arrangement with any competing or potential tendering entity regarding prices, geographical areas in which goods and services will be rendered, approaches to determining prices or pricing parameters, intentions to submit a tender or not, the content of the submission (specification, timing, conditions of contract etc) or intention to not win a tender;

vi) has no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest;

vii) neither the tenderer or any of its principals owes municipal rates and taxes or municipal service charges to any municipality or a municipal entity and are not in arrears for more than 3 months;

viii) SARS may, on an on-going basis during the term of the contract, disclose the tenderer's tax compliance status to the Employer and when called upon to do so, obtain the written consent of any subcontractors who are subcontracted to execute a portion of the contract that is entered into in excess of the threshold prescribed by the National Treasury, for SARS to do likewise.

Signed ---------- Date ----------

Name ---------- Position ----------

Enterprise name ----------

T.2.2.13 MUNICIPAL DECLARATION AND RETURNABLE DOCUMENTS

The following particulars must be furnished in relation to tenders for municipalities and municipal entities:

a) where consultancy services are required; and

b) goods, services or a combination thereof, where the estimated total of the prices exceeds R10 million, including VAT.

In the case of a joint venture, separate municipal declarations and returnable documents shall be submitted in respect of each partner.

Section 1: Enterprise details

Name of enterprise	
Contact person	
Email	
Telephone	
Cell	
Fax	
Physical address	
Postal address	

Section 2: Declaration for consultancy services

The enterprise has been awarded the following consultancy services by an organ of state during the last five years:

Name of organ of state	**Estimated number of contracts**	**Nature of service, e.g. quantity surveying**	**Service similar to required service (yes/no)?**

Attach separate page as necessary

Section 3: Goods, services, or a combination thereof, where the estimated total of the prices exceeds R10 million, including VAT

I/we certify that

1) (tick one of the boxes):

☐ the enterprise **is not** required by law to prepare annual financial statements for auditing

☐ the enterprise **is** required by law to have audited annual financial statements (attached herewith for the past three financial years or the years for which the enterprise has been in operation)

2) the enterprise and its directors have no undisputed commitments for municipal services towards a municipality or other service provider in respect of which payment is overdue for more than 30 days (i.e. all municipal accounts are paid up to date);

3) source of goods and/or services :

(tick one of the boxes and insert percentages if applicable)

☐ goods and/or services are sourced only from within the Republic of South Africa

☐ [ ] % of the total cost of goods and/or services will be sourced from outside the Republic of South Africa, and the percentage of payment from the municipality or municipal entity which is expected to be transferred out of the Republic is [ ] %.

I furthermore confirm that the following contracts were awarded to the enterprise by an organ of state during the last five years and attached particulars of any material non-compliance or dispute concerning the execution of such contracts:

Name of organ of state	**Estimated number of contracts**	**Nature of contracts**

Attach separate page as necessary

I, the undersigned who warrants that I am duly authorised on behalf of the tendering entity, hereby declare that the contents of this Declaration are within my personal knowledge, and save where stated otherwise, are to the best of my belief both true and correct.

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

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

Tenderer .....

T2.2.14 SCHEDULE OF REFERENCE FOR TENDERER

- The Tenderer must provide three (3) separate and unrelated 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, installation and commissioning of Electrification of Houses, i.e. Medium Voltage (MV) and Low Voltage (LV) overhead reticulation and service connections.
- 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.

Referee and Project Information

Employer name:	
Referee name:	
Referee physical address:	
Referee contact number:	
Referee e-mail address:	
Name of Tenderer evaluated:	
Project Name:	
Project Description:	
Project Completion date:	
Project duration:	
Final Project Cost, incl. VAT:	

COMPLETION OF PROJECT ON TIME	
Completion of project according to initial program submitted by Tenderer?	
Yes	
No	

COMPLETION OF ASSIGNMENTS WITHIN BUDGET	
Did the Tenderer complete the project / work within the allocated Budget?	
Yes	
No	

QUALITY OF END PRODUCT	
Was the work executed in accordance with the Specification and did the final product match the expectations that were created during the Project Initiation Stage?	
Exceed initial expectations	
Met expectations	

QUALITY OF END PRODUCT	
Slightly below	
Did not meet expectations	

Additional Remarks/Comments:

I, the undersigned, hereby certify that the above information is, to the best of my knowledge, correct and a true reflection.

Signature of Referee **Date**

Declaration,

I, the undersigned ..... (name) certify that the information furnished above is correct. I accept that the Municipality may exercise due consequence management against me should this declaration prove to be false.

Authorised signature on behalf of Tenderer: .....

Name of Tenderer: .....

Capacity: .....

Date: .....

THE CONTRACT

PART C1 – AGREEMENTS AND CONTRACT DATA

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 in respect of the following works:

Kouga Municipality: Notice No. 126/2023: Electrification of 259 Houses at Kruisfontein in Humansdorp (DMRE Work 2023/24): Specification No. G/10599/E

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

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

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS:

……..

…….. 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 Contractor in the Conditions of Contract identified in the Contract Data.

For the Tenderer:

Signature ……
Name ……
Capacity ……

Name and address of organisation:

……
……..

Signature and name of witness:

Signature ……
Name ……

Date: ……..

ACCEPTANCE

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

The terms of the contract, are contained in:

Part C1	Agreements and Contract Data, (which includes this Agreement)
Part C2	Pricing Data
Part C3	Scope of Work
Part C4	Site Information

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

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

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

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

For the Employer:

Signature ……
Name ……
Capacity ……

Name and address of organisation:

……
……..

Signature and name of witness:

Signature ……
Name ……

Date: ……..

SCHEDULE OF DEVIATIONS

Notes:

1. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender.
2. A Tenderer's covering letter shall not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid, become the subject of Agreements reached during the process of offer and acceptance, the outcome of such Agreement shall be recorded here.
3. Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to the tender documents and which it is agreed by the Parties becomes an obligation of the contract shall also be recorded here.
4. Any change or addition to the tender documents arising from the above Agreements and recorded here, shall also be incorporated into the final draft of the Contract.

(i) Subject _____

Details _____

_____

_____

(ii) Subject _____

Details _____

_____

_____

(iii) Subject _____

Details _____

_____

_____

(iv) Subject _____

Details _____

_____

_____

(v) Subject _____

Details _____

_____

_____

(vi) Subject _____

Details _____

_____

_____

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

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

For the Tenderer:		**For the Employer:**
……..	Signature	……
……..	Name	……
……..	Capacity	……
Name and address of organisation:		Name and address of organisation:
……..		……
……..		……
……..		……
……..	Witness Signature	……
……..	Witness Name	……
……..	Date	……

CONFIRMATION OF RECEIPT

The Tenderer, (now Contractor), identified in the Offer part of this Agreement hereby confirms receipt from the Employer, identified in the Acceptance part of this Agreement, of one fully completed original copy of this Agreement, including the Schedule of Deviations (if any) today:

the …….. (day)

of …….. (month)

20 …….. (year)

at …….. (place)

For the Contractor:

Signature ……

Name ……

Capacity ……

Signature and name of witness:

Signature ……

Name ……

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 following contract specific data, referring to the General Conditions of Contract for Construction Works, Third Edition, 2015, are applicable to this Contract. Tenderers must read the abovementioned General Conditions of Contract in order to understand the implications of the Data provided by the Employer, as well as the Data which has to be completed by the Tenderer.

PART 1: DATA PROVIDED BY THE EMPLOYER

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 Road, JEFFREYS BAY, 6330 Address (postal): PO Box 21, JEFFREYS BAY, 6330 Telephone: 042-200 2200 Facsimile: 042-200 8606 E-mail: tenders@kouga.gov.za
1.2.1.2	The address of the Employer's Agent is: Address (physical: 39 Victoria Street, GEORGE, 6529 Address (postal) PO Box 2551, GEORGE, 6530 Telephone: 044-8741511 Facsimile: 044-8741510 e-mail: sadams@cmbgeorge.co.za
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 and 5.8.1	The non-working days are Sundays, with the exception of work which must be undertaken during scheduled outages planned for Sundays. The special non-working days are: The public holidays. The year-end break commencing 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**.
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 per day.
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 not be allowed. Tenderers must take cognisance of the contract duration and make allowance for escalation in the tendered rates. It must be taken that the contract can be awarded anytime within the tender validity period.
6.8.3	Price adjustments for variations in the costs of special materials are not allowed.
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.

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
8.6.1.1.3	The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is 5% of the contract sum.
8.6.1.3	The limit of indemnity for liability insurance is R10 million.
10.3.2	Amicable settlement in terms of Clause 10.4 shall be contemplated for all disputes prior to referring any dispute to adjudication or arbitration.
10.5.3	The number of Adjudication Board Members to be appointed is one (1).
10.7.1	The determination of disputes which are unresolved in terms of Clause 10.4.2 shall be by arbitration.

C1.2 CONTRACT DATA

PART 2: DATA PROVIDED BY THE CONTRACTOR

The Tenderer shall provide the following information:

<table>
<tr><th>Clause</th><th colspan="2">Data</th></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: ……
Facsimilee: ……
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
(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>

C1.3 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.

CONTRACT DETAILS

Employer's Agent issues: Interim Payment Certificates, Final Payment Certificate and the Certificate of Completion of the Works as defined in the Contract.

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

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) ……..

C1.4 OCCUPATIONAL HEALTH AND SAFETY AGREEMENT

AGREEMENT MADE AND ENTERED INTO BETWEEN

Kouga Municipality …….. (Employer)

and

……. (Contractor / Mandatary)

IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL HEALTH AND SAFETY ACT, ACT No. 85 OF 1993 AS AMENDED.

I, …… representing

the Contractor / Mandatary as an employer in its own right, do hereby undertake to ensure, as far as is reasonably practicable, that all work will be performed, and all equipment, machinery or plant used in such a manner as to comply with the provisions of the Occupational Health and Safety Act (OHSA) and the Regulations promulgated there under.

I furthermore confirm that we are registered with the Compensation Commissioner and that all registration and assessment monies due to the Compensation Commissioner have been fully paid or that we are insured with an approved licensed compensation insurer.

COID ACT Registration Number: ……

OR Compensation Insurer: ..... Policy No.: .....

I undertake to appoint, where required, suitable competent persons, in writing, in terms of the requirements of OHSA and the Regulations and to charge him/them with the duty of ensuring that the provisions of OHSA and Regulations as well as the Employer's Special Conditions of Contract, Way Leave, Lock-Out and Work Permit Procedures are adhered to as far as reasonably practicable.

I further undertake to ensure that any subcontractors employed by me will enter into an occupational health and safety agreement separately, and that such subcontractors comply with the conditions set.

I hereby declare that I have read and understand the Occupational Health and Safety Conditions and undertake to comply therewith at all times.

I hereby also undertake to comply with the Occupational Health and Safety Specification and Plan.

Signed at ..... on the ..... day of ..... 20….

_____ _____

Witness **Contractor / Mandatary**

Signed at ..... on the ..... day of ..... 20 ....

_____ _____

Witness **Employer**

C1.5 CERTIFICATE OF OWNERSHIP OF PLANT / MATERIALS

NAME OF CONTRACTOR: ……
ADDRESS: ……
……
……
……

NAME OF EMPLOYER: ……
ADDRESS: ……
……
……
……

CONTRACT DESCRIPTION: ……

CONTRACT NO: .....

The undersigned Contractor (duly authorised hereto by virtue of a resolution of the Board of Directors/Members on .....) hereby certifies the following in accordance with the terms of Clause 6.10.1.5 of the General Conditions of Contract:

(i) The plant and or materials listed hereunder, which are the Contractor's sole and exclusive property and to which no third party has any rights will upon payment be lawfully acquired by the Employer.
(ii) The Employer is indemnified against any claim to or in respect of the plant and or materials by reason of the Contractor's sequestration or liquidation, or of any defect in the Contractor's title to the plant and or materials.
(iii) Upon payment, effective delivery of the plant and or materials to the Employer will take place.
(iv) Ownership of the plant and or materials will then vest in the Employer.
(v) The plant and or materials are insured in accordance with the requirements of the Conditions of Contract.
(vi) The Contractor shall be responsible for the care of the plant and or materials and clearly mark and identify same as being the property of the Employer.
(vii) The plant and or materials are held by the Contractor in storage for and on behalf of the Employer at address: …… (the premises).
(viii) The premises is:
*a) the property of the Contractor; or
*b) the property of ..... of (address) .....

..... and are let to the Contractor by

..... of (address) .....

.....
* (delete whichever is not applicable)

SIGNATURE OF CONTRACTOR: ……..……..…… **WITNESS: ……..……**

DATE: ……..

LIST OF PLANT / MATERIALS IN STORAGE OF CONTRACTOR

BILL OF QUANTITIES ITEM NUMBER	DESCRIPTION	QTY	STORAGE PREMISES LOCATION

SIGNATURE OF CONTRACTOR: …….. WITNESS: ……..……..

DATE: ……..

PART C2 – PRICING DATA

C2.1 PRICING INSTRUCTIONS

1.0 The Bills of Quantities form part of and must be read in conjunction with the Specification. The Price Summary is to reflect the total price carried forward from the Bills of Quantities which need to be submitted with the tender documents.

2.0 The tender price must be based on the Bills of Quantities. The priced Bills of Quantities shall be submitted with the tender documents.

3.0 The completed Bills of Quantities shall detail the unit rate and total amount for material and labour respectively for each Item. Tenderers are advised to check their Item extensions and total additions since no claim for arithmetical errors will be considered.

"Material Rate" shall include the supply and delivery of all items of material and equipment (plant) to the site including all incidentals necessary for the completion of each Item, plus the profit thereon. Rates shall be exclusive of VAT.

"Labour Rate" shall include the cost of all labour, both skilled and unskilled, including supervision and profit required to complete the installation of all material covered by each Item. Rates shall be exclusive of VAT.

4.0 No alteration, erasure or addition is to be made in the text of the Bills of Quantities. Should any erasure or addition be made it will not be recognised but the original wording of the Bills of Quantities will be adhered to.

5.0 The quantities in the Bills are not to be considered as limiting or extending the amount of work to be done and materials to be supplied.

6.0 The Engineer will check the completed Bills of Quantities for arithmetical errors, omissions and discrepancies in accordance with the Standard Conditions of Tender.

7.0 Only major Items have been scheduled but the Tenderer shall nevertheless include for all things he considers necessary whether specified in detail or not to complete the work to specification and in a satisfactory and workmanlike manner, in order to provide a complete and working system. No extra price will be considered for the provision of materials which should have been allowed in order to provide the completed works unless detailed by the Contractor in the space provided elsewhere in the Specification.

8.0 Where alternative prices for equipment of different manufacture are offered, the lowest alternative price for equipment to specification must be included, against the relevant Item in the Bills of Quantities. The remaining alternative prices must be furnished separately.

Where such equipment is found not to comply with the Specification, the Contractor will be required to provide equipment which does comply, without adjustment to the price in the Bills of Quantities.

9.0 All items in the Bills of Quantities are deemed to include supply, delivery, installation and commissioning where appropriate, unless specifically stated otherwise. The unit rate must include for all things necessary, whether specified in detail or not, including all components, small installation materials, allowance for off-cuts, wastage etc., erection and fixings to complete the item to Specification in a satisfactory and workmanlike manner, in order to provide a complete and working system.

10.0 In certain instances prices are requested for Items which may be required during the progress of the work, but which are not included in the known quantities of material / labour required. These Items are indicated by the designation “R/O” (rate only) in the “Quantity” column and the price is to be noted in the “Rate” columns only and must not be carried forward.

11.0 Where no rates are filled-in by the Tenderer, or the rate is indicated as Nil, it will be assumed that there is no charge for the particular item and that the cost thereof has been included in the other rates provided.

12.0 The Bills of Quantities shall not be used for ordering purposes. The Contractor shall check and measure the lengths of cables / conductors on site before ordering any of these materials.

13.0 The quantities and rates included for Daywork shall form part of the tender price, but Tenderers shall note that this item must be regarded as provisional and will only be payable to the Contractor if and when a written instruction to this effect has been issued.

14.0 Expenditure in connection with Provisional and Prime Cost Sums and under the Contingency Allowance (if any) shall be solely at the discretion and on the written instruction of the Engineer.

15.0 An Excel spreadsheet version of the Bill can be made available to Tenderers on request. The spreadsheet may be used for calculation purposes only. The Engineer or the Employer does not take responsibility for any arithmetical or other errors that may occur due to the use of the spreadsheet. The original wording and quantities of the Bills included in the tender document will be adhered to and this Bill must be completed by hand in black ink and submitted with the tender.

C2.2 BILLS OF QUANTITIES

INDEX TO BILLS OF QUANTITIES **Page No.**

BILL 1.0: PRELIMINARY AND GENERAL ITEMS

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL		LABOUR	
				RATE	TOTAL	RATE	TOTAL
1.0	**Fixed Charge Items**						
1.1	Contractual requirements (Provision of 10% Performance Bond, Insurance of Works, etc.).	Sum	1	R -	R -	R -	R -
1.2	Establish facilities on site:						
1.2.1	Office and storage sheds.	Sum	1	R -	R -	R -	R -
1.2.2	Workshops.	Sum	1	R -	R -	R -	R -
1.2.3	Ablutions and latrines.	Sum	1	R -	R -	R -	R -
1.2.4	Tools and equipment.	Sum	1	R -	R -	R -	R -
1.2.5	Water supply, electrical power, telephone and access.	Sum	1	R -	R -	R -	R -
1.3	Remove site establishment upon completion of contract.	Sum	1	R -	R -	R -	R -
1.4	Allowances:						
1.4.1	For the preparation and submission of a construction programme to the Engineer as required in the documents.	Sum	1	R -	R -	R -	R -
1.4.2	For the submission of construction drawings to the Engineer for approval as required in the documents.	Sum	1	R -	R -	R -	R -
1.4.3	For three (3) sets of test certificates to be submitted to Engineer on hand-over.	Sum	1	R -	R -	R -	R -
1.4.4	For instructions to maintenance staff of operating and maintenance procedure.	Sum	1	R -	R -	R -	R -
1.4.5	Project Notice Board as per Drawing No. 10599/E/24.	Sum	1	R -	R -	R -	R -
1.4.6	Project Notice Board Support Structure Detail as per Drawing No. 10599/E/25.	Sum	1	R -	R -	R -	R -
1.4.7	For compliance with the requirements of the Occupational Health and Safety Act Construction Regulations.	Sum	1	R -	R -	R -	R -
1.4.8	Liaison and co-ordination with Kouga Municipality for the duration of the contract.	Sum	1	R -	R -	R -	R -
2.0	**Time Related Items**						
2.1	Contractual requirements, i.e. insurances, etc.	Sum	1	R -	R -	R -	R -
2.2	Accommodation and / or living out expenses for the duration of the contract.	Sum	1	R -	R -	R -	R -
2.3	Travelling charges for the duration of the contract.	Sum	1	R -	R -	R -	R -
2.4	Supervision and provision of facilities and attendance of site meetings.	Sum	1	R -	R -	R -	R -
2.5	Allowance to publically advertise for a local CLO (Community Liason Officer) for the duration of the contract, as specified.	Sum	1	R -	R -	R -	R -

BILL 1.0: PRELIMINARY AND GENERAL ITEMS

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL		LABOUR	
				RATE	TOTAL	RATE	TOTAL
2.6	Allowance to appoint a local CLO (Community Liason Officer) for the duration of the contract.	Sum	1	R -	R -	R -	R -
2.7	Allowance to fully comply with the Municipality's Local Labour and SMME's requirements as per Clause 14.0 of Part C3.1 for the duration of the contract.	Sum	1	R -	R -	R -	R -
2.8	Operate and maintain facilities on site:						
2.8.1	Office and storage sheds.	Sum	1	R -	R -	R -	R -
2.8.2	Workshops.	Sum	1	R -	R -	R -	R -
2.8.3	Ablutions and latrines.	Sum	1	R -	R -	R -	R -
2.8.4	Tools and equipment	Sum	1	R -	R -	R -	R -
2.8.6	Water supply, electrical power, telephone and access.	Sum	1	R -	R -	R -	R -
3.0	**Day work**						
	The following rates are for variations to the contract, as directed by the Engineer, and are for work not covered by rates in the schedules. The total cost will be adjusted in the final account in accordance with the variation orders issued.						
3.1	Labour, Normal Time:						
3.1.1	Installation Electrician and Labourer.	hour	10	R -	R -	R -	R -
3.1.2	Artisan Electrician and Labourer.	hour	10	R -	R -	R -	R -
3.1.3	Labourer.	hour	10	R -	R -	R -	R -
3.2	Labour, Normal Overtime:						
3.2.1	Installation Electrician and Labourer.	hour	10	R -	R -	R -	R -
3.2.2	Artisan Electrician and Labourer.	hour	10	R -	R -	R -	R -
3.2.3	Labourer.	hour	10	R -	R -	R -	R -
3.3	Labour, Sundays and Public Holidays:						
3.3.1	Installation Electrician and Labourer.	hour	10	R -	R -	R -	R -
3.3.2	Artisan Electrician and Labourer.	hour	10	R -	R -	R -	R -
3.3.3	Labourer.	hour	10	R -	R -	R -	R -
3.4	Transport:						
3.4.1	Private car or light delivery vehicle.	km	10	R -	R -	R -	R -
3.4.2	5 tonne truck.	km	10	R -	R -	R -	R -
3.4.3	10 tonne truck.	km	10	R -	R -	R -	R -
3.4.4	10 tonne truck with crane.	hour	10	R -	R -	R -	R -
3.4.5	5 tonne mobile crane.	hour	10	R -	R -	R -	R -
4.0	Lump sum allowance for any items not included in this schedule, but deemed necessary by the Tenderer, to complete the installation in accordance with the specification and drawings. Brief description of such items to be entered hereunder.	Sum	1	R -	R -	R -	R -
	Totals to Price Summary Item 1.0				R -		R -

BILL 2.0: 22kV OVERHEAD RETICULATION

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL		LABOUR	
				RATE	TOTAL	RATE	TOTAL
	Notes:						
(i)	All rates must be exclusive of VAT.						
(ii)	Refer Drawing No's 10599/E/01 to 23.						
(iii)	All items to include for the supply and delivery thereof, unless specified otherwise.						
(iv)	All quantities are provisional.						
(v)	R/O - Rate Only Cu - Copper Al - Aluminium MV - Medium Voltage (22kV) ACSR - Aluminium Conductor Steel Reinforced						
(vi)	LC - Local Content item. Refer to Part T2.2.13 hereof.						
1.0	Arrange power shut-down with Municipality.	Sum	1	R -	R -	R -	R -
2.0	Obtain services of Professional Land Surveyor to peg MV pole position on site in conjunction with Engineer.	No.	10	R -	R -	R -	R -
3.0	Excavating, backfilling and compaction of hole for pole, single stay or prop structure:						
3.1	Earth	No.	5	R -	R -	R -	R -
3.2	Hard Earth	No.	4	R -	R -	R -	R -
3.3	Rock	No.	3	R -	R -	R -	R -
4.0	Tarred wooden pole drilled for hardware, excluding hardware and pole hole measured elsewhere:						
4.1	12 meter (160/215mm diameters)	No.	1	R -	R -	R -	R -
4.2	11 meter (160/210mm diameters)	No.	9	R -	R -	R -	R -
5.0	Single stay complete with insulator (22kV) excluding stay hole and guard measured elsewhere.	No.	2	R -	R -	R -	R - R -
6.0	Flying stay complete with insulators (22kV), but excluding pole, pole & stay holes and guard measured elsewhere.	No.	R/O	R -	R nil	R -	R nil
7.0	Stay guard fixed to stay wire.	No.	2	R -	R -	R -	R -
8.0	Prop structure complete excluding hole measured elsewhere.	No.	1	R -	R -	R -	R -
9.0 LC	HARE ACSR, (6/1/4,72), greased, conductor (for 3 phases).	m	1200	R -	R -	R -	R -
10.0	New strain A-frame complete with fixing bolts, nuts, washers, etc., excluding insulators measured elsewhere.	No.	4	R -	R -	R -	R -

BILL 2.0: 22kV OVERHEAD RETICULATION

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL		LABOUR	
				RATE	TOTAL	RATE	TOTAL
11.0	Steel cross-arm for T-off and right angle turns, complete with fixing bolts, nuts, washers, etc., excluding insulators measured elsewhere.	No.	2	R -	R -	R -	R -
12.0	Set of three 22kV solid links, complete with fixing bolts, nuts and washers.	No.	2	R -	R -	R -	R -
13.0	Set of three strain insulators (as specified) complete with thimble clevis, pins, etc.	No.	4	R -	R -	R -	R -
14.0	Set of three linepost insulators (as specified) complete with thimble clevis, pins, etc.	No.	3	R -	R -	R -	R -
15.0	Terminate HARE ACSR, (6/1/4,72) conductor at strain insulators using "Preformed" dead ends (set of three).	No.	4	R -	R -	R -	R -
16.0	Bind-in HARE ACSR, (6/1/4,72) conductor at line post insulators using "Preformed" twin-ties (set of three).	No.	3	R -	R -	R -	R -
17.0	Set of three HARE ASCR jumper conductors at strain points, complete with AMPACT Tap Connectors.	No.	4	R -	R -	R -	R -
18.0	Pole No. label with 50mm high lettering nailed to pole at a minimum height of 3000mm above finished ground level using electro galvanised clout nails.	No.	10	R -	R -	R -	R -
19.0	Extra-over Item 3.0 for:						
19.1	Imported backfill material from off-site source.	m^3	10	R -	R -	R -	R -
19.2	Disposal of surplus or unsuitable material including haulage (included in item above up to radius of 5km from site as specified).	m^3	R/O	R -	R nil	R -	R nil
20.0	Lump sum allowance for any items not included in this bill necessary to complete the installation in accordance with the specification and drawings. Brief description of such items to be entered hereunder.	Sum	1	R -	R -	R -	R -
	Totals to Price Summary Item 2.0				R -		R -

BILL 3.0: POLE MOUNTED TRANSFORMER SUBSTATIONS

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL		LABOUR	
				RATE	TOTAL	RATE	TOTAL
	Notes:						
(i)	All rates must be exclusive of VAT.						
(ii)	Refer Drawing No's 10599/E/01 to 23.						
(iii)	All items to include for the supply and delivery thereof, unless specified otherwise.						
(iv)	All quantities are provisional.						
(v)	R/O - Rate Only Cu - Copper Al - Aluminium MV - Medium Voltage (22kV) PMT - Pole Mounted Transformer						
1.0	Mark out PMT position and assist Engineer to finalise this.	No.	1	R -	R -	R -	R -
2.0	Obtain services of Professional Land Surveyor to peg transformer structure pole position on site in conjunction with Engineer.	No.	3	R -	R -	R -	R -
3.0	Excavating, backfilling and compaction of hole for pole, single stay or prop structure:						
3.1	Earth	No.	1	R -	R -	R -	R -
3.2	Hard Earth	No.	1	R -	R -	R -	R -
3.3	Rock	No.	1	R -	R -	R -	R -
4.0	Tarred wooden pole drilled for hardware, excluding hardware and pole hole measured elsewhere:						
4.1	12 meter (160/215mm diameters)	No.	R/O	R -	R nil	R -	R nil
4.2	11 meter (160/210mm diameters)	No.	R/O	R -	R nil	R -	R nil
4.3	10 meter (160/205mm diameters)	No.	3	R -	R -	R -	R -
5.0	Concrete foot 600mm x 600mm x 200mm deep in hole for pole measured elsewhere.	No.	4	R -	R -	R -	R -
6.0	Steelwork complete with bolts, nuts, washers, etc. to support expulsion fuses, lightning arrestors, insulators, transformer and LV distribution box complete as specified.	Sum	1	R -	R -	R -	R -
7.0	Set of three 22kV lightning arrestors mounted on steelwork/transformer measured elsewhere.	Item	1	R -	R -	R -	R -
8.0	Set of three 22kV drop-out fuses mounted on steelwork measured elsewhere.	Item	1	R -	R -	R -	R -
9.0	22000/420V, 315kVA, Pole mounted transformer complete as specified, mounted on steel support structure measured elsewhere.	Item	1	R -	R -	R -	R -

BILL 3.0: POLE MOUNTED TRANSFORMER SUBSTATIONS

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL		LABOUR	
				RATE	TOTAL	RATE	TOTAL
10.0	Separate transformer LV distribution box, complete as specified on steel support structure measured elsewhere.	Item	1	R -	R -	R -	R -
11.0	25mm² Cu XLPE insulated connections between 22kV overhead line and 22kV expulsion fuses (for three phases).	Sum	1	R -	R -	R -	R -
12.0	25mm² Cu XLPE insulated connections between 22kV expulsion fuses, transformer bushings and lightning arrestors (for three phases).	Sum	1	R -	R -	R -	R -
13.0	70mm² Cu black PVC insulated conductor, clamps, 4m long kicker pipe, 1.8m long earth spike, cable markers, etc. to earth MV equipment and PMT as detailed on the drawings.	Sum	2	R -	R -	R -	R -
14.0	70mm² Cu black PVC insulated conductor, clamps, 4m long kicker pipe, 1.8m long earth spike, cable markers, etc. to earth LV equipment as detailed on the drawings.	Sum	1	R -	R -	R -	R -
15.0	70mm² Cu bare conductor, clamps, etc. to earth steelwork as detailed on the drawings.	Sum	1	R -	R -	R -	R -
16.0	Barbed wire anti-climb device and danger notices on pole supporting PMT.	No.	4	R -	R -	R -	R -
17.0 17.1 LC	LV bundled conductor strapped to pole: 3 x 50mm² + 1 x 54,6mm² + 1 x 25mm² Al.	m	35	R -	R -	R -	R -
18.0 18.1	Terminate LV bundled conductor at LV distribution box incl. gland and lugs: 3 x 50mm² + 1 x 54,6mm² + 1 x 25mm² Al.	No.	7	R -	R -	R -	R -
19.0 19.1	600/1000V LV PVCAS cable strapped to pole between PMT and LV distribution box: 95mm² x 4 core (Two lengths of 7m each in parallel, per PMT).	m	14	R -	R -	R -	R -
20.0 20.1	Terminate 600/1000V LV PVCAS cable at PMT or LV distribution box incl. gland and lugs: 95mm² x 4 core.	No.	4	R -	R -	R -	R -
21.0	Length of approx. 2m of UV resistant heatshrink material to cover 95mm² x 4 core cable end tail at PMT LV bushing, incl. phase colour coded heat shrink tag (rate per core).	No.	8	R -	R -	R -	R -

BILL 3.0: POLE MOUNTED TRANSFORMER SUBSTATIONS

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL		LABOUR	
				RATE	TOTAL	RATE	TOTAL
22.0	Padlocks.	No.	2	R -	R -	R -	R -
23.0	70mm² Bare copper earth wire for additional MV and LV earthing at Pole Mounted Transformer Substations (for implementation only if the required earth reading could not be obtained with the material under Item No's 13.0 and 14.0).	m	30	R -	R -	R -	R -
24.0	Supply and install 150A CBI Type F15D circuit breaker inside LV distribution board of existing Pole Mounted Transformer "PMT-PHASE 3B/1" for new LV Feeder No's 4 and 5.	No	2	R -	R -	R -	R -
25.0	Extra-over Item 3.0 for:						
25.1	Imported backfill material from off-site source.	m³	2	R -	R -	R -	R -
25.2	Disposal of surplus or unsuitable material including haulage (included in item above up to radius of 5km from site as specified).	m³	R/O	R -	R nil	R -	R nil
26.0	Lump sum allowance for any items not included in this bill necessary to complete the installation in accordance with the specification and drawings. Brief description of such items to be entered hereunder.	Sum	1	R -	R -	R -	R -
	Totals to Price Summary Item 3.0				R -		R -

BILL 4.0: LV RETICULATION

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL		LABOUR	
				RATE	TOTAL	RATE	TOTAL
	Notes:						
(i)	All rates must be exclusive of VAT.						
(ii)	Refer Drawing No's 10599/E/01 to 23.						
(iii)	All items to include for the supply and delivery thereof, unless specified otherwise.						
(iv)	All quantities are provisional.						
(v)	R/O - Rate Only Cu - Copper Al - Aluminium						
(vi)	LC - Local Content item. Refer to Part T2.2.13 hereof.						
1.0	Mark out overhead line routes and assist Engineer to finalise line routes and pole positions.	Sum	1	R -	R -	R -	R -
2.0	Obtain services of Professional Land Surveyor to peg LV pole position on site in conjunction with Engineer.	No.	82	R -	R -	R -	R -
3.0	Excavating, backfilling and compaction of hole for pole, single stay or prop structure:						
3.1	Earth	No.	60	R -	R -	R -	R -
3.2	Hard Earth	No.	50	R -	R -	R -	R -
3.3	Rock	No.	30	R -	R -	R -	R -
4.0	Tarred wooden pole drilled for bundled conductor clamp but excluding clamp or bracket and pole hole measured elsewhere:						
4.1	13 meter (180/245mm diameters)	No.	2	R -	R -	R -	R -
4.2	11 meter (160/210mm diameters)	No.	4	R -	R -	R -	R -
4.3	9 meter (160/200mm diameters)	No.	80	R -	R -	R -	R -
5.0	Single stay complete with insulator and stay guard, but excluding stay hole measured elsewhere.	No.	52	R -	R -	R -	R -
6.0	Short stay complete with insulator and stay guard, but excluding stay hole measured elsewhere.	No.	2	R -	R -	R -	R -
7.0	Prop structure complete excluding hole measured elsewhere.	No.	4	R -	R -	R -	R -
8.0 LC	5 Core LV bundled conductor suspended between poles. Poles and clamps measured elsewhere:						
8.1	3 x 50mm² + 1 x 54,6mm² + 1 x 25mm² Al.	m	3600	R -	R -	R -	R -
9.0	Strain clamp for bundled conductor including eyebolt, pigtail bolt, nuts, washers, etc.	No.	120	R -	R -	R -	R -

BILL 4.0: LV RETICULATION

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL		LABOUR	
				RATE	TOTAL	RATE	TOTAL
10.0	Suspension clamp for bundled conductor including eyebolt, pigtail bolt, nuts, washers, etc.	No.	40	R -	R -	R -	R -
11.0	Connect one 5 core LV bundled conductor to another using insulation piercing connectors:						
11.1	3 x 50mm² + 1 x 54,6mm² + 1 x 25mm² Al.	No.	16	R -	R -	R -	R -
12.0	Earth at remote pole of LV bundled conductor line (CNE system as per the Standard Technical Specification). This item shall include the 35mm² Cu black PVC insulated down conductor, kicker pipe, 1.5m long earth spike, cable marker and all connections.	No.	14	R -	R -	R -	R -
13.0	Pole No. label with 50mm high lettering nailed to pole at a minimum height of 3000mm above finished ground level using electro galvanised clout nails.	No.	82	R -	R -	R -	R -
14.0	4m Long 25mm diameter kickerpipe to protect earth down conductor against pole.	No.	14	R -	R -	R -	R -
15.0	Extra-over Item 3.0 for:						
15.1	Imported backfill material from off-site source.	m³	80	R -	R -	R -	R -
15.2	Disposal of surplus or unsuitable material including haulage (included in item above up to radius of 5km from site as specified).	m³	R/O	R -	R nil	R -	R nil
16.0	Lump sum allowance for any items not included in this bill necessary to complete the installation in accordance with the specification and drawings. Brief description of such items to be entered hereunder.	Sum	1	R -	R -	R -	R -
	Totals to Price Summary Item 4.0				R -		R -

BILL 5.0: OVERHEAD SERVICE CONNECTIONS TO HOUSES

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL		LABOUR	
				RATE	TOTAL	RATE	TOTAL
	Notes:						
(i)	All rates must be exclusive of VAT.						
(ii)	Refer Drawing No's 10599/E/01 to 23.						
(iii)	All items to include for the supply and delivery thereof, unless specified otherwise.						
(iv)	All quantities are provisional.						
(v)	R/O - Rate Only Cu - Copper Al - Aluminium CSCB - Consumer Service Connection Box						
1.0	CSCB as specified strapped to pole with tails to connect to ABC, but excl. circuit breakers and IPC connectors:						
1.1	12 Way.	No.	80	R -	R -	R -	R -
2.0	63A single pole, slow curve circuit breaker, incl. din rail, mounted inside CSCB including connections, complete as specified.	No.	259	R -	R -	R -	R -
3.0	Set of four (4) individual Surge Arrestors, mounted inside CSCB, complete as specified.	No.	80	R -	R -	R -	R -
4.0	35mm² to 95mm² IPC connectors to connect tails from consumer service connection box to ABC.						
4.1	Single IPC connectors (Phases).	No.	240	R -	R -	R -	R -
4.2	Double IPC Connectors (Neutral & Earth).	No.	160	R -	R -	R -	R -
5.0	Pigtail screw fixed to pole / wooden beam at house for Airdac for strain clamp measured elsewhere.	No.	259	R -	R -	R -	R -
6.0	Strain clamp for Airdac service cable at pole / house.	No.	259	R -	R -	R -	R -
7.0	10mm² Cu Airdac service cable suspended between pole and house, excluding pole and fixtures measured elsewhere. (25m average per house).	m	6500	R -	R -	R -	R -
8.0	Terminate and connect 10mm² Cu Airdac service cable at CSCB measured elsewhere, including UV stable compression gland.	No.	259	R -	R -	R -	R -
9.0	Terminate and connect 10mm² Cu Airdac service connection cable to Small Power Distribution Unit (Ready Board) measured elsewhere, incl. compression gland.	No.	259	R -	R -	R -	R -

BILL 5.0: OVERHEAD SERVICE CONNECTIONS TO HOUSES

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL		LABOUR	
				RATE	TOTAL	RATE	TOTAL
10.0	Lump sum allowance for any items not included in this schedule necessary to complete the installation in accordance with the specification and drawings. Brief description of such items to be entered hereunder.	Sum	1	R -	R -	R -	R -
	Totals to Price Summary Item 5.0				R -		R -

BILL 6.0: INSTALLATION INSIDE HOUSES

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL		LABOUR	
				RATE	TOTAL	RATE	TOTAL
	Notes:						
(i)	All rates must be exclusive of VAT.						
(ii)	Refer Drawing No's 10599/E/01 to 23.						
(iii)	All items to include for the supply and delivery thereof, unless specified otherwise.						
(iv)	All quantities are provisional.						
(v)	R/O - Rate Only Cu - Copper CSCB - Consumer Service Connection Box						
(vi)	LC - Local Content item. Refer to Part T2.2.13 hereof.						
1.0	Drill hole in brick / timber wall of house for side entry of overhead service cable.	No.	259	R -	R -	R -	R -
2.0	UV stable nylon compression gland suitably sized for 10mm² airdac service connection cable at entry point of house structure.	No.	259	R -	R -	R -	R -
3.0	10mm² Airdac Cu service connection cable fixed to wall in 400mm intervals with black PVC saddles, suitably sized for airdac. (3m average per house).	m	800	R -	R -	R -	R -
4.0	Wooden mounting board for prepaid kWh meter and small power distribution unit (ready board), including fixing bolts/screws etc., complete as specified.	No.	259	R -	R -	R -	R -
5.0	Small Power Distribution Unit (Ready Board), with bulkhead light fitting, mounted with galvanised self tapping fixing screws on mounting board, complete as specified.	No.	259	R -	R -	R -	R -
6.0 LC	Split prepaid kWh meter, complete as specified. The Measurement and Control Unit (MCU) to be installed inside CSCB, and the User Interface Unit (UIU) to be installed adjacent to the Ready Board inside the house.	No.	259	R -	R -	R -	R -
7.0	Provide "Certificate of Compliance" for each house.	No.	259	R -	R -	R -	R -
8.0	Lump sum allowance for any items not included in this schedule necessary to complete the installation in accordance with the specification and drawings. Brief description of such items to be entered hereunder.	Sum	1	R -	R -	R -	R -
	Totals to Price Summary Item 6.0				R -		R -

PRICE SUMMARY

ITEM	DESCRIPTION	MATERIAL	LABOUR
1.0	BILL 1.0: PRELIMINARY AND GENERAL ITEMS	R -	R -
2.0	BILL 2.0: 22kV OVERHEAD RETICULATION	R -	R -
3.0	BILL 3.0: POLE MOUNTED TRANSFORMER SUBSTATIONS	R -	R -
4.0	BILL 4.0: LV RETICULATION	R -	R -
5.0	BILL 5.0: OVERHEAD SERVICE CONNECTIONS TO HOUSES	R -	R -
6.0	BILL 6.0: INSTALLATION INSIDE HOUSES	R -	R -
7.0	SUB-TOTALS	R -	R -
8.0	TOTAL NET AMOUNT, excl. VAT.		R -
9.0	ADD 15% VAT		R -
10.0	**TOTAL GROSS TENDER AMOUNT, incl. VAT, TO BE CARRIED FORWARD TO FORM OF OFFER AND ACCEPTANCE IN PART C1.1 HEREOF**		**R -**

Name of Tenderer: .....

Signature of Tenderer: ..... Date: .....

Address: .....

.....

.....

Tel. No: .....

Fax. No: .....

E-mail Address: .....

PART C3 – SCOPE OF WORK

C3.1 GENERAL PROJECT SPECIFICATION

1.0 GENERAL

The work included in this tender includes, inter alia, the electrification of 259 houses, all at Kruisfontein in Humansdorp. The location and access to the area is indicated on the enclosed Drawing No. 10599/E/01.

The Tenderer shall make allowance in the Bills of Quantities to appoint a Professional Land Surveyor to set out any erf boundaries required and confirm the correct and final positions of all cable routes, overhead line poles, etc. relevant to erf and road reserve boundaries, before construction commences.

2.0 PROJECT DESCRIPTION

This contract covers the manufacture, works testing, delivery to site, off-loading, erection, installation and on-site testing of the following items:

- Alterations to existing 22kV overhead line.
- One (1) 315kVA, 22/0,4kV pole mounted transformer substation, complete with a set of three (3) 22kV lightning arrestors and three (3) 22kV expulsion fuses forming part of the transformer.
- One (1) separate and dedicated main LV distribution board, which is to be mounted below the transformer substation.
- Approx. 2000m of LV bundled conductor overhead line.
- Fifty five (55) pole mounted consumer service connection boxes (CSCB's).
- Airdac house service connection cables to 259 houses.
- Small power distribution board (ready board) for 259 house installations.
- Split prepaid kWh meter for 259 house installations.
- Testing and commissioning of the complete installation and issue of a Certificate of Compliance (COC) for each house installation.

The work is further depicted on the drawings and as further detailed hereinafter.

3.0 SITE INFORMATION

Refer to Parts C3.3 and C4.

The Contractor will not have exclusive possession of the site, and it is very important to note that the substation will remain "live" (in operation) during the entire duration of the contract. The Contractor will be required to carefully coordinate power shutdown periods, etc. with the Municipality as and when required.

The Tenderers must familiarise themselves with the local conditions.

The Contractor shall notify the Directorate: Infrastructure & Engineering and the Engineer of the anticipated delivery of the equipment at least fourteen (14) days before the expected arrival time, to enable the necessary arrangements to be made.

4.0 NATURE OF CONTRACT

The conditions of contract will be the General Conditions of Contract for Construction Works, Third Edition (2015), as amended and described in Part C of this document.

Tenderers must carefully study and understand the entire contents of this document and all annexures, and particularly the Contract Data, Part C1.2 which contains vital information peculiar to this contract.

5.0 ENGINEER'S DRAWINGS

The Engineer's Drawings applicable to this installation are listed in Annexure A to this document.

These drawings are sufficiently accurate for tendering purposes, but all dimensions must be verified on site prior to manufacture. No extras will be considered where work has been proceeded with, without such prior verification or approval.

6.0 PROGRAMME AND COMPLETION

The latest date to reach Practical Completion is 31 March 2024. This is dependent on the contract being awarded latest at the end of September 2023. In the event that the latter date could not be made, then the absolute latest date to reach Practical Completion will be 30 June 2024, i.e. the end of the Municipal Financial Year 2023/24.

It is imperative for all tenderers to indicate their completion periods for the work described in this contract. Preference may be given to tenderers with shorter completion periods. In order to meet the target date, the Tenderer must seek ex-stock equipment / materials / plant where considered necessary.

The Electrical Contractor will be responsible for drawing up his own programme in which he must take into account the delivery dates of equipment / materials / plant required. The programme shall be submitted to the Engineer within two weeks after acceptance of tender.

Provision shall be made in the Tenderer's programme for the annual Contractor's holiday as well as two (2) rain days per month.

7.0 PROJECT NOTICE BOARD

A project notice board, constructed in accordance with the details provided under Annexure B, is to be provided by the Contractor as part of the contract and erected in the position indicated by the engineer on site. The wording shall be approved prior to sign writing. The board shall remain in place until the end of the defects liability period at which time it shall be removed by the Contractor.

8.0 ELECTRICAL SUPPLY

The existing electrical supply is 22kV (MV) and 400V (LV) three phase, and 230V (LV) single phase, 50 Hz systems. Actual voltages may deviate by up to 8% from these values and all equipment, jointing materials, etc., shall be suitably rated for these conditions. The phase rotation is to be checked and maintained through-out the network.

9.0 SWITCHING OF SUPPLIES

All switching of the MV and LV supplies shall be arranged in advance with Kouga Municipality. The Electrical Contractor shall establish their requirements regarding advance notice, permits to work, etc., at the beginning of the contract and shall comply with these requirements.

The contact person at the Municipality's Humansdorp Electrical Department is Mr. Kenneth du Preez, contact Tel. No.042 200 2200.

10.0 SITE STAFF

The Contractor shall always have a competent supervisor on site when work is being carried out under this contract. Such supervisor shall be fully conversant with the equipment and materials being installed.

The Contractor shall further comply with Clause No's 4.10, 4.11 and 4.12 of GCC 2015 contractual conditions.

11.0 SITE FACILITIES

The Contractor shall be responsible for negotiating with the Employer to obtain a location for erection of his site office and storage yard. The Contractor shall also arrange for the supply of water, electricity and telephone services to this site at his own costs.

Latrine facilities will be required and must be in accordance with the local Health Department's regulations.

The Contractor shall further comply with all Environmental requirements.

12.0 CLEARANCES WITH OTHER SERVICES

It shall be the Electrical Contractor's responsibility to obtain all necessary drawings and information from the Municipality and Telkom regarding existing and new overhead power and telephone lines to ensure that no damage occurs to the existing services during the installation of electrical services, and also to ensure that all necessary clearances with existing and future plant are maintained.

The Contractor shall familiarise himself with all existing services and liaise with all relevant authorities for the location and detection of existing services. The Contractor shall also use all necessary means to locate and expose services without damage to such services.

13.0 KOUGA SUPPLY CHAIN MANAGEMENT POLICY

Tenders will be adjudicated in terms of Kouga Municipality's Supply Chain Management Policy of 30 May 2014. A copy of this document is available at the Municipality and on the Kouga website.

14.0 LOCAL LABOUR AND SMME's

Optimum use shall be made of local labour and Sub-Contractors, and the Electrical Contractor appointed for this project shall as far as practically possible and economically viable make use of labour-intensive methods to do the work. Sourcing of local labour must be done as soon as the successful Tenderer has been appointed.

The Contractor shall source local labour from the specific area where work is to be undertaken.

Items of work included in this contract classified as labour intensive will include the following:

- Digging, backfilling and compaction of holes for MV and LV poles and stays.

An advert will be placed for the post of a Community Liaison Officer (CLO) which will be employed by the Contractor. Local labour must be arranged through the CLO and interviewed by the contractor in conjunction with the client and the engineer.

Special Requirements

The Tenderer's attention is drawn to the following requirements which will form part of his responsibility and which he needs to take into consideration in his tender price regarding the use of SMME (Small, Medium and Micro-sized Enterprises) Contractors and the use of Local Labour:

- Worker Contracts and Materials Supplier Contracts need to be set up with each employee (full-time and casual) and supplier.
- The Contractor is required to register with the South African Revenue Services.
- Registration with the Unemployment Insurance Fund (UIF) as well as the Compensation of Occupational Injuries and Diseases Fund (Workmen's Compensation) is required.
- Fulfilment of the following employment targets are essential and need to be attained:

    1. At least 10% of the Contract value must be sub-let to SMME's (emerging sub contractor's in Humansdorp / Patensie / Hankey /Jeffreys Bay / St Francis Bay / Oyster Bay areas).

    2. Create a minimum of 10 job opportunities on site for the duration of the contract period.

- The ratio of local labour employed on the project must conform to the following:

    * At least 20% women (Preference must be given to single heads of household)
    * At least 40% youth (Persons above school going age of 18 to 35 years old)
    * 40% men (Over the age of 35 years)

Labour Intensive Work

Guiding Principle:

The guiding principles upon which the labour intensive work to be provided is based, include:-

- creating sustainable job opportunities,
- poverty alleviation,
- local authority empowerment, and
- ensuring financial accountability

In line with the above, the following targets have been set to reach objectives and this Contract will be subject to these targets:

- Labour intensive methods of construction are to be used where possible.
- Women are to make up at least 20% of the Total Local Labour employed on this project with an emphasis on "Women who are the single head of households and have dependents".
- Youth are required to make up at least 40% of the Total Local Labour employed.
- Men are required to make the balance of the Total Local Labour employed.

The Contractor shall therefore be required to plan his activities to maximise the use of local labour. A "local worker" is defined as a person whose domicilium citandi ex executandi is Kruisfontein in Humansdorp. The rates tendered shall cover the full cost of the all labour intensive work.

The following activities will be conducted by hand:

- Digging, backfilling and compaction of holes for MV and LV poles and stays.

Furthermore, the Tenderer is required to complete the Statement of Intent relating to the use of local labour. This statement is required to indicate the methods which the Contractor intends employing to achieve the employment targets. The Contractor shall be expected to limit the use of non-local persons to his permanent core of key personnel only. The table attached should also be completed in full for tender purposes. The statement will be taken into consideration in the adjudication of the tender.

Minimum wages for local labour shall paid as per the statutory requirements for the specified industry.

Penalty Calculation

1. Use of SMME's:

   Should the contractor fail to meet the minimum requirement of subletting at least 10% of the Contract value to SMME's (emerging sub-contractors), a penalty of 1,2 x the value of the amount to be sublet, minus the actual value sublet, will be implemented. This amount will be deducted from the Contractor's payment certificate.

   The Contractor is to indicate to the Client via a report certified by their auditors indicating that at least 10% of the Contract value has been paid to SMME's.

2. Use of Local Labour:

   Should the contractor fail to meet the minimum requirement of creating 10 employment opportunities on site for the duration of the contact, a penalty of 1,5 x the value of the amount of employment that was not created, calculated at R 140-00 per day per person, will be calculated and imposed. This amount will be deducted from the Contractor's payment certificate.

The Contractor is to indicate to the Client via a report certified by their auditors indicating the payments made to Local Labour and SMME's.

Monthly reports on labour to be supplied by the Contractor in the format provided by the Client.

15.0 CONSTRUCTION AND "AS-BUILT" DRAWINGS AND MANUALS

The Electrical Contractor shall submit to the Engineer, within 1 month after appointment, construction drawings of all work to be undertaken under this project.

Before the date of the issue of the Certificate of Completion, the Electrical Contractor shall hand-over to the Engineer three sets of electronic and hard copies of “As-Builts” of the above-mentioned drawings. These drawings shall be complete in all respects, together with operational and maintenance manuals, test certificates, commissioning report, etc, where relevant. The manual shall include a description of the works, operating instructions, manufacturer’s pamphlets and catalogues on all the equipment supplied and a spares list for the same equipment.

These drawings shall clearly show, with measurement relative to the various structures where applicable, all cable routes and positions of cable markers, final details of all circuits, and revised schedules of equipment etc. The Contract will not be considered complete until these drawings and manuals have been received.

16.0 **DAMAGE TO STRUCTURES**

The Electrical Contractor shall be responsible for the making good of damage caused by his / her staff to any part of the structures / equipment. In the event of the occurrence of damage he/she shall arrange the repair of such damage to be carried out at his / her own expense to the satisfaction of the Engineer and Employer.

C3.2 HEALTH AND SAFETY

1.0 GENERAL

The principal Contractor and Contractors are required to adhere to the provisions of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993), as amended, and including the Construction Regulations 2014, as amended, forming part thereof. For the purposes of this part of the document, the terms principal Contractor and Contractor, and Client, shall have the meanings as defined in the abovementioned Regulations.

The principal Contractor, or Contractor shall undertake all the duties and activities required of him in terms of the abovementioned regulations. These may include but not necessarily be limited to the following:

- Notification of construction work.
- Preparation, liaison with and submission to the Client, and implementation and maintenance of a suitable and sufficiently documented health and safety plan which must include and involve all Contractors under a principal Contractor's control.
- Liaison and cooperation with all other Contractors.
- Supervision of construction work, including appointment of a construction supervisor in terms of the Regulations.
- Risk assessment.
- Fall protection.
- Structures, formwork and support work, excavation work, demolition work, scaffolding and suspended platforms, hoists of any type, and explosive powered tools.
- Electrical installations and machinery on construction sites.
- Use and storage of flammable liquids, water hazards, general housekeeping and stacking and storage, as well as fire precautions.

2.0 HEALTH AND SAFETY INFORMATION

The design described in this document has taken into account the hazards to persons which may occur during construction, commissioning and subsequent use and maintenance. However, the nature of the work is such that certain hazards are unavoidable and will be prevalent during the above operations and these must be taken into account by the Contractor when preparing and implementing the health and safety plan.

In order to assist the Contractor, certain hazards and aspects of health and safety are identified in this document and on the drawings and a Hazard Identification List is provided below to inform the Contractor of any known or anticipated dangers or hazards relating to the design or construction work. The information is provided in order to assist the Contractor to analyse and evaluate the risks and does not, in any way, relieve the Contractor of his/her responsibilities in terms of health and safety.

3.0 HEALTH AND SAFETY PLAN

The Contractor shall be deemed to have read and fully understood the requirements of the above Act and Regulations and to have allowed for all costs in compliance therewith.

The Contractor shall prepare a Health and Safety Plan in respect of the Works in accordance with the Act and Regulations, which shall cover inter-alia the following details:

- Management Structure, Site Supervision and Responsible Persons including a succession plan.
- Contractor's induction training programme for employees, sub-contractors and visitors to the Site.
- Health and safety precautions and procedures to be adhered to in order to ensure compliance with the Act, Regulations and Safety Specifications.
- Regular monitoring procedures to be performed.
- Regular liaison, consultation and review meetings with all parties.
- Site security, welfare facilities and first aid.
- Site rules and fire and emergency procedures.

The Contractor is required to ensure that all sub-contractors or others engaged in the performance of the contract also comply with the above requirements.

4.0 HEALTH AND SAFETY CONDITIONS

The Chief Executive Officer of the Contractor shall assume the responsibility in terms of Section 16(1) of the Occupational Health and Safety Act (as amended). Should the Contractor assign any duty in terms of Section 16(2), a copy of such assignment shall immediately be provided to the representative of the Employer as defined in the Contract.

All work performed on the Employer's premises shall be performed under the supervision of the construction supervisor who understand the hazards associated with any work that the Contractor performs on the site in terms of Construction Regulations 2014.

The Contractor shall appoint a Competent Person who shall be trained on any occupational health and safety aspect pertaining to them or to the work that is to be performed.

The Contractor shall ensure that he familiarises himself with the requirements of the Occupational Health and Safety Act and that he, his employees, and any sub-contractors, comply with them.

Discipline in the interests of occupational health and safety shall be strictly enforced.

Personal protective equipment shall be issued by the Contractor as required and shall be worn at all times where necessary.

Written safe work procedures and appropriate precautionary measures shall be available and enforced, and all employees shall be made conversant with the contents of these practices.

No substandard equipment/machinery/articles or substances shall be used on the site.

All incidents referred to in terms of Section 24 of the Occupational Health and Safety Act shall be reported by the Contractor to the Department of Labour and the Employer.

The Employer hereby obtains an interest in the issue of any formal inquiry conducted in terms of Section 32 of the Occupational Health and Safety Act and into any incident involving a Contractor and/or his employees and/or his sub-contractor/s.

No use shall be made of any of the Employer's machinery / plant / equipment / substance / personal protective equipment or any other article without prior arrangement and written approval.

No alcohol or any other intoxicating substance shall be allowed on the site. Any person suspected of being under the influence of alcohol or any other intoxicating substance shall not be permitted access to, or allowed to remain on the site.

Prior to commencement of any work, verified copies of all documents mentioned in the agreement, must be presented to the Employer.

5.0 HEALTH AND SAFETY HAZARD IDENTIFICATION LIST

The following list highlights items identified as presenting a hazard or danger to persons during construction and commissioning:

Item	Hazard Description	Applicable to the Project Yes / No / N/A	Hazard Rating (Low, Medium, High) *	Comment / Recommendation
	Are there any specific client H&S requirements for the work?	Yes	High	The work will be undertaken in close vicinity of live 22kV overhead power lines. All regulatory requirements in this regard shall be adhered to.
	Have site archaeological issues been identified and evaluated (might be of historical importance)	N/A		
	Has a geotechnical survey been carried out, and if so do the results indicate hazards which require control measures?	N/A		
	Is the site adjacent to or over public transport (railways, taxi ranks, bus stops etc.)?	No		
	Is the site adjacent to or over water (eg. rivers, dams, sea, canals)?	No		
	Is the site adjacent to, over or under any services or drains etc.(eg. high voltage cables, municipal sewer lines)?	Yes	High	The work will be undertaken in close vicinity of live 22kV overhead power lines.
	Is the site adjacent to, over or under any public buildings such as schools and hospitals?	No		
	Are there any other local hazards such as overhead power cables?	Yes	High	The work will be undertaken in close vicinity of live 22kV overhead power lines.
	Will the ground contours present any construction problems?	Np		
	Is there any asbestos removal involved?	No		
	Will excavation be close to live electrical cables or pressure pipes?	No		
	Will any excavation works take place?	Yes		MV and LV pole and stay holes.
	Will any work be carried out close to live electrical apparatus?	Yes	High	The work will be undertaken in close vicinity of live 22kV overhead power lines.
	Is there confined space or tank entry work involved?	No		
	Will any steel erection works be taking place?	No		
	Will tower cranes be used or heavy lifting operations taking place?	Yes		

Item	Hazard Description	Applicable to the Project Yes / No / N/A	Hazard Rating (Low, Medium, High) *	Comment / Recommendation
	Will mobile work platforms, cradles or abseiling be necessary?	No		
	Is the access to the site adequate for vehicles and pedestrians? Are there any special arrangements and/or requirements?	Yes	Low	
	Will the public have access to the site?	Yes		
	Have arrangements been made or co-ordinated for temporary electric supplies?	N/A		
	Have site lighting needs been identified for all stages of the work?	N/A		
	Will any accommodation/ office units be located inside an existing structure?	No		
	Have arrangements been made or co-ordinated for temporary supplies such as water and sewage disposal?	N/A		
	What is the type of roof construction? Evaluate fall hazards	NA		
	Are there any 'Hot Works' to be undertaken?	No		
	Are electrical items to be installed?	Yes	Medium	New MV and LV overhead lines.
	Will there be any lift installation works?	No		
	Will there be any escalators to install?	No		
	Is the project a fire risk?	No		
	Have all environmental issues been evaluated and controlled?	N/A		
	Are there any specific fall protection hazards not already assessed?	N/A		
	Are there any additional hazards which have been identified as being site specific and which are not covered by the foregoing? If YES, note here:	No		

* The hazard rating considers the likely level of consequence (injury/death) to which workers are exposed, the likely number of workers exposed to the hazard, and the probability of occurrence on the site.

C3.3 PROJECT TECHNICAL SPECIFICATION

1.0 GENERAL

This part of the specification deals with the main items of material and equipment which will be the Contractor's responsibility to supply and install in accordance with this document and the drawings.

Sufficient information is provided in this document and on the drawings to enable the tenderer to accurately price the work. Tenderers must allow for all items, whether specified in detail or not, required to complete the installation in a neat and workmanlike manner.

2.0 STANDARD TECHNICAL SPECIFICATION

This section of the Specification shall be read in conjunction with the Standard Technical Specification, Part C3.5, hereof, and the installation shall comply with the relevant clauses thereof. The information in this Project Specification, Part C3.3, shall have preference in the interpretation of any ambiguity or inconsistency between it and the Standard Specification, Part C3.5, forming part of this document.

All materials used under this Contract shall be of a quality and class most suitable for working under the conditions specified and shall withstand the variations of temperature and atmospheric conditions that may arise without distortion, deterioration or the setting up of undue stresses in any part such as to affect the efficiency and reliability of the plant, and also without affecting the strength and suitability of the various parts for functions which they have to perform.

3.0 SUPPLY AUTHORITY

The Supply Authority for the area is Kouga Municipality and the installation shall fully comply with their requirements.

4.0 POLE MOUNTED TRANSFORMER SUBSTATIONS (PMT's)

The position, designation and schematic diagram of the PMT to be installed are depicted on Drawing No. 10599/E/01. The constructional details are depicted on Drawing No's 10599/E/02 to 04.

The PMT shall further comply with the relevant clauses of the Standard Technical Specification and as further detailed hereafter:

ITEM	DESCRIPTION	REQUIREMENT
1.0	Expulsion fuses:	22kV Silicone cut-out suitable for 11/22kV operation. 560mm creepage. Fuse elements shall be rated at 15A.
2.0	Lightning arrestors:	Suitable for 22kV operation.

ITEM	DESCRIPTION	REQUIREMENT
3.0	Jumper conductor at transformers:	Jumpers from the overhead line to the expulsion fuses and to MV bushings of the transformer and to the lightning arrestors shall be 25mm² Cu XLPE insulated conductors with UV stable outer sheath.
4.0	Transformer Ratings:	
4.1	kVA rating:	315kVA
4.2	Number of phases:	Three (3)
4.3	Windings:	Double wound
4.4	Material used for transformer windings:	Copper only
4.5	Primary service voltage:	22000 Volt
4.6	Secondary service voltage:	420/240 Volt
4.7	Vector group:	Dyn 11
4.8	Type:	Pole mounted transformer substation, hermetically sealed (welded cover) for outdoor use.
4.9	Primary side circuit arrangement:	Brown glazed porcelain bushings manufactured for severe coastal conditions.
4.10	LV Distribution Board:	Separate LV Distribution Board fitted below the transformer, and suitably sized to accommodate the equipment as indicated on the schematic diagrams, including padlocking facility.
4.11	External Finish:	Zinc metal sprayed and painted in accordance with the requirements for Coastal conditions as laid down in SABS 780. The finishing paint colour shall be avocado green.
4.12	Fittings:	Photo-cell mounted on the outside of the LV distribution box mentioned in Item 4.10 above. It shall be protected with a galvanised steel expanded metal enclosure with a wire mesh grill.

ITEM	DESCRIPTION	REQUIREMENT
4.13	Labels:	Labels shall be provided on the outside of the transformer and for all the equipment in the LV Distribution Box as indicated on the schematic diagrams and in accordance with the Standard Technical Specification.
5.0	Wooden Poles:	In compliance with the Standard Technical Specification and Clause 5.0 hereof.
6.0	Steelwork:	Steelwork to support transformer, etc. shall be as detailed on the relevant drawings. All steelwork shall be hot-dipped galvanised after manufacture.
7.0	Earthing:	The earthing shall be in accordance with the Standard Technical Specification and as further detailed on Drawing No's 10518/E/03 to 05.
8.0	General Requirements:	
8.1	All connections to the overhead line conductors shall be made with Aluminium "AMPACT" connectors, using an approved overhead line crimping tool.	
8.2	Padlocks (one for tap switch and two for LV Distribution Board double door per transformer) shall comply with the requirements of Kouga Municipality.	
8.3	All exposed phase conductor tails of the main LV supply cables between the PMT LV bushings and the LV distribution board to be covered with black coloured UV stable heat shrink material. The cable tail ends at the LV bushings to be colour coded on top of this with 10mm long colour coded heat shrink tags, as per the relevant phase colour.	

5.0 MV OVERHEAD LINE

The extent of the MV overhead lines required is depicted on Drawing No. 10599/E/01, with constructional details on Drawing No's 10599/E/05 to 11.

The line routes and pole positions are provisional and for tender purposes only. The Electrical Contractor shall mark-out the line routes as shown on the drawings, and thereafter assist the Engineer in determining whether they are suitable or not, and make any adjustments deemed necessary.

It is the Electrical Contractor's responsibility to ensure that no line is energised until such permission has been obtained, in writing, from the Engineer.

The lines shall further comply with the relevant clauses of the Standard Technical Specification and as further detailed hereafter:

ITEM	DESCRIPTION	REQUIREMENT
1.0	Conductor:	Aluminium Conductor Steel Reinforced (ACSR), code name HARE (6/1/4,72), greased.
2.0	Insulators: - Strain and Line Post.	In accordance with the Standard Technical Specification, insulators shall be suitable for coastal conditions: Strain – Pure silicone rubber Long Rod 22kV, 70kN, 31mm/kV Creepage. Line Post – Capless brown glazed porcelain 22kV, 12,5kN, 31mm/kV Creepage.
3.0	Conductor Fixtures, etc:	
3.1	Conductor dead-ending (at strain insulators)	Contrary to the Standard Technical Specification, install cast iron thimble clevis and “Preformed” dead end.
3.2	Conductor tying (at post top insulator)	Use “Preformed” twin-tie.
3.3	General	“Preformed” products shall be suitable for the “HARE” conductor specified.
4.0.	Steelwork:	All steelwork for pole mounted transformer substations shall be hot dip galvanised after manufacture.
5.0	Earthing:	Immediately after the new lines have been erected, it shall be effectively bonded to earth (to ensure safety of workers) near the supply points by way of temporary MV conductors. The temporary earths shall remain in situ until approval is obtained, in writing, from the Engineer to remove it. All hardware on poles shall be bonded with 16mm² HD Bare Cu Earth conductor.
6.0	Wooden Poles	The new poles shall be machine peeled and inspected by the Engineer at the Suppliers premises before delivery to site and no excessively bent or ragged looking poles will be accepted. All poles must bear the SABS mark.

ITEM	DESCRIPTION	REQUIREMENT		
	Minimum top diam. and diam. at theoretical ground level and depth pole to be planted at (unless otherwise specified), for the following pole lengths:			
	Poles	**Top diam.**	**Ground diam.**	**Plant depth.**
6.1	10 metres	160mm	205mm	1800m
6.2	11 metres	160mm	210mm	1800m
6.3	12 metres	160mm	215mm	1800m
6.4	13 metres	180mm	245mm	2000m
6.5	14 metres	200mm	260mm	2200m
7.0	General Requirements			
7.1	Poles shall be selected on site in view of their ultimate duty so that heavier poles are used where stresses are highest, i.e. for angle-strain structures, and thereafter for in-line strain structures and suspension structures in that order.			
7.2	All connections to the overhead line conductors shall be covered with “Densal” paste and a double layer of “Denso” tape.			
7.3	No midspan through joints will be accepted in overhead conductors.			
7.4	Distance between centre of overhead line and erf boundaries shall be 1000mm.			
7.5	Poles and stays shall not obstruct entrances into erven.			
7.6	All MV stays shall be terminated at the top of the pole using a Single Wrap Guy-Grip.			
7.7	All MV and LV stay guards shall be of the solid black PVC type with yellow reflective marking tape evenly spaced over the length of the stay guard.			
7.8	Pole labels are to be fixed to poles at a minimum height of 3000mm above finished ground level, using electro-galvanised nails.			

6.0 LV OVERHEAD LINES

The extent of the LV overhead lines required is depicted on Drawing No. 10599/E/01, with constructional details depicted on Drawing No's 10599/E/09 to 18. The line routes and pole positions are provisional and for tender purposes only.

The Contractor shall assist the Engineer to finalise the line routes in the area, before commencing with the work.

The compliance with Telkom requirements shall also apply to LV lines. Since Telkom overhead lines will exist in conjunction with LV lines in the future, it is a requirement of this Specification that the Contractor liaise closely with Telkom regarding the position of poles and the construction of LV lines.

Double clamps or insulation piercing connectors shall be used on all neutral connections at bundled conductor overhead lines.

Pole labels with 50mm high black lettering are to be fixed to poles at a minimum height of 3000mm above finished ground level, using electro-galvanised nails. The LV lines shall generally comply with the relevant clauses of the Standard Technical Specification, Part C3.2.2 hereof and as further detailed in the table hereafter:

ITEM	DESCRIPTION	REQUIREMENT		
1.0	Conductor:			
1.1	For main power distribution:			
1.1.1	Type	Aerial bundled conductor with supporting core system (French system).		
1.1.2	No. cores and sizes	3 x 50mm² Al + 1 x 54,6mm² Al + 1 x 25mm² Al.		
1.2	For house service connections:			
1.2.1	Type	10mm² Airdac.		
1.2.3	Phase Core			
1.2.3.1	Conductor	Standard hard drawn copper		
1.2.3.2	Insulation	Red XLPE and UV Stabilised.		
1.2.4	Neutral Core			
1.2.4.1	Concentric conductor	Annealed copper wires		
1.2.4.2	Insulation	Covering of Black PE		
1.2.5	Earth Conductor	Concentric layer of bare copper wires		
1.2.6	Conductor Cross-section	10mm²		
2.0	Wooden Poles:	Poles shall be machine peeled and inspected by the Engineer at the Suppliers premises before delivery to site and no excessively bent or ragged looking poles will be accepted. Poles must bear the SABS mark.		
	Minimum top diameter and diameter at ground level and depth to be planted, for the following pole lengths:			
	Poles	**Top dia.**	**Ground dia.**	**Plant depth**
2.1	8 metres	140mm	175mm	1500mm
2.2	9 metres	140mm	180mm	1500mm
2.3	10 metres	160mm	205mm	1800mm
3.0	Earthing	Combined Neutral Earth (CNE) System as further detailed in the Standard Technical Specification and on the drawings.		

7.0 CONSUMER SERVICE CONNECTION BOXES (CSCB's)

The extent of the overhead service cabling to the houses and pole mounted Consumer Service Connection Boxes (CSCB's) at LV overhead line poles is depicted on Drawing No's 10599/E/15 to 23. The mounting positions and equipment layout inside the CSCB's are shown on Drawing No. 10599/E/23.

The CSCB's shall be similar or equal approved to the Polybox Polyethylene, GreenBro IP54 pole mounted box fitted with neutral and earth bars, and interconnecting conductors as shown on Drawing No. 10599/E/23.

The box shall be complete with 4 (four) min. 2,5m long min. 16mm² copper UV stable, black insulated, conductor tails for connection to the bundled conductor overhead line, and stainless steel brackets for strapping the box to the wooden pole. The interconnecting conductors shall be colour coded (Red, White and Blue stripe and Black for neutral).

The CSCB's shall each be fitted with the following minimum equipment:

- Set of four (4) individual Surge Arrestors, similar or equal approved to the CBI type QFLN-4(13).
- Three (3) 63A single phase circuit breakers, similar or equal approved to CBI type QF-1(26), orange handle (Curve 1).
- Three (3) split pre-payment kWh meter Measurement and Control Units (MCU's).

The total number of circuit breakers and MCU's required per CSCB is indicated on the drawings.

Three phases shall be connected to each CSCB. Details of which phase colours must be connected for each house are provided on Drawing No. 10599/E/01. The conductors / cables shall be installed as to create a "drip loop" to prevent water running down the conductors/cables into the connectors. Stainless steel straps, 19mm wide, shall be used to strap the box to the pole. The conductors/cables shall be neatly tied together with cable ties and the neutral conductor fixed to the pole with a suitably sixed u-nail.

The protection rating of the box shall be IP54. Stainless steel bolts and nuts to be used to lock doors of CSCB's. All conductor/cable entries into the box shall be by means of suitably sized UV stable (grey) PVC compression glands.

8.0 INSTALLATION INSIDE HOUSES

This contract covers the supply and installation of a prepaid meter and small power distribution unit (ready board) together with its mounting board in each of the houses. The prepaid meters shall be served from the existing System Master Station (SMS) and Credit Dispensing Unit (CDU) of Kouga Municipality at their Humansdorp office. Specifications for the prepaid meter and ready board are included in Clause No's 9.0 and 10.0 hereafter.

The typical installation at each house, together with the termination and connection of the overhead service connection cable is depicted on Drawing No's 10599/E/19 to 22.

The split prepaid kWh meter's User Interface Unit (UIU) and ready board shall be mounted next to each another on a 450 x 350 x 20mm laminated wooden mounting board.

The following shall apply for the house installations:

(i) The position of the board is depicted on the drawings, which is provisional and must be verified on site with the Engineer.

The exact position of the board must also be determined in conjunction with the home owner and his signature of approving the installation must be submitted with each claim for payment. Notwithstanding the above, no equipment shall be installed in a position, which contravenes the Occupational Health and Safety Act, local by laws or this specification. The top of the Small Power Distribution Unit shall be mounted 1800mm above finished floor level.

(ii) The installation shall comply with the SANS 10142, Code of Practise for the Wiring of Premises.

(iii) Fixing screws shall be plated steel, and "Fisher" or similar PVC plugs shall be used to secure screws to the walls.

(iv) The 16A plug top supplied with the User Interface Unit (UIU) shall be connected to one of the 16A socket outlets available on the ready board.

(v) On completion of each house installation, an original "Certificate of Compliance" for each house shall be issued to the Municipality, with a copy to the Engineer and House Owner, all in compliance with the relevant Clauses of the Standard Technical Specification, Part C3.5, hereof.

9.0 SMALL POWER DISTRIBUTION UNITS

This contract covers the supply and installation of a small power distribution unit for each house. These units are also known as Ready Boards.

The boards shall be similar or equal approved to the CBI type NRBCON003 Ready Board with a bulkhead light fitting and contain the following:

- 1 x Switched Bulkhead light fitting, fitted with 1 x 18W CFL lamp
- 3 x 16A Switched Sockets
- 1 x 6A Euro Socket
- Compatible with all the prepayment meters
- Warning labels
- Earth Leakage protection

The boards shall be suitable for a 230 volt single phase supply and comply with SABS 1619: 1995.

10.0 PREPAID kWh METERS

This contract covers the supply and installation of the meters. These meters are also known as "Single Phase Electricity Dispensers".

The meters shall be of the smart prepaid electricity meter type with a User Interface Unit (UIU) installed inside the house and shall comply with the following requirements:

- It shall have a smart configuration, which supports remote disconnect and reconnect of the supply control switch. The meter shall be able to form part of an end to end Advanced Metering Infrastructure (AMI) system when Data Concentrators (DC) are installed. The meter shall communicate to the DC by means of open standard G3-PLC communications.
- It must support account configuration of Standard Transfer Specification (STS) prepayment and post-payment (credit metering).
- It shall be industry and Eskom's standard STS compliant – Certificate of Compliance (COC) to be provided.

- It shall be industry standard Device Language Message Specification (DLMS) compliant – COC to be provided.
- For operating and maintenance purposes, the meter shall support visual indications of load switch status and G3-PLC communications status.
- It shall support an IEC optical interface for field and service read-out and parameterization.
- Ancillary meter support tools, licenses and training for key municipality personnel.
- Full compliance with SABS 1524-1: 1994 and NRS 009.
- Current limiting from 1A to 80A adjustable in 1A steps.
- Maximum initial current limit manufacturer pre-set at 20A.
- Voltage surge protection to comply with SABS 171.
- Fitted with tamperproof protection.

The prepaid meters shall be compatible with the existing split prepaid meters in the previously completed areas of Kruisfontein, i.e. the Actom type DDSY283SR-H12 meter.

11.0 EARTHING

The PMT's shall be earthed as depicted on Drawing No's 10599/E/01 to 03.

The LV bundled conductor neutral shall be earthed at the poles as indicated on Drawing No. 10599/E/01 by means of a 1,5m long earth spike and 70mm² Cu black PVC insulated down conductor.

All earth down conductors against poles shall be fixed with stainless steel straps and shall be protected with 32mm Ø hot dipped galvanised steel kicker pipe from 500mm below to 3500mm above ground level. The pipe ends shall be sealed with "Denso" tape. The straps shall be minimum width 19mm and spaced at 1 metre intervals. Care shall be taken to ensure that the cable conductor is not damaged due to over tightening the straps.

The combined MV and LV earth resistance at the PMT shall not exceed 1 ohm. Should this resistance not be achieved, two separate earth systems shall be installed for the MV and LV earths, of which the earth resistance shall each be below 10 ohm.

Earthing of the installation shall comply with the relevant clauses of the Standard Technical Specification, Part C3.5 hereof, and the AMEU Code of Practice for the Application of Neutral Earthing on Low Voltage Distribution Systems

12.0 TRENCHING, BACKFILLING AND COMPACTION

Disturbance to existing vegetation must be kept to a minimum at all times during construction. Where small trees, plants and shrubs located on the cable route need to be removed, it shall be replanted in its same position after installation of the cable. A 2% cement mixture shall be added to the backfilling for all poles and stays.

The following definitions shall apply to the three categories of trenching. Where the conditions experienced are a combination of two or more of the conditions listed below, the Contractor shall be paid on rates in proportion to the contents of earth, hard earth or rock experienced in the excavations.

*"**Earth**"* shall mean material which can be excavated by means of a suitable shovel, with the aid of a pick or other hand-swung tool.

*"**Hard Earth**"* shall mean material which cannot be excavated by hand even with the aid of a crowbar, and requires the assistance of pneumatic tools.

*"**Rock**"* shall mean material which cannot be fragmented and loosened by hand implements or pneumatic tools and requires drilling and blasting or the use of rock-breaking equipment.

The extent of ***"Hard Earth"*** and ***"Rock"*** excavations must be determined before the work is carried out and prior approved by the Engineer and the Municipality.

Disposal of surplus or unsuitable material including haulage shall be included in the rate for imported backfill material from an off-site source, up to a radius of 5km from the site. A Rate Only (R/O) tariff shall be allowed for in the Bills of Quantities for disposal of surplus or unsuitable material for any distance exceeding a radius of 5km from the site.

13.0 PADLOCKS

Padlocks shall be provided for all equipment and shall comply with the requirements of Kouga Municipality.

14.0 LABELS AND NOTICES

Designation labels shall be provided for the poles and pole mounted switchgear as indicated on the drawings and elsewhere in the specification.

Labels and notices shall further be provided in compliance with the relevant requirements of the Standard Technical Specification, Part C3.5, hereof.

15.0 INSPECTION, TESTING AND COMMISSIONING

The inspection, testing and commissioning procedures to be followed shall comply with the requirements of the Standard Technical Specification, Part C3.5 hereof.

C3.4 STANDARD PRELIMINARY AND GENERAL INFORMATION

1.0 PREAMBLE

This Part of the Tender Document deals with general requirements to be met and standards for plant and workmanship which shall be observed in the execution of the contract covered by this Tender Document. "Plant" is defined as machinery, apparatus, materials, articles and things of all kinds to be provided under the contract other than Construction Equipment.

When the requirements of this Part are at variance with any detailed requirement of any other Part hereof, or the Drawings, such other detailed requirements shall take precedence. All items of plant which are specified in this Tender Document or by nature of the installation are required, shall comply with this Part, unless stated otherwise elsewhere in this Tender Document. In the event of ambiguity the Engineer shall be asked for his clarification prior to submission of the Tender.

Any reference herein to "elsewhere in this Tender Document" shall be deemed to mean in any of the other Parts of this Tender Document or on the Drawings.

This Tender Document covers major items required for this installation but shall not limit the contractor's responsibility to provide everything necessary to complete the contract. The works shall be carried out with best quality items of plant and to a high class of workmanship. All items of plant shall be the best of their respective kinds, and the contractor shall, upon request of the Engineer, furnish him with proof to his satisfaction that they so comply.

This Tender Document and accompanying Drawings are copyright and are the property of the Engineer and must be returned to him whether a bona-fide tender is submitted or not.

2.0 ALTERNATIVE OFFERS

No alternative tender offers will be considered.

3.0 SPARE PARTS

Tenderers shall state in the Schedule of Particulars / Information, Part T2.2.3, the names of the accredited South African Agents from whom spare parts for all items of plant offered are obtainable and the place nearest to the Works from which such spare parts are available. Submission of a tender will be construed as confirmation that spare parts for all equipment offered are readily available, and the contractor will be held responsible for any costs involved if this should prove to be otherwise.

4.0 DELIVERY TIMES OF MANUFACTURED ITEMS

The Tenderer shall, if required in the Schedule of Equipment Offered, state the times quoted by suppliers for both dispatch and delivery of major items of plant which may contribute to an extension of the time for completion.

The contractor shall, during the continuance of the contract, keep the Engineer well and sufficiently informed regarding the placing of all orders for materials and the progress of manufacture of any plant so as to ensure that no extension of the time for completion may be occasioned because of non-delivery of plant within the time specified for delivery of same. A delivery status report on each major item of plant shall be submitted by the 7th of every second month.

The contractor shall at all times remain fully and solely responsible for the timeous delivery to site of all plant, equipment and materials in terms of this contract.

5.0 PACKING AND DELIVERY

Plant shall be carefully packed and protected to avoid mechanical or other damage during transport and off-loading. The contractor will be held responsible for any damage occurring prior to its acceptance in writing by the Employer.

Every item of plant is to be clearly labelled with its description and with the contract number.

All consignments shall be addressed to the contractor on site and he/she shall make prior arrangements for receipt and storage upon arrival. The employer will not accept delivery of items of plant for the contractor unless the contractor has made prior arrangements to this effect with the employer. The contractor will be required to make all arrangements for off-loading since no equipment for this will be available on site unless specifically stated to the contrary elsewhere herein.

6.0 LAYOUT OF INSTALLATION

The layouts shown on the Engineer's Drawings shall be strictly adhered to in principle, only alterations to suit specific plant being provided being acceptable. The Engineer's Drawings show general arrangements of layout but the contractor is required to prepare detailed Drawings of pipework, fabricated plant, machine and plant rooms, ductwork, switchboards, transformers, sub-stations, etc. The position of services detailed by the Engineer shall not be altered.

All architectural and structural dimensions shown on the drawings are approximate and must be verified by the contractor on Site. All measurements specially marked on the drawings in connection with engineering services shall be strictly adhered to.
If Tenderers require alterations to structure these must be described at the time of tendering. Minor structural alterations which may facilitate the work can be arranged with the Engineer as the work progresses, but no claims will be entertained for alteration of any part of the contract works constructed before the necessary dimensions and details have been verified.
Before work on any particular section is commenced, the position of all control equipment and plant shall be approved by the Engineer.

7.0 DRAWINGS, CERTIFICATES AND OPERATING INSTRUCTIONS

7.1 Tenderers shall submit with their tender, outline drawings and pamphlets showing principal dimensions of the plant offered together with a general description of its operation.

7.2 In instances where, for any reason, the contractor is required to prepare and/or submit detailed drawings of any portion of the contract works, the contractor shall, within one month of the date of acceptance of the contract tender, or on such other date as may be agreed with the Engineer to suit the contract programme, submit duplicate copies of such contractor’s detailed drawings to the Engineer for approval. A further two copies of the finally approved drawings shall subsequently be supplied to the Engineer. The following drawings shall be submitted, as appropriate:

General arrangement details of all items of plant.

Schematic and wiring diagrams of all switchboards and control systems.

Detailed layout drawings of all pipework, ducting, cable racking etc.

Detailed layouts, sections and elevations of all plant rooms.

Rating plate details of all plant including inter alia- max. kW rating, speed, temperature limitations, no-load voltage, full load current, percentage impedance, etc.

Cable termination arrangements of all transformers, motors etc.:

Detailed drawings of all plinths, foundations or bases.

Failure to comply with this requirement may result in the Engineer instructing the contractor to place the order for the specific item of plant with another Manufacturer. Where failure of the Contractor to ensure that the proposed Manufacturer complies with this requirement necessitates the above action being taken, no increase in price will be considered.

7.3 The contractor shall, within one month of acceptance of the contract tender, or on such other date as may be agreed with the Engineer to suit the contract programme, submit triplicate copies of type test certificates issued by an authorised inspection authority or other approved testing agency in respect of all items of plant for which such certificates are required by the Engineer.

7.4 After completion of manufacture, all test certificates called for elsewhere in this Part shall be provided in duplicate.

7.5 Prior to the issue of the Practical Completion Certificate the following documents shall be provided, as appropriate, in duplicate, bound in a durable folder bearing the contract title and number:

Test certificates relating to tests done after completion of the installation as called for elsewhere in this Part.

Catalogue extracts of all major items of plant with performance curves marked to show operating duties.

List of spare part numbers and local Agents for these parts.

"As built" drawings, including layouts, sections, wiring and control diagrams and plant schematic diagrams. These are to show in detail the positions of poles, stays, cables, joints, sleeves, ducts, heating and cooling coils, dampers, pipes, control and regulating valves, air release valves, expansion joints, fixed equipment and all other pertinent items of plant. In the case of buried services, the route of such services and location of all cables, pipes, joints, valves, tees, access manholes, etc. are to be dimensioned relative to permanent and fixed objects, and the GPS coordinates must be provided. These drawings must depict the complete installation as finally commissioned.

Detailed instruction manuals covering the operation, maintenance and servicing of each item of major plant provided under this subcontract and, where the complete plant has been supplied under this subcontract, the operation of the plant as a whole.

In addition, one complete set of Engineer's Drawings clearly marked up to indicate all alterations made to the original drawings must be provided.

The contractor shall note that the Practical Completion Certificate may be withheld until the above has been complied with.

8.0 **STANDARDS AND CODES OF PRACTICE**

The installation shall comply with the following, and all amendments thereto, as appropriate:-

The Occupational Health and Safety Act and Regulations

SABS 0142 Code of Practice for the Wiring or Premises, as appropriate (referred to herein as the Wiring Regulations).

The Post Office Act.

The SAIEE Code of Practice for Overhead Power Lines.

The Local Authorities: Standard Electricity Supply By-Law and appropriate Additional By-Law or Regulations.

Any further Specification, Regulation or Code of Practice stated elsewhere in this Specification.

All items of plant supplied and/or installed, whether expressly specified herein or not, shall conform in respect of quality, manufacture, tests and performance with the requirements of the appropriate South African National Standards (SANS) Specifications and addenda thereto, or, if no such Specification exists covering any one or more of these requirements, with the relevant requirements of the appropriate British Standard Specifications and addenda thereto, except where elsewhere required by this Specification or approved by the Engineer. Where the South African Bureau of Standards has issued a licence for the use of its Mark on products complying with any of its Specifications, only such products which carry the Mark shall be supplied.

Preference will be given to plant manufactured in South Africa.

9.0 WORKMANSHIP

All work shall be carried out by qualified artisans or registered apprentices or, only where appropriate, labourers, under the constant supervision of a qualified artisan. At no stage during the construction programme shall any work be carried out without adequately qualified and experienced installation personnel being on site. If the contractor fails to comply with this requirement, the Engineer has the right to instruct the contractor to suspend the contract work. All costs incurred in so doing shall be for the account of the contractor.

10.0 CO-ORDINATION OF SERVICES ON SITE

The contractor will be required to work in close co-operation with other specialist direct contractors and subcontractors to ensure that no conflict arises between the various services, and to plan the progress of the various aspects of his work. It is imperative that such close liaison continues throughout the duration of the contract.

11.0 INTERRUPTION OF EXISTING SERVICES

No interruption of existing services will be permitted without the express permission of the Engineer and/or the Employer or his representative, given as a result of written notification by the contractor of the date, time and duration of such interruption. Any costs arising from the interruption of any service without such permission shall be for the contractor's account.

12.0 BUILDER'S WORK

All builders' work will be carried out as described in Part C3.1 of this Tender Document. The onus shall be on the contractor to ensure that all work carried out by others in this respect, is to the contractor's satisfaction.

Where builders work is to be carried out by others, the contractor shall notify the Engineer timeously of the positions where holes, cuts and recesses will be required and shall ensure

that each is correctly located and that heavy-gauge draw-wires are supplied and installed in all sleeves.

13.0 APPROVAL OF DRAWINGS

All Drawings, circuit or schematic diagrams prepared by or on behalf of the contractor for submission to the Engineer in terms of the requirements of this Tender Document shall have been thoroughly checked, corrected where necessary and signed as approved by the subcontractor, prior to such submission.

14.0 OPERATING, MAINTENANCE AND SERVICING PROCEDURES

The contractor shall, by agreement with the Engineer, instruct the Employer's appointed Representative in routine operating, maintenance and servicing procedures of all items of plant supplied under this subcontract, and shall ensure that the Employer or his/her Representative, fully understands the documents provided in terms of Clause 7.5 hereof.

15.0 MAINTENANCE

During the defects liability period, up until issue of the Final Approval Certificate, the contractor shall, in addition to attending to any lists of work to be completed which may be issued by the Engineer, carry out full maintenance and servicing operations specifically recommended by the suppliers of any item of plant used in the contract works to maintain it in full and correct operation. Such maintenance shall include all attention necessary to comply with the suppliers' recommendations and shall include the provision of all necessary consumable items. The contractor will also be required to make any adjustments necessary during this period to ensure the satisfactory operation of the plant.

On completion of each such maintenance visit the contractor shall submit to the Engineer a schedule detailing the work done, which schedule shall have been countersigned by the Employer's representative, whereupon a certificate will be issued for moneys due, in respect of the particular maintenance service, as included in the original tender price.

Notwithstanding any maintenance and servicing which may be carried out during the defects liability period, the contractor shall carry out a full maintenance and servicing operation at the end of the defects liability period and before the Final Approval Certificate will be issued.

Allowance for all costs in relation to the above must be made in the tender price. It shall be noted that the Engineer reserves the right to omit partly or wholly the prices submitted for the maintenance of the contract works, should the installation not be adequately maintained within the stipulated maintenance period.

The Employer may request the contractor to enter into a Service/Maintenance Agreement for the contractor to continue to maintain and service the contract works, or a portion thereof, beyond the date of issue of the Final Approval Certificate. The terms and duration of such an Agreement shall be subject to mutual agreement between the Employer and Contractor, and shall be concluded before the issue of the Final Approval Certificate.

Mutually agreeable conditions will be negotiated by the Engineer with the Contractor should the contract works not be put into operation immediately on issue of the Practical Completion Certificate.

C3.5 STANDARD ELECTRICAL SPECIFICATION

SECTION 1 – REGULATIONS

The following Regulations shall apply as applicable:

Electricity Act, 1987 (as amended)

Occupational Health & Safety Act, 1993 (as amended)

Post Office, Act 1958 (as amended)

SECTION 2 – STANDARDS

With the exception of Clause 1.0, all clauses hereafter will first contain a list of the SANS, NRS, BS, CKS, etc. Standards, and thereafter the Clinkscales Maughan-Brown Standards, whilst the latter Standards shall take precedence over the afore-mentioned Standards.

The Project Technical Specification contained elsewhere in this document shall, however, take precedence over all Standards contained in this Section.

1.0 DEFINITION

In this Part, the term "Contractor" means the person, firm or company whose tender has been accepted for the work specified in the document of which it forms a part.

High Voltage (HV):	Voltage in excess of 33 000 Volt
Medium Voltage (MV):	Voltage of 6 600 to 33 000 Volt
Low Voltage (LV):	Voltage up to 1 000 Volt

2.0 ELECTRICAL SUPPLY AND PHASE ROTATION

SANS 1019	**Standard voltages, currents and insulation levels for electricity supply**
SANS 1816	**Electricity supply - Quality of supply: Power quality instruments**
NRS 048	**Quality of supply**

CMB Standards

2.1 Electrical power supply details relative to fault levels, voltage and phase rotation are given elsewhere in this Document.

2.2 Phase rotation specified shall be maintained on all overhead lines, cables, transformers, switchgear and distribution equipment.

2.3 Where existing connections are to be reconnected to a new system, phase rotation is to be checked before disconnection and reconnection made to maintain the same phase rotation.

3.0 SWITCHING OF HV, MV AND LV POWER SUPPLIES

3.1 Switching of existing power supplies shall be pre-arranged with the appropriate Authority.

3.2 All possible preparation shall be made in advance, to minimize the time required for re-energising the system.

3.3 All such switching shall be carried out by the "responsible person" unless such authority is given to the Contractor by that person in writing.

4.0 EARTHING AND BONDING

SANS 10142	**The wiring of premises (Part 1) Low voltage installations**
SANS 10200	**Neutral earthing in medium voltage industrial power systems**
SANS 10292	**Earthing of low-voltage (LV) distribution systems**
NRS 076	**Earthing of distribution substations with nominal voltages up to and including 132 kV.**

CMB Standards

4.1 Resistance Values:

4.1.1 Every effort should be made to obtain an earth resistance value of 1,0 ohm or less.

4.1.2 Maximum acceptable values of earth electrode resistance:

Miniature substation = 10 Ohms

Indoor, outdoor switchboard or gang links = 15 Ohms

Cradle, lightning arrestors or other pole mounted equipment = 20 Ohm

Combined resitance to earth of LV feeder and overhead line neutrals = 10 Ohms

4.2 Main Indoor Substation Earth System:

4.2.1 Main earth bar shall consist of an adequate length of minimum 50mm x 6,3mm tinned copper bar.

4.2.2 Main earth bar shall be supported by means of insulators in a suitable position on a wall or plinth.

4.2.3 Conductors connecting equipment to main earth bar shall be 80mm² copper terminated in compression type lugs.

4.2.4 Size of earth bar and number of earth conductors shall be specified elsewhere.

4.2.5 All connections shall be suitably labelled.

4.3 Main Outdoor Substation Earth System:

4.3.1 Shall comply with the above Standards.

4.4 General Earth Systems:

4.4.1 Earth systems for distribution transformers, minisubs shall comprise two earth electrodes with 1,5m long earth spikes located 6,0m apart, linked with 80mm² bare conductor. Spikes are to be located adjacent to pole structures or ends of plinths in case of minisubs and shall be located at least 1,0m therefrom.

4.4.2 In case of transformer earthing, if neutral earth system resistance is not 1,0 ohm or less, two systems as above are to be installed, one for the LV neutral and the other for the tank and associated equipment, in which case they are to be kept at least 6,0m apart and at opposite sides of the transformer position.

4.4.3 Earth system is to be connected with 80mm² insulated earth conductor to the earth bar or transformer tank earth stud as appropriate.

4.4.4 Common leg of secondaries of CT's, other than secondaries of summation transformers, shall be effectively earthed to main earth system.

4.5 Transformer Earthing:

4.5.1 Transformers, pole mounted, ground mounted or in minisubs, shall be provided with earth systems as described in the Sub-Clause "General Earth Systems" above. If earth system resistance is ≤ 1,0 ohm minisub neutral and earth bars, or transformer neutral and tank earth stud, shall be bonded with an insulated earth conductor.

4.5.2 Where earth system resistance is in excess of 1,0 ohm, a second separate earth system shall be installed in accordance with the foregoing Sub-Clause and neutral and tank connections shall be taken to each of the independent earth systems with separate insulated earth conductors. In this case a neutral surge arrestor, complying with the Clause "Lightning Protection" elsewhere in this Part, is to be installed and connected between the transformer neutral and the tank earth point. For tendering purposes it shall be assumed that the second earth system and neutral arrestor will not be required.

4.5.3 Earthing shall further comply with the AMEU/SAIEE Code of Practice for the use of Combined Neutral and Earth (CNE) on Low Voltage Distribution Systems and Separate Neutral Earth (SNE) System for the service connections.

4.6 Reticulation Feeder Neutral Earthing:

4.6.1 At kiosks and fused feeder pillars a 30m length of bare earth conductor of half the size of the phase conductors but not greater than 80mm² shall be laid from each kiosk earth bar towards the source of supply. Neutral bar shall be connected to the earth bar with green insulated conductor of equivalent size.

4.6.2 At various points not exceeding 150m apart along length of overhead lines and at tee connections and ends thereof as indicated on the drawings, neutral conductor shall be bonded to an earthing point which shall comprise a 1,5m long earth spike. Insulated earth conductor shall be carried in a galvanised sleeve from 500mm below ground to 3,5m above, unless otherwise advised. Connection of earth conductor to line conductor shall be made with a connector suitable for the particular line conductor material.

4.7 Earthing of Pole-Mounted Equipment:

4.7.1 At cradle earthing points, reclosers, or sets of lightning arrestors, one 1,5m long earth spike shall be provided, insulated earth connection being enclosed in galvanised conduit as described above.

4.8 Earth Spikes:

4.8.1 Top of earth spikes and interconnecting conductors are to be 1,0m below finished ground level.

4.8.2 Connections to earth spikes shall be by means of at least two suitable mechanical clamps of an approved type for this duty. Clamps shall not be attached to the rod but must be installed so that the bolt face is in contact with the rod. Brazing will not be accepted. Connection must be wrapped with two layers of "Denzo" tape.

4.8.3 Cable marker as described elsewhere in this Part shall be installed above each spike and shall be labelled "Earth Spike".

4.9 Earth Continuity Conductors:

4.9.1 Earth conductors shall be hard drawn bare copper wire or bi-coloured green/yellow or black PVC covered as specified elsewhere in the Specification, the PVC being UV stabilised. Sizes of earth wire are depicted on the drawings.

4.9.2 Bare earth continuity conductors shall be run with all cables constituting a low voltage distribution system except in case of township reticulation where an earth system as described in the sub-Clause “Reticulation Feeder Neutral Earthing" above shall be installed at kiosks, etc.

4.9.3 Uninsulated earth conductors shall not be less than 500mm below ground level. Above this level all earth conductors shall be green insulated carried in a PVC conduit sleeve.

4.9.4 Terminal lug shall be crimped onto the end of the main earth conductor for bolting to the main earth bar of a substation or minisub or other outdoor equipment. Two mechanical clamps shall be used for connection onto cradles or other equipment, as appropriate.

4.9.5 Earth connections must not be carried through metal conduits or sleeves.

4.9.6 Earth connections shall be so made that in event of any connections being removed the earth connection to the rest of the equipment will not be affected.

4.10 Bonding Generally:

4.10.1 All metallic parts of an installation are to be bonded to the earth system as required by the appropriate Standards.

4.11 Bonding of Equipment:

4.11.1 All earth bars shall be run in one continuous length as far as possible, and shall not be bent or formed in any way that requires hammering or severe distortion.

4.11.2 Any joints shall be lapped with at least two bolts with nuts and washers of suitable size. Lapped ends shall be pre-tinned.

4.11.3 If multiple straps are used, they shall be bolted and fixed together at not more than 750mm intervals.

4.11.4 All connections shall be made using brass or stainless steel bolts, nuts and washers, together with a star lock washer, on all kiosks, fused feeder panels, miniature substations and outdoor equipment. Connections to indoor equipment may be made with cadmium plated steel bolts, nuts and washers, with a steel spring washer.

4.11.5 All steelwork on a pole is to be bonded using 20mm² solid copper conductor. Requirement applies to cross-arms, all insulator supports and any other hardware.

4.11.6 Where equipment is also mounted on the pole, bonded metal is to be earthed to an earth spike as elsewhere specified herein, using a 40mm² bare copper conductor.

4.12 Bonding of Steel Lighting Poles

4.12.1 For three phase systems, steel streetlight and site lighting poles shall be bonded with a continuous earth continuity conductor of the size as specified elsewhere. For single phase systems three core cables, of the size specified, shall be installed where the third conductor will be utilised for the continues earth.

4.12.2 Continuous earth continuity conductor shall be connected to the pole earth stud.

4.12.3 At last pole in a run the neutral conductor shall be bonded to earth.

4.13 Supplementary Requirements for Building Services:

4.13.1 Main earth system is to comply with the Supply Authority's requirements.

4.13.2 Earth spikes, mats and conductors shall be installed as early as possible in building programme, and onus is on Contractor to arrange this with Building Contractor so as to avoid later disturbance of completed construction.

4.13.3 Ends of earth conductors shall be terminated in lugs securely bolted to switchboard frames or trays.

4.13.4 Earth conductors run outside flexible tubing, where this has been permitted, shall be run neatly along tubing and shall be held in place by approved cable ties. Such conductors shall not be wound around the tubing.

5.0 LV METER AND DISTRIBUTION KIOSKS

SANS 141	Glass-reinforced polyester (GRP) laminates
SANS 1195	Busbars
NRS 056	Service Distribution Boxes – Meter Kiosks and Distribution Kiosks

CMB Standards:

5.1 Construction:

5.1.1 Type, construction, material and colour specified elsewhere in Project Technical Specification.

5.1.2 Suitable to accommodate all equipment specified elsewhere in Project Technical Specification.

5.1.3 Kiosks to be from same manufacturer.

5.1.4 Restraining device on door – 3 point latching for larger and 2 point for 6 way and smaller.

5.1.5 Padlocking facilities.

5.1.6 Stainless steel, brass or chrome on brass hinges.

5.1.7 Hot dipped galvanised mild steel locking rods, guides, striker plates, etc.

5.1.8 Gland plate pre-drilled for feeder cables specified and total number of service cables for which kiosk is designed.

5.1.9 Neutral bar to be connected to the 12mm stud with 70mm² PVC insulated earth conductor.

5.1.10 Minimum plate thickness for 3CR12 and hot dipped galvanised kiosks shall be 2 and 3 mm respectively.

5.1.11 Welding on 3CR12 shall be M1G. All welded areas to be pickled and passivated after welding.

5.1.12 Hot dipped galvanising shall comply with Clause “Hot Dip Galvanising” elsewhere in this Part.

5.2 Contents and Equipment:

5.2.1 9,5mm “Masonite Weatherboard” mounting board.

5.2.2 HD Copper busbars min. 25mm x 6mm mounted vertically on colour coded stand-off insulators on back face of mounting board.

5.2.3 Busbars equipped with 12mm and 8mm brass bolts & nuts for termination of feeder and service cables respectively.

5.2.4 Busbars to extend downward below the bottom insulator to enable connection of incoming and outgoing feeder cables vertically above one another.

5.2.5 Galvanised steel gland plate to extend full length and width of kiosk.

5.2.6 Gland plate to be provided with two 75mm long brass or stainless steel bolts facing upwards. 12mm Dia for feeder cable earth connection and 8mm dia. for service connection earth connection. Bolts to be held by nuts and washers to gland plate. Each lug to be individually bolted to the stud.

5.2.7 Steel kiosks shall be equipped with a 50 x 50 x 6mm hot dip galvanised under base for bolting down to a concrete plinth.

5.2.8 Labelling shall comply with Clause “Labels and Notices” elsewhere in this Part.

5.2.9 Main circuit breakers shall comply with Clause “LV Circuit Breakers” elsewhere in this Part.

5.3 Installation:

5.3.1 Top of root 100/150mm above top of kerb or 250/300mm above road level.

5.3.2 Sandy soils require a deeper root with wider flange than normal.

6.0 LV MAIN DISTRIBUTION SWITCH BOARDS

These are defined as boards controlling main supplies, either incoming and/or outgoing, by air break or moulded case circuit breakers, or outgoing supplies with fused-switch units.

SANS 10142	The wiring of premises (Part 1) Low voltage installations
SANS 1195	Busbars
SANS 1274	Coatings applied by the powder-coating process
SANS 60529/IEC 60529	Degrees of protection provided by enclosures (IP Code)

CMB Standards:

6.1 Construction:

6.1.1 Construction, material and colour as specified elsewhere in Project Technical Specification.

6.1.2 Type, i.e. flush mounted, wall mounted, extension or floor standing, as specified elsewhere in Project Technical Specification.

6.1.3 Suitable to accommodate all equipment specified elsewhere in Project Technical Specification.

6.1.4 Panels shall be either hinged or removable as specified elsewhere in Project Technical Specification.

6.1.5 Comprise of a welded or bolted framework of steel sections with a minimum 1,6mm thick steel panel cladding.

6.1.6 Securing of fixed panels shall be by means of square key latches with bottom locating pins.

6.1.7 Edges of all doors and removable panels shall be so constructed that they can readily accept a rubber gasket, should dust and damp proofing be required.

6.1.8 All equipment shall be mounted behind removable fascia plates, only switch toggles, etc., protruding.

6.1.9 Padlock able doors over toggles shall be provided. Switch toggles not covered by a padlock able door, shall be provided with means for padlocking in the “OFF” position.

6.1.10 Doors of fuse-switched unit shall be hinged and interlocked with mechanism so that case cannot be opened with switch closed, or switch closed with case open. With case open, no live parts shall be exposed.

6.1.11 Metal surfaces of the boards shall be epoxy powder coated.

6.1.12 Cabling arrangements shall be such that outgoing feeder ends can be made off with board live at all times.

6.1.13 Gland plates shall be bonded to earth bar by means of a 70mm² bare copper conductor fixed with min. 10mm cadmium plated bolts and nuts.

6.1.14 Space shall be left to allow access to the rear of board.

6.1.15 Board must be designed to fit into space available and be of suitable dimensions to enter through door-ways provided.

6.2 Contents and Equipment:

6.2.1 Busbars shall be mounted at top of board, enclosed by removable full height panels at back, removable top panels and removable front panels covering busbar section only. Droppers from enclosed busbar chamber shall pass through insulating barriers located as necessary.

Where busbars are exposed in cubicles requiring access for operation or maintenance, they shall be shrouded with a suitable insulating material.

6.2.2 Busbars shall be of adequate section for current and short circuit rating. Current density shall not be more than 185A per square centimetre at current rating specified. Bars shall have a minimum spacing of 32mm between bars and 25mm to earth.

6.2.3 Where multiple bars are used, the air gap between bars shall be same as bar thickness.

6.2.4 Busbars shall be securely supported by insulators of a size and so spaced that they will prevent busbar distortion under maximum short circuit conditions.

6.2.5 Equipment shall be arranged to connect to busbars with solid copper connections of adequate section to resist short circuit stresses imposed by faults up to maximum breaking capacity of associated switchgear.

6.2.6 Joints between busbars and equipment shall be tinned and connected using phosphor bronze or stainless steel nuts and washers above a fault level of 20kA or cadmium plated steel below this rating. Flat washers shall be provided on both sides of connection and spring lock-washers beneath the nuts.

6.2.7 Busbars shall be pre-drilled and tinned at both ends for future extensions and removable plates shall be fitted at either end of busbar chamber to enable such extensions to be made.

6.2.8 Suitably drilled and tinned fishplates for later coupling of the bars shall be provided.

6.2.9 Air-break fuses shall be provided with best quality dust and damp-proof ironclad cases, arranged for flush mounting.

6.2.10 Tiered construction insulating barriers are to be installed between all fused-switch units.

6.2.11 Equipment inside board shall be of type and manufacture as specified elsewhere in Project Technical Specification.

6.2.12 Six (6) spare HRC fuses for each switch shall be supplied, except that a maximum of 6 spare fuses of any one size are required per board. All such spares shall be mounted in stainless clips, or fuse holder, in a special compartment attached to board, marked “Spare Fuses”.

6.2.13 Metal clad covers of fused switches shall be clearly labelled, where retractable type units are used, both carriage and the panel are to be labelled.

6.2.14 Cabling arrangements shall be such that outgoing feeder ends can be made off with board live at all times.

6.2.15 Continuous earth bar sized to match the specified fault rating of the board but of not less than 25mm x 6,3mm cross section shall be run along the entire length of board and shall be provided with a minimum 10mm cadmium plated bolt for connection of earth conductor.

6.2.16 Wiring of boards shall comply generally with Clause "Control Equipment and Wiring" elsewhere in this Part.

6.2.17 Main circuit breakers shall comply with Clause “LV Circuit Breakers” elsewhere in this Part.

6.2.18 Hot dipped galvanising shall comply with Clause “Hot Dip Galvanising” elsewhere in this Part.

6.2.19 Labelling shall comply with Clause “Labels and Notices” elsewhere in this Part.

6.2.20 Three maximum demand reading ammeters and a voltmeter and selector switch are to be provided for each incoming supply circuit breaker.

6.3 Installation:

6.3.1 No board shall exceed 2,4m in height nor shall any operating handle, button or switch be mounted higher than 1,8m or lower than 0,6m.

6.3.2 No part of any equipment shall be mounted closer than 300mm to the floor.

7.0 LV MCB MAIN AND SUB-DISTRIBUTION BOARDS AND CONTROL PANELS

These are defined as boards controlling the main supplies, normally coming from a LV Main Distribution Switch Board, and outgoing supplies with moulded case circuit breakers.

SANS 10142	The wiring of premises
SANS 1195	Busbars
SANS 1274	Coatings applied by the powder-coating process
SANS 60529/IEC 60529	Degrees of protection provided by enclosures (IP Code)

CMB Standards:

7.1 Construction:

7.1.1 Construction material and colour specified elsewhere in Project Technical Specification.

7.1.2 Larger MCB panel distribution boards and motor control panels shall be floor standing.

7.1.3 Suitable to accommodate all equipment specified elsewhere in Project Technical Specification.

7.1.4 Where single phase breakers are used in three phase boards, these must be arranged in three vertical rows, one for breakers in each phase.

7.1.5 All structural elements of main and sub-distribution boards and complete construction of motor control panels shall be of minimum 2,0mm thick material.

7.1.6 Non-structural elements shall be of 1,6mm material. Minor bonding trays shall be of 1,2mm material and all bonding trays shall be galvanised.

7.1.7 All boards to be mounted outside or specified as being weatherproof shall be constructed of 2,0mm 3CR12 sheet, epoxy powder coated to a thickness of 70 microns.

7.1.8 Cognisance must be taken of the heat dissipated by equipment and adequate ventilation be provided.

7.1.9 Panels shall be either hinged or removable as specified elsewhere in Project Technical Specification.

7.1.10 Securing of fixed panels shall be by means of square key latches with vertical locating pins.

7.1.11 Boards shall be at least 115mm in depth unless otherwise approved.

7.1.12 A maximum of two rows of conduit shall enter horizontal edges of boards and width of board must be sufficient to accommodate all conduits entering.

7.1.13 All control panel doors shall be fitted with dust and damp proof seals

7.1.14 Flush boards in walls shall be provided with a separately attached metal frame and door which is adjustable so that it may be set plumb.

7.1.15 Boards with a width of 600mm or greater shall be fitted with double doors. Surface and flush boards shall be provided with doors.

7.1.16 Hinges shall be as specified elsewhere in Project Technical Specification.

7.1.17 Hot dipped galvanising shall comply with Clause “Hot Dip Galvanising” elsewhere in this Part.

7.1.18 All metal surfaces of boards shall be epoxy powder coated.

7.1.19 Cabling arrangements shall be such that outgoing feeder ends can be made off with board live at all times.

7.1.20 Gland plates shall be bonded to earth bar by means of a 70mm² bare copper conductor fixed with min. 10mm cadmium plated bolts and nuts.

7.1.21 Where single phase breakers are used in three phase boards, these must be arranged in three vertical rows, one for breakers in each phase.

7.1.22 Interior of boards shall be arranged for easy access to all wiring and components.

7.1.23 Where boards are installed in 115mm walls, they shall be provided with expanded metal fixed to entire back of board.

7.1.24 Underside of board shall be rendered vermin proof by means of similar plates to gland plates above.

7.2 Contents and Equipment:

7.2.1 Unless made specifically to clip in from front, blanking plates shall be fixed with short cadmium plated bolts and nuts

7.2.2 All openings for future equipment shall be covered with blanking plates fixed on inside of opening.

7.2.3 Copper busbars are to be provided for each phase and are to be mounted on suitable insulators or fixed to terminals of miniature circuit breakers, and be of sufficient length to accommodate future breakers as specified elsewhere in Project Technical Specification.

7.2.4 Busbar and other connections shall be made using cadmium plated steel (or brass in coastal areas) bolts, nuts, flat and spring washers.

7.2.5 Main neutral feed to busbar shall be connected by a lug bolted to bar, as described above.

7.2.6 Neutral busbars shall be solid brass with two per-way pinching screws and sufficient ways for feed and all circuits connected, including spare ways to same number as spare circuits.

7.2.7 All equipment shall be mounted behind removable fascia plates, only switch toggles, etc., protruding.

7.2.8 Isolating device for all motors situated remote from control panel shall be lockable in the "OFF" position.

7.2.9 Fascia panels shall have moulded knobs for ease of removal of the panel.

7.2.10 Transformers for low voltage supplies and all low voltage wiring shall be separated by metal barriers from medium voltage circuits.

7.2.11 Positions of transformers are to be indicated by labels attached to face of board.

7.2.12 All equipment on boards shall be back-connected and no wire or cable shall be visible from front.

7.2.13 PVC insulated wiring shall be used throughout, current rating being not less than rating of circuit breaker or aggregate rating of bank of circuit breakers which it connects.

7.2.14 In case of MCB Main Boards cabling arrangements shall be such that outgoing feeder ends can be made off with board live at all times.

7.2.15 In case of MCM Main Boards all gland plates shall be bonded to earth bar by means of a 70mm² bare copper conductor fixed with min. 10mm cadmium plated bolts and nuts.

7.2.16 Wiring of boards shall comply generally with Clause "Control Equipment and Wiring" elsewhere in this Part.

7.2.17 Main circuit breakers shall comply with Clause “LV Circuit Breakers” elsewhere in this Part.

7.2.18 Labelling shall comply with Clause “Labels and Notices” elsewhere in this Part.

7.2.19 A spare set of HRC fuses for each switch-fuse unit or set of fuse holders installed shall be supplied and value included in tender price, except that a maximum of 6 spare fuses of any one size is required.

7.2.20 All spares shall be handed to Employer's representative at time of handover inspection.

7.2.21 All instruments, meters, pilot lights, etc., and main isolator must be operable with the doors closed unless otherwise specified.

7.2.22 Heat anti-condensation heaters are to be so constructed and fitted that they cannot be inadvertently touched.

7.2.23 Transformers for low voltage supplies and all low voltage wiring shall be separated by metal barriers from medium voltage circuits.

7.2.24 Positions of transformers are to be indicated by labels attached to face of board.

7.2.25 Equipment on boards shall be back-connected and no wire or cable shall be visible from front.

7.2.26 PVC insulated wiring shall be used throughout, current rating being not less than rating of circuit breaker or aggregate rating of bank of circuit breakers which it connects.

7.3 Installation:

7.3.1 Floor standing boards shall be bolted in position.

7.3.2 No board shall exceed 2,4m in height nor shall any operating handle, button or switch be mounted higher than 1,8m or lower than 0,6m.

7.3.3 No part of any equipment shall be mounted closer than 300mm to floor.

7.3.4 Minor types of main and sub-distribution boards and control panels shall consist of sheet metal trays, suitably built in or secured on surface.

7.3.5 Where boards are installed in 115mm walls, they shall be provided with expanded metal fixed to entire back of board.

7.3.6 Trays of flush boards shall be built in or suitably secured to brickwork in specified places. Each shall be mounted with upper edge at a height of 2,0m above floor level, unless otherwise specified.

7.3.7 Unless otherwise specified elsewhere in this Specification, boards contained in cupboards shall be surface mounted and all conduit shall drop into them neatly, vertically and evenly spaced, in a single row, if possible.

8.0 LV CONSUMER SERVICE CONNECTION BOXES (CSCB)

These are defined as electrical distribution boxes, mounted on poles, controlling main supplies to normally residential units, by circuit breakers.

SANS 1195	Busbars
SANS 60529/IEC 60529	Degrees of protection provided by enclosures (IP Code)

CMB Standards

8.1 Construction:

8.1.1 Construction material and colour specified elsewhere in Project Technical Specification.

8.1.2 Suitable to accommodate all equipment specified elsewhere in Project Technical Specification.

8.1.3 The protection rating of CSCB shall be at least IP54.

8.1.4 All conductor/cable entries into the box shall be by means of suitably sized UV stable PVC compression glands.

8.1.5 Electro-galvanised padlock able lever locks shall be used to lock doors.

8.2 Contents and Equipment:

8.2.1 Equipped with number of and size of UV stable colour coded conductor tails for connection to overhead line specified elsewhere in Project Technical Specification.

8.2.2 Wiring of boards shall comply generally with Clause "Control Equipment and Wiring" elsewhere in this Part.

8.2.3 Main circuit breakers shall comply with Clause “LV Circuit Breakers” elsewhere in this Part.

8.2.4 Each main circuit breaker is to be labelled with erf number it will serve. Such labelling is to comply with appropriate requirements of Clause “Labels and Notices” elsewhere in this Part.

8.3 Installation:

8.3.1 Stainless steel straps, 19mm wide, shall be used to strap box to pole.

8.3.2 Conductors shall be installed at box as to create a “drip loop” to prevent water running down conductors into connectors.

8.3.3 Exact mounting height on poles specified elsewhere in Project Technical Specification.

9.0 READY BOARDS

These are defined as electrical “Small Power Distribution Units”, normally used inside low cost houses.

SANS 1619 Small power distribution units (ready-boards) for single-phase 230 V service connections

CMB Standards

9.1 Contruction:

9.1.1 Shall be suitable for a 230 volt single phase supply.

9.1.2 Suitable to accommodate all equipment specified elsewhere in Project Technical Specification.

9.2 Contents and Equipment:

9.2.1 Wiring of the boards shall comply generally with Clause "Control Equipment and Wiring" elsewhere in this Part.

9.2.2 Main circuit breakers shall comply with Clause “LV Circuit Breakers” elsewhere in this Part.

9.2.3 Labelling shall comply with Clause “Labels and Notices” elsewhere in this Part.

9.2.4 Equipment specified elsewhere in Project Technical Specification.

9.3 Installation:

9.3.1 Not be mounted within a radius of 1000mm from any water tap.

9.3.2 Mounted so that the top of the board is 1800mm above floor.

10.0 LV CIRCUIT BREAKERS

SANS 156	Moulded-case circuit-breakers
SANS 767	Earth leakage protection units
SANS 1473	Low-voltage switchgear and control gear assemblies
SANS 1765	Low-voltage switchgear and control gear assemblies (distribution boards) with a rated short-circuit withstand strength up to and including 10 kA
SANS 60439	Low-voltage switchgear and control gear assemblies
SANS 60934	Circuit-breakers for equipment (CBE)
SANS 61008	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs)
BS EN 60947	Specification for switchgear and control gear for voltages up to and including 1000 V A.C. and 1200 V d.c. Circuit-breakers

CMB Standards

10.1 General*:*

10.1.1 Supply voltage, normal current, fault capacity and type, as well as any special characteristics required for circuit breakers, shall be as stated elsewhere in Project Technical Specification.

10.1.2 Main circuit breakers are to be of one make throughout installation.

10.1.3 Main circuit breakers inside LV main distribution switchboards shall be equipped with adjustable instantaneous magnetic and inverse time delay thermal overload releases on each phase and shall be arranged for flush mounting. Shall be connected to busbars with solid copper connections of adequate section to resist short circuit stresses that may be imposed by faults up to maximum rupturing capacity of breaker.

10.1.4 Where circuit breakers are used to control supply taken directly from Supply Authority, they shall be of a make approved by that Authority, and shall be set to trip within specified limits laid down by that Authority.

10.1.5 Rack-out type air circuit breakers shall have interlocking to ensure that racking in or out can take place only with circuit breaker open.

10.1.6 Moulded case circuit breakers shall have a time delay tripping on low overloads and high speed tripping on short circuit.

10.1.7 Three phase MCB's shall be fitted with suitable phase barriers.

10.1.8 Where MCB's are required to be connected to cables larger than 70mm², terminals shall be of stub busbar or rear connecting stud types. For all other cables, box type terminals shall be provided.

10.2 Installation

10.2.1 Connecting device between incoming cable and air circuit breaker, and between said breaker and outgoing bars shall be fitted with shutters which are automatically closed and locked by the action of racking out.

10.2.2 MCB's shall be fitted with purpose made terminal shrouds where no fascia plate is provided.

11.0 SUPPLY AUTHORITY METERS

BS 5685	Electricity meters. Specification for Class 3 var-hour meters

CMB Standards

11.1 General:

11.1.1 Meters shall be of type as stated elsewhere in the Project Technical Specification.

11.2 Installation and Commissioning:

11.2.1 Meters shall be installed in kiosks / miniature substations as specified elsewhere in the Project Technical Specification.

11.2.2 Allowance must be made in tender price for Metval testing and programming of these meters to meet municipal requirements.

12.0 INSTRUMENTS, METERS AND PROTECTION RELAYS

SANS 473 / NRS 071	Automated meter reading for large power users
SANS 474 / NRS 057:2005	Code of practice for electricity metering
SANS 1524	Electricity payment systems
SANS 1799	Watt-hour meters - AC electronic meters for active energy
SANS 1966 / IEC 60211	Maximum demand indicators, Class l.0
SANS 60044 / IEC 60044	Instrument transformers
SANS 62052 / IEC 62052	Electricity metering equipment (A.C.) - General requirements, tests and test conditions
SANS 620532003 / IEC 62053	Electricity metering equipment (A.C.) - Particular requirements
NRS 057 / SANS 474	Code of practice for electricity metering
NRS 068	Electricity distribution - cable earth fault indicator
NRS 071 /SANS 473	Automated meter reading for large power users
NRS 072	Overhead line fault path indicators
BS EN 60044, BS EN 60044	Specification for voltage transformers

CMB Standards:

12.1 General:

12.1.1 Indicating instruments and meters shall have HRC fuse protection on all voltage connections as specified elsewhere on the drawings.

12.1.2 Meters and instruments shall have labels fitted below, stating in which circuit they are installed.

12.1.3 Cases of all meters shall afford complete protection from dust and damp and shall be suitable for attachment of seals.

12.1.4 Selector switches shall be rated at 16A shall be provided with an "OFF" position.

12.1.5 Tenderer shall submit full details of meters, instruments and control switches offered in the tender, including connection diagrams for all equipment.

12.2 Potential Indicators:

12.2.1 Potential indicators shall comprise three neon indicating lamps each energised from a capacitor bushing connected to indicate that incoming cable or busbars are alive, unless specified elsewhere in the Project Technical Specification.

12.3 Protection Relays:

12.3.1 Protection relays are specified elsewhere in the specification.

12.4 Current Transformers:

12.4.1 Current transformers are specified elsewhere in Project Technical Specification.

12.5 Voltage Transformers:

12.5.1 Voltage transformers shall be three phase and of the type specified in the Project Technical Specification.

12.5.2 Output shall be 50VA per phase at 110V phase to phase.

12.5.3 Fuse protection shall be provided on both primary and secondary.

12.5.4 Transformers shall not be affected by single-phasing on the MV side.

12.6 Indicating instruments:

12.6.1 All instruments shall be as specified elsewhere in the Project Technical Specification.

12.7 Ammeters*:*

12.7.1 Ammeters, including whole current ammeters, unless specified otherwise in the Project Technical Specification, shall be calibrated to 120% of rated current. Overload capability shall be 10 x rated current for 1,0 second. Those reading in excess of 100A shall be CT operated with 5A full scale deflection.

12.7.2 One instantaneous reading ammeter, unless specified otherwise in the Project Technical Specification, shall be provided and connected via a phase selector switch with "OFF" position.

12.7.3 Maximum demand reading ammeters, unless specified otherwise in the Project Technical Specification, shall be of combined maximum demand and instantaneous type, one meter being supplied per phase.

12.7.4 Shall comprise a thermal maximum demand ammeter with drag pointer combined with a moving iron instantaneous pointer. The drag pointer reset knob shall be sealable.

12.7.5 Where dual ratio CT's are specified, ammeter scale plates are to be engraved on both sides to suit these ratios, the plate for the lower ratio being outermost.

12.8 Voltmeters:

12.8.1 One instrument shall be provided in each instance connected via a selector switch to read line to line voltages and also line to neutral voltages.

12.8.2 Voltmeters for MV use shall be suitable for operation on the 110V side of the voltage transformer, while LV voltmeters shall operate off a nominal line to line voltage of 400V. Scales between 90% and 110% of nominal voltage shall be graduated in 1,25% divisions.

12.9 PF Indicators:

12.9.1 Power factor indicators shall be of the type specified in the Project Technical Specification.

12.10 Consumption Meters:

12.10.1 KWh meters shall be of the type specified in the Project Technical Specification.

12.10.2 Full details of programme facilities and operating instructions shall be supplied with these meters.

12.10.3 Allowance must be made in the tender price for Metval testing and the programming of the bulk meters.

12.11 Supply Monitors / Power Analysers

12.11.1 Power analyser module shall display the voltage and currents of all three phases as well as the record the peak, i.e. maximum values of same. The instantaneous power consumed, power factor and total harmonic distortion (THD) of all three phases shall also be accesses via a scrollable menu interface.

12.12 Medium Voltage Metering Units:

12.12.1 Shall comprise of a free standing panel mounted on a concrete plinth.

12.12.2 When used in conjunction with extensible switchgear, metering unit shall form an integral part of the switchboard. In such cases it shall be specifically designed to match the associated switchgear and to be connected to the busbars of the extensible switches from which the complete switchboard is assembled.

12.12.3 When mounted adjacent to non-extensible switchgear or within an extensible switchboard it shall share a common plinth with switchgear.

12.12.4 Voltage transformer, current transformers, and consumption metering equipment shall comply with the relevant requirements detailed elsewhere in this part and in the Project Technical Specification.

12.12.5 Operating voltages, CT and VT ratios, and metering requirements are detailed in the Project Technical Specification.

12.12.6 Voltage transformer shall not be affected by single phasing on the medium voltage side.

12.12.7 Cable boxes shall be suitable for the cable sizes and types specified in the particular specification or on the drawings.

12.12.8 Exposed metal work shall be hot dip galvanized or zinc metal sprayed and painted to match adjacent or associated MV switchgear. Where such switchgear is remote from the metering unit, the unit shall be painted as specified in Project Technical Specification.

12.12.9 Exposed bolts, nuts and hinges shall be galvanized or fabricated from a suitable grade of stainless steel designed to resist corrosion or discolouration in service.

13.0 CONTROL EQUIPMENT AND WIRING

SANS 767	Earth leakage protection units
SANS 1091	National colour standard
BS EN 60947	Specification for motor starters for voltages up to and including 1000 V A.C. and 1200 V D.C. Direct-on-line (full voltage) A.C. starters

CMB Standards*:*

13.1 Time Switches*:*

13.1.1 Time switches shall be mounted in an accessible position for ease of adjustment.

13.1.2 Shall be provided with re-chargeable batteries to provide up to 48 hours of operation should a power failure occur.

13.1.3 Shall be fully programmable as specified in the Project Technical Specification.

13.1.4 Shortest switching interval shall be 1,0 minute for motor control and 30 minutes for general purposes.

13.1.5 Units shall include a manual override facility and be suitable for wall or DIN-rail mounting.

13.1.6 Protection shall be at least to IP42 and the units shall operate satisfactorily in the temperature range - 5℃ to + 55℃.

13.2 Low Voltage Transformers:

13.2.1 Bell and other low voltage transformers shall be of the double wound type.

13.2.2 Shall have an adequate capacity for the duty required but not less than 50VA on short-time rating.

13.2.3 Transformers shall have one end or the centre point of the low voltage winding earthed.

13.3 Contactors:

13.3.1 Contactors shall, unless otherwise specified, comply with the standards for current making and breaking Category AC1 for non-inductive loads and Category AC3 for inductive loads.

13.4 Earth Leakage Protection Units:

13.4.1 Earth leakage protection units shall have a sensitivity of 30mA, unless stated to the contrary elsewhere in this Specification, or on the drawings.

13.4.2 Unit shall actuate a shunt trip isolator or MCB as specified.

13.4.3 Units shall carry the SABS Mark.

13.5 Motor Starters:

13.5.1 All Starters are to be of the same make.

13.5.2 Star-Delta starters are to be provided with both electrical and mechanical interlocks.

13.5.3 Starters are to be protected by moulded case circuit breakers as specified in Sub-Clause "Moulded Case Circuit Breakers" elsewhere in this Part.

13.5.4 Starters are to be so selected that they are not subjected to a higher fault current than that for which they are designed.

13.5.5 MCB's and isolators are to be lockable in "OFF" position where motors are situated remote from control panel.

13.5.6 Starters for all motors shall comprise magnetically operated contactors, shall be of robust design, and operate without undue noise and vibration.

13.5.7 Unless otherwise stated, they shall be of continuous rating, current making and breaking Category AC3.

13.5.8 Contactors shall be of the hold-in type capable of operating satisfactorily without overheating for a period of 10 minutes if the supply voltage falls to two thirds nominal.

13.5.9 Contactors shall not chatter when opened at two thirds voltage, or at a frequency 10% below nominal.

13.5.10 Low voltage release is to be inherent in the operating coil.

13.5.11 Starters are to be equipped with a voltage free auxiliary change-over contact to provide a "RUN" signal during operating.

13.5.12 No motor control gear shall have a continuous rating of less than 10A at Category of duty AC3.

13.5.13 Contactors shall be capable of making and breaking the starting current of the motor and of carrying this current without damage for a period of one minute.

13.5.14 Contactors shall also be capable of withstanding, without damage, the passage of the maximum fault MVA of the circuit until such time as the fault can be cleared by the operation of the back-up protection.

13.5.15 Where anti-condensation heaters are fitted, these must be disconnected by the starter main switch.

13.5.16 Overloads of the thermal type shall be matched to the motor ratings and are to be manually reset.

13.5.17 Overloads are to be so set that the motor will trip within 30 seconds of a single phase condition arising when the motor is hot and operating at 80% of full load current. If the starter is not capable of this, then single phase protection devices are to be fitted for all motors of 10kW and over.

13.5.18 All overload devices must be fitted with a voltage free auxiliary changeover contact to provide a "tripped" signal. If this facility is not available on the overload offered, an interposing relay is to be provided to perform the same function. Such a relay must be energised upon an overload trip occurring.

13.5.19 The following shall be included as standard features :

Overload protection; Phase imbalance and single phase protection; Locked rotor and excessive re-starts protection; Thermal memory; Auxiliary supply dip-proofing; Fail-safe operation on main trip relay; Analogue or LED indication of percentage motor load and thermal memory.

13.5.20 Optional features which may be specified elsewhere in this Specification are:

Earth fault protection; Short circuit protection, etc.

13.5.21 In the case of dual-speed motors, protection shall be provided by a dual-operation relay separately configured to provide full protection at each speed.

13.6 Pilot Lights:

13.6.1 Pilot lights are to be either cluster LED, neon, transformer or resistor reduced wattage type.

13.6.2 Lights shall be easily seen when operating in normal daylight.

13.6.3 Where pilot lights are connected to remote equipment by multi-core control cables neon lamps shall not be used because of the inductive effect of the control cores.

13.6.4 100% spare lamps are to be provided for all pilot lights.

13.6.5 Lamp test facilities via a lamp test push button wired to all indicator lights must be provided.

13.6.6 Pilot lights are to be of the colours indicated below, unless elsewhere specified.

Power on -	Amber
Fault -	Red
Run -	Green

13.6.7 Pilot lights indicating "STARTER CLOSED" and "OVERLOAD TRIP" shall be fitted to all motor circuits.

13.7 Hour Meters:

13.7.1 Hour meters shall be of the digital type reading up to 99999 hours, unless otherwise specified.

13.7.2 Meters shall be suitable for 230V, 50Hz. AC operation.

13.8 Duty Selector Switches:

13.8.1 Control of all items of equipment which can act as standby to each other must include a duty selector switch to enable the lead duty to be selected as well as second and third preference, i.e. 1,2,3; 2,3,1; 3,1,2 for a three motor system.

13.9 Hand/Off/Auto Switches:

13.9.1 The hand/off/auto switch shall be fitted to each starter subject to automatic control.

13.9.2 The hand control circuit, which shall comprise stop-start push button, shall be fed from a fuse other than that for the automatic control system.

13.10 Phase Failure Relays:

13.10.1 Phase failure relays are to provide reverse phase rotation protection.

13.10.2 The relay is to be so arranged with a timer that it will only initiate a trip upon a single phase condition occurring and not upon restoration of power.

13.10.3 Provision is to be made to ensure that a trip occurs irrespective of which phase is lost.

13.11 Relays:

13.11.1 Type of relay specified elsewhere in the Project Technical Specification.

13.11.2 Each relay is to be numbered and this number must appear on both relay and adjacent to its respective base in the case of the plug-in type.

13.11.3 Adjustable timing relays must be labelled with their function.

13.12 Photo-electric Controls:

13.12.1 Photo-electric switches shall be of the type comprising a photo-sensitive resistor, thermal actuator with an inherent operating delay to make it insensitive to short duration changes in light levels and a change-over switch mechanism, all housed within a tough, translucent, weather and ultra-violet resistant cover.

13.12.2 Operating level shall be factory preset to switch on at approximately 50 lux and off at approximately 100 lux.

13.12.3 Response time after sudden changes in light level shall be not less than 15 seconds.

13.12.4 Integral protection against voltage surges shall be provided.

13.13 Main and Control Circuits:

13.13.1 Control equipment shall be mounted in a separate hinged panel fitted with square key latches to permit ease of access to terminals, etc., at the rear of the panel.

13.13.2 Where busbars are located directly behind such panels, a separate removable insulated panel shall screen them.

13.13.3 Wiring shall be carried out using suitably rated, colour coded insulated wire.

13.13.4 Main terminals are to be connected in strict phase rotation.

13.13.5 Wires shall not be joined between terminal points and no terminal shall have more than two wires connected to it unless they are lugged connections.

13.13.6 Spare terminals are to be provided to accommodate all spare control cable cores.

13.13.7 Terminals for wires smaller than 16mm² shall have pressure plates.

13.13.8 Terminals for the connection of external control wiring shall be of the "disconnect" type.

13.13.9 Terminations shall be fitted with numbered ferrules, the numbers corresponding to those on the appropriate wiring diagrams to be prepared by the board Manufacturer. All terminal strips are to be similarly numbered.

13.13.10 Generally, wiring shall be enclosed in strategically placed plastic wireways. Small numbers of wires to remote positions may be neatly strapped, using plastic buckle clips or hard plastic "loom formers". Where wiring is run to equipment mounted on hinged doors, wiring shall be carried in a plastic "loom former" which is so installed that the wiring is not strained with the door fully open.

13.13.11 Colour of all panel wiring shall comply with the following:-

Colour of Wire	Circuit Particulars
Red, White and Blue	Phase connections in current and voltage transformer circuits and in all three phase circuits.
Green/Yellow bi-colour	Insulated earth wires.
Black	Neutral connections.
Grey	Control connections.
White	Connections in DC alarm circuits.

All control circuits shall have 5A HRC fuse protection.

13.14 Labelling:

13.14.1 Control equipment both within the panel as well as all projecting items, are to be labelled in accordance with Clause "Labels and Notices" elsewhere in this Part.

13.14.2 Any device which can be unplugged is to be labelled at the base and on the device.

14.0 TRENCHING, EXCAVATION AND COMPACTION

CMB Standards:

14.1 General:

14.1.1 Contractor to allow for all excavation and backfilling of cable trenches and holes for planting of poles, unless specified otherwise in Project Technical Specification.

14.1.2 Contractor shall be responsible for ensuring that any trenches opened by him, or for him, do not constitute a hazard to the public.

14.1.3 Barriers and warning lights at night, or any other protection of trenches or excavations, to be provided as required by Engineer or any Statutory or Local Authority.

14.1.4 Contractor shall be responsible for leaving all areas affected by cable trenches, holes in the ground, and any other work done by him or on his behalf, in a clean and tidy state, and for making good all tarmacadam, concrete, paved or grassed surfaces.

14.1.5 Contractor's responsibility to make good any subsidence that may occur within six months of back-filling trenches, and, in case of tarred surfaces, to remove and re-tar with new material.

14.2 Routing:

14.2.1 Routes for underground cables are shown on the drawings.

14.2.2 Variation of these routes shall be approved by Engineer or Clerk of Works before trenching is done.

14.2.3 Contractor's responsibility to ensure that the routes of the cables are correct.

14.3 Pegs:

14.3.1 Contractor will be responsible for the replacement of any pegs disturbed or removed by him.

14.4 Trenching and Excavation by Others:

14.4.1 Contractor to co-operate closely with the Trenching Contractor at all times and is required to be in attendance during backfilling of all trenches, etc., to ensure that cables are not damaged in any way and that poles are correctly aligned.

14.5 Type of Material:

14.5.1 Unless otherwise specified elsewhere in this Specification or Bill of Quantities, Tenderers shall allow for excavating cable trenches and holes in earth. In addition, unit rates shall be provided for excavating in soft rock and hard rock.

14.5.2 Following definitions shall apply to the three categories: Where the conditions experienced are a combination of two or more of the conditions listed below, the Contractor shall be paid on rates in proportion to the contents of earth, soft rock or hard rock experienced in the excavations.

"Earth" shall mean ground that can be removed by hand and includes loose gravel, clay, made-up ground, loose or soft shale, loose ouklip, and boulders less than 75mm in diameter.

"Hard Earth" shall mean all hard ground such as ouklip, hard shale, decomposed rock, loose boulders and large stones, etc., which require the use of pneumatic tools, mechanical rippers and / or excessive hard labour to excavate and remove economically.

"Rock" shall mean granite, quartzite, dolomite, or other rock of similar hardness, which can only be excavated and removed economically by blasting, wedging or breaking.

14.6 Verification of Excavation Claims:

14.6.1 Notwithstanding any Provisional Amounts for excavation in rock included in the Schedule of Quantities, payment will only be authorised for excavation in ground other than “earth” and “hard earth” upon submission of documentary proof of such excavation made and signed as correct at the time trenches or holes were excavated.

14.6.2 In all cases where rock has to be excavated, or where poles, etc., have to be stabilised with concrete or by other means, in loose sand or in soft or waterlogged ground or where substitution of excavated material is necessary for backfilling, that the Engineer or Clerk of Works be notified before such excavation work is back-filled.

14.6.3 Amounts and type of rock encountered shall be measured by the Contractor in the presence of the Engineer or Clerk of Works.

14.7 Precaution with regard to other Services:

14.7.1 Contractor shall exercise extreme caution in his work to avoid damage to existing underground services.

14.7.2 Certain services may be indicated on the drawings but it is not to be assumed that these are the only services, nor that their indicated position is entirely accurate. Such information is given as a guide only and does not negate the above responsibility.

14.7.3 All excavation in the vicinity of other services must be undertaken by hand.

14.8 Compaction*:*

14.8.1 Care shall be taken in compacting pole holes, trenches crossing roads and those crossing or running under or within 1,0m of paved or tarred sidewalks.

14.8.2 In trenches, the backfill shall be replaced in 150mm layers and four to six passes with a vibrating pan compactor shall be made per layer. Around poles, a jumping jack shall be used on each 150mm layer.

14.8.3 When clay is encountered, Engineer should be advised and may instruct the Contractor to remove all such excavated material and replace it with more suitable material, which shall then be compacted as above.

14.8.4 Where material is too wet for proper compaction, it should be dried out and if too dry, shall be dampened.

14.8.5 In the case of road crossings, the excavated base and sub-base material shall be mixed and replaced up to the top level of the original sub-base. New material equal in composition to the original base course shall be supplied, this material being used for the full depth of the base course layer.

14.8.6 Degree of compaction required shall be field densities of 95% in respect of poles and road crossings and 90% in respect of sidewalks.

14.8.7 All trenches crossing roads and side walks shall be approved by the Civil Engineer, who will be responsible for the roads and pavements after hand-over. Engineer will, if the compaction is in doubt, arrange to have it independently tested and should the compaction prove to be below standard, the cost of the test will be debited to the Contractor, who will be required, at his own expense, to open and re-fill the trench or pole hole to obtain the specified compaction value.

15.0 MV AND LV CABLES

SANS 97	Electric cables - Impregnated paper-insulated metal-sheathed cables for rated voltages 3,3/3,3 kV to 19/33 kV (excluding pressure assisted cables)
SANS 1339	Electric cables - Cross-linked polyethylene (XLPE) insulated cables for rated voltages 3,8/6,6 kV to 19/33 kV
SANS 1507	Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1 900/3 300 V)
SANS 10198	The selection, handling and installation of electric power cables of rating not exceeding 33 kV Part 1
SANS 60227	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V
SANS 60502	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um = 1,2 kV) up to 30 kV (Um = 36 kV)
NRS 011	Pilot Cables
NRS 013	Medium -Voltage Cables
NRS 074	Low-voltage (600/1000 V) cable systems for underground electrical distribution
NRS 077	XPLE -insulated cables and accessories for system with nominal voltages of 44 kV, 66 kV, 88 kV and 132 kV
NRS 078	Long-span all-dielectric self-supporting fibre optic cable

CMB Standards:

15.1 General:

15.1.1 Type and insulation requirements for paper insulated, or cross-linked polyethylene MV cables specified elsewhere in Project Technical Specification.

15.1.2 PVC insulated cables for LV shall consist of PVC insulated conductors, PVC bedding, galvanised steel wire armouring and PVC sheath. The abbreviation for this type of cable is PVCAS.

15.1.3 Type and insulation requirements for service connection cables specified elsewhere in the Project Technical Specification.

15.1.4 All cables are to be installed in compliance with Manufacturer's recommendations.

15.1.5 Sizes and conductor material, i.e. copper or aluminium, are specified elsewhere in Project Technical Specification and drawings.

15.2 Cable Lengths:

15.2.1 All scheduled cable lengths are for tendering purposes only and Contractor shall measure actual lengths required before ordering.

15.2.2 Length of all cables will be re-measured after installation and lengths indicated in bill will be adjusted accordingly.

15.2.3 Contractor will be paid for actual lengths measured on site and any allowance for snaking, joints or ends must be incorporated in unit price.

15.3 Handling of Cables:

15.3.1 No cable shall be bent to a radius less than 12 times overall diameter of cable.

15.3.2 Bending or straightening shall be done slowly.

15.3.3 Engineer shall be notified immediately should there be any suspicion of moisture having entered a cable.

15.4 Cables fixed to Surface:

15.4.1 Where cables enter flush boards from cable sleeves, sleeve shall turn up to floor level and a duct shall be formed in wall to accommodate cable.

15.4.2 Care shall be taken to ensure that bending tolerance of cable is not exceeded in drawing cable into sleeve.

15.4.3 Edges of duct are to be lined with timber battens to which a bevel edged metal cover is to be screwed, using countersunk headed screws and cup washers.

15.4.4 Wherever cable saddles or any other items are to be fixed to structural components, use of dry plugs of wood will not be permitted. 'Rawl plugs' or other plugs to approval only shall be used.

15.4.5 Surface mounted cable protection pipes shall be galvanised and shall be fixed with saddles of 32mm x 3mm galvanised strap bolted to wall using bolts grouted in, 'Rawlbolts' or similar.

15.4.6 All cables rising on outside of buildings or on poles shall be protected by such pipes to a height of 3,0m above ground level.

15.4.7 Where a cable is installed fixed to a pole, it shall be attached to pole using stainless steel "Bandit" strap or equal.

15.4.8 Care shall be taken to ensure that straps are tightened correctly and that they do not distort or indent cable sheath.

15.5 Cables in Sleeves:

15.5.1 Cables shall pass in and out of buildings and under roadways and pavements in sleeves.

15.5.2 In addition, where cables cross or run along a boundary between two plots, these cables shall, where called for, be installed in sleeves.

15.5.3 All sleeves shall be installed in accordance with Clause "Sleeves" elsewhere in this Part.

15.6 Cables laid in Trenches:

15.6.1 Cables shall be laid at a depth as specified elsewhere in Project Technical Specification and drawings. Should no dimensions be indicated, installations shall comply with applicable standard.

15.6.2 Where two MV cables are run in same trench, they shall be laid a minimum of 300mm apart with separate cable slabs over each cable.

15.6.3 Where MV and LV cables are laid in same trench, MV cable shall be located on road side and LV cables on plot side of trench.

15.6.4 A horizontal distance of not less than 400mm shall be maintained between cables of different voltage groups.

15.6.5 Where a number of LV cables are run in same trench, they shall be laid with a minimum separation of 100mm. This applies to feeder cables only and not streetlighting and service cables which shall be only 25mm apart. Cables shall not cross each other.

15.6.6 Where cables run across erven parallel to lateral boundaries, they shall be located 1,0m from the boundary at a depth of 1,0m. If so specified they shall be run in sleeves, otherwise both MV and LV cables shall be protected by cable slabs and a PVC sheet marker laid 300mm above them.

15.6.7 Trench bottom shall be cleared of all sharp or protruding stones. Trench is then to be refilled with 150mm of soft material and compacted. A further layer of soft material shall be installed after cables are laid to provide 200mm cover for cable when compacted. Protective cable slabs a minimum of 50mm thick x 230mm wide shall then be laid in case of MV cables, as specified in Project Technical Specification, and PVC sheet cable marker strip 300mm wide with indelibly printed warnings every 150mm along its length, in case of LV cables. In cases where MV and LV cables run in same trench, 100mm of soft bedding for LV cables shall be situated above protective cable slabs. Where LV service cables or streetlighting cables only are installed, a clean trench bottom and soft material back-fill only is required,

15.6.8 Soft material described above may be either sand or backfill material sifted through a 3,0mm mesh grid.

15.6.9 Balance of trench is to be back-filled with excavated material from which all stones, etc. greater than 100mm in size have been extracted. All such material is to be removed from site.

15.6.10 Cable route markers shall be provided for all MV and main LV feeder cables at road, culvert and Telkom cable crossings, at all changes of direction, at joints and at intervals not exceeding 60 metres along the straight.

15.6.11 Cable route markers shall comprise concrete blocks in shape of truncated pyramids 300mm high, 150mm x 150mm at top and 225mm x 225mm at base. An aluminium plate 3,0mm thick minimum, with four rods 75mm minimum, welded to it on underside, shall be cast into top of concrete block, and plate shall have stamped on it cable data and direction arrows, and at a crossing, crossing shall be indicated.

15.6.12 Cable route markers shall be placed over cable, in trench way, and shall protrude 25mm above finished ground level but not where they are likely to cause an obstruction or be in way of moving traffic. Joint markers shall indicate as such. Contractor shall ensure that ground under and around cable marker is properly compacted.

15.7 Laying of Cables with other Services:

15.7.1 Where cables are laid in trenches containing water and other pipes, etc., electrical cables shall be laid along one edge of trench with other services occupying the other edge.

15.7.2 Cables shall be laid not less than 600mm from such service unless otherwise approved by the Engineer.

15.7.3 At road and services crossings, sleeves as described elsewhere herein shall be provided, one for each MV cable and a separate sleeve for other cables, unless otherwise indicated on drawings.

15.7.4 At Telkom cable crossings, power cables shall cross 300mm below and at right angles to all such cables or sleeves for future cables. Power cables shall be enclosed in uPVC sleeves with cable slabs over, both of which shall extend 1,0m either side of the crossing. No power cable running parallel with a Telkom cable shall be laid within a distance of 1,0m measured horizontally from the Telkom cable. Wherever existing buried Telkom cables are encountered, strict precautions and care shall be taken and close supervision given. Any damage to, or disturbance of Telkom cables whatsoever shall be immediately reported and confirmed in writing to the Engineer.

15.8 Labeling of Cables:

15.8.1 All cables shall be clearly labelled with an everlasting type of label.

15.8.2 Label shall state cable size and number of cores.

15.8.3 All main feeder cables shall be labelled to state from whence they are supplied.

15.8.4 Labels shall be so installed that they are easily readable.

16.0 MV AND LV CABLE JOINTS AND TERMINATIONS

SANS 808	Cable glands for use on flameproof enclosures (Ex d)
SANS 10198-9	The selection, handling and installation of electric power cables of rating not exceeding 33 kV.
SANS 1213	Mechanical cable glands
SANS 1803	Lugs and ferrules for insulated electric cables
NRS 053	Accessories for medium-voltage power cables (3,8/6,6 kV to 19/33 kV)

CMB Standards:

16.1 General:

16.1.1 Cable jointing and termination shall be carried out by a qualified cable jointer using only approved standard methods for particular type of cable. Proof of his training may be required.

16.1.2 Joints in all cables shall only be made at full drum length intervals, but where necessary and when approved by Engineer cable through joints may be used in other approved positions.

16.1.3 Where a cable has steel wire armouring all strands of armouring shall be through jointed.

16.2 Connections*:*

16.2.1 Cable connections shall be made by means of crimped or sweated lugs, firmly bolted, one plain and one lock washer being placed under nut, so that plain washer is against lug and there shall be no washer between lug and terminal. A plain washer is also required under the bolt head. Alternatively, sweated sytems fitting into clamp connections will be acceptable.

16.2.2 Crimped lugs shall be fitted using manual tools up to 70mm² and hydraulic tools from this size upwards. Approved tools are to be used in both cases. An hydraulic tool is to be used on all sizes of aluminium cable. Where a single point hydraulic crimping tool is used, lug shall be crimped in three places. Where a hexagonal die is used, this shall extend full length of lug.

16.2.3 Where aluminium cored cables are to be connected to circuit breakers, aluminium cable lug shall be bolted to a copper tag or tail, which is to be connected to circuit breaker. Ensure that sufficient Densal paste is installed on faces of lugs.

16.2.4 Where an aluminium cable is to connect to copper, lug shall be a bi-metal type lug with a copper spade and an aluminium ferrule friction welded to the spade.

16.2.5 Cable connections shall be made using brass bolts, nuts and washers, together with a star lock washer, on all kiosks, fused feeder panels and minisubs and with cadmium plated steel bolts and nuts on all indoor equipment.

16.2.6 All bolted joints shall be taped with self-vulcanising (not adhesive) tape, unless otherwise specified elsewhere in Specification.

16.2.7 Where cable connections are required to the MV and LV terminals of transformers, these shall be made off as follows:-

16.2.8 Red Phase to Terminal A

16.2.9 White Phase to Terminal B

16.2.10 Blue Phase to Terminal C

16.2.11 All transformer connections shall be kept in strict phase rotation and where two or more units are to operate in parallel, respective connections are to be checked for phase

rotation and polarity. In case of cable terminations to transformer bushings cable itself shall be clamped substantially to a post adjacent to transformer, connections to bushings being puttied and taped.

16.2.12 All connections are to be colour coded.

16.3 MV Cable Terminations:

16.3.1 PILCA Cables:

16.3.1.1 PILCA cable terminations are to be made in full compliance with recommendations of Supplier of termination system.

16.3.1.2 Where a PILCA cable is terminated onto an item of equipment with a cable box as in case of switchgear, whether indoor or outdoor, an outdoor type taped termination shall be used, unless otherwise specified in the Project Technical Specification.

16.3.1.3 Cable box must be effectively sealed against moisture but shall not be compound filled.

16.3.1.4 Standard compression type gland shall be used where cable enters cable box. Gland plate shall be effectively earthed to equipment earth bar.

16.3.1.5 For through joints a seamless non-porous type of straight through plumbed joint with cast iron protection box fitted with armour tape clamps and finally filled with compound or, heat shrink through-joint, shall be provided as specified in Project Technical Specification.

16.3.2 XLPE Cables**:**

16.3.2.1 XLPE cable terminations are to be made in full compliance with recommendations of Supplier of termination system.

16.3.2.2 Where an XLPE cable is terminated onto an item of equipment with a cable box as in case of switchgear, whether indoor or outdoor, an outdoor type taped termination complete with silicone tape shall be used.

16.3.2.3 Cable box must be effectively sealed against moisture but shall not be compound filled.

16.3.2.4 Standard compression type gland shall be used where cable enters cable box. Gland plate shall be effectively earthed to equipment earth bar.

16.3.2.5 Through joints in XLPE cables shall be provided with steel protective sleeves covering the joint.

16.3.3 Outdoor Terminations:

16.3.3.1 Outdoor cable ends to transformer or similar bushings, overhead line equipment or cable ends within minisubs shall be made with heat-shrinkable high voltage termination systems suitable for 5 - 69kV.

16.3.3.2 At all outdoor terminations a minimum of 3,0m of cable slack shall be provided adjacent to termination point.

16.3.3.3 Where a cold tail is joined to cable tail, this shall be done by means of a barrier ferrule. heat-shrink shall cover barrier ferrule.

16.3.3.4 Where cable tail itself is connected to lug or stud of an item of equipment, a sealed-end lug shall be crimped onto tail and lug connected to equipment. Heat-shrink shall cover all but spade of lug to prevent ingress of moisture.

16.3.3.5 Where a cable tail connects onto an overhead line, a solid centre sleeve shall be crimped onto cable tail and sleeve clamped to line. Heat-shrink is to overlap the sleeve to prevent the ingress of moisture.

16.3.4 LV Cable Terminations:

16.3.4.1 PVCAS cables shall be made off using adjustable mechanical glands.

16.3.4.2 Care shall be taken to ensure that armour wires are correctly seated in gland and that all parts are properly tightened.

16.3.4.3 Outdoors, in damp situations and in all minisubs and kiosks, neoprene waterproofing shrouds are to be fitted over all glands.

16.3.4.4 Wherever PVCAS cables are terminated to overhead lines a suitable moulded heat shrinkable glove to effect a watertight seal at crotch shall be used, in accordance with Manufacturer's instructions. Alternatively, a PVC cable cap may be used.

16.3.5 Service Cable Ends:

16.3.5.1 Service cable ends are to be located in positions indicated on drawings.

16.3.5.2 In general case, ends are to be located 1,0m from each of the front and lateral boundaries. Where they cross road in sleeves they are to be located 1,0m into erf directly opposite the sleeve.

16.3.5.3 No service cables are to be laid to erven directly behind kiosks or at pole positions.

16.3.5.4 Cables are to be left sealed with a heat shrink cap at a depth of 500mm, unless specified elsewhere in the Specification and drawings.

16.3.5.5 Before sealing, each cable is to be checked by Contractor, in Engineer's presence if he so decides, to ensure that it is correctly located and labelled at respective kiosk or pole.

16.3.5.6 After checking and sealing and while end of connection is still exposed, marker posts shall be installed at end of connection and vertically above it as detailed on drawings.

17.0 MV AND LV CABLE TESTING

SANS 97 Electric cables - Impregnated paper-insulated metal-sheathed cables for rated voltages 3,3/3,3 kV to 19/33 kV (excluding pressure assisted cables)

SANS 10198-13 The selection, handling and installation of electric power cables of rating not exceeding 33 kV Part 13: Testing, commissioning and fault location.

CMB Standards*:*

17.1 On completed sections of laid, jointed and terminated MV cables, a high voltage DC test of 15 minutes duration shall be carried out by persons qualified to make such tests.

17.2 Contractors must note that where such tests will include sections of cable which have already been in service, test voltages and duration are to be reduced in accordance with Engineer's instructions.

17.3 After cables have been laid, jointed and terminated, they may, if required, be subjected to appropriate test voltage as follows:

CABLES FOR EARTHED SYSTEMS							
TYPE	PVCAS[1]	BELTED		SCREENED		XLPE[2]	
Rated Voltage	600/1000	11000	22000	11000	22000	11000	22000
Between conductors - DC	3kV	31kV	60kV	-		18kV	36kV
Conductor to screen - DC	-	-	-	19kV	36kV	18kV	36kV
Conductor to earth - DC	3kV	19kV	35kV	19kV	36kV	18kV	36kV

[1] Test only when specifically called for

[2] Obtain instructions from the Engineer before testing.

18.0 MV AND LV OVERHEAD POWER LINES

SANS 182	Conductors for overhead electrical transmission lines
SANS 470	Concrete poles for telephone, power and lighting purposes
SANS 616	High-temperature wood-preserving creosote
SANS 673	Mixtures of copper-chromium-arsenic compounds for timber preservation
SANS 753	Pine poles, cross-arms and spacers for power distribution, telephone systems and street lighting
SANS 935	Hot-dip (galvanized) zinc coatings on steel wire
SANS 10280	Overhead power lines for conditions prevailing in South Africa
SANS 60282-1/IEC 60282-1	High-voltage fuses Part 1: Current-limiting fuses
SANS 60305/IEC 60305	Insulators for overhead lines with a nominal voltage above 1 000 V - Ceramic or glass insulator units for A.C. systems - Characteristics of insulator units of the cap and pin type
SANS 60372/IEC 60372	Locking devices for ball and socket couplings of string insulator units - Dimensions and tests
SANS 60383-1/IEC 60383-1	Insulators for overhead lines with a nominal voltage above 1 000 V Part 1: Ceramic or glass insulator units for A.C. systems - Definitions, test methods and acceptance criteria
SANS 61089/IEC 61089	Round wire concentric lay overhead electrical stranded conductors
SANS 61109/IEC 61109	Composite insulators for A.C.. overhead lines with a nominal voltage greater than 1 000 V - Definitions, test methods and acceptance criteria
SANS 61211/IEC 61211	Insulators of ceramic material or glass for overhead lines with a nominal voltage greater than 1 000 V - Impulse puncture testing in air
SANS 61284/IEC 61284	Overhead lines - Requirements and tests for fittings
SANS 61467/IEC 61467:1997	Insulators for overhead lines with a nominal voltage above 1 000 V - AC power arc tests on insulator sets
SANS 61643-1/IEC 61643-1	Low-voltage surge protective devices Part 1: Surge protective devices connected to low-voltage power distribution systems - Requirements and tests
SANS 61952/IEC 61952	Insulators for overhead lines - Composite line post insulators for alternative current with a nominal voltage > 1 000 V
NRS 022	Electricity distribution - stays and associated components
NRS 028	Cable lugs and ferrules - for copper and aluminium conductors
NRS 031	Alternating current disconnectors and earthing switches (up to 145 kV)
NRS 035	Outdoor distribution cut-outs
NRS 038	Concrete poles
NRS 039	Surge arresters for use in distribution systems
NRS 043	Code of practice for the joint use of structures for power and telecommunication lines
NRS 044	Working procedures and standards in respect of the installation of new electrical works and

	telecommunication facilities, or the extension or modification of such existing works and facilities
NRS 060	Code of practice for clearances for electrical systems with rated voltages up to and including 145 kV, for the safety of persons
NRS 066	Medium voltage insulators
NRS 073	Wood poles, cross-arms and spacer blocks
NRS 075	Mechanical torque shear connectors

CMB Standards:

18.1 General:

18.1.1 Overhead power lines shall be erected to ensure their compliance with requirements of Occupational Health and Safety Act, especially so far as clearances and factors of safety are concerned, as well as with requirements of Telkom's Regulations governing crossing, parallel running, etc. with Telkom lines and any other relevant Acts.

18.2 Surveying and Pegging:

18.2.1 Routes of overhead power lines are shown on drawings.

18.2.2 Contractor will be responsible for ensuring that route is accurately followed and that best locations are selected for poles, taking into account topographical conditions, road crossings, telephone crossings, buildings, gates, etc.

18.2.3 Contractor may not enter private property without owner's written consent.

18.3 Bush Clearance:

18.3.1 Bush clearing includes removal of all trees and bush within 5,0m of centreline of line and for lopping of branches encroaching within this area. Extend of bush clearing will be itemised in Bill of Quantities.

18.3.2 Under no circumstances are protected indigenous trees to be removed or lopped without written permission of Engineer.

18.3.3 All material is to be removed from Site although Contractor shall not be deemed to have ownership of any such material.

18.4 Supports:

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

18.4.2 All poles, crossarms, props and structures made from wood poles shall be Pinus-Radiata. No bent, bowed or split poles will be accepted. All rejected poles shall be removed and replaced at Supplier's / Contractor’s expense.

18.4.3 All poles shall be preserved with creosote and all crossarms with a mixture of creosote and waxy oil or, if so specified, with a copper-chromium-arsenic mixture otherwise referred to as 'Tanolith'.

18.4.4 All poles shall carry SABS mark.

18.4.5 Lengths, top diameter, etc., of poles required are given in Project Technical Specification.

18.4.6 Extreme care shall be taken to ensure that correct size of pole is used at strain and intermediate positions.

18.4.7 All wood poles and crossarms are to be banded by nailing and stapling.

18.4.8 Poles up to 10m shall be planted 1,5m in ground, longer poles 1,8m in ground, unless detailed elsewhere in Project Technical Specification.

18.4.9 Care shall be taken to ensure poles are planted plumb and in line and are properly compacted in accordance with the Clause "Trenching, Excavation and Compaction" elsewhere in this Part.

18.4.10 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 coated with a creosote/tar mixture.

18.4.11 "Shell" of treated poles shall not be damaged by cutting, shaving or drilling unnecessary holes.

18.5 Pole Holes:

18.5.1 It is preferred that pole holes be auger drilled.

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

18.6 Wood Crossarms:

18.6.1 Shall be of suitable lengths and diameter as detailed in Project Technical Specification.

18.7 Steel Crossarms

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

18.8 Insulators:

18.8.1 Type and material of MV and LV insulators shall be as specified elsewhere in Project Technical Specification.

18.8.2 MV Strain insulators are clevis/tongue and shall be "in-line" for tension and "twisted" for suspension applications. A thimble clevis, aluminium for aluminium conductor and cast iron for copper conductor, shall be used.

18.8.3 All spindles mounted on wooden poles or cross-arms are to be bonded with 16mm² HD bare copper.

18.8.4 Type of construction, method of insulator support, details of brackets, spacing, etc., together with details of insulators for other duties or voltages are specified in Project Technical Specification.

18.9 Cross-arm Fixing:

18.9.1 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 hot dipped galvanised braces shall stabilize cross-arms.

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

18.10 Pole Washers:

18.10.1 All bolts used in wood pole construction, all "D" bracket fixing bolts, "A" frame fixing bolts, crossarm bolts, etc. are to be fitted with suitable heavy duty galvanised pole washers below nut.

18.11 Conductor:

18.11.1 Full details of conductors required are given in Project Technical Specification.

18.11.2 Stringing of conductors shall be carried out in accordance with sag curves given in SAIEE "Code of Practice for Overhead Power Lines". Before making off at appropriate tension, conductors shall be over strained to 45% of their breaking strain for 20 minutes.

18.11.3 At strain points "Preformed" dead-ends shall be used.

18.11.4 Binding-in at intermediate MV insulators shall be carried out using "Preformed" twin-ties. Care shall be taken to ensure that ties are correctly sized for both insulator and conductor.

18.11.5 For binding-in of aluminium conductor, armour rods shall always be used except where armouring is automatically provided by use of the proprietary tie installed. In this case extreme care should be taken to ensure that all recommended conductor protection pads are properly in place.

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

18.12 Mid-span Joints:

18.12.1 Approved type proprietary mid-span joints shall be used for copper to copper or for aluminium to aluminium conductors.

18.12.2 Such joints shall be made strictly in accordance with the Manufacturer's instructions.

18.12.3 Mid-span joints of dis-similar conductors will not be permitted.

18.13 Connections and Joints:

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

18.13.2 For aluminium to aluminium or copper to copper non-tension joints, these shall be parallel groove clamp, double line 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 cold compression type.

18.13.3 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 same material as line, shall be joined by means of bi-metal connectors to prevent electrolytic corrosion occurring, and installed in accordance with Manufacturer's recommendations.

18.13.4 Where copper cables not larger than 25mm² 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, copper conductor must be below aluminium to reduce risk of electrolytic corrosion.

18.13.5 All aluminium to aluminium joints are to be coated with "Densal" paste, regardless of method of jointing, and are to be wrapped in "Denso" tape, unless detailed elsewhere in Project Technical Specification.

18.14 Fittings:

18.14.1 All fittings shall be selected to ensure that their factor of safety is in compliance with Code of Practice at maximum design tension.

18.14.2 Pigtail hooks will not be accepted.

18.14.3 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, and shall comply with any other requirements elsewhere in this Specification.

18.15 Stays:

18.15.1 Stays shall be provided as indicated on drawings, and in any other places necessary for proper stability.

18.15.2 Stay wires shall be galvanised steel of 700MPa UTS and shall be 12mm diameter 1/7/4,00mm.

18.15.3 Stays shall, in all cases, be looped twice around pole at a point mid-way between two bolts in case of an 'A' frame construction or at level of middle conductor in case of a vertical construction. Where two stays are called for, these shall be between vertical conductors, or at top and bottom bolts of an 'A' frame.

18.15.4 Stay rods shall be galvanised steel of 400/500MPa UTS of circular section, inc. turnbuckle. Shall have at least 30% take up remaining after line has been tensioned. Stay rods shall be 20mm dia and 2,5m long and base plates shall be 450mm square.

18.15.5 In case of LV ABC lines, rod shall terminate in an eye and no turnbuckle shall be used, guy grip being made off into eye with a GMS 'U' bolt at end of grip.

18.15.6 All stays shall, except in case of LV ABC lines, be fitted with stay insulators. Shall be located not less than 5,0m above ground.In case of ABC lines stay wire is to be bonded to neutral conductor.

18.15.7 Angle between stay wire and pole shall be as near to 45° as possible, but shall not be less than 35°.

18.15.8 Stay wire shall be attached to poles and stay rods using "Preformed" pole and guy grips as required.

18.15.9 Wooden, or approved uPVC, stay guards, shall be fitted to all stays readily accessible to pedestrian or vehicular traffic. Guards shall be painted in alternate yellow and black cross stripes along their complete length.

18.15.10 Flying stays shall be installed as indicated on drawings.

18.16 Props (Struts):

18.16.1 Wood props shall be provided as indicated on drawings.

18.16.2 A concrete block shall be installed at pole butt to decrease ground pressure.

18.17 Cradles and Cradle Supports*:*

18.17.1 Cradles shall be in the form of two stringer wires of 16mm² hard drawn solid copper, with cross-rungs of same wire at 600mm intervals.

18.17.2 Cradle wire stringers shall be securely fixed to each cross-arm and at shackle points. Two clamps per stringer wire shall be used for fixing.

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

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

18.18 Bonding of Steelwork:

18.18.1 All equipment, steelwork, cross-arms, insulator supports and any other hardware on a pole is to be bonded in accordance with Clause "Earthing and Bonding" elsewhere in this Part.

18.19 Expulsion (D) Fuses:

18.19.1 Expulsion fuses, three units to a set, suitable for voltage specified, shall be provided as shown on drawings.

18.20 Links:

18.20.1 Type of links (set of three) specified in Project Technical Specification.

18.20.2 All steelwork shall be hot dip galvanised.

18.21 Lightning Arrestors:

18.21.1 Arrestors shall, be rated as follows for 11kV and 22kV operation. eak values shall apply with a 1,2/50 wave form and peak discharge voltages with 8/20 micro-second current wave of 10kA.

Nominal Voltage	kV	11	22
Rated Voltage	kV	11	24
Rated Current	kA	10	10
Minimum Flash-Over Voltage	kV rms	17.5	38
Peak Flash-Over Voltage	kV rms	44	80

18.21.2 A set shall comprise three units, complete with suitable steel cross arm mounting bracket.

18.21.3 Earthing shall be by means of a 40mm² bare copper conductor to an earth spike, as specified in the Clause "Earthing and Bonding" elsewhere in this Part.

18.21.4 Where arrestors have a connection of a metal not compatible with earth conductor, a sacrificial tail shall be used, generally as specified in Sub-Clause "MV and LV Cable Joints and Terminations" elsewhere in this Part.

19.0 MV AND LV AERIAL BUNDLED CONDUCTOR

SANS 1418	Aerial bundled conductor systems
SANS 1713	Electric cables - Medium-voltage aerial bundled conductors for voltages from 3,8/6,6 kV to 19/33 kV

CMB Standards*:*

19.1 General

19.1.1 Aerial bundled conductor shall be erected on wood poles whose supply and erection shall comply with Clause "MV and LV Overhead Power Lines" elsewhere in this Part.

19.1.2 Where mid-block distribution is called for construction must comply with Telkom's "Guidelines for Sharing of Structures Supporting Aerial Power Conductors and Telecommunication Lines".

19.2 Description:

19.2.1 Size of all conductors, together with details of any auxiliary (ie. streetlighting) cores or earth cores, shall be as specified in Project Technical Specification.

19.2.2 Supporting system shall be Trench type, i.e. supporting core system.

19.3 Suspension System:

Only three or four items of hardware shall be used for suspension of bundle irrespective of size of phase, neutral, streetlighting and earth cores. These items shall be:

1) Dead end or strain clamp assembly
2) Suspension clamp assembly
3) Suspension bracket
4) Eye bolts

19.3.1 Dead end or strain clamp assembly:

19.3.1.1 Shall comprise a heavy duty reinforced plastic body into which fits a glass fibre reinforced plastic or similar moulding designed to hold bundle in tension without damaging its insulation.

19.3.1.2 Clamp shall be attached to pole by means of an aluminium alloy bracket bolted to pole, a suitable pole washer being used on 16mm diameter bolt. Fixing with stainless steel strapping will not be accepted.

19.3.2 Suspension clamp assembly:

19.3.2.1 Shall comprise a support bracket of aluminium alloy with a suitable weather and wear resistant insert, the whole designed to hold the bundle rigidly into the clamp, while the clamp shall be unable to come loose from the suspension bracket.

19.3.2.2 Clamp shall be so designed that it can accommodate an angular line deviation of up to 35° when turning away from pole.

19.3.2.3 Clamp shall be attached to pole by means of an aluminium alloy bracket bolted to pole, a suitable pole washer being used on 16mm diameter bolt. Fixing with stainless steel strapping will not be accepted.

19.3.2.4 Suspension brackets shall be so designed that should line be subjected to excessive downward force due to a fallen tree etc, bracket will shear to prevent breakage of line.

19.3.3 Service conductor strain clamp assembly:

19.3.3.1 Shall generally comply with above, as appropriate, but strain clamp shall be fixed to pole by means of a threaded eye bolt, fitted complete with pole washer.

19.4 Joints and Terminations:

19.4.1 Bundled conductor jointing and termination shall be carried out by a qualified cable jointer using only standard methods approved by Manufacturer for particular type of bundle.

19.4.2 While mid-span joints will be accepted in LV conductor installations, they will not in case of MV installations.

19.4.3 All unconnected ends of line cores shall be sealed with an approved heat-shrink end cap.

19.4.4 MV connections shall be made using an approved heat-shrink termination for cable, as specified in Clause "MV and LV cable Joints and Terminations" elsewhere in this Part, and a termination system approved by the MV bundle Manufacturer for the line conductors.

19.5 Tap-off Connections:

19.5.1 Only tap-off connectors approved by bundle Manufacturer shall be used for connecting to bundled conductor.

19.5.2 Connectors (irrespective of conductor size) shall be of watertight, piercing type, to permit connection to a live cable without stripping of any insulation.

19.5.3 Contact faces of connectors shall have a sealant having a very high resistance to tracking, shall be watertight and have a minimum dielectric strength of 6kV.

19.5.4 Connectors shall have a main body manufactured of glass fibre reinforced plastic or similar material.

19.5.5 Contact faces of clamps shall have inserted copper alloy contact plates with teeth, which shall penetrate conductor insulation and establish sound electrical contact when bolt(s) that hold connector together are tightened. Bolts shall be hot dip galvanised.

19.5.6 Connector shall be suitable for insulated aluminium and copper conductors and shall be designed so that electrolytic corrosion does not occur. Entire construction shall be such that no part may be dislodged or lost during storage or installation.

19.6 Installation:

19.6.1 Installation shall be carried out in accordance with Manufacturer's recommendations. , the Contractor is to ensure that his employees erecting the system are familiar with all aspects of aerial bundled conductor, and shall be suitably equipped to install it.

19.6.2 Ground clearance of bundled conductor shall comply with latest requirements of Occupational Health and Safety Act.

19.6.3 Conductor shall be bound with heavy duty cable ties either side of all suspension points, at strain points and either side of all take-off points.

19.7 Earthing:

19.7.1 Earthing of neutral and/or earth conductor is to comply with appropriate requirements of Clause "Earthing and Bonding" elsewhere in this Part.

20.0 LIGHTNING PROTECTION

SANS 10313	The protection of structures against lightning
SANS 62305/IEC 62305	Protection against lightning

21.0 LV WIRING AND CONDUIT FOR LV WIRING

SANS 950	Unplasticized polyvinyl chloride rigid conduit and fittings for use in electrical installations
SANS 1507	Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1 900/3 300 V)
SANS 1574	Electric flexible cores, cords and cables with solid extruded dielectric insulation
SANS 10142-1	The wiring of premises Part 1: Low-voltage installations
SANS 60614	Conduits for electrical installations
SANS 61035	Specification for conduit fittings for electrical installations

CMB Standards:

21.1 Size of conductor as per Project Technical Specification.

21.2 Loop-in system is to be adopted throughout any conduit installation.

21.3 Circuit wiring for different services, e.g. lighting and power, shall be run in separate conduits.

21.4 Where switches fed from different phases are mounted adjacent, they must be mounted in separate boxes or a single box with a fixed metal barrier between each switch.

21.5 Metal conduit shall be heavy gauge solid lap welded steel, screwed or plain-end galvanised, both as specified in Project Tchnical Specification.

21.6 All metallic conduit shall be manufactured from mild-steel with a minimum thickness of 1,6mm in respect of screwed and 0,9mm for plain-end conduit except that when used in concrete slabs, plain-end conduit shall have a minimum wall thickness of 1,2mm and when laid in screed on top of concrete slabs, 1,6mm.

21.7 Only plastic saddles and compatible fittings shall be used with non-metallic conduit.

21.8 Earth wires shall be installed with all non-metallic conduits.

21.9 All conduit fittings for steel conduit shall be malleable iron or pressed steel except for brass bushes.

21.10 Use of inspection tees or elbow pieces and internally screwed solid bends will not be permitted.

21.11 All conduit shall, wherever possible, be concealed by being cast in concrete slabs, chased in, built in or run in roof spaces.

21.12 When run in surface beds conduit is to be galvanised and is to be laid in concrete on surface bed so that it is completely covered.

21.13 Conduit cast in concrete shall be fixed at intervals to ormwork.

21.14 Where hollow tile slabsare being used in structure back entry conduit boxes shall be used.

21.15 All outlet boxes for lighting points shall be of long spout, deep type.

21.16 Where structural expansion joints occur, conduits shall, as far as possible, be laid to avoid crossing joint.

21.17 When crossings are unavoidable, the following arrangement shall be made. From a drawbox, or the nearest outlet within 4,0m of the joint, conduit of one size larger than necessary for the wire sizes, shall be run straight, and at right angles to the joint, finishing at the joint. Conduit of the required size shall then be passed into this from the other side of the joint, bushed inside the draw-box, but not mechanically connected otherwise. Care shall be taken to prevent concrete from entering the end of the larger conduit. The

Conduits approaching from both sides of the expansion joint shall be wrapped with two layers of corrugated cardboard from a point 1,0m from the joint. A bare earth wire of the same size as the wiring in the conduit shall be run from the drawbox to the next outlet, connecting firmly and solidly to each box. Care shall be taken to exclude the ingress of dirt or moisture to partially completed runs, and all open ends shall be plugged temporarily while work is not actually in progress. Plug may consist of a conduit socket with brass ET plug or conduit fishtail, or purpose made tightly fitting plastic sealing caps. Wooden or paper plugs will not be acceptable.

21.18 Conduit in false ceiling spaces shall be run surface.

21.19 In roof spaces all conduit runs shall be parallel or at right angles to trusses and joists.

21.20 Where conduits run along trusses and joists they shall not be run or fixed on top but on side.

21.21 Conduit shall lead into and out of back entry conduit boxes at all fitting positions. All such boxes shall be finished flush with the underside of ceiling and lighting fittings shall be screwed directly onto box.

21.22 At ceiling positions where conduit runs do not have to continue to next truss (e.g. last point in a row), conduit shall be extended beyond box to next truss. This conduit extension shall be plugged.

21.23 Where conduit is run on surface, it shall be fixed with stand-off saddles, multiple spacer saddles being used for conduits run together.

21.24 Maximum distance between saddles shall not exceed 1,5m.

21.25 Conduit box lighting fitting shall be fixed within 100mm on either side of box.

21.26 Where conduits have to run adjacent to gas or cold water pipes, communication or data circuits, they shall be prevented by spacing or other means from coming into contact with these other services under any condition.

21.27 Under canopies, outlets for future signs, etc., which have been terminated in round conduit boxes, are to be blanked off with 75mm dia galvanised cover plates finished with a zinc plumbate primer. These are to be fitted prior to painting and are to be fixed using cheese headed brass machine screws.

21.28 Where conduit enters boards, trays, etc., locknuts shall be used inside and outside, with female bushes inside. Same arrangement shall be used wherever possible for entry into switch boxes, control gear, etc., provided with clearance holes. Where this arrangement does not allow sufficient wiring space, however, couplings and hexagonal male bushes may be used, but must be very tightly screwed up. In case of multiple back entries into a conduit box, male bushes and couplings are to be used.

21.29 Care must be exercised when laying conduit in vicinity of distribution boards of any type to ensure that conduits radiate from these points in order. Under no circumstances are more than two conduits to cross at any point where cast in concrete and a space of at least 20mm must be left between all conduits both vertically and horizontally after emerging from distribution point.

21.30 Drops to switch and other high level outlets shall be from ceiling while conduit to low level outlets shall be run in floor. In basements and ground floor areas which are below natural ground level, all conduits to any type of outlet shall drop from ceiling level.

21.31 No draw boxes which are not, in themselves, outlets shall be permitted. Notwithstanding Wiring Code, if it proves necessary to draw conductors round more than two 90° bends, or equivalent, or on very long straight runs, draw boxes are required. Maximum length of straight runs between draw boxes shall not exceed 20m. Such draw boxes shall be provided with oversize flat covers fitted flush with ceiling, fixed with cheese-headed screws.

21.32 Contractor is responsible for checking with Building Contractor by reference to drawings on site, of positions where paneling, tiling, tile edging or dados, etc., may affect exact positioning of outlets.

21.33 All setting of conduit shall be done with approved tools. No kinks will be accepted. Where necessary, boxes with special configurations shall be used to avoid necessity for too many sets in conduit work.

21.34 Conduit shall be run or erected in straight or symmetrical lines, with easy sets or bends. Care shall be taken when installing conduit that cut ends are completely free from burrs and sharp edges which might damage conductors. All open ends shall be fitted with brass bushes. Composition bushes will not be accepted. All bushes are to be fitted prior to wiring. All running joints shall be fitted with lock-nuts, and lock-nuts shall be provided wherever necessary to ensure that all conduit joints in installation are tight.

21.35 Where conduit only is required, draw-wires shall be left in each such conduit, irrespective of service for which it is required. Draw-wires shall be minimum 1,6mm dia hot dipped galvanised steel.

21.36 Conduit run on surface within ducts shall be painted an approved colour under this Contract. Conduit in false ceilings and roof spaces is not to be painted.

21.37 Contractor must ensure that, prior to final completion, all openings left at conduit exit from switch rooms or between floors in rising ducts, are made good.

22.0 LV SWITCHES, SOCKET OUTLETS, PLUGS AND BOXES

SANS 164	Plug and socket-outlet systems for household and similar purposes for use in South Africa
SANS 1085	Wall outlet boxes for the enclosure of electrical accessories
SANS 1239	Plugs, socket-outlets and couplers for industrial purposes
SANS 10142-1	The wiring of premises Part 1: Low-voltage installations
SANS 60309	Plugs, socket-outlets and couplers for industrial purposes
SANS 60669	Switches for household and similar fixed-electrical installations
SANS 60670	Boxes and enclosures for electrical accessories for household and similar fixed electrical installations
SANS 60884	Plugs and socket-outlets for household and similar purposes
SANS 60906	IEC system of plugs and socket-outlets for household and similar

CMB Standards:

22.1 Type, size, finishing and IP rating (in case of weatherproof) plugs and switches will be specified in Project Technical Specification.

22.2 Samples of all switches and socket outlets shall be approved by Engineer before installation.

22.3 Weatherproof and watertight switches and socket outlets are to be semi-recessed in a manner to be discussed with Engineer to ensure their acceptable mounting, especially in case of facebrick walls.

22.4 Contractor is to ensure that the Plasterer covers right to edge of various boxes since gaps between plates and plaster will not be accepted, and it is deemed the Contractor's responsibility to ensure that no such gaps are visible.

22.5 Switches and socket outlets shall be mounted at dimensions as indicated in the Project Technical Specification or depicted on drawings.

23.0 LIGHT FITTINGS

SANS 56	Incandescent lamps.
SANS 475	Luminaires for interior lighting, street lighting and floodlighting - Performance requirements
SANS 890	Ballasts for fluorescent lamps
SANS 1012	Electric light dimmers (Metric units)
SANS 1777	Photoelectric control units for lighting (PECUs
SANS 101141	Interior lighting
SANS 60238	Edison Screw Lamp holders
SANS 60598	Luminaires
SANS 60921	Ballasts for tubular fluorescent lamps - Performance requirements
SANS 61184	Bayonet Lamp holders
SANS 61347	Lamp control gear
VC 8043	Incandescent Lamps

CMB Standards:

23.1 Allowance shall be made for light fittings as specified in Project Technical Specification.

23.2 Fittings to be installed at each point are detailed on drawings according to code types set out in in Project Technical Specification.

Fittings shall be directly fixed to ceiling or structure in addition to being fixed to the conduit box.

24.0 PADLOCKS

CMB Standards:

24.1 All padlocks shall be provided by Contractor.

24.2 In case of extensions to existing installations, all padlocks shall match existing with same combinations.

24.3 Padlocks with stainless steel shackles shall be provided.

24.4 Padlocks shall operate with a master key in addition to individual key. Where special combinations are required these will be stated elsewhere in Project Technical Specification. Padlocks and keys shall be stamped with combination number. Three (3) sets of keys for each combination shall be provided.Keys shall be handed to Employer's authorised Representative and a receipt obtained.

Following equipment shall be fitted with padlocks:

Combination No. 1.

Outdoor substation gates.

Transformer tap-change switches.

MV switches and isolators.

Minisub MV compartment doors.

Combination No. 2.

Minisub LV compartment doors.

Distribution kiosk doors.

Combination No. 3.

Doors of compartments containing consumer meters.

25.0 HOT DIP GALVANISING

General Hot Dip Galvanizing Standards:

SANS 32	Hot-dip (galvanized) zinc coatings (other than on continuously zinc-coated and sheet wire)
SANS 121	Hot-dip (galvanized) coatings on fabricated iron and steel articles
SANS 10094	The use of high strength friction grip bolts
SANS 14713	General principles of design and corrosion resistance

Mechanical Cleaning and Zinc Thermal Spraying Standards:

SANS 2063	Metallic and other inorganic coatings

Continuously Hot Dip Galvanized Sheeting Standards:

SANS 4998	Continues hot dip zinc coated carbon steel sheet of structural quality
SANS 3575	Continues hot dip zinc coated carbon steel sheet of commercial, lock forming and drawing qualities
SANS 9364	Continues hot dip aluminium / zinc coated steel sheet of commercial, drawing and structural qualities
SANS 14788	Continues hot dip zinc / 5% aluminium alloy coated sheets

Continuously Hot Dip Galvanized Wire Standards:

SANS 675	Zinc coated fencing wire
SANS 935	Hot dip galvanized zinc coatings on steel wire
SANS 10244	Steel wire and wire products

CMB Standards:

25.1 Before galvanising, all cutting, drilling, welding, etc., shall be complete.

25.2 Galvanised parts shall be stored under cover and in stacks such that no part is resting on another and there is sufficient ventilation to prevent condensation occurring. No galvanised parts shall be stored directly on ground but on pallets or similar protection.

26.0 PAINTING

SANS 1274 Coatings applied by the powder-coating process

CMB Standards:

26.1 Equipment that is delivered to site painted shall, after installation, and as near as possible to handover be inspected for damaged paintwork and be touched up, if necessary, according to manufacturer's recommendation.

26.2 Where any galvanised or zinc coated surface has been damaged or cut, this shall be touched up using an organic zinc rich epoxy primer (containing min. 90% zinc).

27.0 LABELS AND NOTICES

SANS 1186 Symbolic safety signs

CMB Standards:

27.1 Contractor shall arrange for labeling of all equipment, instruments, meters, relays, cables, etc.

27.2 Where identical items of equipment can be removed from their housings, e.g. circuit breaker carriages, plug-in relays etc., both fixed and withdrawable portions are to be labeled identically.

27.3 All labels shall be ivorine or other back engraved white on black labels of sizes indicated.

27.4 Labels are to be located in purpose made holders or otherwise are to be screwed or riveted into position.

27.5 "Dymo" tape or similar labels will not be accepted nor will labels which are glued in position only.

27.6 Labels on poles shall be manufactured from a material as specified in Project Technical Specification with the designated number. Labels shall be nailed to pole 3,5m above ground level, unless otherwise specified in the Project Technical Specification. Nails shall be electro-galvanised clout nails.

27.7 Prior to any equipment being labeled, Contractor shall request Engineer to provide a complete labeling schedule for all items of equipment. Under no circumstances is equipment to be labeled in accordance with tender drawings since any description thereon is for identification purposes during construction only and is unlikely to apply to the completed Works.

27.8 Following list indicates general labeling requirements but does not limit extent of labeling required, which shall encompass full extent of equipment supplied, or in case of existing equipment, any such which is affected by this Contract.

27.8.1 50mm high lettering:-

Substation and minisub designation.

Outdoor switchgear designation. Transformer designation.

Distribution kiosk and fused feeder panel designation.

27.8.2 20mm high lettering:-

Main or sub-main board designation. Control panel designation.

Indoor switchgear designation.

27.8.3 10mm high lettering:-

Individual switches on switchgear.

Cubicles.

Sub-distribution board designation.

Poles for OH lines.

27.8.4 5mm high lettering:-

Minisub feeder breakers and isolators.

Distribution kiosk feeder breakers and isolators.

General distribution switchgear.

Meters, instruments and relays.

Multiplying factors.

27.8.5 3mm high lettering:-

This size shall be used to designate conductor size and number of cores of each cable. In addition, all feeder cables shall be labelled to state from whence they are fed.

27.9 All substations, minisubs, kiosks, transformer rooms and switchrooms shall be provided with notices as required by Occupational Health and Safety Act. All doors to such locations shall be fitted with appropriate notices.

27.10 Where more than one similar item of equipment is fed from same board or control panel, item itself shall be labeled, this being fixed in a permanent position, i.e. not attached to motors, pumps, etc., but to bases or adjacent thereto. The lettering shall be 50mm high.

28.0 DISMANTLING

CMB Standards:

28.1 Where dismantling of existing parts of installation is called for, all components including wire, insulators, poles, cable, switchgear, transformers, etc., are to be removed and handed to appropriate Authority.

28.2 Under no circumstances is any material or equipment to be taken over by Contractor.

28.3 In case of reclamation of conductor, this is to be done after removing binding wires on intermediate insulators so that full strain lengths are recovered.

28.4 All such material is to be neatly coiled, packed, etc., as appropriate.

28.5 Extreme care is to be taken in dismantling all such equipment, since it will be re-used by Employer.

28.6 If, in opinion of Engineer, unnecessary damage is done, cost of replacing such equipment will be debited to Contractor's account.

28.7 Receipt detailing all equipment and materials delivered in accordance with above must be obtained and a copy submitted to Engineer.

29.0 INSPECTION, TESTING AND COMMISSIONING

CMB Standards:

29.1 Engineer shall have access at all reasonable times to such parts of the Works or Contractor's premises or premises of Manufacturer of component parts, as may be necessary for purpose of inspecting, examining and testing materials, workmanship and performance of any plant or equipment specified for Works.

29.2 Contractor shall ensure that complete project and inspection, testing and commissioning of any equipment shall be done as per the applicable SANS or BS Specification.

29.3 Contractor shall supply all equipment necessary for testing and commissioning procedures.

29.4 Contractor shall provide duplicate test certificates relating to cable tests, current injection tests of all instruments, meters and relays and results of earth mat tests.

30.0 COMPLETION OF WORKS

CMB Standards:

30.1 Completion of works will be executed as per relevant contract conditions.

31.0 CERTIFICATE OF COMPLIANCE

CMB Standards:

31.1 Contractor to complete and submit certificate of compliance as per the relevant contract conditions.

C4 SITE INFORMATION

The location and access to the site is indicated on the locality plan provided on Drawing No. 10599/E/01.

The site conditions in Humansdorp are as follows:

Altitude above sea level:	±200m
Max temperature:	40ºC
Min temperature:	-5ºC
Max relative humidity:	±70%
Ambient atmosphere:	Coastal climate with corrosive conditions

Approximate GPS coordinates are as follows:

Latitude	-34.018957˚
Longitude	24.754566˚

ANNEXURE A

Engineer's Drawings

The following Electrical Engineers' Drawings are attached to this Document and are applicable to this installation:

Drawing No.	Description
10599/E/01	PLAN LAYOUT & SCHEMATIC DIAGRAM
10599/E/02	TYPICAL 315kVA POLE MOUNTED TRANSFORMER
10599/E/03	TYPICAL POLE MOUNTED TRANSFORMER EARTHING DIAGRAM
10599/E/04	POLE MOUNTED TRANSFORMER LEGEND AND NOTES
10599/E/05	11/22kV O/H LINE: "A" FRAME FOR SINGLE/DOUBLE STRAIN POLES
10599/E/06	11/22kV O/H LINE: CROSS-ARM FOR USE WITH "A" FRAME AT TEE-OFF'S AND RIGHT-ANGLE TURNS
10599/E/07	22kV STRAIN STRUCTURE FOR VERTICAL CONSTRUCTION
10599/E/08	22kV INTERMEDIATE STRUCTURE FOR VERTICAL CONSTRUCTION
10599/E/09	MV/LV O/H LINE: SINGLE STAY STRUCTURE
10599/E/10	MV/LV O/H LINE: FLYING STAY STRUCTURE
10599/E/11	MV/LV O/H LINE: PROP STRUCTURE
10599/E/12	TYPICAL MOUNTING DETAIL OF SECTOS POLE MOUNTED LOAD BREAK SWITCH
10599/E/13	LV O/H LINE: TERMINAL POLE
10599/E/14	LV O/H LINE: INTERMEDIATE POLE
10599/E/15	LV O/H LINE: STRAIN POLE WITH CONSUMER SERVICE CONNECTION BOX FOR O/H SERVICE CONNECTIONS
10599/E/16	LV O/H LINE: INTERMEDIATE POLE WITH CONSUMER SERVICE CONNECTION BOX FOR O/H SERVICE CONNECTIONS
10599/E/17	LV O/H LINE: INTERMEDIATE POLE WITH TWO CONSUMER SERVICE CONNECTION BOXES (6 < CONSUMER)
10599/E/18	MOUNTING BOARD DETAIL FOR SPLIT PREPAID kWh METER KEYPAD (UIU) AND READY BOARD
10599/E/19	O/H SERVICE CONNECTION: TYPICAL INSTALLATION IN HOUSE: PROPOSED METHOD AND ALTERNATIVE "A"
10599/E/20	O/H SERVICE CONNECTION: TYPICAL INSTALLATION IN HOUSE: ALTERNATIVE "B"
10599/E/21	LEGEND FOR DRAWING NO'S 10599/E/19 & 20
10599/E/22	NOTES FOR DRAWING NO'S 10599/E/19 & 20
10599/E/23	POLE MOUNTED CONSUMER SERVICE CONNECTION BOX (CSCB) FOR MAX 6 x SPLIT PREPAID kWh METERS

ANNEXURE B

Project Notice Board

The following drawings of the project notice board are bound into this document over leaf and must be used when constructing and erecting the engineer's project notice board:

Drawing No.	Description
10599/E/24	PROJECT NOTICE BOARD
10599/E/25	PROJECT NOTICE BOARD SUPPORT STRUCTURE DETAIL