



CLINKSCALES MAUGHAN - BROWN
CONSULTING MECHANICAL
& ELECTRICAL ENGINEERS

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Our ref: JDV/jdv/10541

26 February 2022

To Whom it May Concern

Dear Sir/Madam,

LANGEBERG MUNICIPALITY: TENDER NO. 06/2022
ELECTRIFICATION OF 172 FORMAL HOUSES AT NKQUBELA, ROBERTSON

Enclosed herewith please find the tender documentation for the abovementioned project, consisting of:

- (i) Tender Document No. 06/2022.
- (ii) Drawing No.'s 10541/E/01 to 03 and 10541/E/04 to 33 are bound into the specification under Annexures A and B.

The closing time for submission of tenders is 12H00 on Friday, 11 March 2022.

Your tender must be sealed in an envelope clearly marked with the tender number and title given above, and placed in the **tender box at the offices of Langeberg Municipality, 28 Main Road, Ashton** before the closing date and time. Telegraphic, telephonic, telex, facsimile, e-mail and late tenders will not be accepted. Tenders received late will not be considered and the lowest or any tender may not necessarily be accepted.

No tender clarification meeting will be held for this tender.

.../2

DIRECTORS: • JL RAUCH PrTechEng PrCPM (Managing Director) • BJ ANSELL PrEng • JS DE VILLIERS PrTechEng
• R LAMPRECHT PrEng • RC PALMER PrEng • RL STEENEKAMP PrEng PrCPM • MG TSOSANE PrTechEng • SR WEBB PrTechEng • A ZEELIE PrTechEng

ASSOCIATES: • GS ADAMS PrTechEng • SG MEGGERSEE PrEng
CONSULTANT: FP CONRADIE PrEng



CLINKSCALES MAUGHAN-BROWN (SOUTH) (PTY) LTD (2012/075708/07)



The following items are highlighted in the tender document:

1. Only Tenderers that meet the pre-qualification conditions indicated under **Tender Data, Clauses C.2.1.1, Pages T1.2.2 and T1.2.5** are eligible to have their tenders further evaluated. The Tenderer to ensure that **Clauses C.2.1.1 be fully completed and all supportive documentation, as requested, be enclosed with the tender document.**
2. Tender Offer Validity Period is **eight (8) weeks** as indicated under **Tender Data, Clause C.2.16, Page T1.2.5.**
3. The Tenderer is required to submit with his tender a letter of intent from an approved insurer undertaking to provide the Performance Bond, see **Tender Data, Clause C.2.20, Page T1.2.6.**
4. The Tenderer is required to submit with his tender, see **Tender Data, Clause C.2.23, Page T1.2.6:**
An original of a valid Tax Compliance Status Pin issued by the South African Revenue Services.
Completed and signed Documents as listed in the **List of Returnable Documents in Part T2.1.**
5. Points will be awarded to Tenderers according to the 80/20 preference point system as indicated under **Tender Data, Clause C.3.11.1, Page T1.2.6.**
7. **Returnable Schedule T2.2.11** must be fully completed. Rates of exchange, as per the exchange rate published by the South African Reserve Bank (SARB) at 12:00 on 25 February 2022, must be completed.
8. The Local Content Declaration forms, including all the Annexures C, D and E at the back of the tender document must be fully completed as indicated under **Returnable Schedule T2.2.11, Pages T2.2.11.15 to 20.**
9. **A Tenderer must provide three references on the form as indicated in Returnable Schedule T2.2.12 Schedule of Reference for Tenderer on Pages T2.2.12.1 to 6. Three fully completed and signed reference forms, including a Certificate of Practical Completion or Certificate of Completion or Taking Over Certificate, must therefore be provided with the tender document. (No additional reference letters from Consultants / Clients will be accepted.)**
10. The Form of Offer on **Page C1.1.1** must be completed and signed.
11. The time for achieving Practical Completion is as stipulated under **Part C3.1, Clause 6.0, Page C3.1.2.**
12. The percentage reduction of Contract Price (penalty) per completed week of delay, shall be ½ (half percent) per week or part thereof. The maximum percentage reduction shall be 10% (ten percent.) as indicated under **Clause 5.13.1, Page C1.2.2.**
13. The limit of indemnity for liability insurance is R 10 million. **See Clause 8.6.1.3, Page C1.2.3.**
14. **Part C.1.2, Contract Data, on Page C1.2.4** must be completed.
15. All bills must be completed. Bills available electronically on request. It is to be noted that 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. Spreadsheets can be bound into the document with the Price summary to be completed by hand.

Quantities are re-measurable.

16. The Tenderer to ensure that **Schedule B, under Part C3.3, Pages C3.3.2 to C3.3.20**, be fully completed.
17. Tenderers are required to check that they have received all the pages of the tender documents.

Any questions regarding the technical specification can be made to Mr Neil Albertyn on 023 626 8200, or Mr Johan de Villiers at Tel No. 044 874 1511, or e-mail: jdevilliers@cmbgeorge.co.za.

Yours faithfully

A handwritten signature in dark ink, appearing to read 'J.S. de Villiers', with a stylized flourish at the end.

J.S de Villiers Pr Tech Eng
CLINKSCALES MAUGHAN-BROWN



LANGEBERG MUNICIPALITY

TENDER NO. 06/2022

**LANGEBERG MUNICIPALITY: ELECTRIFICATION OF 172 FORMAL HOUSES AT
NKQUBELA, ROBERTSON:
SPECIFICATION NO. G/10541/E**

PROCUREMENT DOCUMENT

February 2022

Issued by:

Langeberg Municipality
28 Main Road
ASHTON
6715

Prepared by:

Clinkscapes Maughan-Brown
39 Victoria Street
GEORGE
6529

Contact:

N. Albertyn
Tel No: 023-626 8200

Contact:

J de Villiers
Tel No: 044 874 1511

Tenderer's Information:

Name: Contact Person:

Tender Price:

B-BBEE Status Level of Contribution:

Postal Address:

Tel No: Cell No:

E-Mail Address: Facsimile No:



cmb

CLINKSCALES MAUGHAN-BROWN

**CONSULTING MECHANICAL
& ELECTRICAL ENGINEERS**

CONTENTS

Number	Heading	Page Number	Colour
<u>THE TENDER</u>			
<u>TENDERING PROCEDURES</u>			
T1.2	Tender Data	T1.2.1 – T1.2.6	Pink
<u>RETURNABLE DOCUMENTS</u>			
T2.1	List of Returnable Documents	T2.1.1 – T2.1.2	Yellow
T2.2.1	Record of Addenda to tender documents	T2.2.1.1	Yellow
T2.2.2	Schedule of Amendments and Qualifications by Tenderer	T2.2.2.1	Yellow
T2.2.3	Schedule of Particulars / Information	T2.2.3.1 – T2.2.3.2	Yellow
T2.2.4	Compulsory Enterprise Questionnaire	T2.2.4.1	Yellow
T2.2.5	Certificate of Authority for Joint Ventures	T2.2.5.1	Yellow
T2.2.6	Schedule of Tenderer's Experience	T2.2.6.1	Yellow
T2.2.7	Schedule of Sub-Contractors	T2.2.7.1	Yellow
T2.2.8	Schedule of Plant and Equipment	T2.2.8.1	Yellow
T2.2.9	Undertaking to Provide Performance Bond	T2.2.9.1	Yellow
T2.2.10	Authority for Signatory	T2.2.10.1	Yellow
T2.2.11	Municipal Bidding Documents (MBD's)	T2.2.11.1 – T2.2.11.29	Yellow
T2.2.12	Schedule of Reference for Tenderer	T2.2.12.1 – T2.2.12.6	Yellow
<u>THE CONTRACT</u>			
<u>AGREEMENTS AND CONTRACT DATA</u>			
C1.1	Form of offer and acceptance	C1.1.1 – C1.1.5	Yellow
C1.2	Contract Data	C1.2.1 – C1.2.4	Yellow
C1.3	Pro Forma Performance Guarantee	C1.3.1 – C1.3.3	White
C1.4	Occupational Health and Safety Agreement	C1.4.1	White
C1.5	Certificate of Ownership of Plant / Materials	C1.5.1 – C1.5.2	White
<u>PRICING DATA</u>			
C2.1	Pricing instructions	C2.1.1 – C2.1.2	Yellow
C2.2	Bills of Quantities	C2.2.1 – C2.2.15	Yellow
<u>SCOPE OF WORK</u>			
C3.1	GENERAL PROJECT SPECIFICATION	C3.1.1 – C3.1.4	Blue

Number	Heading	Page Number	Colour
	1.0 General	C3.1.1	
	2.0 Site Information	C3.1.1	
	3.0 Nature of Contract	C3.1.1	
	4.0 Letting of Contract	C3.1.1	
	5.0 Engineer's Drawings	C3.1.1	
	6.0 Programme and Completion	C3.1.2	
	7.0 Electrical Supply	C3.1.2	
	8.0 Project Notice Board	C3.1.2	
	9.0 Switching of Supplies	C3.1.2	
	10.0 Cost Price Adjustment	C3.1.2	
	11.0 Re-Measurement	C3.1.2	
	12.0 Clerk of Works	C3.1.2	
	13.0 Weekend, Public Holidays	C3.1.3	
	14.0 Site Staff	C3.1.3	
	15.0 Site Facilities	C3.1.3	
	16.0 Clearances with other Services	C3.1.3	
	17.0 Standard Specification	C3.1.3	
	18.0 Proof of Orders for Materials / Equipment	C3.1.3	
	19.0 Local Labour	C3.1.4	
	20.0 Construction and "As-Built" Drawings	C3.1.4	
	21.0 Damage to Structures	C3.1.4	
	22.0 Site Meetings	C3.1.4	
C3.2	HEALTH AND SAFETY	C3.2.	Blue
	Refer to Baseline Risk Assessment and Specification prepared by Messrs Devac (Pty Ltd, which is attached as Annexure F		
C3.3	PROJECT TECHNICAL SPECIFICATION	C3.3.1 – C3.3.21	Blue
	1.0 General	C3.3.1	
	2.0 Standard Technical Specification	C3.3.1	
	3.0 Supply Authority	C3.3.1	
	4.0 Connection Points	C3.3.1	
	5.0 Project Description	C3.3.1	
	6.0 Detailed Specification of Equipment and Materials	C3.3.2	
	7.0 11kV Overhead Lines	C3.3.2	
	8.0 Pole Mounted Transformer Substation	C3.3.5	
	9.0 MV and LV Cabling	C3.3.8	
	10.0 LV Bundled Conductor and Underground Service Connections	C3.3.11	
	11.0 Sleeves Underneath Roads and Across Drive Ways	C3.3.14	
	12.0 Consumer Service Connection Box (CSCB)	C3.3.15	
	13.0 Prepayment Meter	C3.3.17	
	14.0 Installation Inside Houses	C3.3.17	
	15.0 Streetlights	C3.3.18	
	16.0 Earthing	C3.3.20	
	17.0 Dismantling and Recovering of Material and Equipment	C3.3.21	
	18.0 Inspection, Testing and Commissioning	C3.3.21	

Number	Heading	Page Number	Colour
C3.4	STANDARD PRELIMINARY AND GENERAL INFORMATION	C3.4.1 – C3.4.8	Blue
	1.0 Preamble	C3.4.1	
	2.0 Alternative Offers	C3.4.1	
	3.0 Spare Parts	C3.4.2	
	4.0 Delivery Times of Manufactured Items	C3.4.2	
	5.0 Packing and Delivery	C3.4.2	
	6.0 Layout of Installation	C3.4.2	
	7.0 Drawings, Certificates and Operating Instructions	C3.4.3	
	8.0 Standards and Codes of Practice	C3.4.4	
	9.0 Workmanship	C3.4.4	
	10.0 Co-ordination of Services on Site	C3.4.4	
	11.0 Interruption of Existing Services	C3.4.5	
	12.0 Builder's Work	C3.4.5	
	13.0 Approval of Drawings	C3.4.5	
	14.0 Operating, Maintenance and Servicing Procedures	C3.4.5	
	15.0 Maintenance	C3.4.5	
C3.5	STANDARD TECHNICAL SPECIFICATION	C3.5.1– C3.5.32	Blue
	1.0 Definition	C3.5.1	
	2.0 Electrical Supply and Phase Rotation	C3.5.1	
	3.0 Switching of HV, MV and LV Power Supplies	C3.5.2	
	4.0 Earthing and Bonding	C3.5.2	
	5.0 MV Distribution Transformers	C3.5.5	
	6.0 LV Main Distribution Switch Boards	C3.5.6	
	7.0 LV MCB Main and Sub-Distribution Boards and Control Panels	C3.5.8	
	8.0 LV Consumer Service Connection Boxes (CSCB)	C3.5.11	
	9.0 LV Circuit Breakers	C3.5.12	
	10.0 Supply Authority Meters	C3.5.13	
	11.0 Instruments, Meters and Protection Relays	C3.5.13	
	12.0 Control Equipment and Wiring	C3.5.16	
	13.0 Trenching, Excavation and Compaction	C3.5.20	
	14.0 Sleeves	C3.5.22	
	15.0 MV and LV Cables	C3.5.22	
	16.0 MV and LV Cable Joints and Terminations	C3.5.26	
	17.0 MV and LV Cable Testing	C3.5.28	
	18.0 MV and LV Overhead Power Lines	C3.5.29	
	19.0 MV and LV Aerial Bundled Conductor	C3.5.35	
	20.0 Streetlighting and Site Lighting	C3.5.37	
	21.0 Padlocks	C3.5.47	
	22.0 Hot Dip Galvanising	C3.5.47	
	23.0 Painting	C3.5.48	
	24.0 Labels and Notices	C3.5.48	
	25.0 Dismantling	C3.5.50	
	26.0 Inspection, Testing and Commissioning	C3.5.50	
	27.0 Completion of Works	C3.5.50	
	28.0 Certificate of Compliance	C3.5.51	

Number	Heading	Page Number	Colour
C4	SITE INFORMATION	C4.1	Green
ANNEXURES			
A	Engineers Drawings		White
B	Project Notice Board		White
C	Local Content Declaration – Summary Schedule		White
	Imported Content Declaration – Supporting Schedule to Annexure C		
	Local Content Declaration – Summary Schedule to Annexure C		
F	Health and Safety		White

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THE TENDER

PART T1 – TENDERING PROCEDURES

T1.1 TENDER NOTICE AND INVITATION TO TENDER



LANGEBERG MUNICIPALITY: ELECTRIFICATION OF 172 FORMAL HOUSES AT NKQUBELA, ROBERTSON TENDER NO. 06/2022

Tenders are hereby requested for the electrification of 172 formal houses at Nkqubela at Robertson as specified in the bid document. Completed Bids, in sealed envelopes, clearly marked “**TENDER NO. 06/2022: ELECTRIFICATION OF 172 FORMAL HOUSES AT NKQUBELA, ROBERTSON,**” should be placed in the tender box, at the Langeberg Municipal Office, 28 Main Road, Ashton, not later than **12:00 on Friday, 11 March 2022** when the Bids will be opened in public. Late, faxed or e-mailed tenders will not be considered.

Tenderers must be registered with the CIDB in a class of construction works and have a grading designation equal to or higher than that determined in accordance with the sum tendered or a value determined in accordance with regulation 25 (7A) of the Construction Industry Development Regulations, 2004. It is estimated that tenderers will need a grading designation of 3 EP or higher.

A minimum functional assessment score of 60 points will apply to this contract.

PLEASE NOTE:

The official Bid document must be fully completed in black ink in writing and bound.
Supporting documents must be submitted separately and must be stapled or bound.
Only goods and services applicable to local production and content will be considered.

Preferential Procurement Regulations, 2011 (Regulation 9. (1) and 9. (3) make provision for the promotion of local production and content. Local production content applicable to designated sectors of construction.

Only goods, works and services with a stipulated minimum threshold as applicable for local production and content will be considered. The South African Bureau of Standards approved, Technical Specification Number (SATS 1286:2011) will be used to calculate local content.

Supply only locally produced goods meeting the following minimum threshold for local production and content:

Designated Hardware Components – 100%
Cables used for power transmission – 90%
Steel Pipe fittings and Specials: Galvanized – 100%

The lowest, or any tender, will not necessarily be accepted and council reserves the right to accept any tender. Tenders will be evaluated according to the Council's Supply Chain Management Policy and the 80/20 Preference Point system. The Supply Chain Management Policy can be viewed at Municipal Offices or www.langeberg.gov.za

Tender documents are available from 25 February 2022, on the Langeberg Municipal website: www.langeberg.gov.za

Please refer written enquiries to Mr. NW Albertyn (nalbertyn@langeberg.gov.za).

ASA DE KLERK
MUNICIPAL MANAGER
Private Bag X2
Ashton, 6715

THE TENDER

PART T1

TENDERING PROCEDURES

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 Langeberg 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: Clinkscapes Maughan-Brown (South) (Pty) Ltd Address: 39 Victoria Street, P.O. Box 2551, George, 6530 Tel: 044-8741511 Fax: 044-8741510 E-mail: jdeilliers@cmbgeorge.co.za Any inquiries relating to this tender must be submitted in writing via e-mail to sngqcongolo@langeberg.gov.za and copied to nalbertyn@langeberg.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 60 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 T2.2.12 in this document for each of the following items stipulated. Unclear or incomplete information provided will result in no points being awarded. <u>Note:</u> 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. <table><tr><th>Item</th><th>Description</th><th>Column to be completed by Tenderer</th><th>Points awarded by Employer</th></tr><tr><td>a)</td><td> Tenderer's relevant experience (track record) on previously completed projects of a similar nature, scope and complexity on electrification projects, i.e. Supply and installation of material and equipment to a minimum of 100 low cost houses per project, over the past five (5) years: 1 to 2 projects = 8 points 3 to 4 projects = 16 points 5 to 6 projects = 24 points More than 6 projects = 30 points (Maximum points = 30) <u>Completion certificates of previously completed projects to be included with the tender. This requirement is compulsory in order to claim for points.</u> </td><td> </td><td> </td></tr></table>	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 projects, i.e. Supply and installation of material and equipment to a minimum of 100 low cost houses per project, over the past five (5) years: 1 to 2 projects = 8 points 3 to 4 projects = 16 points 5 to 6 projects = 24 points More than 6 projects = 30 points (Maximum points = 30) <u>Completion certificates of previously completed projects to be included with the tender. This requirement is compulsory in order to claim for points.</u>		
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 projects, i.e. Supply and installation of material and equipment to a minimum of 100 low cost houses per project, over the past five (5) years: 1 to 2 projects = 8 points 3 to 4 projects = 16 points 5 to 6 projects = 24 points More than 6 projects = 30 points (Maximum points = 30) <u>Completion certificates of previously completed projects to be included with the tender. This requirement is compulsory in order to claim for points.</u>								

	b)	Feedback received from Referees – Returnable Schedule T2.2.12: <u>Referee No.1:</u> 1. Completion of project according to initial program submitted by the Tenderer? Yes = 1 point No = 0 points 2. Completion of assignments within budget? Yes = 1 point No = 0 points 3. Quality of End Product? Exceed initial expectations = 3 points Met expectations = 2 points Slightly below = 0 points Did not meet expectations = 0 <u>Referee No.2:</u> 1. Completion of project according to initial program submitted by the Tenderer? Yes = 1 point No = 0 points 2. Completion of assignments within budget? Yes = 1 point No = 0 points 3. Quality of End Product? Exceed initial expectations = 3 points Met expectations = 2 points Slightly below = 0 points Did not meet expectations = 0 <u>Referee No.3:</u> 1. Completion of project according to initial program submitted by the Tenderer? Yes = 1 points No = 0 points 2. Completion of assignments within budget? Yes = 1 points No = 0 points 3. Quality of End Product? Exceed initial expectations = 3 points Met expectations = 2 points Slightly below = 0 points Did not meet expectations = 0 (Maximum points = 15) <u>Completion certificates of previously completed projects to be included with the tender. This requirement is compulsory in order to claim for points.</u>	..... ..... ..... ..... ..... ..... ..... .....	..... ..... ..... ..... ..... ..... ..... .....

c)	<u>Compulsory</u> minimum qualification/s, plus experience in number of years, of Tenderer's proposed <u>Project Manager</u>: Compulsory Qualification/s: - Electrician Trade 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) <u>A CV of the proposed Project 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.</u>	..... .....	..... .....
d)	<u>Compulsory</u> minimum qualification/s, plus experience in number of years, of Tenderer's proposed <u>Site Supervisor</u>: Compulsory Qualification/s: - Electrician Trade 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) <u>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.</u>	..... .....	..... .....
e)	Locality. Location of a local office in relation to the Langeberg Municipal Area: - Within the Langeberg Municipal Area = 25 points - Within Western Cape Province = 15 points - Outside Western Cape Province = 5 points (Maximum points = 25) <u>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.</u>	..... .....	..... .....

		Total points awarded out of 100	.....	.....
C.2.1.1	Only Tenderers that meet the following pre-qualification conditions are eligible to have their tenders further evaluated: Supply only locally produced goods meeting the following minimum threshold for local production and content: Designated Hardware Components - 100% Cables used for Power Transmission - 90% Steel Pipe Fittings and Specials: Galvanised - 100% For this purpose, the MBD 6.2 – Declaration Certificate for Local Content which is attached under Part T2.2.11 must be completed and duly signed. The exchange rate to be used for the calculation of local production and content must be the exchange rate published by the South African Reserve Bank (SARB) at 12:00 on Friday, 25 February 2022. (date of advertisement of the tender), and only the South African Bureau of Standards (SABS) approved Technical specification number SATS 1286:2011 must be used to calculate local content.			
C.2.1.1	A Tenderer should endeavour to sub-contract a minimum of 30% of the total cost of the works to a local SMME Sub-Contractor. It is the responsibility of the Tenderer to select competent and capable Sub-Contractor/s that meet the requirements of the tender so that their tender is not jeopardized by the Sub-Contractor/s when evaluated. Tenderers are responsible for all due diligence on their Sub-Contractor/s, and will be held liable for their performance. The following supporting documentation must be submitted with the tender: • CV of the proposed Sub-Contractor/s. • A sworn affidavit to proof that the proposed Sub-Contractor/s is a SMME.			
C.2.7	No clarification meeting will be held. A covering letter is included with the tender document which highlighted all the important items.			
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: Ashton Office Physical address: Municipal Offices, 28 Main Road, Ashton Identification details: Bid reference number, Title and the closing date and time of tender			
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 eight (8) weeks.			
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 T2.2.9 can be used for this purpose.			

C.2.23	The tenderer is required to submit with his tender the following: 1) Tax Compliance Status Pin 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 according to the 80/20 preference point system for acquisition of goods or services for Rand value equal to or above R 30 000 and up to R 50 million as indicated under Clause 6.1 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	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).

T2.1 LIST OF RETURNABLE DOCUMENTS

Part No.	The tenderer must ensure that the following documents are completed and included with his tender. The tender may be regarded as non-responsive, should these documents be incomplete or not be submitted.	Tenderer to confirm in this column that document has been completed and returned.
T1.2	1. Returnable Schedules required for tender evaluation purposes: Completed Tender Data Schedules on Pages T1.2.2 to T1.2.5, including supportive documentation as indicated.	☐
T1.2	CV of the proposed SMME Sub-Contractor	☐
T1.2	Sworn affidavit to proof that the proposed SMME Sub-Contractor is a SMME	☐
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	☐
T2.2.3	CV of proposed Project Manager	☐
T2.2.3	CV of proposed Site Supervisor	☐
T2.2.3	CV of proposed Sub-Contractor to supply and install the sleeves	☐
T2.2.3	CV of proposed Cable Joints / Terminator	☐
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 Subcontractors	☐
T2.2.7	CV's of proposed Subcontractors	☐
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	Municipal Bidding Documents (MBD):	☐
	MBD 2 – Tax Clearance Certificate	☐
	Declaration of "In The Service of the State"	☐
	MBD 4 – Declaration of Interest	☐
	MBD 6.1 – Preference Points Claim Form (80/20)	☐
	MBD 6.2 – Declaration Certificate for Local Production and Content	☐
	MBD 8 – Declaration of Bidders Past Supply Chain Management Practices.	☐
	MBD 9 – Certificate of Independent Bid Determination	☐
	Invitation to Bid	☐
T2.2.12	Schedule of Reference for Tenderer.	☐
	2. Other documents required for tender evaluation purposes:	☐
-	Valid Original Tax Clearance Certificate.	☐
-	Certificate of Contractor Registration issued by the Construction Industry Development Board.	☐
-	Certified copies of identities of the Directors and owners of tendering entity.	☐
-	Proof that the Tenderer is in good standing and registered for workmen compensation purposes.	☐
-	Tenderer's original and valid B-BBEE status level verification certificate or a certified copy thereof.	☐

Part No.	The tenderer must ensure that the following documents are completed and included with his tender. The tender may be regarded as non-responsive, should these documents be incomplete or not be submitted.	Tenderer to confirm in this column that document has been completed and returned.
- - - - -	- Proposed Sub-Contractors' original and valid B-BBEE status level verification certificate or a certified copy thereof. - Certified copies of the Directors' Municipal accounts for the month preceding the tender closing date. - Certified copy of Tenderer's Municipal account for the month preceding the tender closing date or a municipal accounts clearance certificate. - If the Tenderer rents premises, proof that the rental includes Municipal rates and taxes and municipal charges, and that rent is not in arrears. - Proof of indemnity for liability insurance, i.e. R 10 mil	☐ ☐ ☐ ☐ ☐
	3. Returnable Schedules that will be incorporated into the Contract: All schedules as per Item 1 above.	☐
C1.1 C1.2 C1.3 C1.4 C1.5 C2.1 C2.2 C3 C4 -	4. Other documents that will be incorporated into the Contract: Form of Offer and Acceptance Contract Data Performance Guarantee Occupational Health and Safety Agreement Certificate of Ownership of Plant / Materials Pricing Instructions Bill of quantities Scope of Work Site information Annexures	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

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 a covering letter, published literature, etc.
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 TECHNICAL

Refer to pages C3.3.2 to C3.3.19 of Part C3.3 of this Specification where Schedule B must be completed by the Tenderer.

Is the above schedules completed? YES/NO

2.0 GENERAL

(a) Location of nearest permanent office:

.....

.....

.....

.....

(b) Name and experience of the Project Manager the Tenderer intends using on this project: **(Provide CV to claim points under Tender Data, Part T1.2, Clauses C.2.1.1 (c) Page T1.2.4)**

.....

.....

.....

.....

(c) Name and experience of Site Supervisor the Tenderer intends using on this project: **Provide CV to claim points under Tender Data, Part T1.2, Clauses C.2.1.1 (d) Page T1.2.4)**

.....

.....

.....
.....

(d) Name of Sub-Contractor to undertake the supply and installation of the sleeves (terra-mole soil displacement / fluid assisted directional drilling method) on this project:

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

(e) Name of Sub-Contractor to undertake the cable joints and terminations on this project.

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

(f) Are brochures of all equipment offered attached to this document?.....YES / NO

SIGNATURE:

DATE:.....
(For the Tenderer)

PRINT NAME:
(For the Tenderer)

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: SBD4 issued by National Treasury must be completed for each tender and be attached as a tender requirement.

Section 8: SBD6 issued by National Treasury must be completed for each tender and be attached as a tender requirement.

Section 9: SBD8 issued by National Treasury must be completed for reach tender and be attached as a tender requirement.

Section 10: SBD9 issued by National Treasury must be completed for reach tender 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) authorises the employer to verify the tenderers 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 tenders or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest; and
- 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 over the past 5 years, i.e. Supply and installation of material and equipment to a minimum of 100 low cost houses per project:

Refer to Tender Data, Part T1.2, Clause C.2.2.1 (a) on Page T1.1.2 regarding Tenderer's experience to be provided to claim points.

Completion certificates of previously completed projects to be included with the tender to claim points under Tender Data, Part T1.2, Clause C.2.1.1 (a), Page T1.2.2.

Employer, contact person and telephone number.	Description of contract	Value of work inclusive of VAT (Rand)	Date completed

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.

A CV of each of the proposed Sub-contractors must be submitted with the Tender.

	Name and address of Sub-contractor	B-BBEE / EME Status	Nature and extent of work	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 to this page 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 to this page 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 Numberand 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 MUNICIPAL BIDDING DOCUMENTS (MBD's)**DECLARATION OF "IN THE SERVICE OF THE STATE"**

If a spouse, child or parent of the owner, director, manager, shareholder or stakeholder of the entity is in the service of the state, or has been in the service of the state in the previous twelve months, the following information must be completed: (Please indicate if not applicable)

The name of the person in the employment of the state:

.....

The capacity in which that person is in service of the state:

.....

Is that person an owner, director, manager, shareholder or connected to the business:
Yes or No? (If yes please specify)

.....

The relationship to the owner, director, manager, shareholder or stakeholder of the entity:

	Spouse	Child	Parent
Owner	☐	☐	☐
Director	☐	☐	☐
Manager	☐	☐	☐
Shareholder	☐	☐	☐

"in the service of the state" means to be –

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

CERTIFICATION

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

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

.....
 Signature

.....
 Date

.....
 Position

.....
 Name of Bidder

TAX CLEARANCE CERTIFICATE REQUIREMENTS	
It is a condition of tender that the taxes of the successful bidder must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the bidder's tax obligations, before an award may be considered.	
1.	Bidders must ensure compliance with their Tax Obligations.
2.	Bidders are required to submit their unique personal identification number (PIN) issued by SARS to enable the Organ of State to view the taxpayer's profile and tax status.
3.	SARS will then furnish the bidder with a Tax Compliance Status PIN that will be valid for a period of 1 (one) year from the date of approval.
4.	In bids where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate TCS Certificate / PIN / CSD number.
5.	Application for the Tax Compliance Status (TCS) PIN may also be made via e-Filing. In order to use this provision, taxpayers will need to register with SARS as e-Filers through the website www.sars.gov.za .

DECLARATION OF INTEREST

- 1.0 Any legal person, including persons employed by the state¹, or persons having a kinship with persons employed by the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid (includes an advertised competitive bid, a limited bid, a proposal or written price quotation). In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons employed by the state, or to persons connected with or related to them, it is required that the bidder or his/her authorised representative declare his/her position in relation to the evaluating/adjudicating authority where-
- 1.1 The bidder is employed by the state; and/or the legal person on whose behalf the bidding document is signed, has a relationship with persons/a person who are/is involved in the evaluation and or adjudication of the bid(s), or where it is known that such a relationship exists between the person or persons for or on whose behalf the declarant acts and persons who are involved with the evaluation and or adjudication of the bid.
- 2.0 In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.
- 2.1 Full Name of bidder or his or her representative:
- 2.2 Identity Number:
- 2.3 Position occupied in the Company (director, trustee, shareholder², member):
.....
- 2.4 Registration number of company, enterprise, close corporation, partnership agreement or trust:
.....
- 2.5 Tax Reference Number:
- 2.6 VAT Registration Number:
- 3.0 The names of all directors / trustees / shareholders / members, their individual identity numbers, tax reference numbers and, if applicable, employee / PERSAL numbers must be indicated in paragraph 6.5 below.

¹"State" means –

- a) any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No. 1 of 1999);

- b) any municipality or municipal entity;
- c) provincial legislature
- d) national Assembly or the national Council of provinces; or
- e) Parliament.

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

4.0 Are you or any person connected with the bidder presently employed by the state?
.....YES / NO

4.1 If so, furnish the following particulars:

Name of person / director / trustee / shareholder/ member:

.....

Name of state institution at which you or the person connected to the bidder is
employed:

Position occupied in the state institution:

Any other particulars:

.....

.....

4.2 If you are presently employed by the state, did you obtain the appropriate authority to
undertake remunerative

4.3 work outside employment in the public sector? YES / NO

4.4 If yes, did you attach proof of such authority to the bid document? YES / NO

4.5 (Note: Failure to submit proof of such authority, where applicable, may result in the
disqualification of the bid.

4.6 If no, furnish reasons for non-submission of such proof:

.....

.....

.....

4.7 Did you or your spouse, or any of the company's directors / trustees / shareholders /
members or their spouses conduct business with the state in the previous twelve
months? YES / NO

4.8 If so, furnish particulars:

.....

.....
.....

4.9 Do you, or any person connected with the bidder, have any relationship (family, friend, other) with a person employed by the state and who may be involved with the evaluation and or adjudication of this bid? YES/NO

4.10 If so, furnish particulars.

.....
.....

4.11 Are you, or any person connected with the bidder, aware of any relationship (family, friend, other) between any other bidder and any person employed by the state who may be involved with the evaluation and or adjudication of this bid? YES/NO

4.11.1 If so, furnish particulars.

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

4.12 Do you or any of the directors / trustees / shareholders / members of the company have any interest in any other related companies whether or not they are bidding for this contract? YES/NO

4.12.1 If so, furnish particulars:

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

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

Full Name	Identity Number	Personal Tax Number	Income Reference	State Number / Personal Number	Employee Number

5.0 DECLARATION

I, THE UNDERSIGNED (NAME):
 CERTIFY THAT THE INFORMATION FURNISHED IN THE ABOVE PARAGRAPHS IS CORRECT.

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

.....
Signature

.....
Date

.....
Position

.....
Name of bidder

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

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

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

1. GENERAL CONDITIONS

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

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

1.2

- a) The value of this bid is estimated to not exceed R50 000 000 (all applicable taxes included) and therefore the **80/20** preference point system shall be applicable; or

1.3 Points for this bid shall be awarded for:

- (a) Price; and
- (b) B-BBEE Status Level of Contributor.

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

	POINTS
PRICE	80
B-BBEE STATUS LEVEL OF CONTRIBUTOR	20
Total points for Price and B-BBEE must not exceed	100

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

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

1.7 Failure on the part of a bidder to fill in, sign this form and submit a B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System (SANAS) or a Registered Auditor approved by the Independent Regulatory Board of Auditors (IRBA) or a Accounting Officer as contemplated in the Close Corporation Act (CCA), or a sworn affidavit (EME's and QSE's) together with the bid, will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

1.8 If the contributor status level of a bidder changes after the closing date of the tender, the bidder must notify the municipality, as such a tender will not be eligible for any change in preference points, based on the changes status.

2. DEFINITIONS

- (a) **“B-BBEE”** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;
- (b) **“B-BBEE status level of contributor”** means the B-BBEE status of an entity in terms of a code of good practice on black economic empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;
- (c) **“bid”** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the provision of goods or services, through price quotations, advertised competitive bidding processes or proposals;
- (d) **“Broad-Based Black Economic Empowerment Act”** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);
- (e) **“EME”** means an Exempted Micro Enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;
- (f) **“functionality”** means the ability of a tenderer to provide goods or services in accordance with specifications as set out in the tender documents.
- (g) **“prices”** includes all applicable taxes less all unconditional discounts;
- (h) **“proof of B-BBEE status level of contributor”** means:
 - 1) B-BBEE Status level certificate issued by an authorized body or person;
 - 2) A sworn affidavit as prescribed by the B-BBEE Codes of Good Practice;
 - 3) Any other requirement prescribed in terms of the B-BBEE Act;
- (i) **“QSE”** means a qualifying small business enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;
- (j) **“rand value”** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;

3. POINTS AWARDED FOR PRICE

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

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

80/20

or

90/10

$$P_s = 80 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right) \quad \text{or} \quad P_s = 90 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$$

Where

P_s = Points scored for price of bid under consideration

P_t = Price of bid under consideration

$P_{\min}$ = Price of lowest acceptable bid

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

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

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

5. BID DECLARATION

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

6. B-BBEE STATUS LEVEL OF CONTRIBUTOR CLAIMED IN TERMS

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

(Points claimed in respect of paragraph 6.1 must be in accordance with the table reflected in paragraph 4 and must be substantiated by relevant proof of B-BBEE status level of contributor.

7. SUB-CONTRACTING

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

(Tick applicable box)

YES	☐	NO	☐
-----	--------------------------	----	--------------------------

- 7.1.1 If yes, indicate:

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

(Tick applicable box)

YES	☐	NO	☐
-----	--------------------------	----	--------------------------

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

Designated Group: An EME or QSE which is at last 51% owned by:	EME	QSE
	√	√

Black people		
Black people who are youth		
Black people who are women		
Black people with disabilities		
Black people living in rural or underdeveloped areas or townships		
Cooperative owned by black people		
Black people who are military veterans		
OR		
Any EME		
Any QSE		

8. DECLARATION WITH REGARD TO COMPANY/FIRM

8.1 Name of company/firm:.....

8.2 VAT registration number:.....

8.3 Company registration number:.....

8.4 TYPE OF COMPANY/ FIRM

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

[TICK APPLICABLE BOX]

8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

.....

.....

.....

.....

.....

8.6 COMPANY CLASSIFICATION

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

[TICK APPLICABLE BOX]

8.7 MUNICIPAL INFORMATION

Municipality where business is situated:

Registered Account Number:

Stand Number:.....

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

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

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
- iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;
- iv) If the B-BBEE status level of contributor has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have –
 - (a) disqualify the person from the bidding process;
 - (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
 - (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
 - (d) recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
 - (e) forward the matter for criminal prosecution.

Witness:

Signature of Bidder

1

2 **Date:**

Adress:

.....

MBD 6.2: DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT FOR DESIGNATED SECTORS

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

Before completing this declaration, bidders must study the General Conditions, Definitions, Directives applicable in respect of Local Content as prescribed in the Preferential Procurement Regulations, 2011 and the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:2011 (Edition 1).

1. General Conditions

- 1.1. Preferential Procurement Regulations, 2011 (Regulation 9.(1) and 9.(3)) make provision for the promotion of local production and content.
- 1.2. Regulation 9.(1) prescribes that in the case of designated sectors, where in the award of bids local production and content is of critical importance, such bids must be advertised with the specific bidding condition that only locally produced goods, services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.
- 1.3. Regulation 9.(3) prescribes that where there is no designated sector, a specific bidding condition may be included, that only locally produced services, works or goods or locally manufactured goods with a stipulated minimum threshold for local production and content, will be considered.
- 1.4. Where necessary, for bids referred to in paragraphs 1.2 and 1.3 above, a two stage bidding process may be followed, where the first stage involves a minimum threshold for local production and content and the second stage price and B-BBEE.
- 1.5. A person awarded a contract in relation to a designated sector, may not sub-contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.
- 1.6. The local content (LC) expressed as a percentage of the bid price must be calculated in accordance with the SABS approved technical specification number SATS 1286: 2011 as follows:

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

Where

- x is the imported content in Rand
y is the bid price in Rand excluding value added tax (VAT)

Prices referred to in the determination of x must be converted to Rand (ZAR) by using the exchange rate published by the South African Reserve Bank (SARB) at 12:00 on the date of the advertisement as indicated in paragraph 4.1 below.

The SABS approved technical specification number SATS 1286:2011 is accessible on [http://www.thedti.gov.za/industrial development/ip.jsp](http://www.thedti.gov.za/industrial%20development/ip.jsp) at no cost.

1.7. A bid will be disqualified if:

- (a) The bidder fails to achieve the stipulated minimum threshold for local production and content indicated in paragraph 3 below; and
- (b) this Declaration Certificate is not submitted as part of the bid documentation.

2. Definitions

- 2.1. **“bid”** includes written price quotations, advertised competitive bids or proposals;
- 2.2. **“bid price”** price offered by the bidder, excluding value added tax (VAT);
- 2.3. **“contract”** means the agreement that results from the acceptance of a bid by an organ of state;
- 2.4. **“designated sector”** means a sector, sub-sector or industry that has been designated by the Department of Trade and Industry in line with national development and industrial policies for local production, where only locally produced services, works or goods or locally manufactured goods meet the stipulated minimum threshold for local production and content;
- 2.5. **“duly sign”** means a Declaration Certificate for Local Content that has been signed by the Chief Financial Officer or other legally responsible person nominated in writing by the Chief Executive, or senior member / person with management responsibility (close corporation, partnership or individual).
- 2.6. **“imported content”** means that portion of the bid price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or its subcontractors) and which costs are inclusive of the costs abroad, plus freight and other direct importation costs, such as landing costs, dock duties, import duty, sales duty or other similar tax or duty at the South African port of entry;
- 2.7. **“local content”** means that portion of the bid price which is not included in the imported content, provided that local manufacture does take place;
- 2.8. **“stipulated minimum threshold”** means that portion of local production and content as determined by the Department of Trade and Industry; and
- 2.9. **“sub-contract”** means the primary contractor's assigning, leasing, making out work to, or employing another person to support such primary contractor in the execution of part of a project in terms of the contract.

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

	<u>Description of services, works or goods</u>	<u>Stipulated minimum threshold</u>
3.1.1	<u>Steel Pipe Fittings and Special: Galvanised:</u> Bill 2, Item 22.0; Bill 3, Item 20.0; Bill 4, Item 17.0; Bill 4, Item 20.2; Bill 4, Item 20.3; Bill 4, Item 20.3; Bill 5, Item 8.0	100 %
3.1.2	<u>Power Cables: Medium and Low Voltage:</u> Bill 2, Item 16.0; Bill 2, Item 33.0; Bill 2, Item 34.0; Bill 3, Item 15.0; Bill 4, Item 11.2; Bill 4, Item 11.3; Bill 4, Item 11.4; Bill 4, Item 12.2; Bill 4, Item 12.3; Bill 4, Item 12.6; Bill 4, Item 21.2; Bill 4, Item 21.3; Bill 4, Item 21.6; Bill 5, Item 7.0; Bill 5, Item 9.0; Bill 5, Item 4.0; Bill 6, Item 2.0; Bill 7, Item 1.0	90 %

3.1.3 Designated Hardware Components:

Bill 2, Item 4; Bill 2, Item 6; Bill 2, Item 7; Bill 2, Item 9;
 Bill 2, Item 10; Bill 2, Item 11; Bill 2, Item 12; Bill 2, Item
 14; Bill 2, Item 15; Bill 2, Item 17; Bill 2, Item 18; Bill 2,
 Item 19; Bill 2, Item 21; Bill 2, Item 23; Bill 2, Item 37;
 Bill 2, Item 38; Bill 3, Item 5; Bill 3, Item 6; Bill 8, Item
 8.1; Bill 8, Item 8.2; Bill 3, Item 10.1; Bill 3, Item 10.2;
 Bill 3, Item 11; Bill 3, Item 12; Bill 3, Item 13; Bill 4, Item
 6; Bill 4, Item 7;
 Bill 4, Item 13; Bill 4, Item 14; Bill 4, Item 16; Bill 4, Item
 19; Bill 4, Item 23; Bill 5, Item 5.1; Bill 5, Item 5.2; Bill 6,
 Item 3

100 %

4. Does any portion of the services, works or goods offered
 have any imported content?
 (**Tick applicable box**)

YES		NO	
-----	--	----	--

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

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

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

Currency	Rates of exchange
US Dollar	
Pound Sterling	
Euro	
Yen	
Other	

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

5. Were the Local Content Declaration Templates (Annex C, D and E) audited and
 certified as correct?
 (**Tick applicable box**)

YES		NO	
-----	--	----	--

- 5.1. If yes, provide the following particulars:

- (a) Full name of auditor:
- (b) Practice number:
- (c) Telephone and cell number:
- (d) Email address:

(Documentary proof regarding the declaration will, when required, be submitted to the
 satisfaction of the Accounting Officer / Accounting Authority)

6. Where, after the award of a bid, challenges are experienced in meeting the stipulated
 minimum threshold for local content the dti must be informed accordingly in order for the
 dti to verify and in consultation with the Accounting Officer / Accounting Authority provide
 directives in this regard.

LOCAL CONTENT DECLARATION

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

Steel Pipe Fittings and Special: Galvanised

IN RESPECT OF BID NO. TENDER NO. 06/2022: ELECTRIFICATION OF 172 FORMAL HOUSES AT NKQUBELA, ROBERTSON

ISSUED BY: LANGE BERG MUNICIPALITY

NB

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

2 Guidance on the Calculation of Local Content together with Local Content Declaration Templates (Annex C, D and E) is accessible on <http://www.thedti.gov.za/industrialdevelopment/ip.jsp>. Bidders should first complete Declaration D. After completing Declaration D, bidders should complete Declaration E and then consolidate the information on Declaration C. **Declaration C should be submitted with the bid documentation at the closing date and time of the bid in order to substantiate the declaration made in paragraph (c) below.** Declarations D and E should be kept by the bidders for verification purposes for a period of at least 5 years. The successful bidder is required to continuously update Declarations C, D and E with the actual values for the duration of the contract.

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

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

(b) I have satisfied myself that

- (i) the goods/services/works to be delivered in terms of the above-specified bid comply with the minimum local content requirements as specified in the bid, and as measured in terms of SATS 1286:2011; and
- (ii) the declaration templates have been audited and certified to be correct.

(c) The local content percentages (%) indicated below has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 above and the information contained in Declaration D and E which has been consolidated in Declaration C;

Bid price, excluding VAT (y)	R
Imported content (x), as calculated in terms of SATS 1286:2011	R
Stipulated minimum threshold for local content (paragraph 3 above)	
Local content %, as calculated in terms of SATS 1286:2011	

If the bid is for more than one product, the local content percentages for each product contained in Declaration C shall be used instead of the table above. The local content percentages for each product has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 above and the information contained in Declaration D and E.

(d) I accept that the Procurement Authority / Municipality /Municipal Entity has the right to request that the local content be verified in terms of the requirements of SATS 1286:2011.

(e) I understand that the awarding of the bid is dependent on the accuracy of the information furnished in this application. I also understand that the submission of incorrect data, or data that are not verifiable as described in SATS 1286:2011, may result in the Procurement Authority / Municipal / Municipal Entity imposing any or all of the remedies as provided for in Regulation 13 of the Preferential Procurement Regulations, 2017 promulgated under the Preferential Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

SIGNATURE: _____

DATE: _____

WITNESS No. 1 _____

DATE: _____

WITNESS No. 2 _____

DATE: _____

LOCAL CONTENT DECLARATION

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

Cables used for Power Transmission

IN RESPECT OF BID NO. TENDER NO. 06/2022: ELECTRIFICATION OF 172 FORMAL HOUSES AT NKQUBELA, ROBERTSON

ISSUED BY: LANGE BERG MUNICIPALITY

NB

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

2 Guidance on the Calculation of Local Content together with Local Content Declaration Templates (Annex C, D and E) is accessible on <http://www.thedti.gov.za/industrialdevelopment/ip.jsp>. Bidders should first complete Declaration D. After completing Declaration D, bidders should complete Declaration E and then consolidate the information on Declaration C. **Declaration C should be submitted with the bid documentation at the closing date and time of the bid in order to substantiate the declaration made in paragraph (c) below.** Declarations D and E should be kept by the bidders for verification purposes for a period of at least 5 years. The successful bidder is required to continuously update Declarations C, D and E with the actual values for the duration of the contract.

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

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

(b) I have satisfied myself that

- (iii) the goods/services/works to be delivered in terms of the above-specified bid comply with the minimum local content requirements as specified in the bid, and as measured in terms of SATS 1286:2011; and
- (iv) the declaration templates have been audited and certified to be correct.

(c) The local content percentages (%) indicated below has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 above and the information contained in Declaration D and E which has been consolidated in Declaration C;

Bid price, excluding VAT (y)	R
Imported content (x), as calculated in terms of SATS 1286:2011	R
Stipulated minimum threshold for local content (paragraph 3 above)	
Local content %, as calculated in terms of SATS 1286:2011	

If the bid is for more than one product, the local content percentages for each product contained in Declaration C shall be used instead of the table above. The local content percentages for each product has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 above and the information contained in Declaration D and E.

(d) I accept that the Procurement Authority / Municipality /Municipal Entity has the right to request that the local content be verified in terms of the requirements of SATS 1286:2011.

(e) I understand that the awarding of the bid is dependent on the accuracy of the information furnished in this application. I also understand that the submission of incorrect data, or data that are not verifiable as described in SATS 1286:2011, may result in the Procurement Authority / Municipal / Municipal Entity imposing any or all of the remedies as provided for in Regulation 13 of the Preferential Procurement Regulations, 2017 promulgated under the Preferential Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

SIGNATURE: _____

DATE: _____

WITNESS No. 1 _____

DATE: _____

WITNESS No. 2 _____

DATE: _____

LOCAL CONTENT DECLARATION

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

Designated Hardware Components

IN RESPECT OF BID NO. TENDER NO. 06/2022: ELECTRIFICATION OF 172 FORMAL HOUSES AT NKQUBELA, ROBERTSON

ISSUED BY: LANGEBERG MUNICIPALITY

NB

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

2 Guidance on the Calculation of Local Content together with Local Content Declaration Templates (Annex C, D and E) is accessible on <http://www.thedti.gov.za/industrialdevelopment/ip.jsp>. Bidders should first complete Declaration D. After completing Declaration D, bidders should complete Declaration E and then consolidate the information on Declaration C. **Declaration C should be submitted with the bid documentation at the closing date and time of the bid in order to substantiate the declaration made in paragraph (c) below.** Declarations D and E should be kept by the bidders for verification purposes for a period of at least 5 years. The successful bidder is required to continuously update Declarations C, D and E with the actual values for the duration of the contract.

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

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

(b) I have satisfied myself that

- (v) the goods/services/works to be delivered in terms of the above-specified bid comply with the minimum local content requirements as specified in the bid, and as measured in terms of SATS 1286:2011; and
- (vi) the declaration templates have been audited and certified to be correct.

(c) The local content percentages (%) indicated below has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 above and the information contained in Declaration D and E which has been consolidated in Declaration C;

Bid price, excluding VAT (y)	R
Imported content (x), as calculated in terms of SATS 1286:2011	R
Stipulated minimum threshold for local content (paragraph 3 above)	
Local content %, as calculated in terms of SATS 1286:2011	

If the bid is for more than one product, the local content percentages for each product contained in Declaration C shall be used instead of the table above. The local content percentages for each product has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 above and the information contained in Declaration D and E.

(d) I accept that the Procurement Authority / Municipality /Municipal Entity has the right to request that the local content be verified in terms of the requirements of SATS 1286:2011.

(e) I understand that the awarding of the bid is dependent on the accuracy of the information furnished in this application. I also understand that the submission of incorrect data, or data that are not verifiable as described in SATS 1286:2011, may result in the Procurement Authority / Municipal / Municipal Entity imposing any or all of the remedies as provided for in Regulation 13 of the Preferential Procurement Regulations, 2017 promulgated under the Preferential Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

SIGNATURE: _____ **DATE:** _____

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

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

Local production and content

- (1) The Department of Trade and Industry may, in consultation with the National Treasury-
 - (a) designate a sector, sub-sector or industry or product in accordance with national development and industrial policies for local production and content, where only locally produced services or goods or locally manufactured goods meet the stipulated minimum threshold for local production and content, taking into account economic and other relevant factors; and
 - (b) stipulate a minimum threshold for local production and content.
- (2) An organ of state must, in the case of a designated sector, advertise the invitation to tender with a specific condition that only locally produced goods or locally manufactured goods, meeting the stipulated minimum threshold for local production and content, will be considered.
- (3) The National Treasury must inform organs of state of any designation made in terms of regulation 8(1) through a circular.
- (4) (a) If there is no designated sector, an organ of state may include, as a specific condition of the tender, that only locally produced services or goods or locally manufactured goods with a stipulated minimum threshold for local production and content, will be considered.
 - (b) The threshold referred to in paragraph (a) must be in accordance with the standards determined by the Department of Trade and Industry in consultation with the National Treasury.
- (5) A tender that fails to meet the minimum stipulated threshold for local production and content is an unacceptable tender.

DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

- 1 This Municipal Bidding Document must form part of all bids invited.
- 2 It serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.
- 3 The bid of any bidder may be rejected if that bidder, or any of its directors have:
 - a. abused the municipality's / municipal entity's supply chain management system or committed any improper conduct in relation to such system;
 - b. been convicted for fraud or corruption during the past five years;
 - c. willfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or
 - d. been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).
- 4 **In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.**

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

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

CERTIFICATION

I, THE UNDERSIGNED (FULL NAME)

CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM TRUE AND CORRECT.

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

.....

Signature

.....

Date

.....

Position

.....

Name of Bidder

CERTIFICATE OF INDEPENDANT BID DETERMINATION

1. This Municipal Bidding document (MBD) must form part of all bids¹ invited.
2. Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or bid rigging).² Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.
3. Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:
 - a. Take all reasonable steps to prevent such abuse;
 - b. Reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and
 - c. Cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.
4. This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.
5. In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid:

¹ includes price quotations, advertised competitive bids, limited bids and proposals.

² Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly

conspire to raise prices or lower the quality of goods and / or services for purchases who wish to acquire goods and

/ or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

CERTIFICATE OF INDEPENDENT BID DETERMINATION
I, THE UNDERSIGNED, IN SUBMITTING THE ACCOMPANYING BID:

In response to the invitation for the bid made by **Hessequa Municipality** do hereby make the following statement that I certify to be true and complete in every respect:

I certify, on behalf of:

.....that:
 (Name of Bidder)

1. I have read and I understand the contents of this Certificate;
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect.
3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
 - (a) Has been requested to submit a bid in response to this bid invitation;
 - (b) Could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
 - (c) Provides the same goods and services as the bidder and/or is in the same line of business as the bidder.
6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium³ will not be construed as collusive bidding.
7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
 - a. Prices;
 - b. Geographical area where product or service will be rendered (market allocation)
 - c. Methods, factors or formulas used to calculate prices;
 - d. The intention or decision to submit or not to submit, a bid;
 - e. The submission of a bid which does not meet the specifications and conditions of the bid; or
 - f. Bidding with the intention not to win the bid.
8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.
9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.

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

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

.....
Signature

.....
Date

.....
Position

.....
Name of Bidder

BID FOR THE REQUIREMENTS OF THE LANGE BERG MUNICIPALITY

PART A
INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE LANGE BERG MUNICIPALITY					
BID NUMBER:	06/2022	CLOSING DATE:	4 March 2022	CLOSING TIME:	12:00
DESCRIPTION	TENDER NO. 06/2022: ELECTRIFICATION OF 172 FORMAL HOUSES AT NKQUBELA, ROBERTSON				
THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (MBD7).					
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT (STREET ADDRESS)					
HESSEQUA MUNICIPALITY – SCM POST OFFICE BUILDING					
19 MAIN ROAD					
RIVERSDALE					
6670					
SUPPLIER INFORMATION					
NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE		NUMBER		
CELLPHONE NUMBER					
FACSIMILE NUMBER	CODE		NUMBER		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
TAX COMPLIANCE STATUS	TCS PIN:		OR	CSD No:	
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE [TICK APPLICABLE BOX]	☐ Yes ☐ No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT ☐ Yes ☐ No		
[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]					

ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ No [IF YES ENCLOSE PROOF]	ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ No [IF YES, ANSWER PART B:3]
TOTAL NUMBER OF ITEMS OFFERED		TOTAL BID PRICE	R
SIGNATURE OF BIDDER	.....	DATE	.....
CAPACITY UNDER WHICH THIS BID IS SIGNED			
BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO:		TECHNICAL INFORMATION MAY BE DIRECTED TO:	
DEPARTMENT	SCM	CONTACT PERSON	NEIL ALBERTYN
CONTACT PERSON	Sabelo NGCONGOLO	TELEPHONE NUMBER	023 626 8200
TELEPHONE NUMBER	023 615 8000	FACSIMILE NUMBER	-
FACSIMILE NUMBER	023 615 1563	E-MAIL ADDRESS	nalbertyn@langeberg.gov.za
E-MAIL ADDRESS	sngcongolo@langeberg.gov.za		

PART B

TERMS AND CONDITIONS FOR BIDDING

1. BID SUBMISSION:										
1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION. 1.2. ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED–(NOT TO BE RE-TYPED) 1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.										
2. TAX COMPLIANCE REQUIREMENTS										
2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS. 2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VIEW THE TAXPAYER'S PROFILE AND TAX STATUS. 2.3 APPLICATION FOR THE TAX COMPLIANCE STATUS (TCS) CERTIFICATE OR PIN MAY ALSO BE MADE VIA E-FILING. IN ORDER TO USE THIS PROVISION, TAXPAYERS WILL NEED TO REGISTER WITH SARS AS E-FILERS THROUGH THE WEBSITE WWW.SARS.GOV.ZA. 2.4 FOREIGN SUPPLIERS MUST COMPLETE THE PRE-AWARD QUESTIONNAIRE IN PART B:3. 2.5 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID. 2.6 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER. 2.7 WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.										
3. QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS										
<table style="width: 100%; border: none;"> <tr> <td style="width: 70%;">3.1. IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?</td> <td style="width: 30%; text-align: right;"> ☐ YES ☐ NO </td> </tr> <tr> <td>3.2. DOES THE ENTITY HAVE A BRANCH IN THE RSA?</td> <td style="text-align: right;"> ☐ YES ☐ NO </td> </tr> <tr> <td>3.3. DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?</td> <td style="text-align: right;"> ☐ YES ☐ NO </td> </tr> <tr> <td>3.4. DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?</td> <td style="text-align: right;"> ☐ YES ☐ NO </td> </tr> <tr> <td>3.5. IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?</td> <td style="text-align: right;"> ☐ YES ☐ NO </td> </tr> </table> IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 ABOVE.	3.1. IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?	☐ YES ☐ NO	3.2. DOES THE ENTITY HAVE A BRANCH IN THE RSA?	☐ YES ☐ NO	3.3. DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?	☐ YES ☐ NO	3.4. DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?	☐ YES ☐ NO	3.5. IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?	☐ YES ☐ NO
3.1. IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?	☐ YES ☐ NO									
3.2. DOES THE ENTITY HAVE A BRANCH IN THE RSA?	☐ YES ☐ NO									
3.3. DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?	☐ YES ☐ NO									
3.4. DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?	☐ YES ☐ NO									
3.5. IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?	☐ YES ☐ NO									

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

SIGNATURE OF BIDDER:

CAPACITY UNDER WHICH THIS BID IS SIGNED:

DATE:

T2.2.12 SCHEDULE OF REFERENCE FOR TENDERER

Refer to Tender Data, Part T1.2, Clause C.2.2.1 (b) on Page T1.1.3 regarding Tenderer's feedback from Referees to be provided to claim points.

Referee No. 1 and Project Information

- The Tenderer must provide three (3) separate and unrelated contactable Referees.
- The Referees must relate to three (3) separate successfully completed projects in the last 5 years.
- The reference projects must be for the electrification of at least 100 low cost houses where the Tenderer was responsible for the supply and installation of the material / equipment.
- The Tenderer must arrange for the Referee to complete this form and the completed form (scanned copy acceptable) must be submitted with the tender document.
- **A Certificate of Practical Completion, Certificate of Completion, or Taken Over Certificate signed by the Employer's Agent must be attached for the project referenced herein. (Note that no additional reference letters from Clients / Engineers will be accepted.)**

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 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	
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:

Referee No. 2 and Project Information

- The Tenderer must provide three (3) separate and unrelated contactable Referees.
- The Referees must relate to three (3) separate successfully completed projects in the last 5 years.
- The reference projects must be for the electrification of at least 100 low cost houses where the Tenderer was responsible for the supply and installation of the material / equipment.
- The Tenderer must arrange for the Referee to complete this form and the completed form (scanned copy acceptable) must be submitted with the tender document.
- **A Certificate of Practical Completion, Certificate of Completion, or Taken Over Certificate signed by the Employer's Agent must be attached for the project referenced herein. (Note that no additional reference letters from Clients / Engineers will be accepted.)**

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 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	
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:

Referee No. 3 and Project Information

- The Tenderer must provide three (3) separate and unrelated contactable Referees.
- The Referees must relate to three (3) separate successfully completed projects in the last 5 years.
- The reference projects must be for the electrification of at least 100 low cost houses where the Tenderer was responsible for the supply and installation of the material / equipment.
- The Tenderer must arrange for the Referee to complete this form and the completed form (scanned copy acceptable) must be submitted with the tender document.
- **A Certificate of Practical Completion, Certificate of Completion, or Taken Over Certificate signed by the Employer's Agent must be attached for the project referenced herein. (Note that no additional reference letters from Clients / Engineers will be accepted.)**

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 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	
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**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:

TENDER NO. 06/2022: ELECTRIFICATION OF 172 FORMAL HOUSES AT NKQUEBELA, ROBERTSON

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	

C1.1.4

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:

..... Signature

..... Name

..... Capacity

Name and address of organisation:

.....

.....

.....

..... Witness Signature

..... Witness Name

..... Date

For the Employer:

.....

.....

.....

Name and address of organisation:

.....

.....

.....

.....

.....

.....

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

C.1.2 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 is twelve (12) Calendar Weeks. The time for achieving Practical Completion includes the days referred to under Clause 5.3.2, the non-working days and special non-working days (Clauses 5.1.1 and 5.8.1).
1.1.1.15	The name of the Employer is Langeberg 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): <i>Municipal Offices, 28 Main Road, Ashton</i> Address (postal): <i>Private Bag X2, Ashton, 6715</i> Telephone: 023 615 8000 Facsimile: 023 615 1563 e-mail: admin@breeland.gov.za
1.2.1.2	The address of the Employer's Agent is: Address (physical): 39 Victoria Street, George, 6529 Address (postal) P O Box 2551, George, 6530 Telephone: 044-8741511 Facsimile: 044-8741510 e-mail: jdevilliers@cmbgeorge.co.za

C1.2.2

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). 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). Letter of Good Standing from the Compensation Commissioner. Proof of order for 11kV cable, LV wooden poles, LV equipment / material.
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 2 (Two) 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 2 (Two) 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 percentage reduction of Contract Price (penalty) per completed week of delay, shall be ½ (half percent) per week or part thereof. The maximum percentage reduction shall be 10% (ten percent.)
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 5 years.
5.4.2	The access and possession of the Site shall not be exclusive to the Contractor but as set out in the Site Information.
6.5.1.2.3	The percentage allowance on the net cost of materials actually used in the completed Works is 10%. The percentage allowance on the gross remuneration of the workmen and foremen actually engaged is 10%.

C1.2.3

6.8.2	Contract Price Adjustment 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.
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.
10.7.1	The determination of disputes which are unresolved in terms of Clause 10.4.2 shall be by arbitration.

C.1.2 CONTRACT DATA**PART 2: DATA PROVIDED BY THE CONTRACTOR**

The Tenderer shall provide the following information

Clause	Data								
1.1.1.9	The name of the Contractor is								
1.2.1.2	The address of the Contractor is:								
	Address (physical): Address (postal): Telephone: Facsimilee: E-mail:								
1.1.1.14	I / we hereby confirm that I / we will comply with the programme as stipulated under the Data provided by the Employer.....Yes / No.								
6.2.1	The security to be provided by the Contractor shall be one of the following:								
	<table border="1"> <thead> <tr> <th>Type of security (Value Added Tax is excluded from the Contract Sum and the value of the Works for calculating the percentages)</th><th>Contractor's Choice (Indicate "Yes" or "No")</th></tr> </thead> <tbody> <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>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> </tbody> </table>	Type of security (Value Added Tax is excluded from the Contract Sum and the value of the Works for calculating the percentages)	Contractor's Choice (Indicate "Yes" or "No")	Cash deposit of 10% of the Contract Sum plus retention of 5% of the value of the Works		Performance guarantee of 10% of the Contract Sum plus retention of 5% of the value of the Works.		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.	No
Type of security (Value Added Tax is excluded from the Contract Sum and the value of the Works for calculating the percentages)	Contractor's Choice (Indicate "Yes" or "No")								
Cash deposit of 10% of the Contract Sum plus retention of 5% of the value of the Works									
Performance guarantee of 10% of the Contract Sum plus retention of 5% of the value of the Works.									
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.	No								

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: ***Langeberg Municipality***

“Contractor” means:

“Engineer” means: ***Clinkscapes Maughan-Brown (South) (Pty) Ltd***

“Works” means: ***Electrification of 172 Formal Houses at Nkqubela, Robertson***

“Site” means: ***Nkqubela, Robertson***

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

“Contract Sum” means: The accepted amount inclusive of tax of ***R***

Amount in words:

“Guaranteed Sum” means: The maximum aggregate amount of ***R***

Amount in words:

“Expiry Date” means: The date of issue of the Certificate of Completion of the Works by the Engineer.

CONTRACT DETAILS

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

PERFORMANCE GUARANTEE

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

C1.3.2

3. The Guarantor hereby acknowledges that:
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; its obligation under this Performance Guarantee is restricted to the payment of money.
4. Subject to the Guarantor's maximum liability referred to in 1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 4.1 to 4.3:
 - 4.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Engineer in an Interim 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 4.2;
 - 4.2 A first written demand issued by the Employer to the Guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) days has elapsed since the first written demand in terms of 4.1 and the sum certified has still not been paid;
 - 4.3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum certified in 4.
5. Subject to the Guarantor's maximum liability referred to in 1, the Guarantor undertakes to pay 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:
 - 5.1 the Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 5; or
 - 5.2 a provisional or final sequestration or liquidation court order has been granted against the Contractor and that the Performance Guarantee is called up in terms of 5; and
 - 5.3 the aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provisional liquidation court order.
6. It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4 and 5 shall not exceed the Guarantor's maximum liability in terms of 1.
7. Where the Guarantor has made payment in terms of 5, the Employer shall upon the date of issue of the Final Payment Certificate submit an expense account to the Guarantor showing how all monies received in terms of this Performance Guarantee have been expended and shall refund 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.
8. Payment by the Guarantor in terms of 4 or 5 shall be made within seven (7) calendar days upon receipt of the first written demand to the Guarantor.
9. Payment by the Guarantor in terms of 5 will only be made against the return of the original Performance Guarantee by the Employer.

C1.3.3

10. The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.
11. The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.
12. This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.
13. This Performance Guarantee, with the required demand notices in terms of 4 or 5, shall be regarded as a liquid document for the purposes of obtaining a court order.
14. 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

..... (Employer)
and

.....(Contractor / Mandatory)

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

I, representing

the Contractor / Mandatory 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 aton the.....day of.....20....

Witness

Contractor / Mandatory

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

[illegible]

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 mathematical 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 mathematical 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 connection 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 Engineer or the Employer does, however, 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.

C2.2 BILLS OF QUANTITIES

<u>INDEX TO BILLS OF QUANTITIES</u>	<u>Page No's</u>
BILL 1: PRELIMINARY AND GENERAL ITEMS	C2.2.1
BILL 2: EXTERNAL MV (11kV) AND LV RETICULATION	C2.2.3
BILL 3: POLE MOUNTED TRANSFORMER SUBSTATIONS	C2.2.6
BILL 4: LV RETICULATION	C2.2.8
BILL 5: SERVICE CONNECTIONS	C2.2.11
BILL 6: INSTALLATION INSIDE HOUSES	C2.2.13
BILL 7: STREETLIGHTING INSTALLATION	C2.2.14
PRICE SUMMARY	C2.2.15

BILL 1: PRELIMINARY AND GENERAL ITEMS

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL				LABOUR			
					RATE		TOTAL		RATE		TOTAL
	<u>Notes:</u>										
(i)	All rates must be exclusive of VAT.										
(ii)	<u>All the items below to include for the specific requirements to the COVID 19 Pandemic.</u>										
1.0	<u>Fixed Charge Items</u>										
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 sets of electronic and hard copies of "As-built" drawings, test certificates to be submitted to Engineer on hand-over.	Sum	1	R	-	R	-	R	-	R	-
1.4.4	For testing, inspection and commissioning.	Sum	1	R	-	R	-	R	-	R	-
1.4.5	Project notice board.	Sum	1	R	-	R	-	R	-	R	-
1.4.6	For compliance with the requirements of the Occupational Health and Safety Act construction regulations.	Sum	1	R	-	R	-	R	-	R	-
1.4.7	Liaison and co-ordination with Langeberg Municipality.	Sum	1	R	-	R	-	R	-	R	-
2.0	<u>Time Related Items:</u>										
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	Operate and maintain facilities on site:										
2.5.1	Office and storage sheds.	Sum	1	R	-	R	-	R	-	R	-
2.5.2	Workshops.	Sum	1	R	-	R	-	R	-	R	-
2.5.3	Ablutions and latrines.	Sum	1	R	-	R	-	R	-	R	-
2.5.4	Tools and equipment	Sum	1	R	-	R	-	R	-	R	-
2.5.5	Water supply, electrical power, telephone and access.	Sum	1	R	-	R	-	R	-	R	-
2.6	Allowances:										
2.6.1	Liaison and co-ordination with Swellendam Municipality.	Sum	1	R	-	R	-	R	-	R	-
2.6.2	For maintenance as required.	Sum	1	R	-	R	-	R	-	R	-

BILL 1: PRELIMINARY AND GENERAL ITEMS

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL			LABOUR		
					RATE	TOTAL		RATE	TOTAL
3.0	Daywork 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	1	R	-	R	-	R	-
3.1.2	Artisan Electrician and Labourer	hour	2	R	-	R	-	R	-
3.1.3	Labourer	hour	10	R	-	R	-	R	-
3.2	Labour, Normal Overtime:								
3.2.1	Installation Electrician and Labourer	hour	1	R	-	R	-	R	-
3.2.2	Artisan Electrician and Labourer	hour	2	R	-	R	-	R	-
3.2.3	Labourer	hour	10	R	-	R	-	R	-
3.3	Labour, Sundays and Public Holidays:								
3.3.1	Installation Electrician and Labourer	hour	1	R	-	R	-	R	-
3.3.2	Artisan Electrician and Labourer	hour	2	R	-	R	-	R	-
3.3.3	Labourer	hour	10	R	-	R	-	R	-
3.4	Materials:								
3.4.1	Percentage mark-up on nett cost of materials.	%	.....						
3.5	Transport:								
3.5.1	Private car or light delivery vehicle.	km	10	R	-	R	-	R	-
3.5.2	10 tonne truck	km	10	R	-	R	-	R	-
3.5.3	15 tonne truck with crane	km	10	R	-	R	-	R	-
3.5.4	5 tonne mobile crane	hour	2	R	-	R	-	R	-
	TOTAL BILL 1 TO BE CARRIED FORWARD TO PRICE SUMMARY, ITEM 1					R	-	R	-

BILL 2: EXTERNAL MV (11kV) AND LV RETICULATION

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL				LABOUR			
				RATE		TOTAL		RATE		TOTAL	
	<u>Notes:</u> (i) All rates must be exclusive of VAT. (ii) Refer to Drawing No.'s 10541/E/01 to 26. (iii) All items to include for the supply and delivery thereof, unless specified otherwise. (iv) All quantities are provisional. (v) HD-Hard Drawn, Cu-Copper, Al-Aluminium, R/O-rate only. <u>MV Overhead Reticulation:</u>										
1.0	Peg MV pole positions on site in conjunction with the Engineer.	Item	1	R	-	R	-	R	-	R	-
2.0	Excavation, backfilling and compaction of hole for MV pole and stay in intermediate earth soil.	No.	9		Nil		Nil	R	-	R	-
3.0	11 metre Tarred wooden pole as specified drilled for hardware, excluding hardware and pole hole measured elsewhere.	No.	5	R	-	R	-	R	-	R	-
4.0	Single stay complete with insulator (11kV), excluding stay hole and guard measured elsewhere.	No.	4	R	-	R	-	R	-	R	-
5.0	Stay guard fixed to stay wire.	No.	4	R	-	R	-	R	-	R	-
6.0	Strain A-frame complete with fixing bolts, nuts, washers, etc., excluding insulators measured elsewhere.	No.	1	R	-	R	-	R	-	R	-
7.0	Intermediate A-frame complete with fixing bolts, nuts, washers, etc. excluding insulators measured elsewhere.	No.	1	R	-	R	-	R	-	R	-
8.0	Galvanised steel cross-arm for use with "A" frame at Tee-Offs and right angle turns, as detailed on Drawing No.'s 10541/E/12 and 13, incl. 16mm² Cu earth bonding to A-frame.	No.	R/O	R	-		Nil	R	-		Nil
9.0	Separate cross-arm equipped with set of three expulsion fuses as Detailed on Drawing No. 10541/E/14, complete with bolts, washers, nuts, etc, incl. 16mm² Cu earth bonding for A-frame:	No.	1	R	-	R	-	R	-	R	-
10.0	<u>Set of three</u> strain insulators complete with thimble clevis, pins, etc.	Sets	2	R	-	R	-	R	-	R	-
11.0	<u>Set of three</u> linepost insulators complete with bolts, nuts, washers, etc.	No.	1	R	-	R	-	R	-	R	-
12.0	61,50mm² (6/1/3,35) Rabbit ACSR Overhead Conductor suspended between	m	60	R	-	R	-	R	-	R	-
13.0	61,50mm² (6/1/3,35) Rabbit ACSR Jumpers , <u>set of three</u> , between overhead lines (1,5m long) , incl line taps and connections (See Drawing No. 10541/E/14).	No.	1	R	-	R	-	R	-	R	-
14.0	Terminate and connect 61,50mm² (6/1/3,35) Rabbit ACSR conductor at strain insulators using "Preformed" dead ends (set of three).	No.	2	R	-	R	-	R	-	R	-
15.0	Bind in 61,50mm² (6/1/3,35) Rabbit conductor at line post insulators using "Preformed" twin-ties (set of three).	Set	1	R	-	R	-	R	-	R	-

BILL 2: EXTERNAL MV (11kV) AND LV RETICULATION

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL		LABOUR	
				RATE	TOTAL	RATE	TOTAL
16.0	35mm ² MV (11kV) ABC conductor suspended between poles. Poles and clamps measured elsewhere.	m	160	R	-	R	-
17.0	Strain clamp for 35mm ² MV (11kV) ABC bundled conductor including pistol grib, pigtail bolt, eye bolt, nuts, washers, etc, as detailed on Drawing No. 10541/E/26.	No.	2	R	-	R	-
18.0	Suspension clamp for 35mm ² MV (11kV) ABC bundled conductor including bracket, U-Bolt, hanger bracket, pigtail bolt, nuts, washers, etc, as detailed on Drawing No. 10541/E/25.	No.	4	R	-	R	-
19.0	Separate cross-arm equipped with <u>set of three</u> expulsion fuses, a pin insulator, as Detailed on Drawing No. 10541/E/15, complete with bolts, washers, nuts, etc.	No.	1	R	-	R	-
20.0	<u>Set of three</u> lightning arrestors, incl. jumpers, mounted to a cross-arm, measured elsewhere, as detailed on Drawing No. 10541/E/15.	No.	1	R	-	R	-
21.0	35mm ² Cu black PVC insulated earth down conductor, including clamps, lugs, straps, etc. connect to earth spike at MV lightning arrestors / MV cable using 2 insulation piercing connectors.	No.	2	R	-	R	-
22.0	4m Long 25mm diameter kickpipe to protect earth down conductor against pole.	No.	2	R	-	R	-
23.0	4,5meter long (3x 1,5m) earth spike, including cable marker at neutral earth pole.	No.	2	R	-	R	-
24.0	Terminate and connect MV ABC conductor to set of three expulsion fuses, incl. lugs etc.	No.	2	R	-	R	-
25.0	Clamp 35mm ² MV (11kV) ABC bundled conductor to strain clamp measured elsewhere.	No.	2	R	-	R	-
26.0	Clamp 35mm ² MV (11kV) ABC bundled conductor to suspension clamp measured elsewhere.	No.	4	R	-	R	-
27.0	Creosote MV pole.	No.	3	R	-	R	-
	<u>MV Underground cable</u>						
28.0	Mark out MV cable route and assist Engineer to finalise this.	Sum	1	R	-	R	-
29.0	Breaking-up of surface, 600mm wide, including making good of surface:						
29.1	Tar	m	R/O	R	-	Nil	Nil
29.2	Cement	m	R/O	R	-	Nil	Nil
29.3	Paving	m	R/O	R	-	Nil	Nil
30.0	Trenching by hand inspection trenches to locate and expose existing underground cables / other services, 400mm wide x 1200mm deep, including backfilling and compaction:						
30.1	Earth	m	5	nil	Nil	R	-
30.2	Intermediate	m	5	nil	Nil	R	-
30.3	Rock	m	2	nil	Nil	R	-

BILL 2: EXTERNAL MV (11kV) AND LV RETICULATION

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL				LABOUR			
				RATE		TOTAL		RATE		TOTAL	
31.0	Trenching by hand in parallel with and crossing existing services for new MV cables/sleeves 500mm wide x 1150mm deep <u>on the pavement</u> , including backfilling (300mm imported sand) and compaction:										
31.1	Earth	m	4	R	-	R	-	R	-	R	-
31.2	Intermediate	m	25	R	-	R	-	R	-	R	-
31.3	Rock	m	1	R	-	R	-	R	-	R	-
32.0	1x 160mm Dia. sleeve installed by using terra-mole soil displacement / fluid assisted directional drilling method:										
32.1	Excavation hole for drilling equipment <u>per intersection</u> .	No.	2		Nil		Nil	R	-	R	-
32.2	Establish setup of drilling equipment and remove equipment, incl. time related charges <u>per intersection</u> .	Item	2	R	-	R	-	R	-	R	-
32.3	Drilling for 1 x 160mm Dia. HDPE PE100 PN10 sleeve 10m long.	No.	2		Nil		Nil	R	-	R	-
32.4	Supply, weld and install <u>10m x 160mm</u> Dia. HDPE PE100 PN10 sleeve complete with draw wire.	No.	2	R	-	R	-	R	-	R	-
32.5	Seal 160mm Dia uPVC sleeve-ends per intersection, i.e. two sleeve ends.	No.	2	R	-	R	-			R	-
33.0	35mm ² , 3 core Cu, 11/11kV (Table 18) underground cable in trench / sleeve measured elsewhere.	m	40	R	-	R	-	R	-	R	-
34.0	35mm ² , 3 core Cu, 11/11kV (Table 18) underground cable strapped to pole measured elsewhere.	m	20	R	-	R	-	R	-	R	-
35.0	300mm wide x 150 micron PVC marker tape over cable in trench measured elsewhere.	m	30	R	-	R	-	R	-	R	-
36.0	Terminate and connect 3 core, 11/11kV (Table 18) cable to expulsion fuses on overhead line structure with heat shrink termination, incl line taps.	No.	2	R	-	R	-	R	-	R	-
	<u>LV Overhead Reticulation.</u>										
37.0	Strain clamp for LV bundled conductor including pigtail bolt, eye bolt, nuts, washers, etc.	No.	2	R	-	R	-	R	-	R	-
38.0	Suspension clamp for LV bundled conductor including pigtail bolt, nuts, washers, etc.	No.	6	R	-	R	-	R	-	R	-
39.0	Strap and seal end of 3 x (120mm ² to 35mm ²) Al + 1 x 25mm ² Al + 1 x 54,6mm ² LV bundled conductor at terminal pole.	No.	2	R	-	R	-	R	-	R	-
40.0	Disconnect the following equipment / material from existing pole and connect to										
40.1	Stay	No.	6	R	-	R	-	R	-	R	-
40.2	Flying Stay	No.	1	R	-	R	-	R	-	R	-
40.3	Streetlight fitting	No.	2	R	-	R	-	R	-	R	-
41.0	Recover the following material / equipment and return to Municipal Stores:										
41.1	10m Pole, incl. pole hole.	No.	2		Nil		Nil	R	-	R	-
41.2	LV ABC Strain and Suspension brackets.	No.	11		Nil		Nil	R	-	R	-
42.0	Extra over Item No.'s 30.0 and 31.0 for:										
42.1	Imported bedding/backfill material from off-	m ³	5	R	-	R	-	R	-	R	-
42.2	Disposal of surplus or unsuitable material including haulage up to 10km from site.	m ³	5		Nil		Nil	R	-	R	-
	TOTAL BILL 2 TO BE CARRIED FORWARD TO PRICE SUMMARY, ITEM 2					R	-			R	-

BILL 3: POLE MOUNTED TRANSFORMER SUBSTATIONS

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL		LABOUR			
				RATE	TOTAL	RATE	TOTAL		
	<u>Notes:</u> (i) All rates must be exclusive of VAT. (ii) Refer to Drawing No. 10541/E/01, 03, 04 to 09. (iii) All items to include for the supply and delivery thereof, unless specified otherwise. (iv) All quantities are provisional. (v) HD-Hard Drawn, Cu-Copper, Al-Aluminium, R/O-rate only.								
1.0	Mark out pole mounted transformer substations and assist Engineer to finalise this.	Item	2	R	-	R	-	R	-
2.0	Excavating, backfilling and compaction of hole for PMT structures:								
2.1	Earth	No.	1	Nil	Nil	R	-	R	-
2.2	Intermediate	No.	2	Nil	Nil	R	-	R	-
2.3	Rock	No.	1	Nil	Nil	R	-	R	-
3.0	10 metre tarred wooden pole as specified drilled for hardware, excluding hardware and pole hole measured elsewhere.	No.	3	R	-	R	-	R	-
4.0	Concrete foot 600mm x 600mm x 200mm deep in hole for pole measured elsewhere.	No.	4	R	-	R	-	R	-
5.0	Steelwork complete with bolts, nuts, washers, etc. to support expulsion fuses, Pin Insulators, Main LV Distribution Board and transformer complete as detailed on the drawings measured elsewhere.	Item	2	R	-	R	-	R	-
6.0	Set of three (3) lightning arrestors (11kV) mounted on transformer substation.	Item	2	R	-	R	-	R	-
7.0	Set of three (3):.....mounted on steelwork measured elsewhere:								
7.1	MV (11kV) expulsion fuses and fuse elements.	Item	1	R	-	R	-	R	-
7.2	Pin insulators .	Item	1	R	-	R	-	R	-
8.0	Jumpers between overhead line, expulsion fuses, transformer bushings and lightning arrestors, incl line taps and connections. (set of three):								
8.1	25mm² Cu XLPE insulayed UV stable PVC Conductor.	Item	1	R	-	R	-	R	-
8.2	61,70mm² (6/1/3,35) Rabbit conductor.	Item	1	R	-	R	-	R	-
9.0	200kVA 11000/420V Pole Mounted Transformer Substation, supplied by the Municipality as a free-issue item, on steelwork support structure measured elsewhere. <u>Material rate to only include the handling fee on the transformer substation. Transformer to be collected at the municipal stores in Robertson.</u>	Item	2	R	-	R	-	R	-
10.0	LV Distribution Board complete as specified on steel support structure measured elsewhere:								
10.1	Main LV Distribution Board - Nkqubela No.1	Item	1	R	-	R	-	R	-
10.2	Main LV Distribution Board - Nkqubela No.2	Item	1	R	-	R	-	R	-
11.0	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.	Item	2	R	-	R	-	R	-

BILL 3: POLE MOUNTED TRANSFORMER SUBSTATIONS

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL				LABOUR			
				RATE		TOTAL		RATE		TOTAL	
12.0	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.	Item	2	R	-	R	-	R	-	R	-
13.0	70mm² Cu bare conductor, clamps, etc. to earth steelwork as detailed on the drawings.	Item	2	R	-	R	-	R	-	R	-
14.0	Barbed wire anti-climb device and danger notice on pole supporting PMT.	No.	4	R	-	R	-	R	-	R	-
15.0	2 x 70mm² Cu x 4 core LV PVCAS cables strapped to pole in PVC pipes as detailed on the drawings.	m	10	R	-	R	-	R	-	R	-
16.0	Terminate and connect 2 x 70mm² Cu x 4 core LV PVCAS cables at LV bushings of PMT.	No.	1	R	-	R	-	R	-	R	-
17.0	Terminate and connect 2 x 70mm² Cu x 4 core LV PVCAS cables at LV distribution board incl. gland and lugs.	No.	1	R	-	R	-	R	-	R	-
18.0	Padlocks	No.	4	R	-	R	-	R	-	R	-
19.0	Labelling of cables.	Item	1	R	-	R	-	R	-	R	-
20.0	3m Long galvanised steel kickerpipe for 35mm² Cu x 3 core MV cable.	No.	4	R	-	R	-	R	-	R	-
21.0	Extra-over for item 2.0:										
21.1	Imported backfill	m³	1	R	-	R	-	R	-	R	-
21.2	Disposal of unsuitable material.	m³	1		Nil		Nil	R	-	R	-
</											

BILL 4: LV RETICULATION

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL		LABOUR	
				RATE	TOTAL	RATE	TOTAL
	<u>Notes:</u> (i) All rates must be exclusive of VAT. (ii) Refer to Drawing No. 10541/E/01, 02, 03 and 28. (iii) All items to include for the supply and delivery thereof, unless specified otherwise. (iv) All quantities are provisional. (v) HD-Hard Drawn, Cu-Copper, Al-Aluminium, R/O-rate only. <u>LV Reticulation:</u> 1.0 Mark out LV overhead line / underground cable routes, pole positions and assist Engineer to finalise these. 2.0 Excavating, backfilling and compaction of hole for pole, single stay, flying stay or prop structure: 2.1 Soft 2.2 Intermediate 2.3 Rock 3.0 Trenching by hand in parallel with and crossing existing services for new LV cable 400mm wide x 700mm deep on the pavement / erf including backfilling (200mm imported sand) and compaction: 3.1 Soft 3.2 Intermediate 3.3 Rock 4.0 1x 110mm Dia. sleeve installed by using terra-mole soil displacement / fluid assisted directional drilling method: 4.1 Excavation holes (2 holes) for drilling equipment <u>per intersection</u> . 4.2 Establish setup of drilling equipment and remove equipment, incl. time related charges <u>per intersection</u> . 4.3 Drilling for 1 x 110mm Dia. HDPE PE100 PN10 sleeve 8,5m long. 4.4 Supply, weld and install <u>8,5m x 110mm</u> Dia. HDPE PE100 PN10 sleeve complete with draw wire. 4.5 Seal 110mm Dia uPVC sleeve-ends per intersection, i.e. two sleeve ends. 5.0 9m Tarred wooden pole with pole cap and drilled for hardware, excluding hardware and pole hole measured elsewhere. 6.0 Single stay complete with insulator, excluding stay hole and guard measured 7.0 Flying Stay, excluding pole, stay guard, and holes measured elsewhere. 8.0 Short stay (20° instead of 45°) complete with insulator, excluding stay hole and guard measured elsewhere. 9.0 Prop structure complete with danger notice and barbed wire, excluding hole measured elsewhere. 10.0 Stay guard fixed to stay wire.	Sum <					

BILL 4: LV RETICULATION

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL			LABOUR		
				RATE	TOTAL		RATE	TOTAL	
11.0	LV bundled conductor suspended between poles. Pole and clamps measured elsewhere:								
11.1	3 x 120mm ² Al + 1 x 25mm ² Al + 1 x 54,6mm ²	m	R/O	R	-	Nil	R	-	Nil
11.2	3 x 95mm ² Al + 1 x 25mm ² Al + 1 x 54,6mm ²	m	470	R	-	R	R	-	R
11.3	3 x 70mm ² Al + 1 x 25mm ² Al + 1 x 54,6mm ²	m	450	R	-	R	R	-	R
11.4	3 x 50mm ² Al + 1 x 25mm ² Al + 1 x 54,6mm ²	m	220	R	-	R	R	-	R
11.5	3 x 35mm ² Al + 1 x 25mm ² Al + 1 x 54,6mm ²	m	R/O	R	-	Nil	R	-	Nil
12.0	4 Core LV PVCAS cable, unless shown otherwise, in trench measured elsewhere:								
12.1	95mm ² Cu	m	R/O	R	-	Nil	R	-	Nil
12.2	70mm ² Cu	m	45	R	-	R	R	-	R
12.3	50mm ² Cu	m	15	R	-	R	R	-	R
12.4	35mm ² Cu	m	R/O	R	-	Nil	R	-	Nil
12.5	25mm ² Cu	m	R/O	R	-	Nil	R	-	Nil
12.6	6mm ² Cu x 3 core	m	60	R	-	R	R	-	R
13.0	Strain clamp for LV bundled conductor including pigtail bolt, eye bolt, nuts, washers, etc.	No.	28	R	-	R	R	-	R
14.0	Suspension clamp for LV bundled conductor including pigtail bolt, nuts, washers, etc.	No.	27	R	-	R	R	-	R
15.0	Strap and seal end of 3 x (120mm ² to 35mm ²) Al + 1 x 25mm ² Al + 1 x 54,6mm ² LV bundled conductor at terminal pole.	No.	10	R	-	R	R	-	R
16.0	35mm ² Cu black PVC insulated earth down conductor, including clamps, lugs, straps, etc. connect to earth spike at LV bundled conductor neutral earth pole using 2 insulation piercing connectors (CNE system as per the Standard Technical Specification).	No.	11	R	-	R	R	-	R
17.0	4m Long 25mm diameter kickpipe to protect earth down conductor against pole.	No.	11	R	-	R	R	-	R
18.0	4,5meter long (3x 1,5m) earth spike, including cable marker at neutral earth pole.	No.	11	R	-	R	R	-	R
19.0	Connect one ABC LV bundled conductor to another using insulation piercing connectors. 2 Insulation piercing connectors shall be used on neutral connection:								
19.1	3 x 120mm ² Al + 1 x 25mm ² Al + 1 x 54,6mm ² to another.	No.	R/O	R	-	Nil	R	-	Nil
19.2	3 x 95mm ² Al + 1 x 25mm ² Al + 1 x 54,6mm ² to another.	No.	1	R	-	R	R	-	R
19.3	3 x 70mm ² Al + 1 x 25mm ² Al + 1 x 54,6mm ² to another.	No.	2	R	-	R	R	-	R
19.4	3 x 50mm ² Al + 1 x 25mm ² Al + 1 x 54,6mm ² to another.	No.	1	R	-	R	R	-	R
19.5	3 x 35mm ² Al + 1 x 25mm ² Al + 1 x 54,6mm ² to another.	No.	R/O	R	-	Nil	R	-	Nil
20.0	4m Galvanised steel kickpipe strapped to pole for 4 core LV PVCAS cable, unless shown otherwise, incl. stainless steel								
20.1	95mm ² Cu	No.	R/O	R	-	Nil	R	-	Nil
20.2	70mm ² Cu	No.	2	R	-	R	R	-	R
20.3	50mm ² Cu	No.	2	R	-	R	R	-	R
20.4	35mm ² Cu	No.	R/O	R	-	Nil	R	-	Nil
20.5	25mm ² Cu	No.	R/O	R	-	Nil	R	-	Nil
20.6	6mm ² Cu x 3 core	No.	4	R	-	R	R	-	R

BILL 4: LV RETICULATION

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL		LABOUR	
				RATE	TOTAL	RATE	TOTAL
21.0	4 Core LV PVCAS, unless shown otherwise, strapped to pole incl. stainless steel straps.						
21.1	95mm ² Cu	m	R/O	R	-	R	-
21.2	70mm ² Cu	m	20	R	-	R	-
21.3	50mm ² Cu	m	20	R	-	R	-
21.4	35mm ² Cu	m	R/O	R	-	R	-
21.5	25mm ² Cu	m	R/O	R	-	R	-
21.6	6mm ² Cu x 3 core	m	40	R	-	R	-
22.0	Through-joint in 4 core LV PVCAS, unless shown otherwise, cable:						
22.1	95mm ² Cu	No.	R/O	R	-	R	-
22.2	70mm ² Cu	No.	R/O	R	-	R	-
22.3	50mm ² Cu	No.	R/O	R	-	R	-
22.4	35mm ² Cu	No.	R/O	R	-	R	-
22.5	25mm ² Cu	No.	R/O	R	-	R	-
22.6	6mm ² Cu x 3 core	No.	R/O	R	-	R	-
23.0	Terminate and connect 4 core LV PVCAS cable, unless shown otherwise, to LV ABC overhead conductor on pole, incl. piercing connectors. 2 Insulation piercing connectors shall be used on neutral connection:						
23.1	95mm ² Cu	No.	R/O	R	-	R	-
23.2	70mm ² Cu	No.	2	R	-	R	-
23.3	50mm ² Cu	No.	2	R	-	R	-
23.4	35mm ² Cu	No.	R/O	R	-	R	-
23.5	25mm ² Cu	No.	R/O	R	-	R	-
23.6	6mm ² Cu x 3 core	No.	4	R	-	R	-
24.0	Terminate and connect 4 core LV PVCAS cable, unless shown otherwise, to LV distribution board on pole, incl. cable glands and lugs:						
24.1	95mm ² Cu	No.	R/O	R	-	R	-
24.2	70mm ² Cu	No.	R/O	R	-	R	-
24.3	50mm ² Cu	No.	R/O	R	-	R	-
24.4	35mm ² Cu	No.	R/O	R	-	R	-
24.5	25mm ² Cu	No.	R/O	R	-	R	-
25.0	Terminate and connect ABC LV bundled conductor to LV distribution board on pole incl. compression glands and lugs:						
25.1	3 x 120mm ² Al + 1 x 25mm ² Al + 1 x 54,6mm ² to another.	No.	R/O	R	-	R	-
25.2	3 x 95mm ² Al + 1 x 25mm ² Al + 1 x 54,6mm ² to another.	No.	2	R	-	R	-
25.3	3 x 70mm ² Al + 1 x 25mm ² Al + 1 x 54,6mm ² to another.	No.	1	R	-	R	-
25.4	3 x 50mm ² Al + 1 x 25mm ² Al + 1 x 54,6mm ² to another.	No.	1	R	-	R	-
25.5	3 x 35mm ² Al + 1 x 25mm ² Al + 1 x 54,6mm ² to another.	No.	R/O	R	-	R	-
26.0	300mm Wide x 150 micron PVC marker tape over cable in trench measured	m	60	R	-	R	-
27.0	Trenching by hand inspection trenches to locate and expose existing underground cables / other services, 400mm wide x 1200mm deep, including backfilling and compaction:						
27.1	Earth	m	5	nil	Nil	R	-
27.2	Intermediate	m	5	nil	Nil	R	-
27.3	Rock	m	2	nil	Nil	R	-
28.0	Extra over Item No.'s 2.0, 3.0 and 27.0 for:						
28.1	Imported bedding/backfill material from off-site source.	m ³	10	R	-	R	-
28.2	Disposal of surplus or unsuitable material including haulage up to 10km from site.	m ³	10	Nil	Nil	R	-
	TOTAL BILL 4 TO BE CARRIED FORWARD TO PRICE SUMMARY, ITEM 4				R	-	R

BILL 5: SERVICE CONNECTIONS

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL				LABOUR			
				RATE		TOTAL		RATE		TOTAL	
	<u>Notes:</u> (i) All rates must be exclusive of VAT. (ii) Refer to Drawing No's 10541/E/01 to 03, and 19 to 33. (iii) All items to include for the supply and delivery thereof, unless specified otherwise. (iv) All quantities are provisional. (v) HD-Hard Drawn, Cu-copper, Al-Aluminium, R/O-rate only, CSCB-Consumer Service Connection Box.										
1.0	Mark-out service cable routes and assist Engineer to finalise same.	Sum	1	R	-	R	-	R	-	R	-
2.0	Trenching by hand in parallel with and crossing existing services for new LV cable 400mm wide x 700mm deep on the pavement / erf including backfilling (200mm imported sand) and compaction:										
2.1	Soft	m	546	R	-	R	-	R	-	R	-
2.2	Intermediate	m	1182	R	-	R	-	R	-	R	-
2.3	Rock	m	2	R	-	R	-	R	-	R	-
3.0	1x 110mm Dia. sleeve installed by using terra-mole soil displacement / fluid assisted directional drilling method:										
3.1	Excavation holes (2 holes) for drilling equipment <u>per intersection</u> .	No.	30		Nil		Nil	R	-	R	-
3.2	Establish setup of drilling equipment and remove equipment, incl. time related charges <u>per intersection</u> .	Item	30	R	-	R	-	R	-	R	-
3.3	Drilling for 1 x 110mm Dia. HDPE PE100 PN10 sleeve 8,5m long.	No.	30		Nil		Nil	R	-	R	-
3.4	Supply, weld and install <u>8,5m x 110mm</u> Dia. HDPE PE100 PN10 sleeve complete with draw wire.	No.	30	R	-	R	-	R	-	R	-
3.5	Seal 110mm Dia uPVC sleeve-ends per intersection, i.e. two sleeve ends.	No	30	R	-	R	-	R	-	R	-
4.0	CSCB as specified, strapped to pole with tails to connect to ABC, but excl. MCB's and IPC connectors:										
4.1	6 Way	No	35	R	-	R	-	R	-	R	-
4.2	7 to 12 Way	No	R/O	R	-		Nil	R	-		Nil
5.0	OD IPC connectors to connect tails from consumer service connection box to ABC:										
5.1	Single IPC connectors (Phases)	No.	105	R	-	R	-	R	-	R	-
5.2	Double IPC Connectors (Neutral & Earth)	No.	70	R	-	R	-	R	-	R	-
6.0	50A single pole, slow curve (orange handle)	No.	172	R	-	R	-	R	-	R	-
7.0	10mm ² Cu Airdac cable strapped to pole including stainless steel straps.	m	1462	R	-	R	-	R	-	R	-
8.0	4m Long, 25mm dia hot dipped galvanised steel kickpipe strapped to pole, incl. stainless steel straps.	No.	172	R	-	R	-	R	-	R	-
9.0	10mm ² Cu Airdac cable laid in trench measured elsewhere.	m	3231	R	-	R	-	R	-	R	-
10.0	PVC marker tape above cable in trench.	m	1730	R	-	R	-	R	-	R	-
11.0	Terminate and connect 10mm ² Cu Airdac cable at CSCB measured elsewhere, incl. compression gland.	No.	172	R	-	R	-	R	-	R	-

BILL 5: SERVICE CONNECTIONS

[illegible]

BILL 6: INSTALLATION INSIDE HOUSES

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL				LABOUR			
				RATE		TOTAL		RATE		TOTAL	
	<u>Notes:</u> (i) All rates must be exclusive of VAT. (ii) Refer to Drawing No's 10541/E/01, 03, 29 to 31. (iii) All items to include for the supply and delivery thereof, unless specified otherwise. (iv) All quantities are provisional. (v) HD-Hard Drawn, Cu-copper, Al-Aluminium, R/O-rate only.										
1.0	<u>Install only</u> Split prepaid kWh meter, complete as specified, supplied by others as a free-issue item. The Measurement and Control Unit (MCU) to be installed inside the CSCB mesured elsewhere, and the User Interface Unit (UIU) to be installed adjacent to the Distribution Board inside the house. <u>Material rate to inculd the handling fee on the meter, incl. UIU.</u>	No.	172	R	-	R	-	R	-	R	-
2.0	10mm² Cu Airdac cable inside 40mm Dia PVC sleeve supplied and installed by others.	m	568	R	-	R	-	R	-	R	-
3.0	Terminate and connect Airdac cable to distribution board, supplied by others.	No.	172	R	-	R	-	R	-	R	-
4.0	Terminate and connect pilot wires of Airdac cable to UIU, supplied by others.	No.	172	R	-	R	-	R	-	R	-
</											

PRICE SUMMARY

ITEM	DESCRIPTION	MATERIAL		LABOUR	
1.0	BILL 1: PRELIMINARY AND GENERAL ITEMS	R	-	R	-
2.0	BILL 2: EXTERNAL MV (11kV) AND LV RETICULATION	R	-	R	-
3.0	BILL 3: POLE MOUNTED TRANSFORMER SUBSTATIONS	R	-	R	-
4.0	BILL 4: LV RETICULATION	R	-	R	-
5.0	BILL 5: SERVICE CONNECTIONS	R	-	R	-
6.0	BILL 6: INSTALLATION INSIDE HOUSES	R	-	R	-
7.0	BILL 7: STREETLIGHTING INSTALLATION	R	-	R	-
8.0	SUB-TOTALS	R	-	R	-
9.0	TOTAL MATERIAL AND LABOUR			R	-
10.0	CONTINGENCY SUM			R	50 000,00
10.1	Contractor's mark-up on Contingency Sum =%			R	-
11.0	NETT TENDER AMOUNT, EXCLUDING VAT.			R	-
12.0	15% VAT			R	-
13.0	GROSS TENDER AMOUNT, 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:

E-mail No:

PART C3 - SCOPE OF WORK**C3.1 GENERAL PROJECT SPECIFICATION****1.0 GENERAL**

This contract includes the supply, delivery to site, off-loading, storage, installation, commissioning, testing and handing over in full working order of the material and equipment necessary for the electrification of 172 formal houses at Nkqubela, Robertson.

The Contractor must allow for all items, whether specified or not, required to complete the installation in a neat and workmanlike manner, according to the true intent of this Document, and the Drawings.

2.0 SITE INFORMATION

All upgrading works will take place in existing residential areas and special care must be taken to ensure the safety of all residents and existing underground services.

The site is located in Robertson as indicated on the layout drawing referred to under Annexure A of this document. Access to the site is available from a number of roads as depicted on the locality plan.

3.0 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.

The Contractor 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.

4.0 LETTING OF CONTRACT

The contract will be let as a Direct Contract with Langeberg Municipality in terms of the Conditions of Contract as set out in this document. On completion, the entire installation will be taken-over by and become the property of Langeberg Municipality.

The Employer reserves the right to accept the tender as set out in the document, thus accepting the "Tender Sum" as included in the Price Summary, or enter into a reduced / increased scope of works to be determined by the Client and Engineer at a later stage.

The Bills of Quantities for the Preliminary & General Items will be revised on a pro rata to the revised scope of works.

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 project will be completed in the 2021/22 financial year.

The following estimated dates are as follows:

(i)	Appointment of Contractor	07/04/2022
(ii)	Completion of Contract Documentation	21/04/2022
(iii)	Contractor on site	28/04/2022
(iv)	Completion of project	30/06/2022

The Contractor will be responsible for drawing up his own programme in which he must take into account the delivery dates of the equipment. The programme shall be submitted to the Engineer two weeks after acceptance of tender in order that such programme may be available for discussion at the first official site meeting.

The overall completion period has been based on a twelve (12) calendar week completion period, the Contractor must ensure that all house connections are completed by 30 June 2022.

7.0 **ELECTRICAL SUPPLY**

The electrical supply to the MV underground network will be taken at nominally 11 000 Volts, three phase. The phase rotation on the existing installation is to be carefully checked and maintained through-out the network.

8.0 **PROJECT NOTICE BOARD**

A project notice board, constructed in accordance with the details provided in Annexure B, is to be provided by the Contractor as part of the contract and erected in the position indicated by the engineer. 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.

9.0 **SWITCHING OF SUPPLIES**

All switching of the MV supplies shall be arranged in advance with Langeberg Municipality.

The Contractor shall establish his requirements regarding advance notice, permits to work, etc., at the beginning of the contract and shall comply with these requirements. The contact person at Langeberg Municipality is Mr Ryno Bouwer at 023 626 8266.

10.0 **COST PRICE ADJUSTMENT**

Prices shall not be subject to escalation.

11.0 **RE-MEASUREMENT**

All quantities in the Bills of Quantities, are provisional and are subject to re-measurement on site.

12.0 **CLERK OF WORKS**

A Clerk of Works will not be appointed for this project.

13.0 WEEKEND, PUBLIC HOLIDAYS

No work shall be carried out on weekends or public holidays or outside of normal working hours during week days, unless the Engineer's permission, in writing, is obtained.

14.0 SITE STAFF

The Contractor shall have a competent supervisor on site at all times to ensure that work is being carried out under this contract. Such supervisor shall be fully conversant with the equipment and materials being installed.

15.0 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.

If the Contractor intends to provide storage accommodation on site in the form of a container or shed, the position of such accommodation, and the provision of power shall be arranged with the Municipality. Latrine facilities will be required and must be in accordance with the local Health Department's regulations.

16.0 CLEARANCES WITH OTHER SERVICES

It shall be the Contractor's responsibility to obtain all necessary drawings and information from the Municipality and Telkom regarding existing and new overhead/underground power and telephone lines, and underground sewer and water pipes, to ensure that there is no damage to this plant during the installation of electrical services and that all necessary clearances with existing and future plant are maintained. The Contractor shall first locate existing underground services before trenching for his cables.

17.0 STANDARD SPECIFICATION

This specification shall be read in conjunction with the Standard Specifications, which forms Parts C3.4 and C3.5 of this document. The Standard Specifications and the Codes referred to therein shall be regarded as the Operative Code of Practice.

Where specific reference is made in the Project Specifications to particular clauses in the Standard Specifications such reference shall in no way be construed as meaning that only those clauses specifically mentioned apply.

18.0 PROOF OF ORDERS FOR MATERIALS/EQUIPMENT

Proof of orders for items with delivery periods in excess of 4 weeks shall be provided to the Engineer within two weeks after the Contractor has been appointed.

19.0 LOCAL LABOUR

It is a requirement of the Contract that the maximum possible use of local labour be made. To this end the Contractor shall limit his own staff to key personnel only. All unskilled staff shall be employed from within the Municipal boundaries. Skilled staff may only complete “trade” related work activities, all other work will be regarded as “general work” and must be completed by unskilled staff. The Contractor shall make provision in the tendered Preliminary and General rates for all costs and additional superintendence to ensure a high standard of work when complying with this contractual requirements.

This is not an EPWP project, but the project needs to report to EPWP with regards to creation of job opportunities. The Langeberg Municipality will do induction training on EPWP, where after the Contractor will have to abide to the monthly reporting instructions related to it.

20.0 CONSTRUCTION AND “AS-BUILT” DRAWINGS

Before the date of the issue of the Certificate of Completion, the Contractor shall hand-over to the Engineer a complete set of “As-Built” of the installation. 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.

21.0 DAMAGE TO STRUCTURES

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

22.0 SITE MEETINGS

The first official site meeting, to introduce the Contractor to the Town Electrical Engineer and/or his representative and the Consulting Engineer, and to establish lines of communication and requirements, will be convened within one (1) week of acceptance of tender at a time and place to be arranged.

Site meetings will be held at two week intervals, or longer or shorter as may be necessary, at a time and day of the week to be mutually agreed, for the duration of the Contract.

C3.2 HEALTH AND SAFETY

C3.2.1

Refer to Baseline Risk Assessment and Specification prepared by Messrs Devac (Pty) Ltd. which is attached as **Annexure F**.

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.

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 Langeberg Municipality and the installation shall fully comply with their requirements.

4.0 CONNECTION POINTS

The connection points to the MV (11kV) network are shown on the layout plan and schematic diagram i.e. Drawing No.'s 10541/E/01 & 03. It shall be the Contractor's responsibility to make all necessary arrangements with Langeberg Municipality's Electrical Department to de-energise the connection points so that the necessary connections can be made.

The longest period permissible for a continuous power shut down to do work shall be eight (8) hours, on a date to be agreed two weeks in advance with the Municipality. All work shall be planned in advanced and as much as possible of the work done beforehand. Allowance must, however been made to complete the shutdown work required over a Saturday/Sunday.

5.0 PROJECT DESCRIPTION

The works will consist of the following:

- (i) The electrification of 172 low cost houses at Nkqubela, Robertson, as depicted on Drawing No. 10541/E/01.
- (ii) The testing and commissioning of the complete installation.

The exact quantities of material and equipment to be supplied and installed are shown in the Bill of Quantities, Part C2.2 hereof.

6.0 **DETAILED SPECIFICATION OF EQUIPMENT AND MATERIALS**

The detailed specification of the equipment required is given in tabled form hereafter. It must be noted that Schedule A of each table gives information affecting and laying down the requirements for the equipment, whilst Schedule B is to be completed by the Tenderer in order to provide guarantees, technical and other particulars of the equipment offered and for acknowledgement of certain requirements. Failure to complete Schedule B could invalidate the tender.

7.0 **11kV OVERHEAD LINES:**

7.1 **11kV Overhead Line and Equipment for Bare Overhead Conductor:**

The MV overhead line material and equipment to be supplied and installed is depicted on Drawing No. 10541/E/01.

ITEM	DESCRIPTION	SCHEDULE "A"	SCHEDULE "B"
1.0	Conductor:		
1.1	Bare conductor	61,70mm ² (6/1/3,35) Rabbit ACSR conductor.	.....
2.0	Insulators:		
2.1	Strain	Pure silicone rubber, 22kV, 31mm/kV, long rod insulator, 70kN.	.....
2.2	Line post	Brown glazed porcelain, 22kV, capless linepost insulator, 4kN.	.....
3.0	Steelwork	Steelwork to support insulators and conductors shall be A-frame unless detailed elsewhere on the relevant drawings. All steelwork shall be hot-dipped galvanised after manufacture. Cross-arms for use with 'A' Frame at right angles shall be hot dipped galvanised and as detailed further on Drawing No.'s 10541/E/14.	.....
4.0	Earthing	Immediately after the new line has been erected, it shall be effectively bonded to earth (to ensure safety of workers) near the supply points by way of a temporary 40mm ² copper conductor. The temporary earths shall remain in position until approval is obtained, in writing, from the Engineer to remove it.	.....
5.0	Expulsion fuses		
5.1	Insulators:	Suitable for 11kV operation and manufactured from silicone.	.....
5.2	Fuse elements rating:	20A	.....
5.3	Type and Catalogue Number		.....

ITEM	DESCRIPTION	SCHEDULE "A"		SCHEDULE "B"
6.0	Wooden Poles			
	Poles shall be <u>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.</u> Poles must bear the SABS mark. All poles shall be 11m long, unless shown otherwise.			
6.1		Minimum top diam. and plant depth (unless otherwise specified), for the following pole lengths:		
		Top diam.	Plant depth	
6.1.1	10 metres	160mm	1800mm	.....
6.1.2	11 metres (Intermediate Pole)	160mm to 180mm	1800mm	.....
6.1.3	11 metres (Strain Pole)	200mm to 220mm	1800mm	.....
7.0	Manufacturer:	Name and Address		
7.1	Bare Conductor			.....
7.2	Insulators (Strain and Line Post)			.....
7.3	Steelwork			.....
7.4	Earthing material			.....
7.5	Expulsion Fuses			.....
8.0	Delivery time:	To the site for installation, from the date of tender acceptance.		
8.1	Bare Conductor			weeks
8.2	Insulators (Strain and Line Post)			weeks
8.3	Steelwork			weeks
8.4	Earthing material			weeks
8.5	Expulsion Fuses			weeks

7.2 **11kV Overhead Line and Equipment for ABC Conductor:**

The MV ABC overhead line material and equipment to be supplied and installed is depicted on Drawing No. 10541/E/01.

ITEM	DESCRIPTION	SCHEDULE "A"	SCHEDULE "B"
1.0	Conductor:		
1.1	Type	(6,35/11kV) ABC bundeld conductor with supporting core system.	.....
1.2	No. cores and size	3 x 35mm ² (min) Compacted Stranded Aluminium Conductors laid around a 50mm ² galvanised steel wire catenary, PVC served. Outer servings of all three cores and catenary are carbon-loaded to provide UV protection. Phases identified by numerals 1,2, and 3 embossed on serving surface.	.....
1.3	To comply with:	Conductor to be manufactured from the best grade material to SANS 1339 using the latest technology.	.....
2.0	Support Brackets:		
2.1	Strain	See Drawing No. 10541/E/26.	.....
2.2	Line post	See Drawing No. 10541/E/25.	.....
2.3	Steelwork	All steelwork shall be hot-dipped galvanised / stainless steel after manufacture.	.....
3.0	Expulsion fuses		
3.1	Insulators:	Suitable for 11kV operation and manufactured from silicone.	.....
3.2	Fuse elements rating:	30A.	.....
4.0	Wooden Poles		
	Poles shall be <u>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.</u> Poles must bear the SABS mark. All poles shall be 11m long, unless shown otherwise.		

ITEM	DESCRIPTION	SCHEDULE "A"		SCHEDULE "B"
4.1		Minimum top diam. and plant depth (unless otherwise specified), for the following pole lengths:		
		Top diam.	Plant depth	
4.1.1	11 metres (Intermediate Pole)	160mm to 180mm	1800mm	.....
4.1.2	11 metres (Strain Pole)	200mm to 220mm	1800mm	.....
5.0	Manufacturer:	Name and Address		
5.1	ABC Conductor			.....
5.2	Support Brackets (Strain and Line Post)			.....
5.3	Expulsion Fuses			.....
5.2	Poles			.....
6.0	Delivery time:	To the site for installation, from the date of tender acceptance.		
6.1	ABC Conductor			weeks
6.2	Support Brackets (Strain and Line Post)			weeks
6.3	Expulsion Fuses			weeks
6.4	Poles			weeks

7.3 **General Requirements:**

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 suspension structures.

All connections to the overhead line conductors shall be covered with "Densal" paste and a double layer of "Denso" tape.

Poles and stays shall not obstruct roads or entrances into erven.

No mid span through joints will be accepted in overhead conductors.

8.0 **POLE MOUNTED TRANSFORMER SUBSTATIONS**

Two 200kVA, 11kV/420V, pole mounted transformer substations will be supplied by the Municipality as free-issue items to the project. Provision has been made in the Bill for the Contractor to claim a handling fee on the transformers. The transformers must be collected at the Municipal Stores in Robertson.

The LV distribution boards, shall be supplied and installed in the positions depicted on Drawing No. 10451/E/01. Constructional details are shown on Drawing No.'s 10451/E/04 to 09.

The pole mounted transformer substation installations shall further comply with the relevant clauses of the Standard Technical Specification:

ITEM	DESCRIPTION	SCHEDULE "A"	SCHEDULE "B"
1.0	Expulsion fuses		
1.1	Insulators:		
	PMT Nkqubela No.1	Suitable for 11kV operation and manufactured from silicone.	.....
	PMT Nkqubela No.2	Fuses not required, but pin insulators must be supplied and installed as depicted on Drawing No. 10541/E/05 - Brown glazed porcelain, 22kV, capless linepost insulator, 4kN.	.....
1.2	Fuse elements rating:	20A	.....
2.0	Lightning arrestors	Suitable for 11kV operation.	.....
3.0	Jumpers	Jumpers between the expulsion fuses pin insulators, lightning arrestors and MV bushings of the transformer shall be:	
	PMT Nkqubela No.1	25mm ² Cu XLPE insulated conductor with UV stable PVC.	.....
	PMT Nkqubela No.2	61,70mm ² (6/1/3,35) Rabbit conductors.	.....
4.0	200kVA, 11kV/420V, Pole Mounted Transformers:		
4.1	PMT Nkqubela No.1 PMT Nkqubela No.2	To be supplied by Langeberg Municipality as free-issue items. <u>Contractor to provide handling fee on transformers in Bill.</u>	.....
5.0	Pole mounted LV distribution boards:		
5.1	Layout and equipment:		
5.1.1	General	Refer to the Standard Technical Specification, Drawing No.'s 10541/E/01, 03, 04 to 09. Boards shall be weatherproof and shall be constructed of 2mm 3CR12 sheet, epoxy powder coated to a thickness of 70 microns. Paint colour shall be Avocado Green.	.....
		The distribution boards shall be designed and manufactured for 420V and a fault level of 15kA – Cascading. The board shall be dust-proof. It shall be fully equipped and designed for the bottom entry of cabling of the quantity and sizes depicted on Drawing No.'s 10541/E/01 and 03.	.....

ITEM	DESCRIPTION	SCHEDULE "A"	SCHEDULE "B"
5.1.2	CT's	300/5	.....
5.1.3	Ammeters & Voltmeter	0-500A with maximum demand indication; 0-500V	.....
5.1.4	Contactor	No bare electrical connections. Can be mounted in plastic enclosure of a bulkhead light fitting.	.....
5.1.5 5.1.5.1	Make and type of: MCB's	All live terminals of MCB's shall be shrouded.	.....
5.1.6	Busbars and earth bars	<u>Note:</u> All busbars shall be silver plated, including the earth bar.	.....
5.1.7	Gland plates	Stainless steel and sufficient for total number of conductors, incl. future cables. Pre-drilled for conductor sizes given on Drawing No. 10541/E/03.	.....
5.1.8	Labels	Labels shall be provided on the outside of the LV Distribution Boards and for all equipment in the LV Distribution Boards as indicated on the Schematic Diagram in accordance with the Standard Technical Specification.	.....
5.1.9	kWh streetlight consumption meter	Similar or equal to Elster Type type A100C.	.....
6.0	Steelwork	Steelwork to support transformers, distribution boards, expulsion fuses and pin insulators, 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. 10541/E/06.	.....
8.0	Wooden Poles Poles shall be <u>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.</u> Poles must bear the SABS mark.		

C3.3.8

ITEM	DESCRIPTION	SCHEDULE "A"		SCHEDULE "B"
8.1		Minimum top diam. And plant depth (unless otherwise specified), for the following pole lengths:		
		Top diam.	Plant depth	
8.1.1	10 metres	160mm	1800mm	.....
8.1.2	11 metres (Strain Pole)	200mm to 220mm	1800mm	.....
9.0	Manufacturer:	Name and Address		
9.1	LV Distribution board			.....
9.2	Expulsion Fuses			.....
9.3	Steelwork			.....
9.2	Poles			.....
10.0	Delivery time:	To the site for installation, from the date of tender acceptance.		
10.1	LV Distribution board			weeks
10.2	Expulsion Fuses			weeks
10.3	Steelwork			weeks
10.4	Poles			weeks

General requirements:

All connections to the overhead line conductors shall be covered with "Densal" paste and a double layer of "Denso tape".

Padlocks (one each for tap switch and LV Distribution Boxes doors) shall comply with the requirements of Langeberg Municipality.

A Certificate of Compliance shall be provided by the manufacturer of the board and handed to the Engineer at the time of inspection of the boards at the Manufacturer's Works, which shall comply with the latest regulatory requirements.

The boards shall be sized to ensure that there is sufficient bending radius for the main incoming and outgoing feeders.

Shop drawings of the boards shall be provided to the Engineer for approval before manufacturing.

9.0 **MV AND LV CABLING**

MV and LV cabling shall be supplied and installed under this contract in as depicted on Drawing No.'s 10541/E1/01 and detailed on Drawing No.'s 10541/E/27 and 28.

C3.3.9

	DESCRIPTION	SCHEDULE A	SCHEDULE B
1.0	Number required.	See the abovementioned drawing. The cable routes must be finalised on site by the Contractor in conjunction with the Engineer and Client, prior to trenching.	.....
2.0	Cable types:		
2.1	11kV Cables:		
2.1.1	MV Reticulation cable	3 core Cu, 11/11kV (Table 18) underground cable, general purpose belted cables, PVC served. Sizes of cable is shown on the aforementioned drawing.	.....
2.2	Low voltage Cables:		
2.2.1	LV reticulation cables.	600 / 1 000V PVCAS with copper conductors as indicated on the drawings.	.....
2.2.2	Streetlight cables.	6mm ² stranded copper conductor, 3 core, 600 / 1000V PVCAS cable.	.....
3.0	Trenching:		
3.1	Classification of excavated materials:		
3.1.1	Soft	Material which can be excavated by means of a suitable shovel, with the aid of a pick or other hand-swung tool.	.....
3.1.2	Intermediate	Material which cannot be excavated by hand even with the aid of a crowbar and requires the assistance of pneumatic tools.	
3.1.3	Rock	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.	.....
3.2	11kV cables	Laid minimum 1000mm below natural / finished ground level as detailed on Drawing No. 10541/E/27.	.....
3.3	LV cables	Laid minimum 700mm below finished ground level as detailed on as detailed on Drawing No. 10541/E/28.	.....

	DESCRIPTION	SCHEDULE A	SCHEDULE B
3.4	Cables run in parallel.	a) MV cables shall be spaced min. 450mm apart. b) MV and LV cables shall be spaced min. 300mm apart. c) LV reticulation cables shall be spaced 150mm apart. d) LV streetlight and service connection cables shall be spaced 25mm apart.	..... ..... ..... .....
3.5	Marker tape.	300mm wide 150 micron PVC sheet marker tape laid above all cables.	.....
4.0 4.1	Cable terminations: PILCA.	a) Heat shrink type in full compliance with the recommendations of the supplier of the cable and termination system. b) All MV terminations shall be done by a suitably qualified and competent cable jointer / terminator who shall be approved by Langeberg Municipality.	..... .....
4.2 4.2.1	LV PVCAS: At pole mounted distribution boards: Gland plates	Outdoor termination glands to be of an anti-corrosion type CCG Posi-Seal or similar.	.....
5.0	Cable joints.	a) MV cable joints to be the heat shrink type in full compliance with the recommendations of the supplier of the cable. b) All MV cable joints shall be done by a suitably qualified and competent cable jointer / terminator who shall be approved by Langeberg Municipality. c) LV Cable joints shall be permitted in exceptional circumstances only (for example end of standard drum length) and on the written permission of the Engineer.	..... ..... .....

	DESCRIPTION	SCHEDULE A	SCHEDULE B
6.0	Labelling.	All cables shall be labelled at terminations, indicating the cable size and the designation.	.....
7.0	Standard Technical Specification	The cabling shall further comply with the relevant clauses of the Standard Technical Specification, Part C3.5 hereof and the requirements of Langeberg Municipality.	.....
8.0	Manufacturer:	Name and Address.	.....
8.1	PILCA cables.		.....
8.2	LV PVCAS cables.		.....
9.0	Delivery Time:	To the site for installation, from the date of tender acceptance.	
9.1	PILCA cables.		weeks
9.2	LV PVCAS copper cables.		weeks

10.0 **LV BUNDLED CONDUCTOR AND UNDERGROUND SERVICE CONNECTIONS:**

The extent of the LV lines to be erected is shown on Drawing No.'s 10541/E/01 & 03 and constructional details are shown on Drawing No.'s 10541/E/17 to 31.

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

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

ITEM	DESCRIPTION	SCHEDULE "A"	SCHEDULE "B"
1.0	<u>Conductor</u>		
1.1	<u>For main power distribution:</u>		
1.1.1	Type	Aerial bundled conductor with supporting core system (French system)	.....

ITEM	DESCRIPTION	SCHEDULE "A"	SCHEDULE "B"
1.1.2	No. cores and size	3 x 95mm ² Aluminium + 1 x 54,6mm ² + 1 x 25mm ² 3 x 70mm ² Aluminium + 1 x 54,6mm ² + 1 x 25mm ² 3 x 50mm ² Aluminium + 1 x 54,6mm ² + 1 x 25mm ²	..... ..... .....
1.2	<u>For underground house service connections:</u>		
1.2.1	Type	Airdac SNE XLPE insulated, 600-1000V, Nylon ripcord laid under sheath <u>with two Pilot Cores.</u>	.....
1.2.2	To comply with	NRS 017 Overhead Split – Concentric Service Cable	.....
1.2.3	<u>Phase Core</u>		
1.2.3.1	Conductor	Circular stranded hard drawn copper	.....
1.2.3.2	Insulation	Red XLPE and UV stabilise	.....
1.2.4	<u>Neutral Core</u>		
1.2.4.1	Concentric conductor	Annealed copper wires	.....
1.2.4.2	Insulation	Covering of Black XLPE	.....
1.2.5	Earth conductor	Concentric layer of bare copper wires	.....
1.2.6	Conductor cross-section	10mm ²	.....
1.2.7	Pilot Cores cross-section	2 x 1,13mm ²	.....
2.0	Support Brackets:		
2.1	Strain	See Drawing No. 10541/E/19, which depicts the M16 Pigtail Bolt.	.....
2.2	Line post	See Drawing No. 10541/E/20, which depicts the M16 Pigtail Bolt with suspension clamp.	.....
2.3	Steelwork	All steelwork shall be hot-dipped galvanised stainless steel after manufacture.	.....
3.1	Classification of excavated materials:		
3.1.1	Soft	Material which can be excavated by means of a suitable shovel, with the aid of a pick or other hand-swung tool.	.....
3.1.2	Intermediate	Material which cannot be excavated by hand even with the aid of a crowbar and requires the assistance of pneumatic tools.	.....

ITEM	DESCRIPTION	SCHEDULE "A"	SCHEDULE "B"
3.1.3	Rock	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.	.....
4.0	Depth of Underground Service Connection Cable	Laid minimum 700mm below natural / finished ground level as detailed on Drawing No. 10541/E/28.	.....
5.0	Marker tape.	300mm wide 150 micron PVC sheet marker tape laid above all cables.	.....
6.0	Airdac Cable terminations:		
6.1	At pole mounted distribution consumer service connection boxes.	UV stable compression gland.	.....
7.0	Kickerpipe	A 4m long, 25mm dia hot dipped galvanised steel kickerpipe, strapped to the LV pole with 19mm wide stainless steel straps, shall be provided for each house connection.	.....
8.0	Labelling.	All cables shall be labelled at terminations, indicating the designation.	.....
9.0	Standard Technical Specification	The cabling shall further comply with the relevant clauses of the Standard Technical Specification, Part C3.5 hereof and the requirements of Langeberg Municipality.	.....
10.0	<u>Wooden Poles</u> Poles shall be <u>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.</u> Poles must bear the SABS mark. All poles shall be 9m long, unless shown otherwise.		

ITEM	DESCRIPTION	SCHEDULE "A"	SCHEDULE "B"
10.1		Minimum top diam. and diam. at theoretical ground level and depth pole to be planted (unless otherwise specified), for the following pole lengths:	
10.1.1	Top Dia.	140mm	.....
10.1.2	Ground Dia.	180mm	.....
10.1.3	Plant Depth.	1500mm	.....
11.0	Manufacturer:	Name and Address	
11.1	LV ABC Conductor		.....
11.2	Airdac Conductor		.....
11.3	Support Brackets		.....
11.4	Kickpipe		.....
11.5	Poles		.....
12.0	Delivery time:	To the site for installation, from the date of tender acceptance.	
12.1	LV Distribution board		weeks
12.2	Expulsion Fuses		weeks
12.3	Steelwork		weeks
12.4	Poles		weeks

11.0 **SLEEVES UNDERNEATH ROADS AND ACROSS DRIVE WAYS**

No provision has previously been made for house service connection, nor MV and LV cable sleeves across the existing paved roads and therefore provision must now be made for the supply and installation of sleeves as detailed hereafter.

ITEM	DESCRIPTION	SCHEDULE A	SCHEDULE B
1.0	Extent.	The sleeves shall be supplied installed in the locations as indicated on Drawing No. 10541/E/02.	.....
2.0	Sleeve type.	1 x 160mm Dia. and 1 x 110mm Dia. HDPE PE100 PN10 sleeves complete with draw wire, unless other wise shown on the above drawing.	.....
3.0	Installation.	Sleeves shall installed by using the terra-mole soil displacement / fluid assisted directional drilling method. Provision to be made for the excavation of the holes for the drilling equipment on both sides of the sleeve crossing. Provision must be made to weld the sleeves where necessary	..... ..... .....

ITEM	DESCRIPTION	SCHEDULE A	SCHEDULE B
		Sleeve-ends to be sealed by means of wet paper compressed into the sleeve or a double layer of plastic wiring tape tied around the end with galvanised wire.	.....
4.0	Manufacturer of sleeve.	Name and Address	.....
5.0	Sub-Contractor who will supply and install the sleeve.	Name and Address	.....
6.0	Delivery Time of sleeve and installation of same.	To site for installation from date of tender acceptance	weeks

12.0 **CONSUMER SERVICE CONNECTION BOX (CSCB)**

The extent of the Airdac underground service cable to the houses and pole mounted Consumer Service Connection Boxes (CSCB's) at the LV overhead line poles is depicted on Drawing No. 10541/E/01 and 03. The mounting positions and equipment layout inside the CSCB's are shown on Drawing No's 10541/E/19 to 22.

ITEM	DESCRIPTION	SCHEDULE A	SCHEDULE B
1.0	Type	Manufactured from polyethelene, fitted with hinged door.	.....
2.0 2.1	Internal Equipment: Busbars	Fitted with earth and neutral busbars. 16mm ² Cu black PVC insulated conductor bridge between busbars.	.....
2.2	Circuit breakers	Single pole 50A, 6kA, slow curve (orange handle) main circuit breakers similar or equal to CBI.	.....
2.3	Interconnecting Cables	16mm ² Cu Interconnecting conductors.	.....
2.4	Conductor Tails	2,5 m long, 16mm ² copper UV stable conductor tails for connection to the bundled conductor overhead line as shown on the Drawing No.'s 10541/E/ 19 & 20. The conductor tails shall be colour coded (Red, White and Blue stripe and Black for neutral)	.....

ITEM	DESCRIPTION	SCHEDULE A	SCHEDULE B
2.5	kWh Meter	Split prepaid kWh meter measurement and control units (MCU's) fixed to a din rail shall be fitted inside the box. The meter is further specified below under Schedule 13.0.	.....
2.6	Surge Arrestors	4 x Surge Arrestors similar or equal to CBI, type QFLN-4(13).	.....
3.0	Colour	The colour of the boxes shall be green.	.....
4.0	Mounting	Stainless steel straps, 19mm wide, shall be used to strap the box to the pole.	.....
5.0	Protection	The ingress protection rating of the CSCB shall be IP54.	.....
6.0	Door Handle	Electro-galvanised padlockable bracket to be used to lock doors of CSCB's.	.....
7.0	Conductor Entries	<u>All conductor/cable entries into the box shall be by means of suitably sized UV stable PVC compression glands.</u>	.....
8.0	Labels	Labels to be provided to indicate erf no. served by circuit breaker / meter.	.....
9.0	Hinges, bolts, nuts etc.	All bolts, nuts, pop rivets, hinges etc. to be stainless steel.	.....
10.0	Standard Technical Specification	The consumer service connection boxes shall further comply with the relevant clauses of the Standard Technical Specification, Part C3.5 hereof, and the requirements of Langeberg Municipality.	.....

ITEM	DESCRIPTION	SCHEDULE A	SCHEDULE B
11.0	Manufacturer	Name and Address	.....
12.0	Delivery Time	To site for installation from date of tender acceptance	weeks

13.0 **PREPAYMENT METER**

This contract covers the installation only 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:

ITEM	DESCRIPTION	SCHEDULE A	SCHEDULE B
1.0	Type	Landis & Gyr, Type 10-PR300 split pre-payment, incl. the Cashpower CIU 3 Interface Unit 3 <u>will be supplied by others</u> on the project. Provision has been made in the Bill for a handling fee to collect the meters at the municipal stores. The meter and User Interface Unit will be installed by the Contractor.	.....
2.0	Current limiting setting	The Contractor will ensure that the meter is set at 20 Amp.	.....

14.0 **INSTALLATION INSIDE HOUSES**

The work includes the connection of the service cable at the distribution board and User Interface Unit as depicted on Drawing No.'s 10541/E/29 to 31.

The Electrical Contractor shall be responsible for the supply and installation of 10mm² Cu conductor inside a PVC conduit supplied and installed by others. Note that the Builder will be responsible for the supply and installation of the additional earth wire at each house, and therefore the Contractor must be in contact with the Builder to ensure that the cable and earth wire are installed at the same time.

The installation shall comply with the SANS 10142-1: 2003, Code of Practise for the Wiring of Premises.

15.0 **STREETLIGHTS**

Streetlights shall be supplied and installed as detailed on Drawing No.'s 10541/E/01 and 03 with constructional details on Drawing No.'s 10541/E/23 and 24.

ITEM	DESCRIPTION	SCHEDULE A	SCHEDULE B
1.0	General	Shall be Class 1 of IEC 60598-1 and be of the totally enclosed type. Luminaires shall be delivered completely assembled with housing, driver, LED module, and protective lens.	.....
2.0	Defects	Any faulty power supply units or LED's shall be replaced at no additional cost during the twelve month defects liability period.	.....
3.0	Type	Side entry streetlight luminaire	.....
4.0	Construction	2-compartment design, i.e. optical compartment with LED engine, gear compartment and a spigot compartment. Both optical and gear compartments must be rated IP 66. The LED engine, consisting of the LED light source and the power supply must be easily replaceable or upgradeable (Future Proof).	.....
5.0	Surge protection	Integral 10kV/10kA surge protection device. Additional safety by means of electronic temperature monitoring preventing overheating of LEDs and power supply.	.....
6.0	Material	The luminaire housing to be manufactured of marine grade cast aluminium (EN 1706 AC-44300) with high impact polycarbonate protector.	.....
7.0	Luminaire Output	Nominal flux at Ta of 35 °C ≥ 5340 lumens.	.....
8.0	Lifetime residual flux @ 25 °C	70% @ 60 000h	.....
9.0	Colour temperature	Neutral White (4000k)	.....
10.0	Colour rendering index (CRI)	CRI ≥ 70	.....

ITEM	DESCRIPTION	SCHEDULE A	SCHEDULE B
11.0	Operating temperature	$\leq 35^{\circ}\text{C}$	.....
12.0	Power factor	≥ 0.95	.....
13.0	Luminaire	36W	.....
14.0	Spigot entry	Spigot entry shall be side entry 42mm diameter by 125mm, in accordance with SANS 1088. Provision must be made for a typical streetlight bracket as depicted on Drawing No. 10541/E/24.	.....
15.0	Finish	Unpainted aluminium	.....
16.0	Connection to ABC Conductor	Where a streetlight fitting is to be connected directly from the ABC conductor, it shall be done via a 4mm ² Airdac II cable terminated to the ABC conductor with piercing connectors.	.....
17.0	Standard Technical Specification	The streetlight luminaires shall further comply with the relevant clauses of the Standard Technical Specification, Part C3.5 hereof, and the requirements of Langeberg Municipality.	.....
18.0	Manufacturer	Name and Address	.....
19.0	Delivery Time	To site for installation from date of tender acceptance	weeks

15.0 **EARTHING**

ITEM	DESCRIPTION	SCHEDULE A	SCHEDULE B
1.0	LV Bundled Conductor	Neutral shall be earthed at the poles by means of a 1,5m long earth spike and 35mm ² Cu black PVC insulated down conductor.	.....

ITEM	DESCRIPTION	SCHEDULE A	SCHEDULE B
		All earth down conductors against poles shall be fixed with a stainless steel straps and shall be protected with 25mm diameter 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 1 metre intervals. Care shall be taken to ensure that the cable conductor is not damaged due to over tightening the straps. 	
2.0	Termination at earth spikes.	Double clamps to connect conductor to earth spike.	.....
3.0	Test certificate	The Contractor shall issue an earth test certificate confirming the measured earth resistance values to be within acceptable limits.	.....
4.0	Standard Technical Specification	The earthing shall further comply with the relevant clauses of the Standard Technical Specification, Part C3.5 hereof and the requirements of Langeberg Municipality.	.....
6.0	Manufacturer:	Name and Address	
6.1	Earth conductors		.....
6.2	Earth spikes		.....
7.0	Delivery Time:	To site for installation from date of tender acceptance	
7.1	Earth conductors		weeks
7.2	Earth spikes		weeks

16.0 **DISMANTLING AND RECOVERING OF MATERIAL AND EQUIPMENT**

The extent of the equipment and material to be recovered is depicted on Drawing No. 10541/E/01.

All recovered material not being utilized on the project shall be delivered to the municipal stores.

A receipt shall be obtained from the Municipality, which must be included with any claims for payment in this regard.

17.0 **INSPECTION, TESTING AND COMMISSIONING**

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

Provision shall be made for a Specialist Commissioning Engineer to test and commission the ring main unit including verifying all other control functions.

Three (3) sets of the Specialist Commissioning Engineer's test report, containing all test certificates, readings taken, relay settings, programming set-up, etc. and operating and maintenance manual of the ring main unit, etc. shall be issued to the Engineer before Practical Completion.

C3.4: STANDARD PRELIMINARY AND GENERAL INFORMATION

1.0 PREAMBLE

This Part of the Specification 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 Specification. "Plant" is defined as machinery, apparatus, materials, articles and things of all kinds to be provided under the Contract other than Constructional Plant.

This Specification is indexed at the beginning hereof. Pages are numbered and Tenderers must check that all pages are included. In the event of any material omission, discrepancy, or otherwise occurring, the attention of the Engineer must be directed thereto at the time of tendering. If this is not done, it will be taken that the Tenderer is in possession of a complete copy and is aware of the contents thereof.

When the requirements of this Part are at variance with any detailed requirement of any other Part hereof or the Drawings, such detailed requirements shall take precedence. All items of plant which are specified in this Specification or by nature of the installation are required, shall comply with this Part, unless stated otherwise elsewhere in this Specification. 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 Specification" shall be deemed to mean in any of the other Parts of this Specification or on the Drawings.

This Specification 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 Specification 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

Tenderers are recommended to tender in accordance with the Specification. While Tenderers may offer alternative materials, makes of equipment, construction techniques, etc. which they believe will be advantageous, it is to be clearly understood that the main tender is to be in full compliance with this Specification.

The total tender price entered on the Form of Tender, all prices entered in any Schedule of Quantities and the prices detailed in the Price Summary, must reflect the price to provide the plant and everything which is or may be necessary for the completion of the Works in complete accordance with this Specification, irrespective of any alternatives that may be offered.

Where alternative offers are submitted, these shall comply in principle with all requirements of this Specification. Tenderers should note that should any accepted alternative subsequently be found not to meet this condition, the Contractor will be liable for all costs incurred in making the necessary alterations.

Should tenderers wish to offer alternative makes and types of equipment to those specified herein, the alternatives are to be listed separately in detail, complete with make, type No.,

price etc: in the Schedule of Departures from the Technical Specification. In cases where a Schedule of Quantities is applicable, the alternative price for each noted item must be submitted.

The Engineer shall have the right to accept any or all of the alternative offers as he thinks appropriate and must give his written acceptance of these prior to orders being placed.

Failure to comply with the foregoing may result in the Contractor being compelled to meet the requirements of this Specification in full at the tendered price.

3.0 SCHEDULES TO BE COMPLETED

The Tenderer shall, unless relief is given elsewhere in this Specification, complete the Schedules of Amendments and Qualifications, Particulars / Information, Experience, Sub-Contractors, Plant and Equipment in Part T2 hereof, and the Bill/Schedule of Quantities, Schedule of Rates, Schedule of Daywork Rates and the Price Summary in Part C2 hereof. The tender will be considered incomplete and therefore may be disqualified if all of this information is not submitted with the tender.

4.0 SPARE PARTS

Tenderers shall state in the Schedule of Particulars the names of the accredited South African Agents from whom spare parts for all items of plant offered are obtainable and the nearest Centre to the Works at 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.

5.0 DELIVERY TIMES OF MANUFACTURED ITEMS

The Tenderer shall, if required in the Schedule of Particulars, Part T2 hereof, state the times quoted by the Suppliers for both despatch and delivery of major items of plant likely to 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.

6.0 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 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 stated to the contrary in Part C3.1 hereof.

7.0 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 might facilitate the work can be arranged with the Engineer and/or Architect as the work progresses, but no claims will be entertained for alteration of any part of the 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.

8.0 DRAWINGS, CERTIFICATES AND OPERATING INSTRUCTIONS

- 8.1 Tenderers shall submit with their tender, outline drawings and pamphlets showing principal dimensions of the plant offered together with a general description of it's operation.
- 8.2 The Contractor shall within one month of the Contract being let, submit duplicate copies of his 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.

- 8.3 The Contractor shall, within one month of the Contract being let, or earlier if so required, submit triplicate copies of type test certificates issued by an approved testing station in respect of all items of plant for which such certificates are required by the Engineer.
- 8.4 After completion of manufacture, all test certificates called for in Parts C3.3 and/or C3.5 hereof shall be provided in duplicate.

- 8.5 Prior to the issue of the 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 in Parts C3.3 and/or C3.5 hereof.

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. These drawings must depict the complete installation as finally commissioned.

Detailed instruction manual covering the operation, maintenance and servicing of each item of major plant provided under this Contract and, where the complete plant has been supplied under this Contract, 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 Completion Certificate will not be issued until the above has been complied with.

9.0 **STANDARDS AND CODES OF PRACTICE**

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

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

The Occupational Health and Safety Act (Act 85, 1993) and 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 Bureau of Standards 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.

10.0 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 Specification shall have been thoroughly checked, corrected where necessary and signed as approved by the Contractor, prior to such submission.

11.0 CLERK OF WORKS

If a Clerk of Works is to be appointed this will be specified in Part C3.1 hereof.

In cases where a Clerk of Works is appointed to the Project the Contractor shall afford him every facility for the performance of his duty. When the Clerk of Works is appointed on an "ad hoc" basis the Contractor shall arrange to meet him at specific times, to avoid unnecessary interruption of his other duties.

12.0 STORAGE AND ACCOMMODATION

It shall be the responsibility of the Contractor to arrange a site for the purpose of stacking and storing his plant, and for other activities necessary in connection with the execution of the Works. The Contractor shall also be responsible for arranging with the relevant Authorities for water, electricity and telephone connection and shall bear all costs involved, including the cost of supply.

13.0 CONTRACTOR'S REPRESENTATIVE

Immediately the successful Tenderer is advised that his tender is to be accepted and before a formal contract may have been entered into, he shall designate a senior member of his staff to be his Contractor's representative. Such representative shall be an experienced engineer, who will be resident close to the site of the Works and shall be competent and duly authorised to co-ordinate the work in the Contractor's office, and between his office and the Site, and between the Contractor and his Suppliers as well as to maintain liaison with the Employer, Engineer and other parties, to attend progress meetings and generally to represent the Contractor on all aspects of his Contract. In particular, the representative shall attend at the office of the Engineer as and when required, and shall collaborate with him in finalising the drawings of the Works as a whole, so far as the installation which forms the subject of this Contract, is concerned.

14.0 PROGRESS MEETINGS

The Contractor shall ensure that his Supervisor attends all progress meetings. In the case of large building service contracts in major centres these will normally be held weekly and in the case of building services contracts in country districts and all purely engineering contracts, they will be held monthly. Any deviation from the foregoing will be stated elsewhere in this Specification. If the Contractor's progress is such that more frequent meetings are considered necessary by the Engineer, the Supervisor shall also attend these at the Contractor's expense.

15.0 VARIATION ORDERS

The Contractor shall note that all variation orders issued to him must be fully priced and returned to the Engineer within six weeks of the date of issue indicated on the variation orders.

Should this requirement not be complied with, and no correspondence is received by the Engineer within the specified time-period giving good and fair reason why the Contractor has failed to submit fully priced variation orders, the Engineer will price the variation orders without reference to the Contractor and the price thus calculated will be taken as final and no further correspondence will be entered into.

16.0 VALUE OF VARIATIONS

When the Contract is based upon a Schedule of Quantities, approximate Schedule of Quantities, or Schedule of Prices with approximate quantities, the value of all alterations, additions or omissions shall be ascertained by measurement and valuation in accordance with the nett rates of prices for similar work in the Schedules.

Where the nett rates or prices in the Schedules do not apply or it is not practicable to deduce nett rates or prices therefrom, the said value shall be agreed upon between the Engineer and the Contractor if reasonably possible before the commencement of the alterations or additions and where the valuation of the alterations and additions cannot be ascertained by measurement or the value thereof ascertained or agreed upon as aforesaid then the value of the work shall be based on the value of the materials used and labour employed thereon at day work rates.

17.0 ATTENDING FOR MEASUREMENT

The Contractor, or his Representative shall, from time to time, when required on reasonable notice by the Engineer, attend at the Works to take jointly with the Engineer's Representative any measurements of the work executed that may be necessary for the purpose of preparing the final account. Any such measurements when ascertained and any differences arising thereon, shall be duly recorded in the manner required by the Engineer.

The Contractor shall, without extra charge, provide assistance with every appliance and other thing necessary for measuring the work.

If the Contractor's Representative fails to attend when so required, the Engineer's Representative shall have power to proceed by himself to take such measurements and to prepare the final account, and in that case any decision of the Engineer shall be final and conclusive.

18.0 OPERATING, MAINTENANCE AND SERVICING PROCEDURES

The Contractor shall instruct the Employer's appointed Representative in routine operating, maintenance and servicing procedures of all items of plant supplied under this Contract, and shall ensure that he fully understands the documents provided in terms of Clause 9.5 hereof.

19.0 MAINTENANCE

During the Defects Liability Period, the Contractor shall, if required by Part C3.1 hereof, carry out full maintenance operations specifically recommended by the Suppliers of any item of plant used in the 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 monies due, in respect of the particular maintenance service, as included in the original Tender Price.

Allowance for all costs in relation to the above must be made in the Tender Price. It shall be noted that the Employer reserves the right to omit partly or wholly the prices submitted for the maintenance of the Works, should the installation not be adequately maintained within the stipulated maintenance period. Mutually agreeable conditions will be negotiated by the Employer with the Contractor should the Works not be put into operation immediately on issue of the Completion Certificate.

20.0 **VALUE ADDED TAX**

The attention of Tenderers is drawn to the Value Added Tax Act (Act 89 of 1991) and any amendments thereto. All tenders submitted shall indicate the nett tender price, the amount of VAT and the gross tender price carried to the Form of Tender as provided for in the Price Summary. The amount stated in the Form of Offer and Acceptance will be taken as being inclusive of any tax due in terms of the said Act and no claims whatsoever in this respect will be considered.

21.0 **GUARANTEE**

The Contractor shall guarantee to the Employer the material, equipment and workmanship delivered by him, for a period of 12 months or any other period stated elsewhere in this Specification. The guarantee must be valid for a period starting on the date when the Works or portion thereof are accepted by the Engineer as complete and in working condition. The complete installation must be guaranteed against defects as a result of patent and latent defects of the design and equipment, save design defects made or specified by the Engineer, as well as against faulty materials and workmanship. Fair wear and tear is excluded from the guarantee. The guarantee must provide that all material, equipment, parts, spares and appurtenances that become defective during the guarantee period be replaced free of charge of any nature to the Employer or engineer. The costs of labour and transportation required to replace such part of a defective installation shall be borne by the Contractor and shall be included in his guarantee. The Contractor shall cede to the Employer the remainder of any guarantee which he has received from his Suppliers and which extends beyond the period mentioned herein.

If it becomes necessary for the Contractor to replace or remove any defective portions of the Works under this condition, the provisions thereof shall apply to the portions so renewed or replaced until the expiry of the guarantee from the date of such replacement or renewal, and in the event of any defects occurring or being discovered in or to the Works within the guarantee period as aforesaid, the guarantee shall continue until the defects have been made good to the satisfaction of the Engineer.

If any defects are not remedied within a reasonable time, the Employer shall proceed to have the work done at the risk and expense of the Contractor, but without prejudice to any

C3.4.8

other rights which the Employer may have against the Contractor in respect of such defects.

C3.5 STANDARD TECHNICAL 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 Clinkscles 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 resistance 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 70mm² 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 70mm² 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 70mm² 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 $\leq 1,0$ 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 LV Meter and Distribution kiosks a 30m length of bare earth conductor of half the size of the phase conductors but not greater than 70mm² 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 / bare 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 cases where an earth system as described in the Sub-Clause "Reticulation Feeder Neutral Earthing" above shall be installed.
- 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 MV DISTRIBUTION TRANSFORMERS

SANS 780 Distribution transformers

SANS 60076 Part 11 : Dry-type transformers

CMB Standards:

5.1 General:

- 5.1.1 Transformers up to 1000kVA shall have hermetically sealed welded covers, phase, vector group, service voltage and cable termination details being given elsewhere in this Specification.

They shall be equipped as follows:-

Losses	Low
Impedance	Standard
Off-load tap switch	Provision for padlocking is to be provided
Fittings for units	As required by the applicable standards, including inter alia :- in excess of 1000kVA Dial thermometer with maximum pointer Oil level gauge Conservator Silica gel breather containing 1,5kg silica gel/3000 litres oil
Fittings for all units	Lifting Lugs Skid Underbase
Insulating Oil	First filling to be included

Pole mounted transformers shall be fitted with type of bushings as requested elsewhere in the Project Technical Specification.

- 5.1.2 All transformers shall be painted in accordance with requirements for coastal conditions.
- 5.1.3 Pole mounted transformers, if to be installed within 5,0 km of the coast, shall be zinc sprayed.
- 5.1.4 Paint colour shall be as specified in the Project Technical Specification.

- 5.1.5 Outdoor transformers shall be installed on plinths constructed as specified in the Clause "Plinths" elsewhere in this Part.
- 5.2 **Completely Self Protected (CSP) Transformers:**
- 5.2.1 Where a completely CSP transformer is called for, MV switchgear shall comprise two pairs of fault make, load break rotary switches housed within transformer tank, operating spindles being extended to front of unit within MV compartment.
- 5.2.2 Load side of switches shall feed transformer through specially designed expulsion fuses so rated that they will always discriminate with LV circuit breaker and only operate in case of an internal transformer fault.
- 5.2.3 Each pair of switches shall be interlocked with a stainless steel plate mounted on stainless steel posts such that switches cannot be in the "ON" and "EARTHED" positions together. Label in white on red, reading "DO NOT OPERATE EARTH SWITCH BEFORE ISOLATING POWER SUPPLY TO INCOMING CABLE" shall be fitted to each earth switch.
- 5.2.4 LV protection shall comprise an LV circuit breaker mounted in transformer tank, so selected that it will trip as a function of oil temperature by way of a thermal device, as well as instantaneously by means of a magnetic trip device. Circuit breaker must be fully compatible with MV expulsion fuses to ensure their absolute discrimination under all operating and fault conditions.
- 5.2.5 An auxiliary light operated by a separate thermal device in tank is to indicate when oil temperature reaches 75% of circuit breaker trip value.
- 5.3 **Dry Type Transformers:**
- 9.3.1 Dry type transformers shall be supplied in IP31 enclosures fitted with limit switches that can be linked to the switchgear to trip the relay when any of the doors are opened.

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 units 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 All air circuit breakers shall be of the withdrawable type.
- 6.2.10 Phase barriers are to be installed for all circuit breakers.
- 6.2.11 Equipment inside board shall be of type and manufacture as specified elsewhere in Project Technical Specification.
- 6.2.12 Moulded case circuit breakers shall be provided with lockout latches.
- 6.2.13 Circuit breakers shall be clearly labelled, where withdrawable 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 Interior of boards shall be arranged for easy access to all wiring and components.
 - 7.1.22 Where boards are installed in 115mm walls, they shall be provided with expanded metal fixed to entire back of board.
 - 7.1.23 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 Bridge conductors and tails to circuit breakers shall be suitably rated for the fault level at the board. The cross sectional area of these conductors (mm²) must at least be equal to the prospective short-circuit current (in kA).
- 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:**
- 8.1.1.1 Construction material and colour specified elsewhere in Project Technical Specification.
- 8.1.1.2 Suitable to accommodate all equipment specified elsewhere in Project Technical Specification.
- 8.1.2 The protection rating of CSCB shall be at least IP54.
- 8.1.3 All conductor/cable entries into the box shall be by means of suitably sized UV stable PVC compression glands.
- 8.1.4 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 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
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

9.1 General:

- 9.1.1 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.
- 9.1.2 Main circuit breakers are to be of one make throughout installation.
- 9.1.3 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.

- 9.1.4 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.
- 9.1.5 Rack-out type withdrawable air circuit breakers shall have interlocking to ensure that racking in or out can take place only with the circuit breaker open.
- 9.1.6 Moulded case circuit breakers shall have a time delay tripping on low overloads and high speed tripping on short circuit.
- 9.1.7 Three phase MCB's shall be fitted with suitable phase barriers.
- 9.1.8 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.

9.2 Installation

- 9.2.1 The connecting device between the 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.
- 9.2.2 MCB's shall be fitted with purpose made terminal shrouds where no fascia plate is provided.

10.0 SUPPLY AUTHORITY METERS

BS 5685

Electricity meters. Specification for Class 3 var-hour meters

CMB Standards

10.1 General:

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

10.2 Installation and Commissioning:

- 10.2.1 Meters shall be installed in kiosks / miniature substations as specified elsewhere in the Project Technical Specification.
- 10.2.2 Allowance must be made in tender price for calibration testing and programming of these meters to meet municipal requirements.

11.0 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 I.0

SANS 60044 / IEC 60044

Instrument transformers

SANS 62052 / IEC 62052	Electricity metering equipment (A.C.) - General requirements, tests and test conditions
SANS 62053 / IEC 62053	Electricity metering equipment (A.C.) - Particular requirements
NRS 068	Electricity distribution - cable earth fault indicator
NRS 072	Overhead line fault path indicators
BS EN 60044, BS EN 60044	Specification for voltage transformers

CMB Standards:

11.1 General:

- 11.1.1 Indicating instruments and meters shall have HRC fuse protection on all voltage connections as specified elsewhere on the drawings.
- 11.1.2 Meters and instruments shall have labels fitted below, stating in which circuit they are installed.
- 11.1.3 Cases of all meters shall afford complete protection from dust and damp and shall be suitable for attachment of seals.
- 11.1.4 Selector switches shall be rated at 16A shall be provided with an "OFF" position.
- 11.1.5 Tenderer shall submit full details of meters, instruments and control switches offered in the tender, including connection diagrams for all equipment.
- 11.1.6 Unless otherwise specified in the Project Technical Specification, all meters shall be digital power meters.

11.2 Potential Indicators:

- 11.2.1 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.

11.3 Protection Relays:

- 11.3.1 Protection relays are specified elsewhere in the specification.

11.4 Current Transformers:

- 11.4.1 Current transformers are specified elsewhere in Project Technical Specification.

11.5 Voltage Transformers:

- 11.5.1 Voltage transformers shall be three phase and of the type specified in the Project Technical Specification.
- 11.5.2 Output shall be 50VA per phase at 110V phase to phase.
- 11.5.3 Fuse protection shall be provided on both primary and secondary.
- 11.5.4 Transformers shall not be affected by single-phasing on the MV side.

11.6 Indicating instruments:

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

11.7 Ammeters:

- 11.7.1 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.
- 11.7.2 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.
- 11.7.3 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.
- 11.7.4 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.
- 11.7.5 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.

11.8 Voltmeters:

- 11.8.1 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.
- 11.8.2 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.

11.9 PF Indicators:

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

11.10 Consumption Meters:

- 11.10.1 KWh meters shall be of the type specified in the Project Technical Specification.
- 11.10.2 Full details of programme facilities and operating instructions shall be supplied with these meters.
- 11.10.3 Allowance must be made in the tender price for calibration testing and the programming of the bulk meters.

11.11 Digital Power Meter:

- 11.11.1 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 true, reactive and apparent power consumed, power factor and total harmonic distortion (THD) of all three phases shall also be accesses via a scrollable menu interface.

11.12 Medium Voltage Metering Units:

- 11.12.1 Shall comprise of a free standing panel mounted on a concrete plinth.
- 11.12.2 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.
- 11.12.3 When mounted adjacent to non-extensible switchgear or within an extensible switchboard it shall share a common plinth with the switchgear.

- 11.12.4 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.
- 11.12.5 Operating voltages, CT and VT ratios, and metering requirements are detailed in the Project Technical Specification.
- 11.12.6 Voltage transformer shall not be affected by single phasing on the medium voltage side.
- 11.12.7 Cable boxes shall be suitable for the cable sizes and types specified in the particular specification or on the drawings.
- 11.12.8 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.
- 11.12.9 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.

12.0 **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:

12.1 **Time Switches:**

- 12.1.1 Time switches shall be mounted in an accessible position for ease of adjustment.
- 12.1.2 Shall be provided with re-chargeable batteries to provide up to 48 hours of operation should a power failure occur.
- 12.1.3 Shall be fully programmable as specified in the Project Technical Specification.
- 12.1.4 Shortest switching interval shall be 1,0 second for motor control and 30 minutes for general purposes.
- 12.1.5 Units shall include a manual override facility and be suitable for wall or DIN-rail mounting.
- 12.1.6 Protection shall be at least to IP42 and the units shall operate satisfactorily in the temperature range - 5°C to + 55°C.

12.2 **Low Voltage Transformers:**

- 12.2.1 Bell and other low voltage transformers shall be of the double wound type.
- 12.2.2 Shall have an adequate capacity for the duty required but not less than 50VA on short-time rating.
- 12.2.3 Transformers shall have one end or the centre point of the low voltage winding earthed.

12.3 Contactors:

- 12.3.1 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.

12.4 Earth Leakage Protection Units:

- 12.4.1 Earth leakage protection units shall have a sensitivity of 30mA, unless stated to the contrary elsewhere in this Specification, or on the drawings.
- 12.4.2 Unit shall actuate a shunt trip isolator or MCB as specified.
- 12.4.3 Units shall carry the SABS Mark.

12.5 Motor Starters:

- 12.5.1 All Starters are to be of the same make.
- 12.5.2 Star-Delta starters are to be provided with both electrical and mechanical interlocks.
- 12.5.3 Starters are to be protected by moulded case circuit breakers as specified in Sub-Clause "Moulded Case Circuit Breakers" elsewhere in this Part.
- 12.5.4 Starters are to be so selected that they are not subjected to a higher fault current than that for which they are designed.
- 12.5.5 MCB's and isolators are to be lockable in "OFF" position where motors are situated remote from control panel.
- 12.5.6 Starters for all motors shall comprise magnetically operated contactors, shall be of robust design, operate without undue noise and vibration.
- 12.5.7 Unless otherwise stated, they shall be of continuous rating, current making and breaking Category AC3.
- 12.5.8 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.
- 12.5.9 Contactors shall not chatter when opened at two thirds voltage, or at a frequency 10% below nominal.
- 12.5.10 Low voltage release is to be inherent in the operating coil.
- 12.5.11 Starters are to be equipped with a voltage free auxiliary change-over contact to provide a "RUN" signal during operating.
- 12.5.12 No motor control gear shall have a continuous rating of less than 10A at Category of duty AC3.
- 12.5.13 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.
- 12.5.14 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.
- 12.5.15 Where anti-condensation heaters are fitted, these must be disconnected by the starter main switch.
- 12.5.16 Overloads of the thermal type shall be matched to the motor ratings and are to be manually reset.
- 12.5.17 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.

- 12.5.18 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.
- 12.5.19 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.
- 12.5.20 Optional features which may be specified elsewhere in this Specification are:
Earth fault protection; Short circuit protection, etc.
- 12.5.21 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.
- 12.6 Pilot Lights:
- 12.6.1 Pilot lights are to be either cluster LED, neon, transformer or resistor reduced wattage type.
- 12.6.2 Lights shall be easily seen when operating in normal daylight.
- 12.6.3 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.
- 12.6.4 100% spare lamps are to be provided for all pilot lights.
- 12.6.5 Lamp test facilities via a lamp test push button wired to all indicator lights must be provided.
- 12.6.6 Pilot lights are to be of the colours indicated below, unless elsewhere specified.
- | | | |
|----------|---|-------|
| Power on | - | Amber |
| Fault | - | Red |
| Run | - | Green |
- 12.6.7 Pilot lights indicating "STARTER CLOSED" and "OVERLOAD TRIP" shall be fitted to all motor circuits.
- 12.7 Hour Meters:
- 12.7.1 Hour meters shall be of the digital type reading up to 99999 hours, unless otherwise specified.
- 12.7.2 Meters shall be suitable for 230V, 50Hz. AC operation.
- 12.8 Duty Selector Switches:
- 12.8.1 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.
- 12.9 Hand/Off/Auto Switches:
- 12.9.1 The hand/off/auto switch shall be fitted to each starter subject to automatic control.
- 12.9.2 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.

12.10 Phase Failure Relays:

- 12.10.1 Phase failure relays are to provide reverse phase rotation protection.
- 12.10.2 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.
- 12.10.3 Provision is to be made to ensure that a trip occurs irrespective of which phase is lost.

12.11 Relays:

- 12.11.1 Type of relay specified elsewhere in the Project Technical Specification.
- 12.11.2 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.
- 12.11.3 Adjustable timing relays must be labelled with their function.

12.12 Photo-electric Controls:

- 12.12.1 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.
- 12.12.2 Operating level shall be factory preset to switch on at approximately 50 lux and off at approximately 100 lux.
- 12.12.3 Response time after sudden changes in light level shall be not less than 15 seconds.
- 12.12.4 Integral protection against voltage surges shall be provided.

12.13 Main and Control Circuits:

- 12.13.1 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.
- 12.13.2 Where busbars are located directly behind such panels, a separate removable insulated panel shall screen them.
- 12.13.3 Wiring shall be carried out using suitably rated, colour coded insulated wire.
- 12.13.4 Main terminals are to be connected in strict phase rotation.
- 12.13.5 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.
- 12.13.6 Spare terminals are to be provided to accommodate all spare control cable cores.
- 12.13.7 Terminals for wires smaller than 16mm² shall have pressure plates.
- 12.13.8 Terminals for the connection of external control wiring shall be of the "disconnect" type.
- 12.13.9 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.
- 12.13.10 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.
- 12.13.11 Colour of all panel wiring shall comply with the following:-

Colour of WireCircuit 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.

12.14 Labelling:

12.14.1 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.

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

13.0 **TRENCHING, EXCAVATION AND COMPACTION****CMB Standards:**13.1 General:

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

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

13.1.3 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.

13.1.4 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.

13.1.5 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.

13.2 Routing:

13.2.1 Routes for underground cables are shown on the drawings.

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

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

13.3 Pegs:

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

13.4 Trenching and Excavation by Others:

13.4.1 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.

13.5 Type of Material:

13.5.1 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.

13.5.2 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 oukclip, and boulders less than 75mm in diameter.

"Hard Earth" shall mean all hard ground such as oukclip, 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.

13.6 Verification of Excavation Claims:

13.6.1 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.

13.6.2 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.

13.6.3 Amounts and type of rock encountered shall be measured by the Contractor in the presence of the Engineer or Clerk of Works.

13.7 Precaution with regard to other Services:

13.7.1 Contractor shall exercise extreme caution in his work to avoid damage to existing underground services.

13.7.2 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.

13.7.3 All excavation in the vicinity of other services must be undertaken by hand.

13.8 Compaction:

13.8.1 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.

13.8.2 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.

13.8.3 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.

13.8.4 Where material is too wet for proper compaction, it should be dried out and if too dry, shall be dampened.

- 13.8.5 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.
- 13.8.6 Degree of compaction required shall be field densities of 95% in respect of poles and road crossings and 90% in respect of sidewalks.
- 13.8.7 All trenches crossing roads and sidewalks 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.

14.0 **SLEEVES**

SANS 791

Unplasticized poly(vinyl chloride) (PVC-U) sewer and drain pipes and pipe fittings

CMB Standards:

- 14.1 Type, material, colour and size specified elsewhere in Project Technical Specification.
- 14.2 Sleeves shall extend at least 1,0 m beyond each side of road crossing and shall be effectively sealed at ends.
- 14.3 Each sleeve shall be provided with a draw-wire.
- 14.4 Both ends of all sleeved crossings shall be marked by means of cable markers as elsewhere specified, labelled "cable sleeve".
- 14.5 Where MV or main LV cables cross over or pass under other services such as water or drain pipes, they shall be run in sleeves.
- 14.6 All sleeves shall be laid at a depth of 900mm.
- 14.7 Radius of bends used in sleeves shall not be less than six times diameter of sleeve, and sleeve not less than twice cable diameter.
- 14.8 Sleeves shall be laid on a 100mm compacted layer of selected bedding material or, if this is not available, on a 100mm sand bedding. Cover layer shall be hand compacted completely around sleeves and to a cover of 150mm above top of them. Sleeves shall be supported along their entire length by bedding. A further 100mm layer of selected bedding material shall be added and this shall be compacted using four to six passes of a vibration pan compactor. Thereafter, trench shall be back-filled and compacted as specified in Sub-Clause "Trenching, Excavation and Compaction" elsewhere in this Part.
- 14.9 Contractor shall make all necessary arrangements with the appropriate Authorities for closing sidewalks and/or half the roadway at a time, and he shall comply fully with any statutory requirement applicable and any requirements the Authorities deem necessary. Surfaces shall be made good to satisfaction of Authorities and Engineer.

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
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 ($U_m = 1,2$ kV) up to 30 kV ($U_m = 36$ 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	XLPE -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 even 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 Labelling 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 systems 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. A 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.

16.4 LV Cable Terminations:

- 16.4.1 PVCAS cables shall be made off using adjustable mechanical glands.
- 16.4.2 Care shall be taken to ensure that armour wires are correctly seated in gland and that all parts are properly tightened.
- 16.4.3 Outdoors, in damp situations and in all minisubs and kiosks, neoprene waterproofing shrouds are to be fitted over all glands.
- 16.4.4 Wherever PVCAS cables are terminated to overhead lines a suitable moulded heat shrinkable glove to affect a watertight seal at crotch shall be used, in accordance with Manufacturer's instructions. Alternatively, a PVC cable cap may be used.

16.5 Service Cable Ends:

- 16.5.1 Service cable ends are to be located in positions indicated on drawings.
- 16.5.2 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.
- 16.5.3 No service cables are to be laid to erven directly behind kiosks or at pole positions.
- 16.5.4 Cables are to be left sealed with a heat shrink cap at a depth of 500mm, unless specified elsewhere in the Specification and drawings.
- 16.5.5 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.
- 16.5.6 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 033	Guidelines for the application design, planning and construction of medium voltage overhead power lines up to and including 22kV, using wooden pole structures and bare conductors.
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 off 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 Cross-arms:
- 18.6.1 Shall be of suitable lengths and diameter as detailed in Project Technical Specification.
- 18.7 Steel Cross-arms
- 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 dissimilar 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. Each value 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 joiner 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 **STREETLIGHTING AND SITE LIGHTING**

SANS 141	Glass-reinforced polyester (GRP) laminates
SANS 470	Concrete poles for telephone, power and lighting purposes
SANS 475	Luminaires for interior lighting, streetlighting and floodlighting - Performance requirements
SANS 529	Heat resisting wiring cables
SANS 1088	Luminaire entries and spigots
SANS 1266	Ballasts for discharge lamps (excluding tubular fluorescent lamps)

SANS 1421	Rubber- or plastics-coated fabrics - Determination of tensile strength and elongation at break
SANS 1464	Safety of luminaires Part 22: Luminaires for emergency lighting
SANS 1507	Electric cables with extruded solid dielectric insulation for fixed installations (300/500V to 1 900/3300V) Part 3 PVC distribution cables.
SANS 1574	Electric flexible cores, cords and cables with solids extruded dielectric insulation. Part 3: PVC insulated cores and cables.
SANS 1777	Photoelectric control units for lighting (PECUs)
VC 8011	Lamp holders
SANS 10098	Public lighting
SANS 10225	The design and construction of lighting masts
SANS 60529	Enclosures for electrical equipment classified by IP Code
SANS 61000	Electromagnetic compatibility (EMC): Part 3-2: Limits – Limits for harmonic current emissions
SANS 61048	Capacitors for use with fluorescent and other discharge lamp ballasts.
SANS ARP 035	Guidelines for the installation and maintenance of street lighting
NRS 038	Concrete poles
BS EN 14598-1, BS EN 14598- 2, BS EN 1459	Polyester moulding compounds for electrical and other purposes. Methods of test.
IEC 60598	Luminaires – Part1: General Requirements and tests. Part 2: Particular Requirements. Section 3: Luminaires for road and street lighting.

CMB Standards:

- 20.1 General:
- 20.1.1 Streetlighting poles and luminaires including type, mounting height, outreach dimensions, quantities, etc., are detailed elsewhere in Project Technical Specification.
- 20.1.2 All poles offered shall conform in all respects to requirements of Occupational Health and Safety Act, where applicable.

- 20.1.3 Poles shall be designed for terrain Category 2 locations using a basic 3 second gust speed for locality of site.
- 20.1.4 Poles shall have neat flush access openings with centre of opening approximately 500mm above ground level and bottom of opening not less than 350mm above ground level.
- 20.1.5 Opening shall have radiused corners and shall be adequately sized to facilitate installation of specified electrical equipment. Minimum size shall be 140mm x 355mm.
- 20.1.6 Opening shall be provided with a neat flush weatherproof door fitted with a stainless steel tamper proof locking device designed to secure door firmly in position and prevent unauthorised access into base compartment.
- 20.1.7 A hot dipped galvanised steel plate (250mm x 70mm) complete with DIN rail for two miniature circuit breakers shall be mounted to a bolt provided opposite access opening.
- 20.1.8 On steel poles a threaded 12mm earth stud shall be provided in a convenient position in base compartment to facilitate earthing of electrical equipment.
- 20.1.9 On concrete or glass fibre poles fitted with galvanised steel access opening covers, a stainless steel earthing stud complete with washer and two nuts shall be provided on inside of the cover to access opening.
- 20.1.10 Where control gear is to be mounted in pole base compartment it shall be Contractor's responsibility to ensure that dimensions of base compartment and access opening are adequate, notwithstanding minimum dimensions specified herein.
- 20.1.11 Poles shall have adequate cable entry slots for specific application in ground section on each side located 400mm below ground level.
- 20.1.12 Spigots shall be provided to suit the luminaires specified elsewhere in this Specification.
- 20.2 Steel Poles:
- 20.2.1 Material and Construction:
- 20.2.1.1 Steel poles shall be fabricated from mild steel having an ultimate tensile stress of not less than 400MPa.
- 20.2.1.2 Poles shall be hollow and shall have circular or polygonal cross-section.
- 20.2.1.3 Vertical section above ground level shall be continuously tapered throughout its length and outreach shall be integral with pole.
- 20.2.1.4 Base plates shall be provided for all poles.
- 20.2.1.5 Base plates shall be a minimum of 610mm x 610mm x 6mm thick and shall be provided with drain holes.
- 20.2.1.6 Base plates shall be bolted in position by means of a minimum of 2 x 20mm diameter hook bolts.
- 20.2.2 Corrosion Protection:
- 20.2.2.1 All steel poles designed for a mounting height exceeding 8,0m shall be provided with anti-corrosion ground sleeves.
- 20.2.2.2 Anti-corrosion ground sleeves shall be 600mm in length and shall be positioned such that centre of the sleeve will be at ground level with pole planted at its designed planting depth.
- 20.2.2.3 Sleeves shall be welded to pole at top and bottom such that no moisture can penetrate between sleeve and pole. Sleeves shall be welded in position prior to galvanising.

- 20.2.2.4 All poles shall be hot-dip galvanised to coastal conditions.
- 20.2.3 Handling and Transport:
 - 20.2.3.1 Poles shall be stacked and transported in such a way as to minimise mechanical damage to the zinc coating.
 - 20.2.3.2 Poles shall not be stored in direct contact with the ground and if stacked on top of each other, wood spacers shall be used to prevent formation of white rust
 - 20.2.3.3 Any small areas of galvanised coating which have become damaged during transport, storage or erection, shall be repaired by in situ shot blasting and zinc spraying to a nominal thickness of not less than 0,1mm.
- 20.3 Concrete Poles:
 - 20.3.1 Material and Construction:
 - 20.3.1.1 Reinforcing shall be pre-stressed and concrete shall be compacted using centrifugal spun process.
 - 20.3.1.2 Stainless steel spacers shall be used to ensure adequate cover over reinforcing steel.
 - 20.3.1.3 Poles shall have a smooth finish free from surface defects.
 - 20.3.1.4 No base plates are required but where planted in soft, sandy material or in fill material a flat, mesh reinforced, cable slab at least 600mm long shall be placed on a flat well compacted sand layer under butt of pole.
 - 20.3.1.5 Access openings shall be not less than 80mm by 390mm for poles with a butt diameter less than 250mm and 110mm by 390mm for poles with a butt diameter of 250mm or larger.
 - 20.3.2 Handling and Transport:
 - 20.3.2.1 Poles up to 4,5m in length shall be supported in at least two places and poles exceeding 4,5m in length must be supported in at least three places during transport.
 - 20.3.2.2 Supports must be shaped to accommodate poles and covered with rubber to avoid surface damage.
 - 20.3.2.3 Poles should never be lifted at a single point during loading or off-loading.
 - 20.3.2.4 Ropes or slings placed approximately 20% of length of pole from each end should be used.
 - 20.3.2.5 Poles stored on site should be placed on 50mm by 75mm timber supports at same positions used for transport.
- 20.4 Glass Fibre Reinforced Polyester Poles:
 - 20.4.1 Material and Construction:
 - 20.4.1.1 Poles shall be fabricated from glass fibre reinforced polyester resin using filament winding process.
 - 20.4.1.2 Material shall be coloured throughout with a colour finish as specified elsewhere in Project Technical Specification.
 - 20.4.1.3 Poles for planting in earth shall be provided with a minimum 300mm by 300mm by 1,6mm thick hot dipped galvanised steel base plate fixed with two hot dipped galvanised steel hook bolts.
- 20.5 Erection of Poles
 - 20.5.1 Poles shall be planted in positions indicated on drawings.

- 20.5.2 Poles shall be carefully aligned with each other to form straight lines or smooth curves generally following alignment of the associated roads.
- 20.5.3 Planting depth shall be carefully controlled to ensure that all luminaires will be at same height above level of carriageway.
- 20.5.4 Backfilling around pole as per requirements specified in the Sub-Clause "Trenching, Excavation and Compaction" elsewhere in this Part.
- 20.5.5 Where pole is planted in sloping ground height shall be carefully adjusted to ensure that not less than 150mm of ground sleeve projects above ground on high side and not more than 300mm on low side. If this is not possible due to slope of ground then a platform shall be formed by extending fill in vicinity of pole until this requirement can be met.
- 20.5.6 Where poles are to be anchored into rock, base of pole shall have a reinforced concrete block cast around it as detailed elsewhere in Project Technical Specification.
- 20.6 Luminaires:
- 20.6.1 General Requirements:
- 20.6.1.1 Types and wattage of luminaires required are detailed in Project Technical Specification.
- 20.6.2 Materials and Construction:
- 20.6.2.1 Body shall be constructed from inherently corrosion resistant materials of adequate strength and rigidity as further detailed in Project Technical Specification.
- 20.6.2.2 Material shall be coloured throughout.
- 20.6.2.3 Colour of luminaries shall be as detailed in Project Technical Specification.
- 20.6.2.4 A smooth defect free finish is required.
- 20.6.2.5 Material shall be adequately protected against deterioration due to exposure to UV radiation and shall be designed to provide a normal service life of at least 10 years.
- 20.6.2.6 Control gear shall be mounted within luminaire body if required.
- 20.6.2.7 Control gear compartment shall have a hinged cover.
- 20.6.2.8 Control gear shall be easily removed and replaced with luminaire on pole.
- 20.6.2.9 Diffuser shall be constructed from high impact acrylic, tempered glass or other approved material which is not subject to degradation and discoloration through heat or exposure to UV radiation.
- 20.6.2.10 Diffuser shall have a smooth outer surface designed to limit accumulation of dirt and shall be attached to luminaire body in such a way that it provides easy access for relamping and cleaning.
- 20.6.2.11 No tools shall be needed to open lamp compartment.
- 20.6.2.12 When retaining clips are released diffuser shall swing down to allow relamping while remaining attached to luminaire body.
- 20.6.2.13 Design of hinge shall allow easy removal of diffuser, without tools, for replacement or cleaning.
- 20.6.2.14 Hinges and retaining clips shall be manufactured from a suitable grade of stainless steel or other approved material.
- 20.6.2.15 Lamp holders shall be porcelain or thermal plastic types depending on type of lamp to be installed.

- 20.6.2.16 Lamp compartment shall be gasketed to provide and maintain an IP65 rating in service.
- 20.6.2.17 Control gear compartment shall have a minimum IP23 rating.
- 20.6.2.18 All nuts, bolts, washers and screws shall be manufactured from corrosion resisting materials and where in contact with aluminium or other non-ferrous metals they shall be manufactured from a suitable grade of stainless steel.
- 20.6.3 Control Gear:
 - 20.6.3.1 Control gear shall be designed specifically to operate specified lamps.
 - 20.6.3.2 Ballasts shall bear SABS mark.
 - 20.6.3.3 Connections shall be brought out to suitable terminals on ballast base plate.
 - 20.6.3.4 Ballasts shall be provided with tappings for 95% and 100% of normal voltage.
 - 20.6.3.5 Capacitors shall bear SABS mark.
 - 20.6.3.6 Operating power factor at rated voltage shall not be less than 0,85 lagging.
 - 20.6.3.7 External igniters shall be provided for all high pressure sodium and metal halide lamps exceeding 70 Watts in rating and shall be of superposed pulse type.
 - 20.6.3.8 Where called for in Project Technical Specification, luminaires shall have a 5A, 2,5kA MCB mounted in control gear compartment and wired into incoming phase conductor. Switch shall project through a cut-out in cover such that it may be operated from outside luminaire.
- 20.6.4 Light Distribution:
 - 20.6.4.1 Design of luminaire optical system shall provide a non-axial asymmetric luminous intensity distribution complying with requirements set out below.
 - 20.6.4.2 Project Technical Specification will indicate whether a cut-off or semi-cut-off distribution is required, either explicitly, or by specifying a particular make, model and type of luminaire
 - 20.6.4.3 Semi-cut-off luminaires shall limit direction of peak intensity to a maximum of 75° to downward vertical. Intensity at 90° to downward vertical shall be of order of 50cd/klm with a maximum of 1000cd. Intensity at 80° to downward vertical shall be of order of 30cd/klm.
 - 20.6.4.4 Cut-off luminaires shall limit direction of peak intensity to a maximum of 65° to downward vertical. Intensity at 90° to downward vertical shall be of order of 10cd/klm with a maximum of 1000cd. Intensity at 80° to downward vertical shall be of order of 30cd/klm.
- 20.6.5 Labelling:
 - 20.6.5.1 Self adhesive labels shall be fixed to underside of control gear compartment cover such that they are readily visible from ground.
 - 20.6.5.2 Label shall identify type and wattage of lamp using black 40mm high lettering on a light orange background for sodium lamps, a strong blue background for mercury vapour lamps and a white background for metal halide lamps.
 - 20.6.5.3 Letter "T" after wattage shall be used to distinguish tubular lamps from elliptical lamps.

20.7 High Intensity Discharge Lamps:

20.7.1 General:

20.7.1.1 All luminaires shall be supplied complete with specified type and wattage of lamp.

20.7.1.2 Lamps suitable for operation on either a 230V $\pm 10\%$, 50Hz supply or, where specifically called for, a 400V $\pm 10\%$, 50Hz supply.

20.7.2 Materials and Construction:

20.7.2.1 Lamps shall be robust and suitable in all respects for the intended duty.

20.7.2.2 Arc tube shall be accurately located in outer envelope.

20.7.2.3 Base shall be secured to glass envelope using a high quality heat resistant cement which will keep base securely fixed to glass envelope throughout life of lamp.

20.7.2.4 Coating of phosphor lamps shall be uniform and shall provide required spectral distribution.

20.7.3 Lamp Data:

20.7.3.1 Lamp data sheets shall be submitted with tenders. As a minimum they shall provide following information.

Guaranteed minimum lumen output at 100h and at 1000h.

Lumen maintenance and lamp mortality curves.

Spectral distribution and colour temperature.

Colour rendering index or group.

Minimum guaranteed life.

Life to 50% failures

20.8 Light Emitting Diode (LED):

20.8.1 General:

20.8.1.1 Luminaires shall be Class 1 and of the totally enclosed type.

20.8.1.2 Luminaires shall be delivered completely assembled with housing, driver, LED module and protector lens.

20.8.1.3 Luminaire output shall be provided as nominal flux at Ta of 35°C.

20.8.1.4 Colour temperature of luminaire shall be neutral white, 4000K to 5300K, and a colour rendering index of minimum 70, unless specified otherwise in the Project Technical Specification.

20.8.1.5 Luminaires shall deliver 70% of the initial lumens, when installed for a minimum of 50 000 hours.

20.8.1.6 The Tenderer shall provide a lumen depreciation graph by means of the IES LM 80-08 data of the LED's. The LED light source test data shall provide the expected data for at least 25% of rated LED light source life time, i.e. 10 000 hrs.

20.8.1.7 Luminaire shall offer a composite system efficiency of at least 90 Lumen/Watt.

20.8.1.8 All luminaires offered shall have a minimum guarantee period of five years.

20.8.1.9 The following information and conditions shall be met:

- LED light source (s) have been tested according to LN-80-80.

- LED drive current specified by luminaire manufacturer is less than or equal to the drive current specified in the LM-80 test report.

- 20.8.1.10 LED module shall be designed in such a manner that the failure of one LED shall not cause additional LED's to switch-off. LED's shall be series connected. Chip on Board not permitted due to parallel connections.
- 20.8.1.11 Temperature sensors shall be fitted as protection devices to the luminaire. These shall not switch-off the luminaire completely. Full details of how the luminaire manage its temperature, through the use of sensors and the effect on lumen maintenance, shall be supplied.
- 20.8.1.12 Only ceramic or metal core PCB's are to be used to maximize heat transfer.
- 20.8.1.13 Luminaires shall have a minimum rating of IP 66 for both the driver and LED module compartments, when mounted as per SANS 475.
- 20.8.2 Construction of Luminaires:
- 20.8.2.1 Luminaires shall be suitable for operation at an ambient temperature, T_a , of 35°C.
- 20.8.2.2 Luminaires shall contain a heat sink with no fans, pumps or liquids, and the design thereof on the external surfaces shall prevent the accumulation of dirt.
- 20.8.2.3 Body shall be constructed from inherently corrosion resistant materials of adequate strength and rigidity.
- 20.8.2.4 If powder coated, same shall be of a high quality.
- 20.8.2.5 Ferrous components shall be hot-dip galvanized and shall withstand the test specified in the SANS specifications for heavy duty application.
- 20.8.2.6 External components, such as toggle clips, bolts, screws, nuts, washers, shall be 304 stainless steel or better. Screws, which are used to secure covers, shall be held captive when opened.
- 20.8.2.7 Upgrading and / or service of LED unit and driver / power supply shall be possible.
- 20.8.3 Mounting:
- 20.8.3.1 Spigot entries shall be designed to fit easily over bracket pipe and shall be truly parallel to the fitting axis.
- 20.8.3.2 Attachment of the luminaire shall be designed to withstand wind speeds of up to 150km / hour on the projected surface of the luminaire without due deflection.
- 20.8.4 Optics:
- 20.8.4.1 Luminaires shall be able to be equipped with a variety of lenses, providing the desired light distribution.
- 20.8.4.2 Luminaires shall be photometered according to the C-Gamma system as detailed in the IEC publication.
- 20.8.4.3 For LED luminaires with non-replaceable LED modules, the intensity values shall be given in candela. The results shall be published in an intensity distribution table, indicating the intensity in cd/klm at each horizontal and vertical angle. This intensity distribution table shall be converted by an accredited test facility and / or luminaire suppliers into a suitable electronic format for use with any of the commercially available lighting computer programs.
- 20.8.5 Diffuser:
- 20.8.5.1 Diffuser shall be high-impact, toughened, clear flat glass.

- 20.8.5.2 Diffuser shall form a seal completely preventing the entry of moisture, dust and insects into the lamp.
- 20.8.6 Power Supply or Driver Requirements:
 - 20.8.6.1 LED module (s) drivers shall be housed fully within the sealed body of the luminaire.
 - 20.8.6.2 Output frequency of the drivers shall be 100Hz or greater to avoid visible flicker.
 - 20.8.6.3 Harmonic distortion levels of the LED module driver (s) shall comply with the SANS or IEC standards.
 - 20.8.6.4 LED module driver (s) shall operate at a power factor of 0,9 or greater, and the harmonic distortion levels shall be limited to 20% so as to not cause interference on the electrical network.
 - 20.8.6.5 The driver shall be able to withstand surges of up to 10kV/10kA by means of an external inline fused surge protection device inside the gear compartment. This surge protection shall be easily replaceable.
 - 20.8.6.6 The driver shall incorporate a thermal switch to prevent exceeding the case temperature for maximum life time of equipment.
 - 20.8.6.7 Lifetime of the driver shall be 100 000 hrs with 90% survival over the lifetime.
 - 20.8.6.8 The driver shall be suitable for nominal 220V-240V, 50Hz, main supply.
- 20.8.7 Earthing:
 - 20.8.7.1 Luminaire shall be earthed in accordance with the Electricity Machinery Regulations of the OHSACT.
 - 20.8.7.2 All metal parts of luminaires shall be permanently and reliably connected to an earthing terminal and shall withstand the test specified in the standards.
 - 20.8.7.3 All parts of earth terminals shall be made of brass or other corrosion resistant metal and the contact surfaces shall be bare metal and not painted or vanished surfaces.
 - 20.8.7.4 Earth connections shall be effected by means of suitable lugs.
- 20.8.8 Wiring:
 - 20.8.8.1 Internal wiring of luminaires shall be flexible and suitably insulated to withstand the voltage and the temperature encountered.
- 20.9 Electrical Connections:
 - 20.9.1 No cable glands or gland plates are required for termination of PVCAS cables in streetlighting poles.
 - 20.9.2 Cable shall be brought up to a convenient position adjacent to lower section of access opening.
 - 20.9.3 Outer PVC sheath shall be stripped back and steel wire armouring pulled away from around cables, twisted into compact tails and bonded together by means of an adequately sized line tap.
 - 20.9.4 All strands of armour wires shall be used.
 - 20.9.5 A separate earth conductor shall be taken from this line tap to earth stud in pole base compartment.
 - 20.9.6 Phase and neutral conductors shall be jointed using Pratley end connectors fitted with insulating sleeves.
 - 20.9.7 Except where an integral circuit breaker is called for in luminaire phase conductor to luminaire control gear shall be protected by a MCB attached to dinrail.

- 20.9.8 Phase and neutral conductors between pole base and luminaires shall be 1,5mm² PVC insulated for luminaires up to 400W and 2,5mm² PVC insulated above this rating.
- 20.9.9 Phase to which each luminaire is to be connected is indicated on drawings.
- 20.10 Photo-Electric Controls:
- 20.10.1 Photo-electric control unit shall be used to switch streetlighting installation.
- 20.10.2 Photo-electric switches shall be of the fully electronic type.
- 20.10.3 Switching shall be fully electronic or by means of a sealed relay capable of switching streetlighting circuits directly or via a contactor with a 230V operating coil.
- 20.10.4 Sensor and switching device shall be housed within a tough, translucent, weather and ultra-violet resistant cover.
- 20.10.5 Operating level shall be factory pre-set to switch on at approximately 50 lux and off at approximately 100 lux.
- 20.10.6 Unit shall provide an operating delay to make it insensitive to short duration changes in light levels.
- 20.10.7 Response time after sudden changes in light level shall not be less than 15 seconds.
- 20.10.8 Integral protection against voltage surges shall be provided.
- 20.10.9 Where photo-electric switch is pole mounted it shall be positioned in such a way that it will not be affected by spill-light from streetlighting installation or by vehicle headlamps.
- 20.11 Completion and Testing:
- 20.11.1 Immediately after completion of installation streetlighting system shall be switched on and lamps allowed to stabilise for at least one hour.
- 20.11.2 Voltage at each luminaire shall be measured and tapings on ballasts set accordingly.
- 20.11.3 Before performance testing is carried out, installation shall be put into service until approximately 100h of operation has been reached. Procedure shall be carried out as follows.
1. An illuminance calculation shall be carried out using approved design software.
 2. Actual illuminance values shall be measured on calculation grid points using a suitable and accurate luxmeter. Measurements need only be taken along three longitudinal lines coinciding with left and right carriageway edges and centre of lane nearest to line of luminaires. Calculated and measured values shall be tabulated and delivered to Engineer together with a copy of a print out from approved software giving predicted lux values.
 3. If measured values are all within 15% of calculated values and uniformity along three measured lines is within 10% of calculated uniformity along same lines then installation will be considered to be performing to specification.
- 20.12 Guarantees and Maintenance:
- 20.12.1 Installation shall be guaranteed and maintenance carried out in accordance with requirements detailed in Project Technical Specification.

21.0 **PADLOCKS**

CMB Standards:

- 21.1 All padlocks shall be provided by Contractor.
- 21.2 In case of extensions to existing installations, all padlocks shall match existing with same combinations.
- 21.3 Padlocks with stainless steel shackles shall be provided.
- 21.4 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.

22.0 **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
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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:

- 22.1 Before galvanising, all cutting, drilling, welding, etc., shall be complete.
- 22.2 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.

23.0 **PAINTING**

SANS 1274	Coatings applied by the powder-coating process
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CMB Standards:

- 23.1 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.
- 23.2 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).

24.0 **LABELS AND NOTICES**

SANS 1186	Symbolic safety signs
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CMB Standards:

- 24.1 Contractor shall arrange for labelling of all equipment, instruments, meters, relays, cables, etc.
- 24.2 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 labelled identically.
- 24.3 All labels shall be ivory or other back engraved white on black labels of sizes indicated.

- 24.4 Labels are to be located in purpose made holders or otherwise are to be screwed or riveted into position.
- 24.5 "Dymo" tape or similar labels will not be accepted nor will labels which are glued in position only.
- 24.6 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.
- 24.7 Prior to any equipment being labelled, Contractor shall request Engineer to provide a complete labelling schedule for all items of equipment. Under no circumstances is equipment to be labelled 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.
- 24.8 Following list indicates general labelling requirements but does not limit extent of labelling required, which shall encompass full extent of equipment supplied, or in case of existing equipment, any such which is affected by this Contract.
- 24.8.1 50mm high lettering:-
- Substation and minisub designation.
- Outdoor switchgear designation. Transformer designation.
- Distribution kiosk and fused feeder panel designation.
- 24.8.2 20mm high lettering:-
- Main or sub-main board designation. Control panel designation.
- Indoor switchgear designation.
- 24.8.3 10mm high lettering:-
- Individual switches on switchgear.
- Cubicles.
- Sub-distribution board designation.
- Poles for OH lines.
- 24.8.4 5mm high lettering:-
- Minisub feeder breakers and isolators.
- Distribution kiosk feeder breakers and isolators.
- General distribution switchgear.
- Meters, instruments and relays.
- Multiplying factors.
- 24.8.5 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.

- 24.9 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.
- 24.10 Where more than one similar item of equipment is fed from same board or control panel, item itself shall be labelled, 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.

25.0 **DISMANTLING**

CMB Standards:

- 25.1 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.
- 25.2 Under no circumstances is any material or equipment to be taken over by Contractor.
- 25.3 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.
- 25.4 All such material is to be neatly coiled, packed, etc., as appropriate.
- 25.5 Extreme care is to be taken in dismantling all such equipment, since it will be re-used by Employer.
- 25.6 If, in opinion of Engineer, unnecessary damage is done, cost of replacing such equipment will be debited to Contractor's account.
- 25.7 Receipt detailing all equipment and materials delivered in accordance with above must be obtained and a copy submitted to Engineer.

26.0 **INSPECTION, TESTING AND COMMISSIONING**

CMB Standards:

- 26.1 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.
- 26.2 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.
- 26.3 Contractor shall supply all equipment necessary for testing and commissioning procedures.
- 26.4 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.

27.0 **COMPLETION OF WORKS**

CMB Standards:

- 27.1 Completion of works will be executed as per relevant contract conditions.

28.0 **CERTIFICATE OF COMPLIANCE**

CMB Standards:

- 28.1 Contractor to complete and submit certificate of compliance as per the relevant contract conditions.

PART C4 - SITE INFORMATION

Existing electrical and civil services exists along the routes where the new MV & LV underground cable and overhead lines are to be supplied and installed. The drawings enclosed are not to be used by the contractor to determine the position of the existing underground electrical services. The routes of all existing electrical cables must be verified by means of a cable detector by the contractor and expose before trenching for new, or upgraded services, commence.

All Telkom and civil services must be verified before any trenching commence.

All work related to the project must therefore be discussed with the Client / Engineer before the works proceed to ensure that existing civil services are not damaged during construction.

All work is to be carried out in residential areas and in the vicinity of moving vehicles and due care must be taken to ensure that all the necessary precautions have been undertaken to ensure the safety off all workers and residents at all times.

The site location is indicated on Layout Drawing No. 10541/E/01.

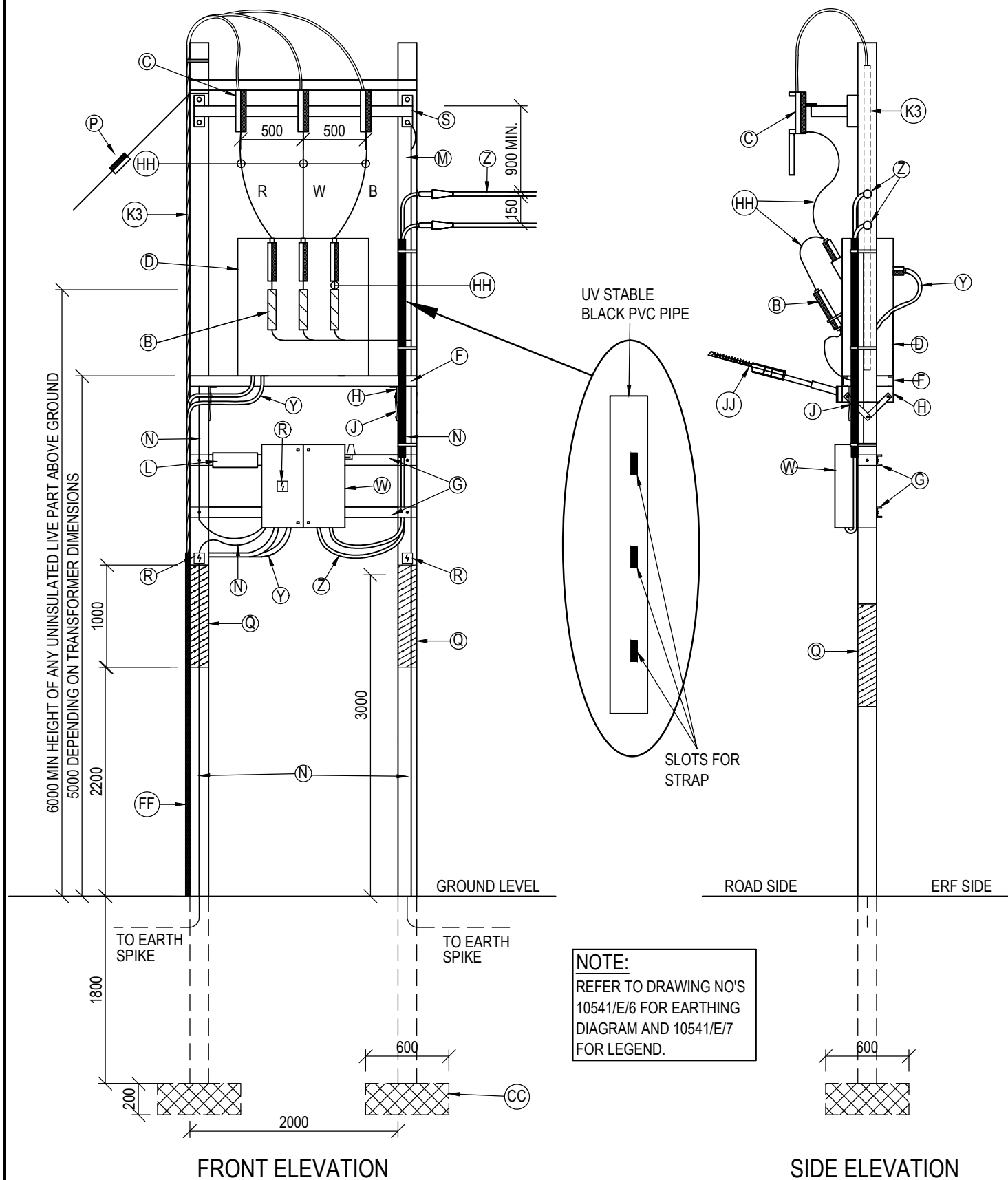
ANNEXURES

ANNEXURE A

Engineer's Drawings

The following Engineer's Drawings are attached and bound to this Document and are applicable to this installation:

<u>Drawing No</u>	<u>Description</u>
10541/E/01	MV and LV Reticulation & Streetlighting Layout
10541/E/02	Sleeve Layout
10541/E/03	Schematic Diagram
10541/E/04	Pole Mounted Transformer "PMT Nkqubela No.1 (200kVA)"
10541/E/05	Pole Mounted Transformer "PMT Nkqubela No.2 (200kVA)"
10541/E/06	Pole Mounted Transformer: Earthing Diagram
10541/E/07	Pole Mounted Transformer: Legend
10541/E/08	Typical Pole Mounted Transformer L.V. Distribution Box
10541/E/09	Legend for Drawing No. 10541/E/08
10541/E/10	11/22kV O/H Line: "A" Frame for Single/Double Strain Poles
10541/E/11	11/22kV O/H Line: "A" Frame for Intermediate Poles
10541/E/12	11/22kV O/H Line: Cross-Arm for Use with "A" Frame at Tee-Off's and Right Angle Turns
10541/E/13	11kV O/H Line: Right Angle Strain Pole with Separate Cross-Arm
10541/E/14	11/22kV O/H Line: Right Angle Strain Pole with Separate Cross-Arm and Fuses
10541/E/15	11kV O/H Line: Right Angle Strain Pole with Separate Cross-Arm
10541/E/16	Detail of 11kV ABC / Cable Connection at Pole
10541/E/17	MV/LV O/H Line: Single Stay Structure
10541/E/18	MV/LV O/H Line: Prop Structure
10541/E/19	LV O/H Line: Strain Pole with Consumer Service Connection Box for Underground Service Connections
10541/E/20	LV O/H Line: Intermediate Pole with Consumer Service Connection Box for Underground Service Connection Cables
10541/E/21	Larger Pole Mounted Consumer Service Connection Box (7 to 12 House Connections)
10541/E/22	Smaller Pole Mounted Consumer Service Connection Box (Maximum 6 House Connections)
10541/E/23	Streetlight Pole with Overhead Airdac Connection
10541/E/24	Typical Streetlight Bracket Detail
10541/E/25	MV ABC Suspension Assembly
10541/E/26	MV ABC Dead-end Assembly
10541/E/27	Typical Trench Detail for MV Cable
10541/E/28	Typical Trench Detail for LV Cable
10541/E/29	Typical House Installation for Type DS4 Duplex
10541/E/30	Typical House Installation for Type 4SS Conventional
10541/E/31	Typical House Installation for Type 4RA Conventional
10541/E/32	Project Notice Board
10541/E/33	Support Structure Detail for Project Notice Board



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CLIENT

LANGEBERG MUNICIPALITY

PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQUBELA, ROBERTSON**

DRAWING TITLE

**POLE MOUNTED TRANSFORMER
"PMT NKQUBELA NO.1 (200KVA)"**

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

CAD REF No.

10541-E-DET

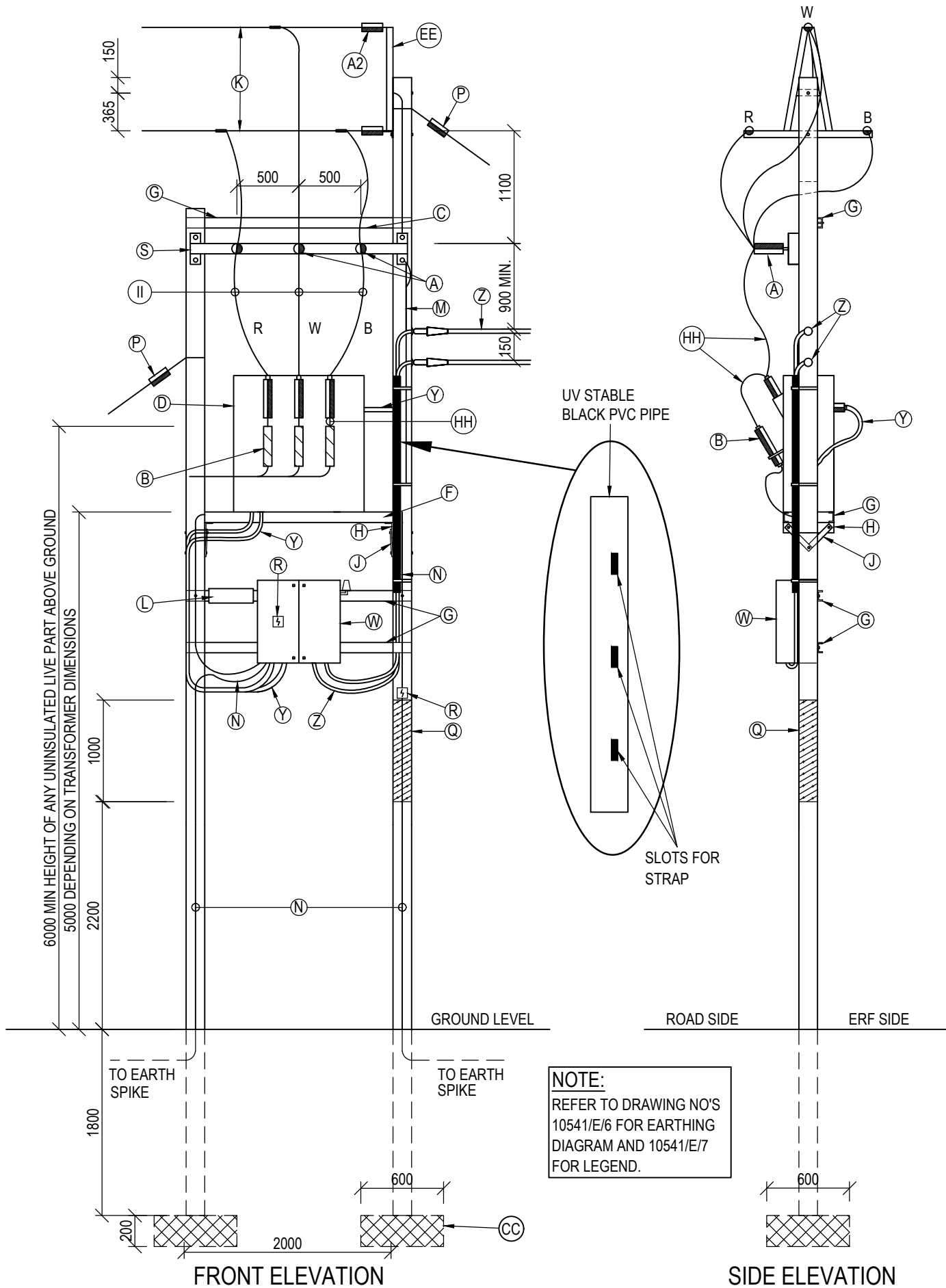
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DRAWING NO

10541/E/04

REVISION



CLINKSCALES MAUGHAN-BROWN

CONSULTING MECHANICAL & ELECTRICAL ENGINEERS

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CLIENT

LANGEBERG MUNICIPALITY

PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQUBELA, ROBERTSON**

DRAWING TITLE

**POLE MOUNTED TRANSFORMER
"PMT NKQUBELA NO.2 (200KVA)"**

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

CAD REF No.

10541-E-DET

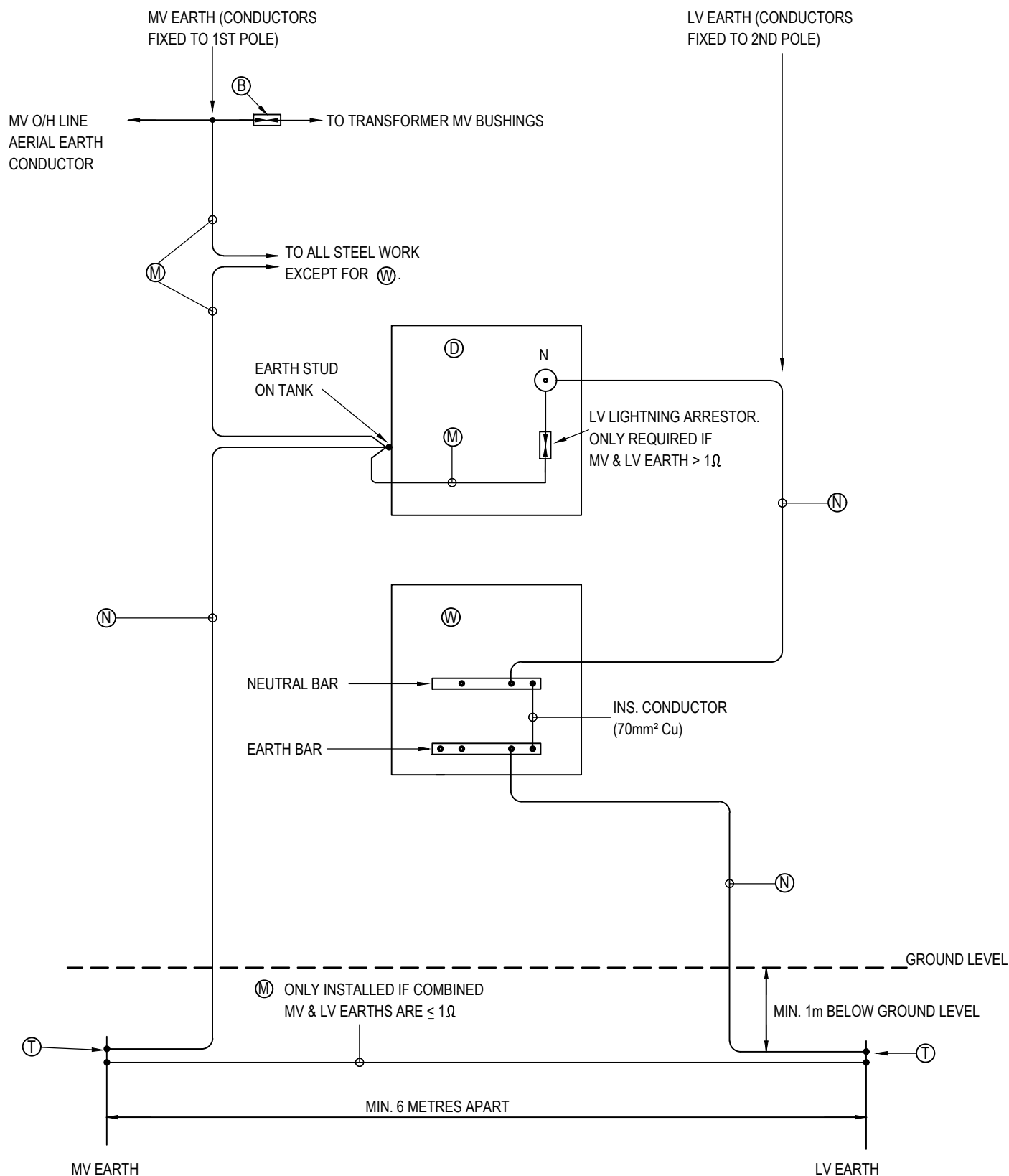
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DRAWING NO

10541/E/05

REVISION



NOTE: REFER TO DRAWING NO. 10541/E/07 FOR LEGEND



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CLIENT

LANGEBERG MUNICIPALITY

PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQBELA, ROBERTSON**

DRAWING TITLE

**POLE MOUNTED TRANSFORMER:
EARTHING DIAGRAM**

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

CAD REF No.

10541-E-DET

DWG-SIZE

A4

DRAWING NO

10541/E/06

REVISION

LEGEND

- (A) 11kV POS TOP INSULATOR
- (A2) 11kV STRAIN INSULATOR
- (A3) 11kV STRAIN CLAMP
- (B) 11kV LIGHTNING ARRESTOR
- (C) 11kV EXPULSION FUSES
- (D) 11kV TO 420/240V TRANSFORMER
- (E) 200 x 75 x 25mm GALVANISED CHANNEL IRON
- (F) 160 x 65 x 19mm GALVANISED CHANNEL IRON
- (G) 100 x 50 x 11mm GALVANISED CHANNEL IRON
- (H) 150 x 75 x 12mm GALVANISED ANGLE IRON
- (J) 50 x 12mm GALVANISED FLAT IRON
- (K) 11kV OVERHEAD LINE CONDUCTOR
- (K2) 11kV ABC
- (K3) 11kV UNDERGROUND CABLE
- (L) SUBSTATION DESIGNATION BOARD
- (M) 70mm² BARE Cu EARTH CONDUCTOR
- (N) 70mm² Cu BLACK PVC INSULATED EARTH CONDUCTOR PROTECTED WITH 25mm DIAM. GALVANISED STEEL KICKER PIPE FOR 3.5m ABOVE LEVEL.
- (P) STAY WITH INSULATOR
- (Q) BARBED WIRE TWISTED AROUND POLES
- (R) DANGER NOTICE
- (S) 100 x 50mm GALVANISED CHANNEL STAND-OFF BRACKET FOR EXPULSION FUSES / PIN INSULATORS.
- (T) EARTH SPIKES
- (U) PROP
- (W) POLE MOUNTED L.V. DISTRIBUTION BOX
- (Y) L.V. BUNDLED CONDUCTOR/CABLE CONNECTION BETWEEN TRANSFORMER & L.V. DISTRIBUTION BOX
- (Z) L.V. BUNDLED CONDUCTOR (POWER & STREETLIGHTING)
- (ZZ) L.V. PVCAS CABLE
- (AA) METER BOX (FIBRE GLASS OR 3CR12 STEEL ENCLOSURE)
- (BB) GALVANISED STEEL KNEE-BRACE
- (CC) 600 x 600 x 200mm CONCRETE FOOT
- (EE) SINGLE/DOUBLE STRAIN A-FRAME
- (FF) GALVANISED STEEL KICKER PIPE
- (HH) 25mm² Cu XLPE INSULATED CONNECTIONS WITH UV STABLE PVC OUTER SHEATH
- (II) 61,70mm² (6/1/3,35) RABBIT CONDUCTOR
- (JJ) STREETLIGHT LUMINAIRE

NOTES

- ① INSTALL SECTION OF PVCAS CABLE SHEATH AROUND BUNDLED CONDUCTOR WHERE IT IS STRAPPED TO POLES AND WHERE IT IS IN CONTACT WITH STAY WIRE. WHERE APPLICABLE, STEEL KICKER PIPES SHALL BE STRAPPED TO POLES USING STAINLESS STEEL STRAPS.
- ② ALL BOLTS TO BE M20 & GALVANISED



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CLIENT

LANGEBERG MUNICIPALITY

PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQUBELA, ROBERTSON**

DRAWING TITLE

**POLE MOUNTED TRANSFORMER:
LEGEND**

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

CAD REF No.

10541-E-DET

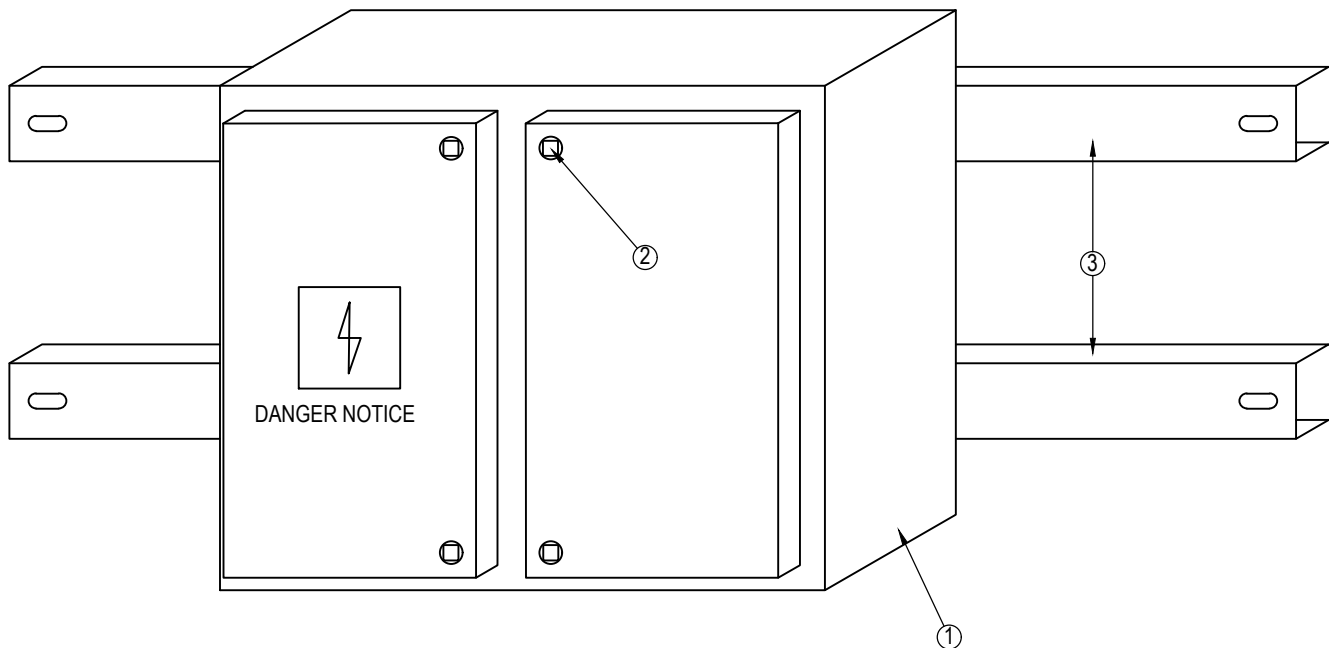
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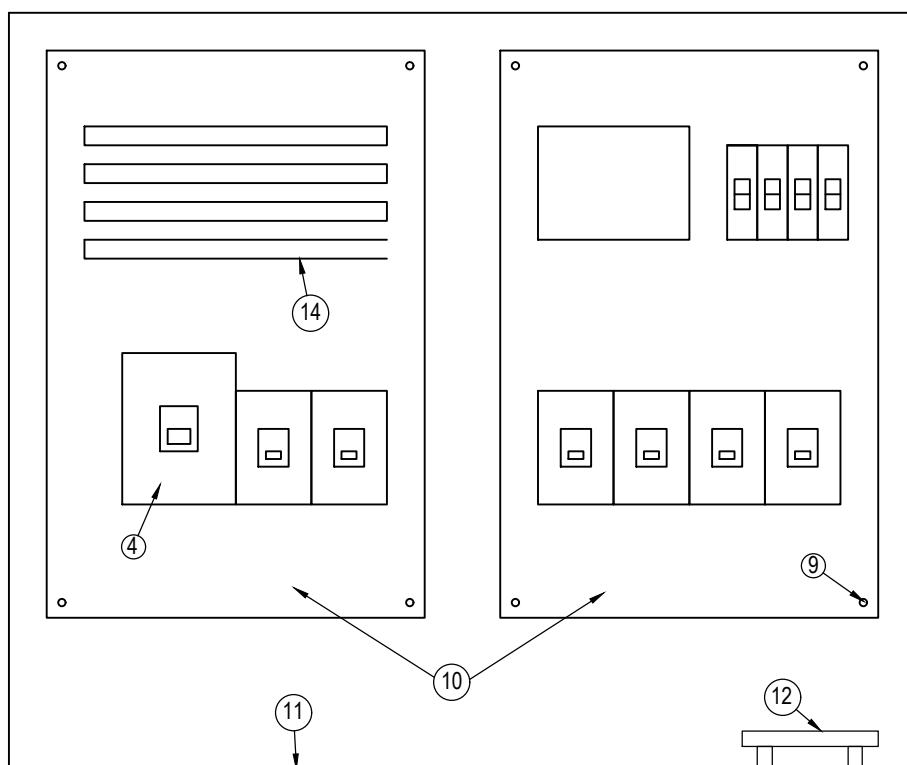
DRAWING NO

10541/E/07

REVISION



ENCLOSURE AND MOUNTING BRACKETS



INTERNAL LAYOUT



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LANGEBERG MUNICIPALITY

PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQUBELA, ROBERTSON**

DRAWING TITLE

**TYPICAL POLE MOUNTED TRANSFORMER
L.V. DISTRIBUTION BOX**

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

CAD REF No.

10541-E-DET

DWG-SIZE

A4

DRAWING NO

10541/E/08

REVISION

LEGEND:

- ① ENCLOSURE (DIMENSIONS TO SUIT EQUIPMENT SPECIFIED)
- ② LATCH WITH PADLOCK FACILITY
- ③ 100 x 50 x 11mm GALVINISED CHANNEL
- ④ TRIPLE POLE (TP) MAIN CIRCUITBREAKER
- ⑤ TP DISTRIBUTION CIRCUIT BREAKER
- ⑥ STREETLIGHTING EQUIPMENT
- ⑦ THUMB SCREWS
- ⑧ REMOVABLE FACE PLATE
- ⑨ GLAND PLATE PRE-DRILLED FOR CABLE SIZES AS PER DRAWING NO'S. 10145/E/01.
- ⑩ EARTH BAR
- ⑪ 23 x 60mm SLOTS
- ⑫ BUSBARS
- ⑬ PHOTOCCELL

NOTES:

- A REFER TO DRAWING No. 10541/E/08.
- B IVORINE LABELS, 10mm HIGH LETTERING, INSTALLED ON FACE PLATES FOR ALL EQUIPMENT AS PER DRAWING No. 10541/E/03.
- C ENCLOSURE AND INTERNAL STEELWORK TO BE MANUFACTURED OF GALVANISED SHEET METAL ENCLOSURE TO BE SAME COLOUR AS TRANSFORMER SUBSTATION AND INTERNAL STEELWORK WHITE.



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PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQUBELA, ROBERTSON**

DRAWING TITLE

LEGEND FOR DRAWING NO. 10541/E/08

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

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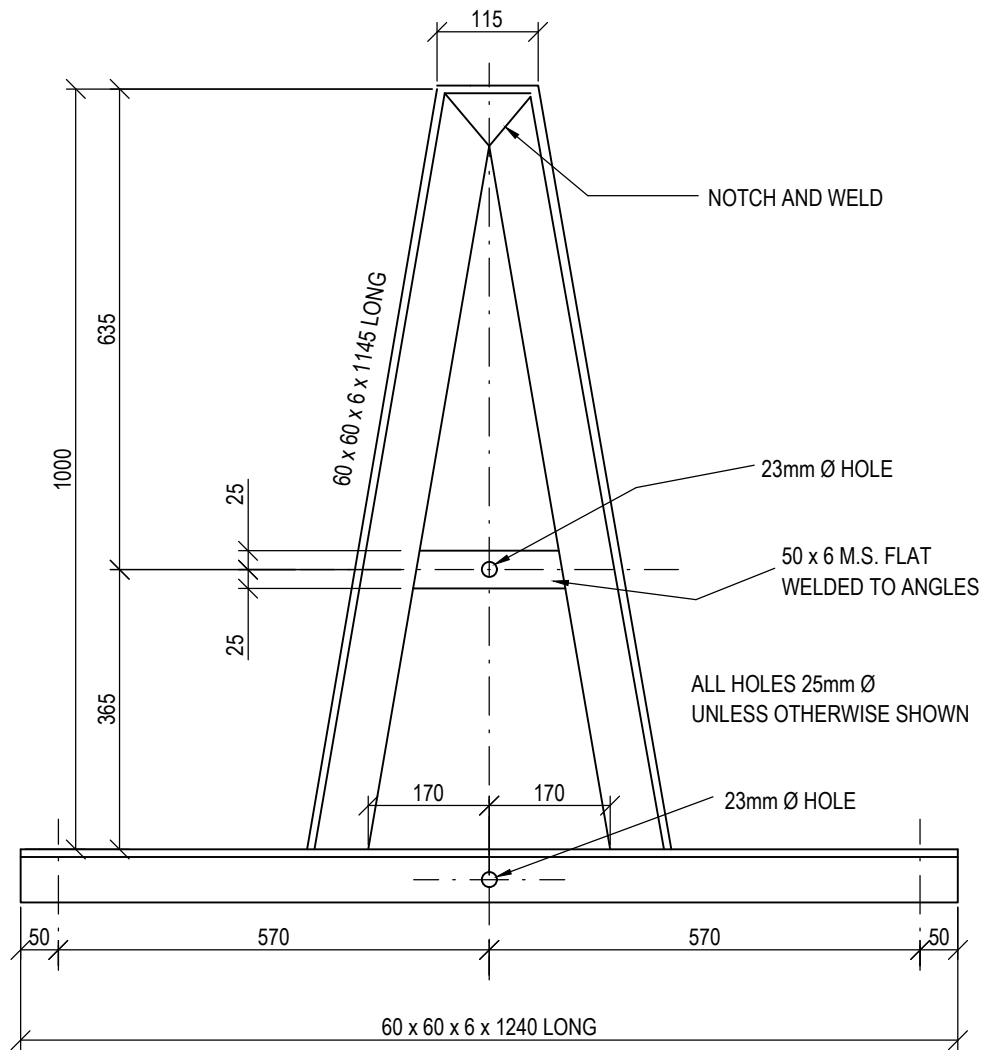
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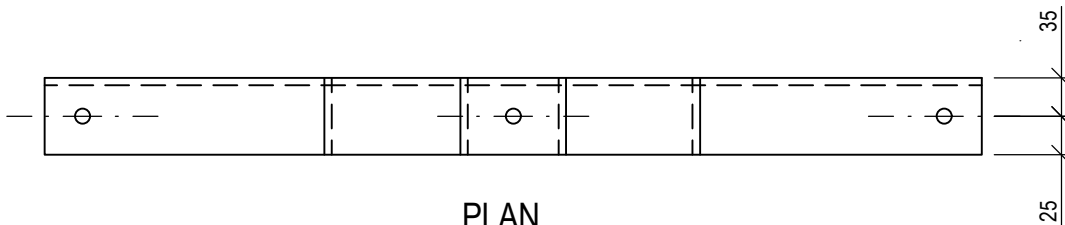
REVISION



FRONT ELEV.



END ELEV.



PLAN

NOTE: STEELWORK HOT-DIPPED GALVANISED AFTER MANUFACTURE



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PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQBELA, ROBERTSON**

DRAWING TITLE

**11/22kV O/H LINE: "A" FRAME FOR
INTERMEDIATE POLES**

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

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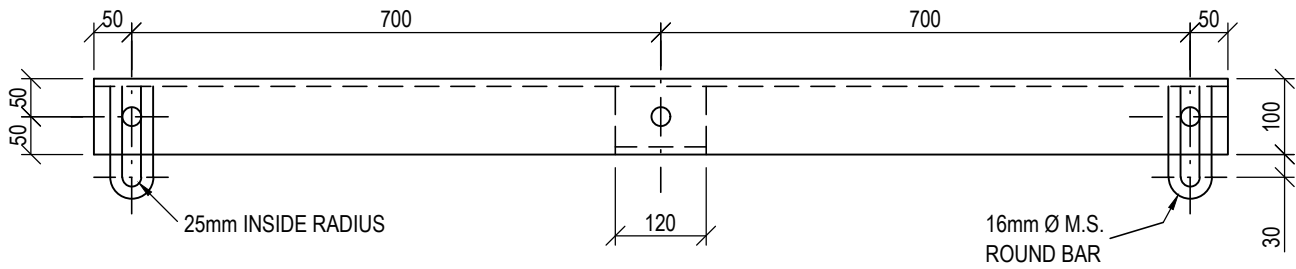
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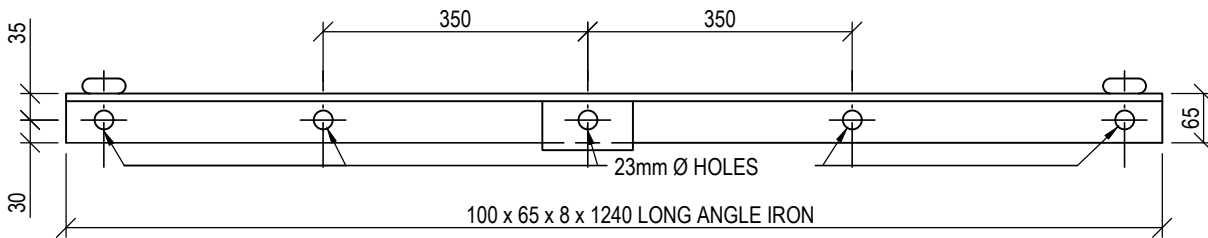
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REVISION

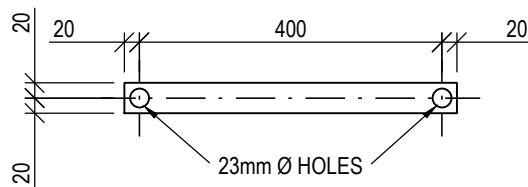


PLAN

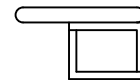
ALL HOLES 25mm Ø
UNLESS OTHERWISE SHOWN



FRONT ELEVATION



KNEE-BRACE FOR ANGLE CROSS-ARM



END ELEVATION

NOTE: STEELWORK HOT-DIPPED GALVANISED AFTER MANUFACTURE



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PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQBELA, ROBERTSON**

DRAWING TITLE

11/22kV O/H LINE: CROSS-ARM FOR
USE WITH "A" FRAME AT TEE-OFF'S
AND RIGHT ANGLE TURNS

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

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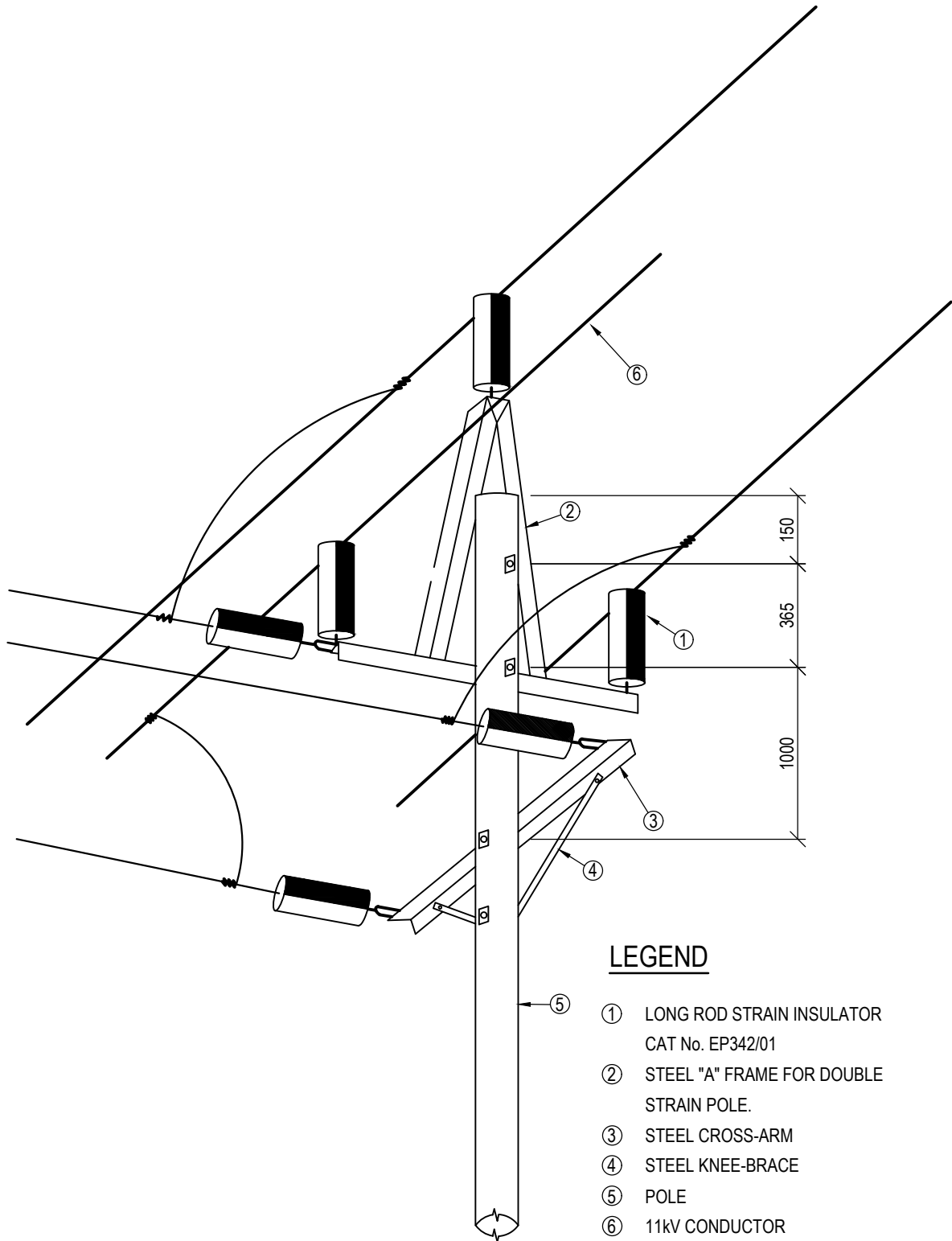
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REVISION



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PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQBELA, ROBERTSON**

DRAWING TITLE

**11kV O/H LINE: RIGHT ANGLE STRAIN
POLE WITH SEPARATE CROSS-ARM**

DRAWN
MvM

DESIGNED
JdV

CHECKED
JdV

APPROVED

SCALE
N.T.S.

DATE
28/01/2022

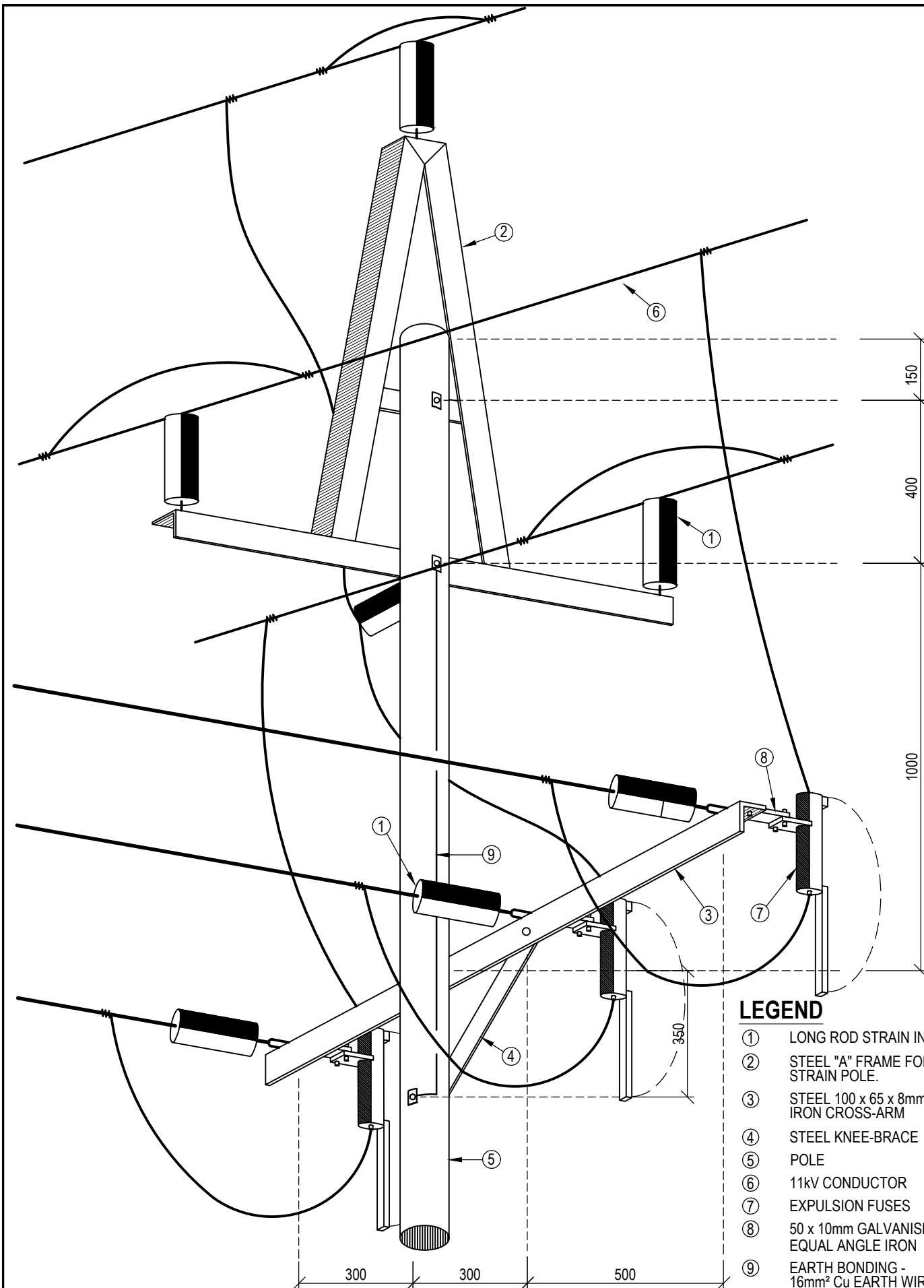
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DRAWING NO

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REVISION



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LANGEBERG MUNICIPALITY

PROJECT
**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQBELA, ROBERTSON**

DRAWING TITLE

**11/22kV O/H LINE: RIGHT ANGLE STRAIN
POLE WITH SEPARATE CROSS-ARM AND
FUSES**

DRAWN MvM	DESIGNED JdV	CHECKED JdV	APPROVED
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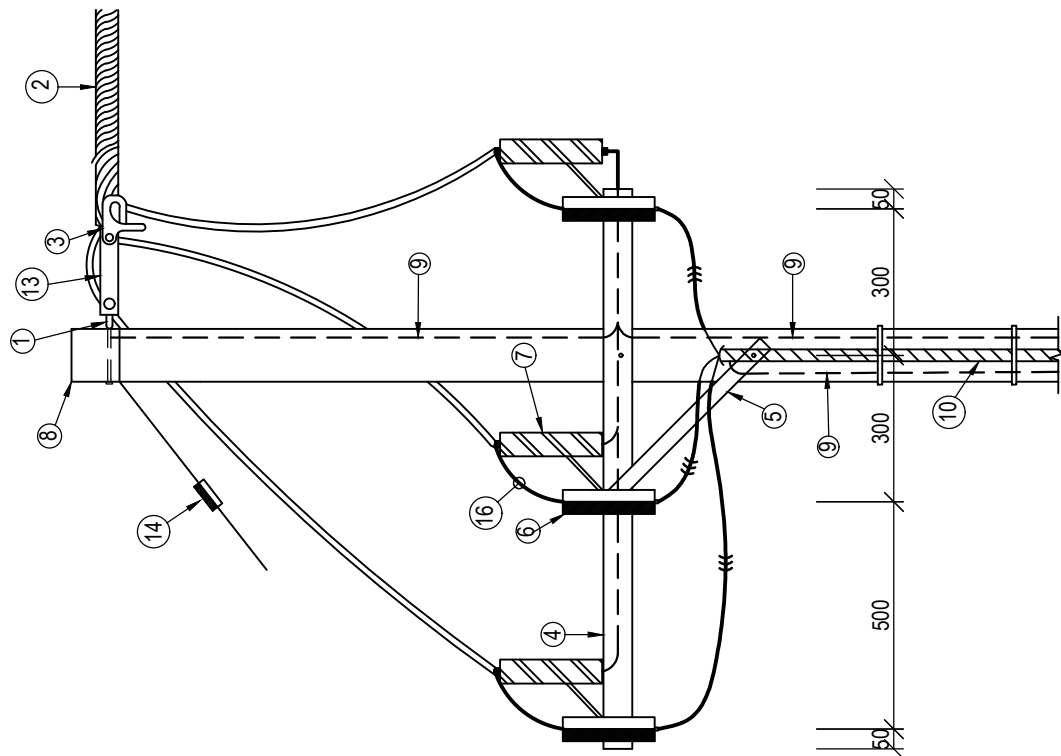
SCALE N.T.S.	DATE 28/01/2022	CAD REF No. 10541-E-DET	DWG-SIZE A4
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DRAWING NO
10541/E/14

REVISION

LEGEND

- ① PIGTAIL BOLT M16
- ② NEW MV ABC CONDUCTOR
- ③ MV ABC PISTOL GRIP
- ④ 100 X 50 X 11mm GALVANISED CHANNEL IRON
- ⑤ 50 X 12mm GALVANISED FLAT IRON
- ⑥ 11kV EXPULSION FUSES
- ⑦ 11kV LIGHTNING ARRESTORS
- ⑧ MV POLE
- ⑨ 35mm² Cu ISOLATED PVC INSULATED EARTH DOWN CONDUCTOR
- ⑩ 11kV CABLE
- ⑪ 50 X 10mm GALVANISED EQUAL ANGLE IRON
- ⑫ WOODEN BLOCK SPACER
- ⑬ DOUBLE LINK PLATE
- ⑭ STAY WIRE
- ⑮ MV ABC JUMPERS



FRONT ELEVATION

SIDE ELEVATION

NOTES

1. ALL BOLTS SECURING HARDWARE TO POLE SHALL BE M20 GALVANISED.
2. EARTH DOWN CONDUCTOR SHALL BE PROTECTED WITH GALVANISED KICKER PIPE 500mm BELOW TO 3.5m ABOVE GROUND LEVEL.
3. GALVANISED STEEL WIRE CATENARY OF MV ABC CONDUCTOR TO BE CONNECTED TO EARTH CONDUCTOR.



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PROJECT
LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQUBELA, ROBERTSON

DRAWING TITLE

11kV O/H LINE: RIGHT ANGLE STRAIN POLE
WITH SEPARATE CROSS-ARM

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

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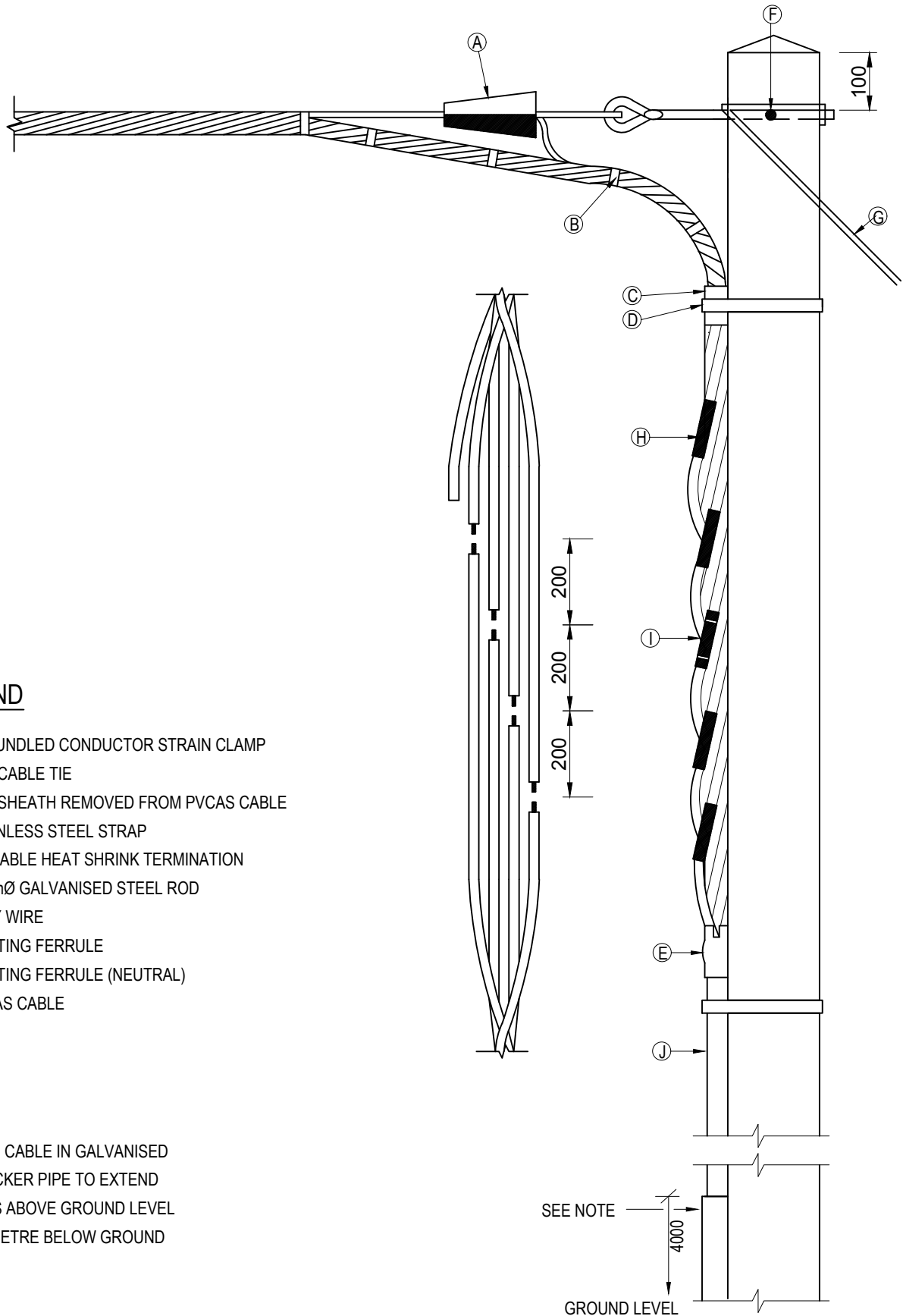
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DRAWING NO

10541/E/15

REVISION



LEGEND

- (A) LV BUNDLED CONDUCTOR STRAIN CLAMP
- (B) PVC CABLE TIE
- (C) PVC SHEATH REMOVED FROM PVCAS CABLE
- (D) STAINLESS STEEL STRAP
- (E) MV CABLE HEAT SHRINK TERMINATION
- (F) 20mmØ GALVANISED STEEL ROD
- (G) STAY WIRE
- (H) JOINTING FERRULE
- (I) JOINTING FERRULE (NEUTRAL)
- (J) PVCAS CABLE

NOTE

LV PVCAS CABLE IN GALVANISED
STEEL KICKER PIPE TO EXTEND
4 METRES ABOVE GROUND LEVEL
AND 0,5 METRE BELOW GROUND
LEVEL.

SEE NOTE

GROUND LEVEL



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LANGEBERG MUNICIPALITY

PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQBELA, ROBERTSON**

DRAWING TITLE

**DETAIL OF 11kV ABC / CABLE CONNECTION
AT POLE**

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

JdV

SCALE

N.T.S.

DATE

28/01/2022

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DRAWING NO

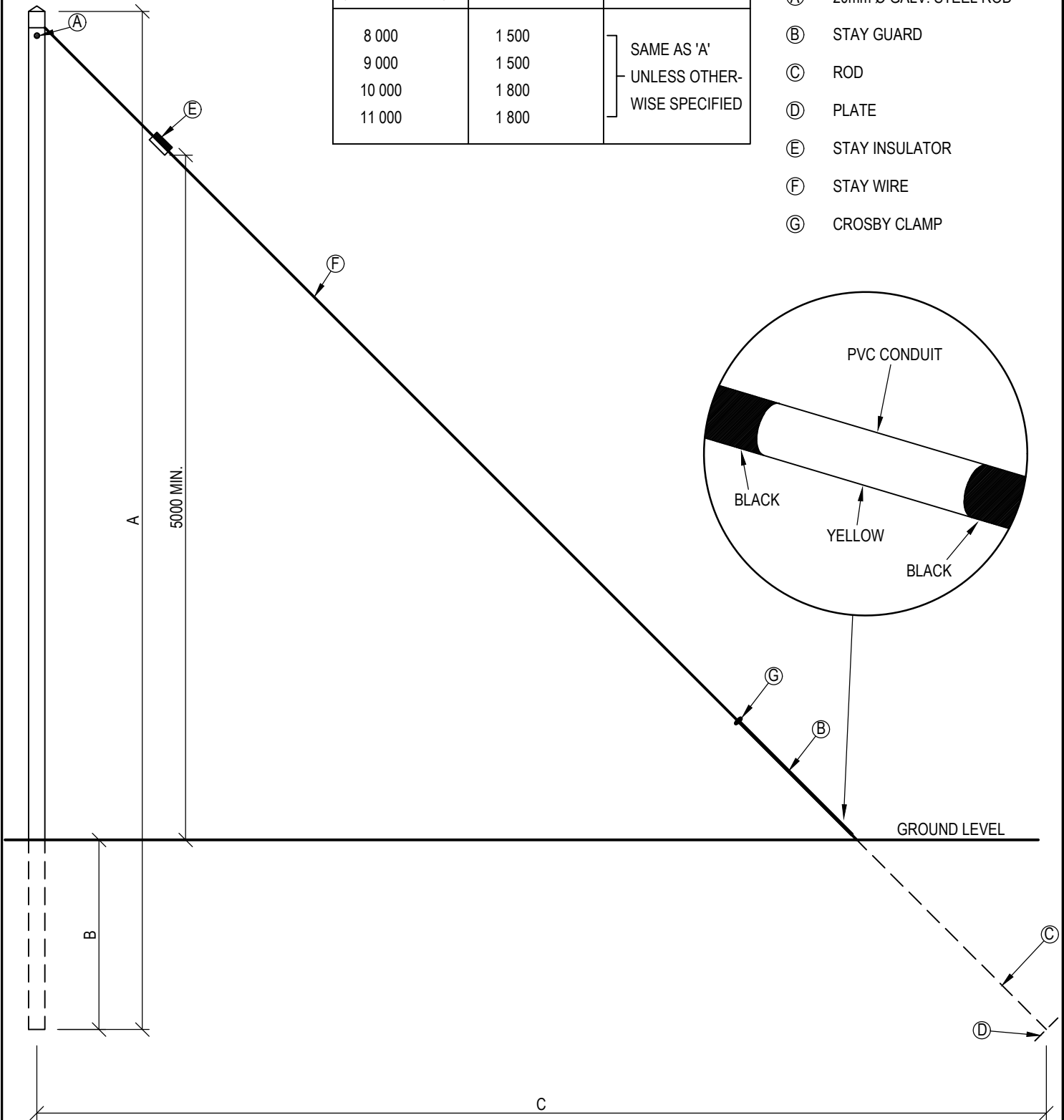
10541/E/16

REVISION

DIMENSIONS (MILLIMETRES)		
A (POLE LENGTH)	B	C
8 000	1 500	SAME AS 'A' UNLESS OTHER- WISE SPECIFIED
9 000	1 500	
10 000	1 800	
11 000	1 800	

LEGEND

- (A) 20mm Ø GALV. STEEL ROD
- (B) STAY GUARD
- (C) ROD
- (D) PLATE
- (E) STAY INSULATOR
- (F) STAY WIRE
- (G) CROSBY CLAMP



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PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQBELA, ROBERTSON**

DRAWING TITLE

**MV/LV O/H LINE: SINGLE STAY
STRUCTURE**

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

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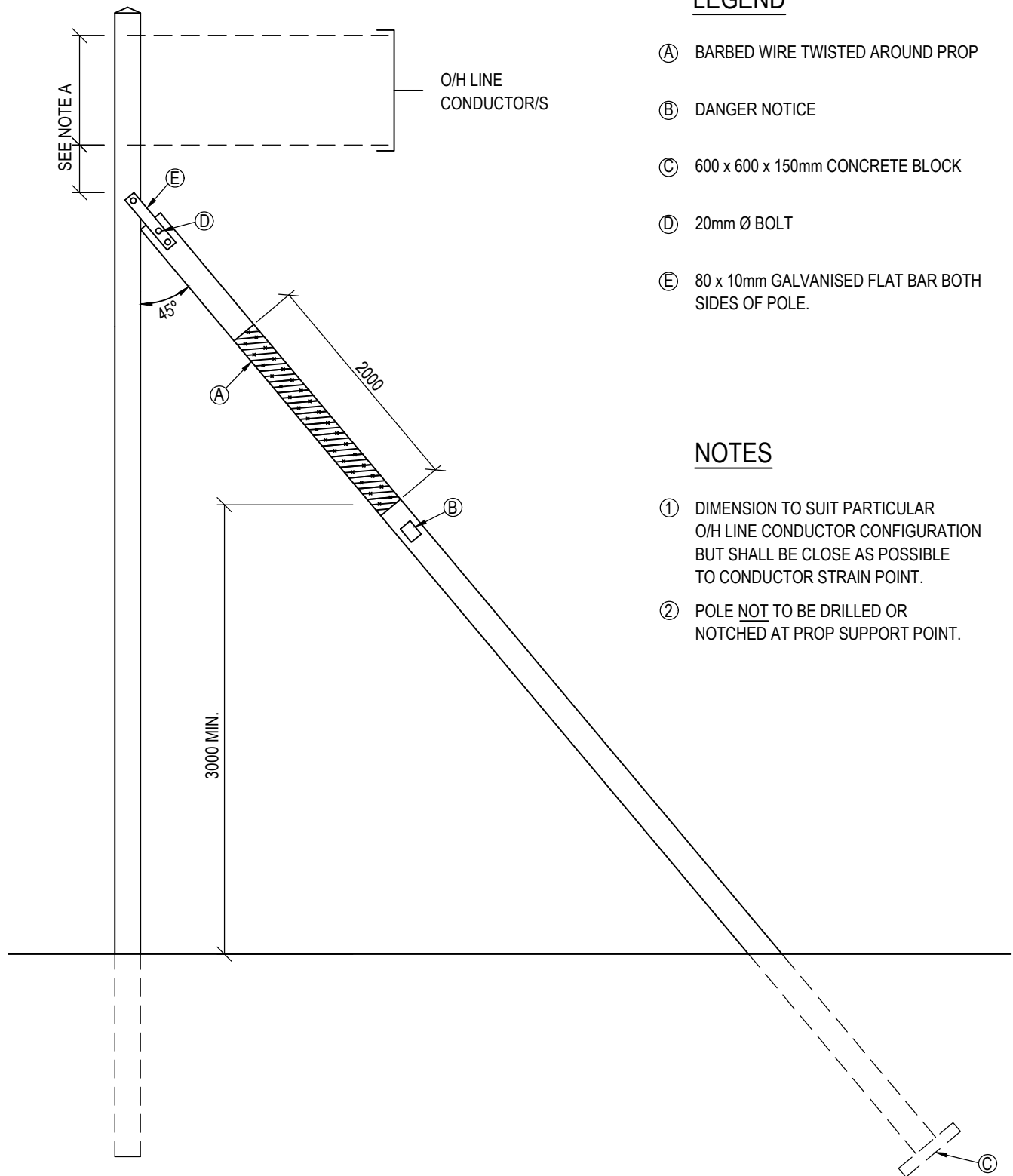
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DRAWING NO

10541/E/17

REVISION



LEGEND

- (A) BARBED WIRE TWISTED AROUND PROP
- (B) DANGER NOTICE
- (C) 600 x 600 x 150mm CONCRETE BLOCK
- (D) 20mm Ø BOLT
- (E) 80 x 10mm GALVANISED FLAT BAR BOTH SIDES OF POLE.

NOTES

- ① DIMENSION TO SUIT PARTICULAR O/H LINE CONDUCTOR CONFIGURATION BUT SHALL BE CLOSE AS POSSIBLE TO CONDUCTOR STRAIN POINT.
- ② POLE NOT TO BE DRILLED OR NOTCHED AT PROP SUPPORT POINT.



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LANGEBERG MUNICIPALITY

PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQBELA, ROBERTSON**

DRAWING TITLE

MV/LV O/H LINE: PROP STRUCTURE

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

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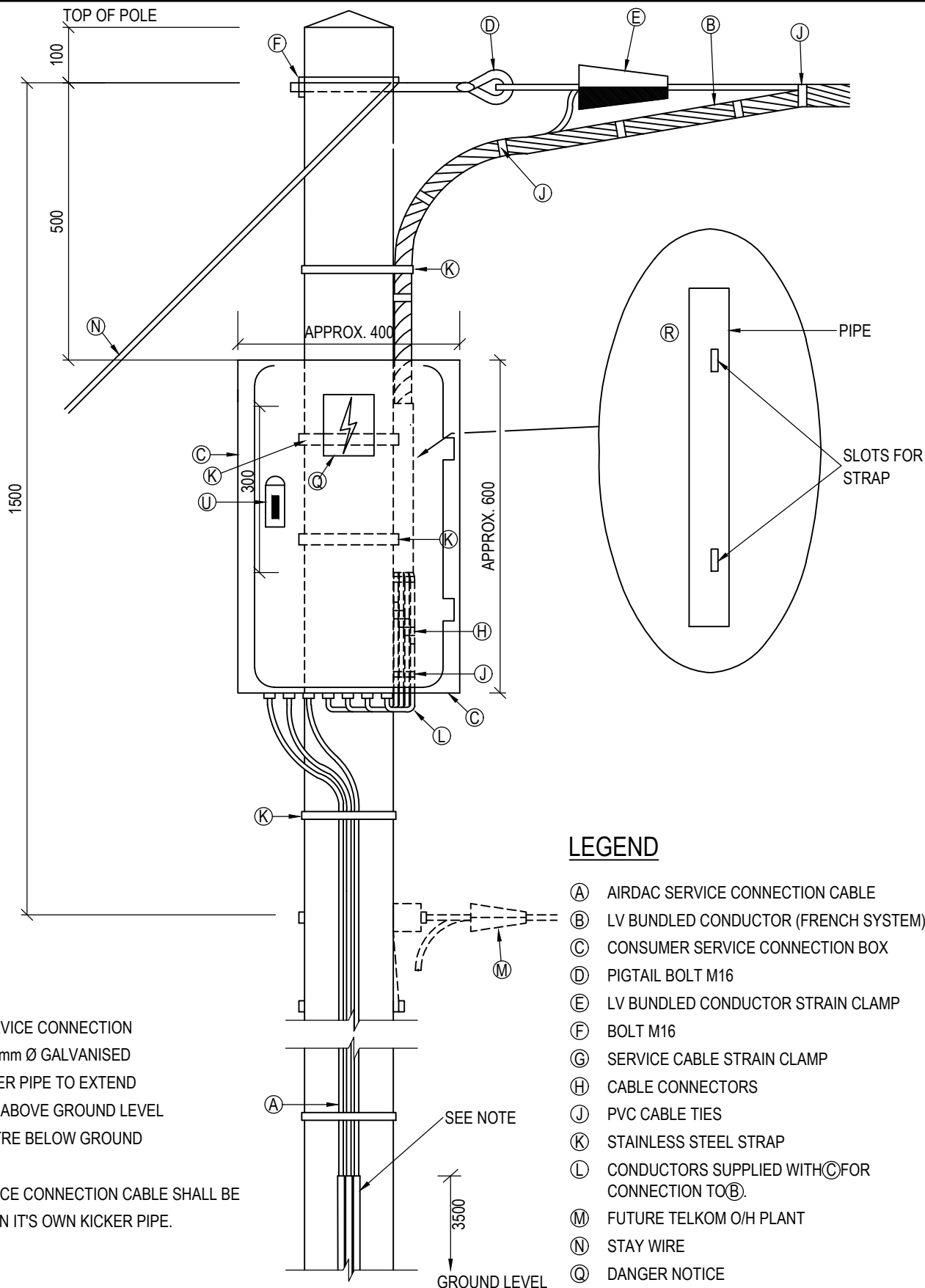
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DRAWING NO

10541/E/18

REVISION



NOTE

AIRDAC SERVICE CONNECTION
CABLE IN 25mm Ø GALVANISED
STEEL KICKER PIPE TO EXTEND
3,5 METRES ABOVE GROUND LEVEL
AND 0,5 METRE BELOW GROUND
LEVEL.

EACH SERVICE CONNECTION CABLE SHALL BE
INSTALLED IN IT'S OWN KICKER PIPE.

LEGEND

- (A) AIRDAC SERVICE CONNECTION CABLE
- (B) LV BUNDLED CONDUCTOR (FRENCH SYSTEM)
- (C) CONSUMER SERVICE CONNECTION BOX
- (D) PIGTAIL BOLT M16
- (E) LV BUNDLED CONDUCTOR STRAIN CLAMP
- (F) BOLT M16
- (G) SERVICE CABLE STRAIN CLAMP
- (H) CABLE CONNECTORS
- (J) PVC CABLE TIES
- (K) STAINLESS STEEL STRAP
- (L) CONDUCTORS SUPPLIED WITH (C) FOR CONNECTION TO (B).
- (M) FUTURE TELKOM O/H PLANT
- (N) STAY WIRE
- (Q) DANGER NOTICE
- (R) BLACK PVC PIPE STRAPPED TO POLE
- (S) STAINLESS STEEL BANDIT STRAPS



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CLIENT

LANGEBERG MUNICIPALITY

PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQUBELA, ROBERTSON**

DRAWING TITLE

**LV O/H LINE: STRAIN POLE WITH CONSUMER
SERVICE CONNECTION BOX FOR
UNDERGROUND SERVICE CONNECTIONS**

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

CAD REF No.

10541-E-DET

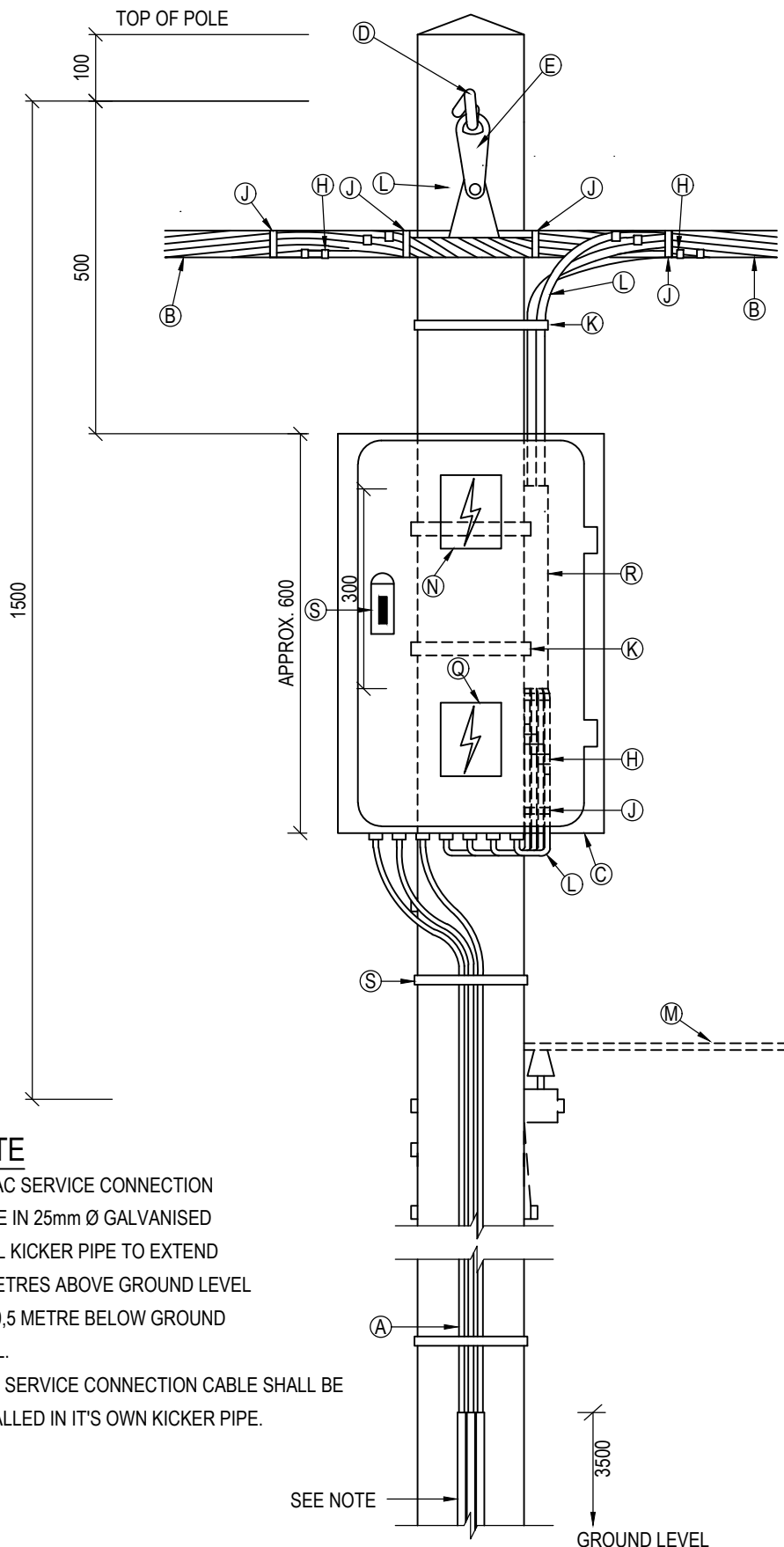
DWG-SIZE

A4

DRAWING NO

10541/E/19

REVISION



LEGEND

- (A) AIRDAC SERVICE CONNECTION CABLE
- (B) LV BUNDLED CONDUCTOR (FRENCH)
- (C) CONSUMER SERVICE CONNECTION BOX
- (D) PIGTAIL BOLT M16
- (E) BUNDLED CONDUCTOR INTERMEDIATE SUSPENSION CLAMP
- (F) BOLT M16
- (G) SERVICE CABLE STRAIN CLAMP
- (H) CABLE CONNECTORS
- (J) PVC CABLE TIES
- (K) STAINLESS STEEL STRAP
- (L) CONDUCTORS SUPPLIED WITH (C) FOR CONNECTION TO (B).
- (M) FUTURE TELKOM O/H PLANT
- (Q) DANGER NOTICE
- (R) BLACK PVC PIPE STRAPPED TO POLE
- (S) STAINLESS STEEL BANDIT STRAPS AT 1 METRE INTERVALS

NOTE

AIRDAC SERVICE CONNECTION CABLE IN 25mm Ø GALVANISED STEEL KICKER PIPE TO EXTEND 3,5 METRES ABOVE GROUND LEVEL AND 0,5 METRE BELOW GROUND LEVEL.

EACH SERVICE CONNECTION CABLE SHALL BE INSTALLED IN IT'S OWN KICKER PIPE.

SEE NOTE

GROUND LEVEL



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LANGEBERG MUNICIPALITY

PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQUBELA, ROBERTSON**

DRAWING TITLE

**LV O/H LINE: INTERMEDIATE POLE WITH
CONSUMER SERVICE CONNECTION BOX FOR
UNDERGROUND SERVICE CONNECTION
CABLES**

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

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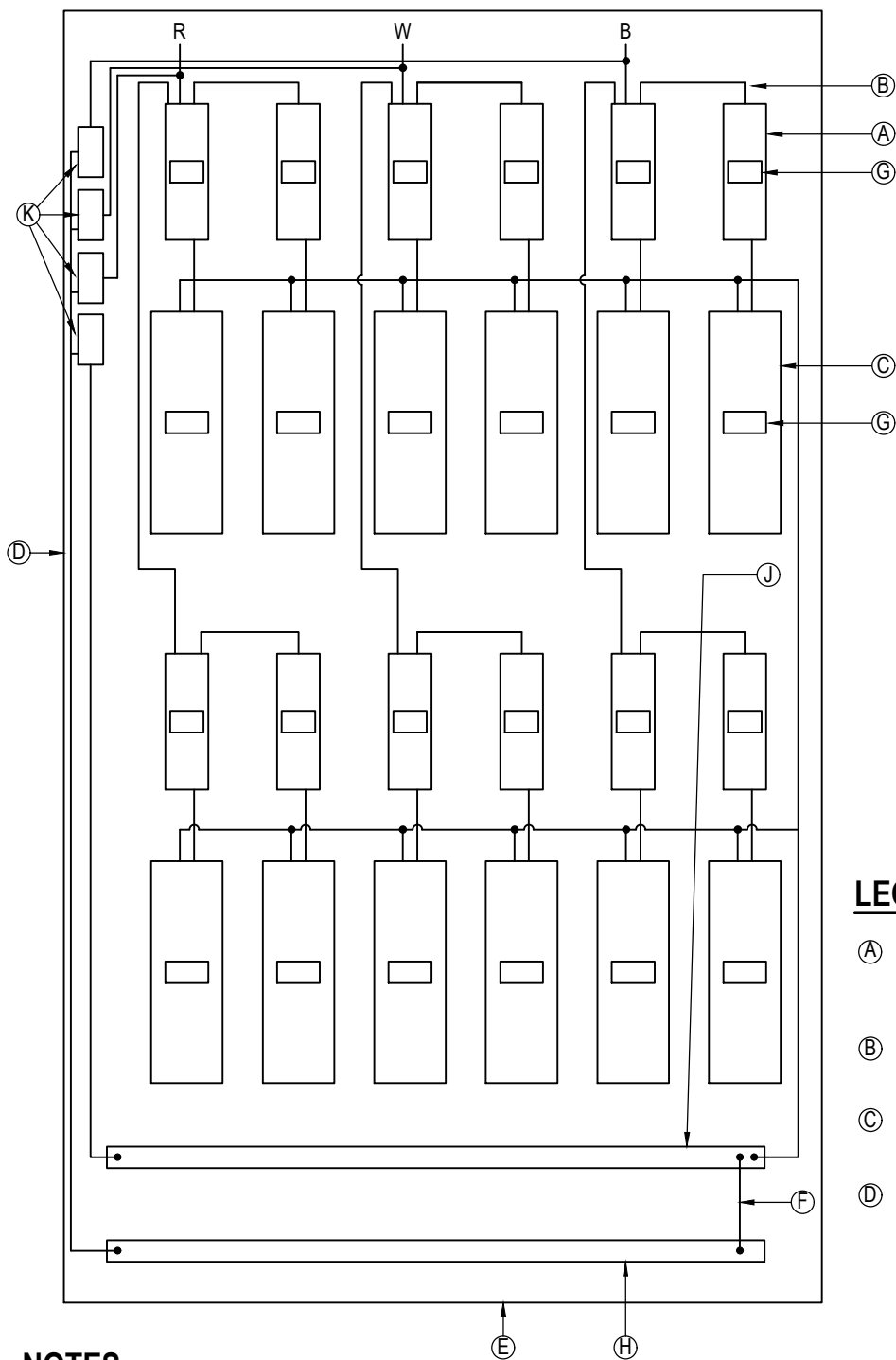
DWG-SIZE

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DRAWING NO

10541/E/20

REVISION



LEGEND

- (A) 63A SP MCB'S, CBI TYPE QF, ORANGE HANDLE (CURVE 1) FIXED TO CLIP IN FRAME COMPLETE WITH SHROUD.
- (B) 16mm² Cu INSULATED CONDUCTOR CONNECTIONS TO PHASES.
- (C) SPLIT PREPAID kWh METER MEASUREMENT AND CONTROL UNITS (MCU'S) FIXED TO DIN RAIL
- (D) POLYETHYLENE POLE MOUNTED CONSUMER SERVICE CONNECTION BOX (CSCB) FITTED WITH STAINLESS STEEL MOUNTING BRACKETS SUITABLE FOR FIXING BOX TO POLE WITH 19mm STAINLESS STEEL STRAPS. CSCB TO BE PROVIDED WITH A DOOR THAT IS OPENED UPWARDS AND A FACILITY TO KEEP DOOR IN OPEN POSITION.
- (E) PRE-DRILLED FOR LV CONDUCTOR
- (F) BRIDGE BETWEEN NEUTRAL AND EARTH BAR USING 16mm² Cu BLACK PVC INSULATED CONDUCTOR
- (G) LABEL TO INDICATE ERF NO. SERVED BY MCB / METER
- (H) EARTH BAR
- (J) NEUTRAL BAR
- (K) 4 x SURGE ARRESTORS SIMILAR OR EQUAL TO CBI TYPE QFLN-4(13)

NOTES

1. BOX TO BE PROVIDED COMPLETE WITH MIN. 2.5m LONG 16mm² Cu BLACK, UV STABLE, CONDUCTORS FOR CONNECTIONS TO OVERHEAD LINE. RED, BLUE & WHITE COLOUR CODED HEAT SHRINK TAGS TO BE INSTALLED ON ALL CONDUCTOR TAIL ENDS.
2. *TO BE SUPPLIED WITH CONSUMER SERVICE CONNECTION BOX.
3. ALL BOLTS, NUTS, POP RIVETS, HINGES, HASP AND STAPLE TO BE STAINLESS STEEL.
4. CONTRACTOR TO ENSURE THAT THE CSCB IS OF SUFFICIENT SIZE TO ACCOMMODATE ALL THE EQUIPMENT SHOWN.



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LANGEBERG MUNICIPALITY

PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQUBELA, ROBERTSON**

DRAWING TITLE

**LARGER POLE MOUNTED CONSUMER
SERVICE CONNECTION BOX (7 TO 12
HOUSE CONNECTIONS)**

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

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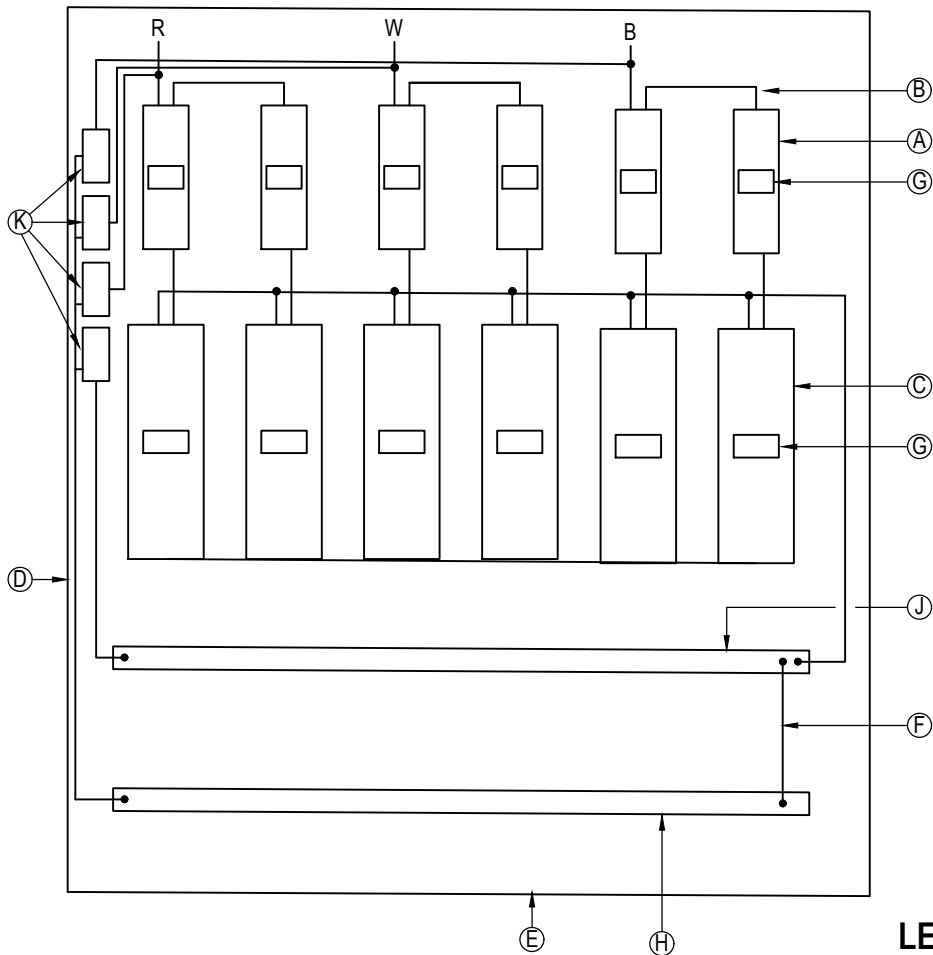
DWG-SIZE

A4

DRAWING NO

10541/E/21

REVISION



INTERNAL LAYOUT

NOTES

- BOX TO BE PROVIDED COMPLETE WITH MIN. 2.5m LONG 16mm² Cu BLACK, UV STABLE, CONDUCTORS FOR CONNECTIONS TO OVERHEAD LINE. RED, BLUE & WHITE COLOUR CODED HEAT SHRINK TAGS TO BE INSTALLED ON ALL CONDUCTOR TAIL ENDS.
- *TO BE SUPPLIED WITH CONSUMER SERVICE CONNECTION BOX.
- ALL BOLTS, NUTS, POP RIVETS, HINGES, HASP AND STAPLE TO BE STAINLESS STEEL.
- CONTRACTOR TO ENSURE THAT THE CSCB IS OF SUFFICIENT SIZE TO ACCOMMODATE ALL THE EQUIPMENT SHOWN.

LEGEND

- (A) 63A SP MCB'S, CBI TYPE QF, ORANGE HANDLE (CURVE 1) FIXED TO CLIP IN FRAME COMPLETE WITH SHROUD.
- (B) 16mm² Cu INSULATED CONDUCTOR CONNECTIONS TO PHASES.
- (C) SPLIT PREPAID kWh METER MEASUREMENT AND CONTROL UNITS (MCU'S) FIXED TO DIN RAIL
- (D) POLYETHYLENE POLE MOUNTED CONSUMER SERVICE CONNECTION BOX (CSCB) FITTED WITH STAINLESS STEEL MOUNTING BRACKETS SUITABLE FOR FIXING BOX TO POLE WITH 19mm STAINLESS STEEL STRAPS. CSCB TO BE PROVIDED WITH A DOOR THAT IS OPENED UPWARDS AND A FACILITY TO KEEP DOOR IN OPEN POSITION.
- (E) PRE-DRILLED FOR LV CONDUCTOR
- (F) BRIDGE BETWEEN NEUTRAL AND EARTH BAR USING 16mm² Cu BLACK PVC INSULATED CONDUCTOR
- (G) LABEL TO INDICATE ERF NO. SERVED BY MCB / METER
- (H) EARTH BAR
- (J) NEUTRAL BAR
- (K) 4 x SURGE ARRESTORS SIMILAR OR EQUAL TO CBI TYPE QFLN-4(13)



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LANGEBERG MUNICIPALITY

PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQBELA, ROBERTSON**

DRAWING TITLE

**LV INTERMEDIATE POLE WITH
STREETLIGHT**

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

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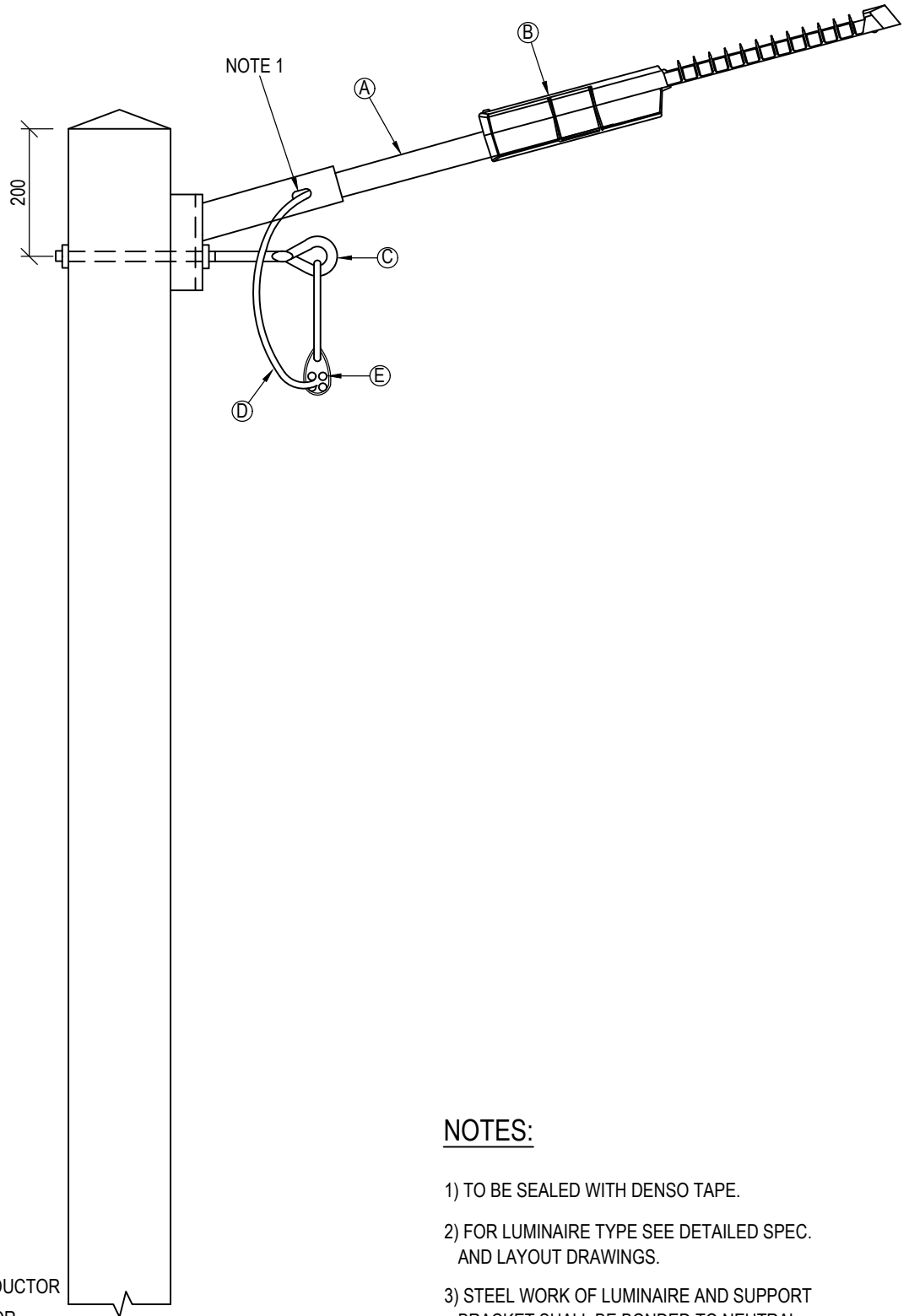
DWG-SIZE

A4

DRAWING NO

10541/E/22

REVISION



LEGEND:

- (A) STREETLIGHT BRACKET
- (B) LED STREETLIGHT
- (C) PIGTAIL BOLT M16
- (D) 4mm² Cu AIRDAC II CONDUCTOR
- (E) LV BUNDLED CONDUCTOR

NOTES:

- 1) TO BE SEALED WITH DENSO TAPE.
- 2) FOR LUMINAIRE TYPE SEE DETAILED SPEC. AND LAYOUT DRAWINGS.
- 3) STEEL WORK OF LUMINAIRE AND SUPPORT BRACKET SHALL BE BONDED TO NEUTRAL CONDUCTOR.
- 4) FOR BRACKET DETAILS SEE DRAWING NO. 10541/E/24.



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LANGEBERG MUNICIPALITY

PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQUBELA, ROBERTSON**

DRAWING TITLE

**STREETLIGHT POLE WITH OVERHEAD
AIRDAC CONNECTION**

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

CAD REF No.

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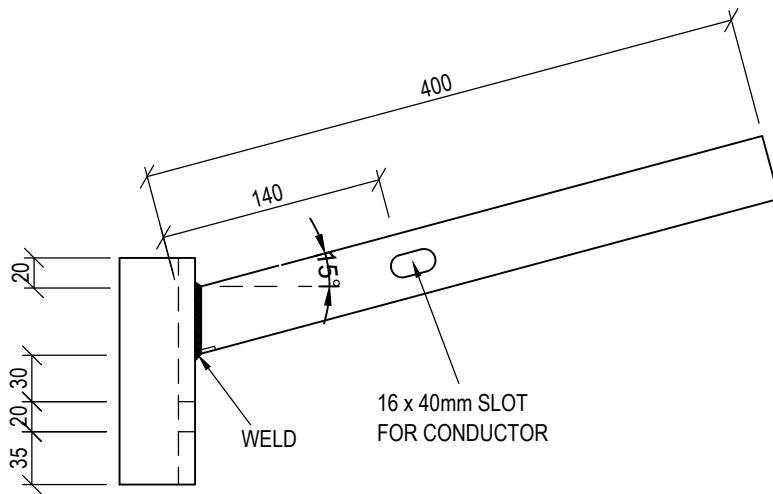
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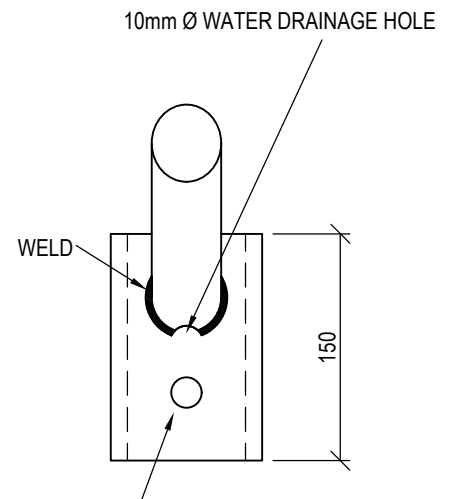
DRAWING NO

10541/E/23

REVISION



SIDE ELEVATION



FRONT ELEVATION



PLAN

NOTES

- 1) PIPE DIAMETER TO BE DECIDED IN CONJUNCTION WITH STREET LIGHT SUPPLIER, THE PIPE SHALL HOWEVER HAVE A WALL THICKNESS OF NOT LESS THAN 2.5mm.
- 2) ALL WELDS TO BE FULL STRENGTH.
- 3) CHANNEL IRON TO BE 100 x 50 x 11mm.
- 4) ALL STEEL WORK TO BE HOT DIPPED GALVANISED AFTER MANUFACTURE.



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LANGEBERG MUNICIPALITY

PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQBELA, ROBERTSON**

DRAWING TITLE

TYPICAL STREETLIGHT BRACKET DETAIL

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

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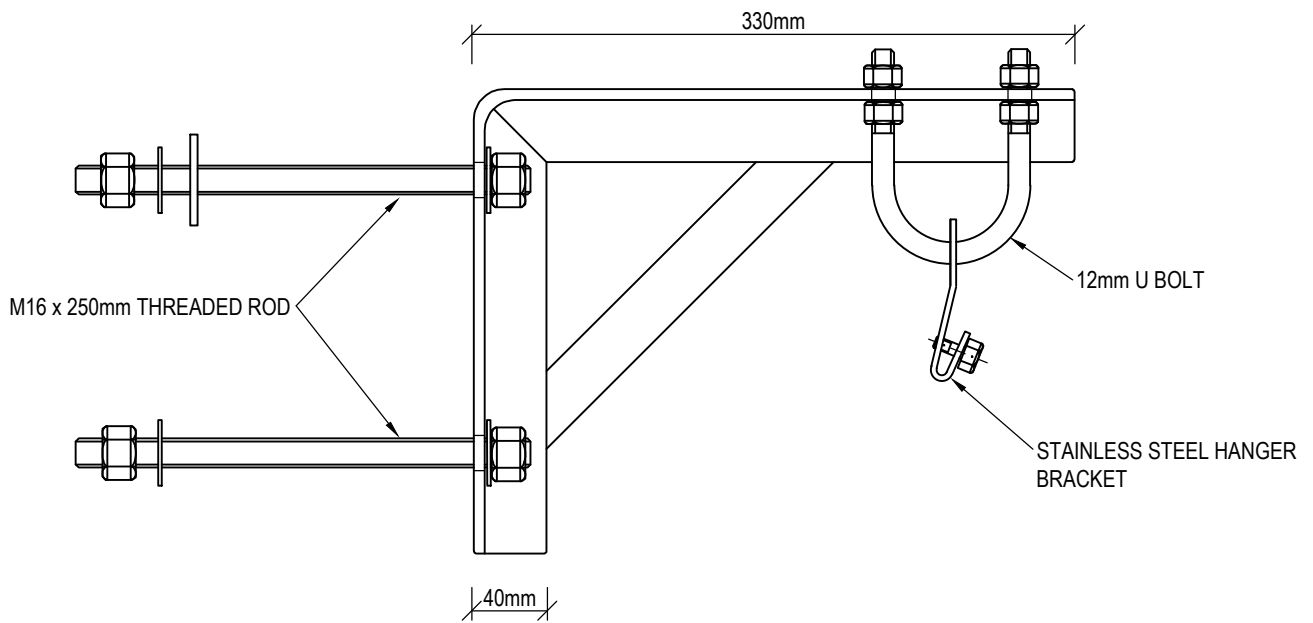
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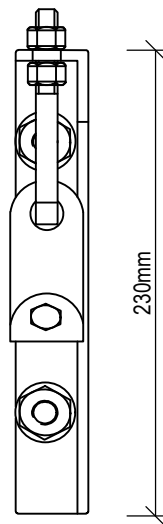
DRAWING NO

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REVISION



SIDE VIEW



END VIEW



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PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQBELA, ROBERTSON**

DRAWING TITLE

MV ABC SUSPENSION ASSEMBLY

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

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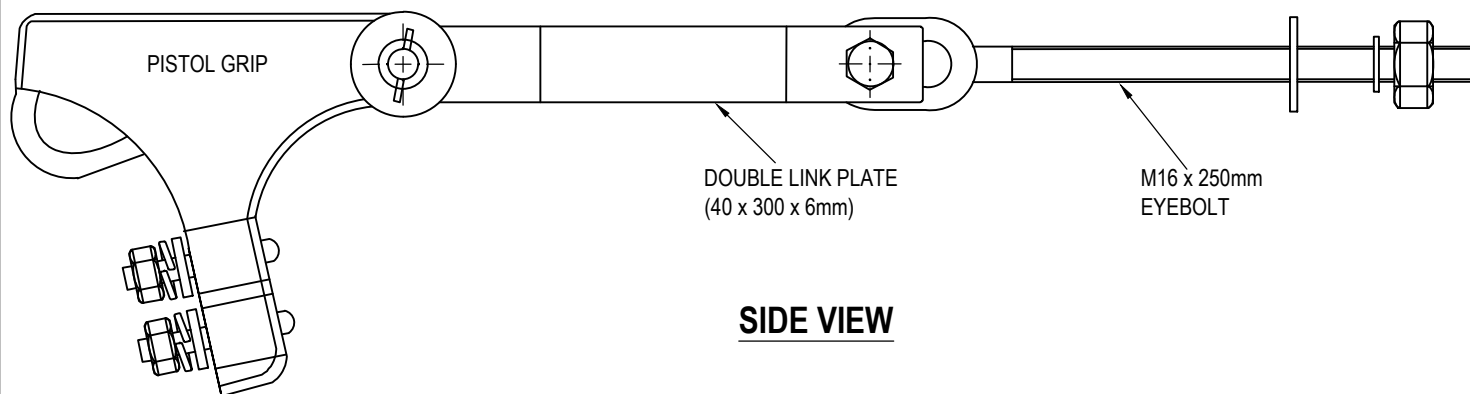
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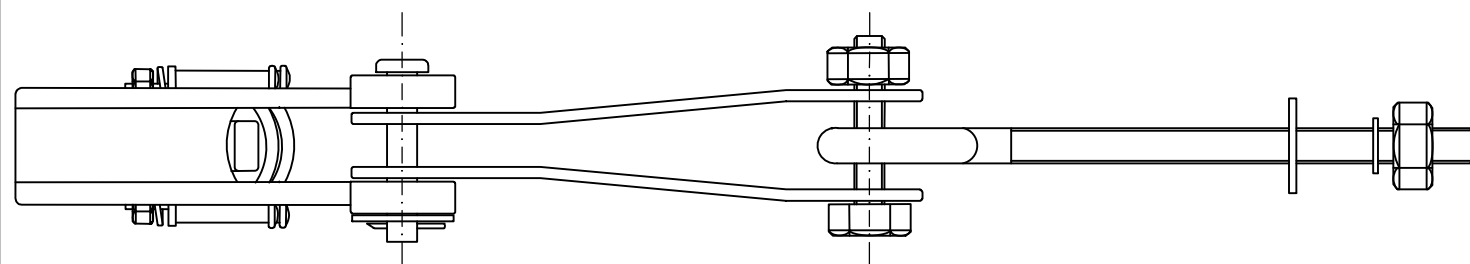
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REVISION



SIDE VIEW



TOP VIEW



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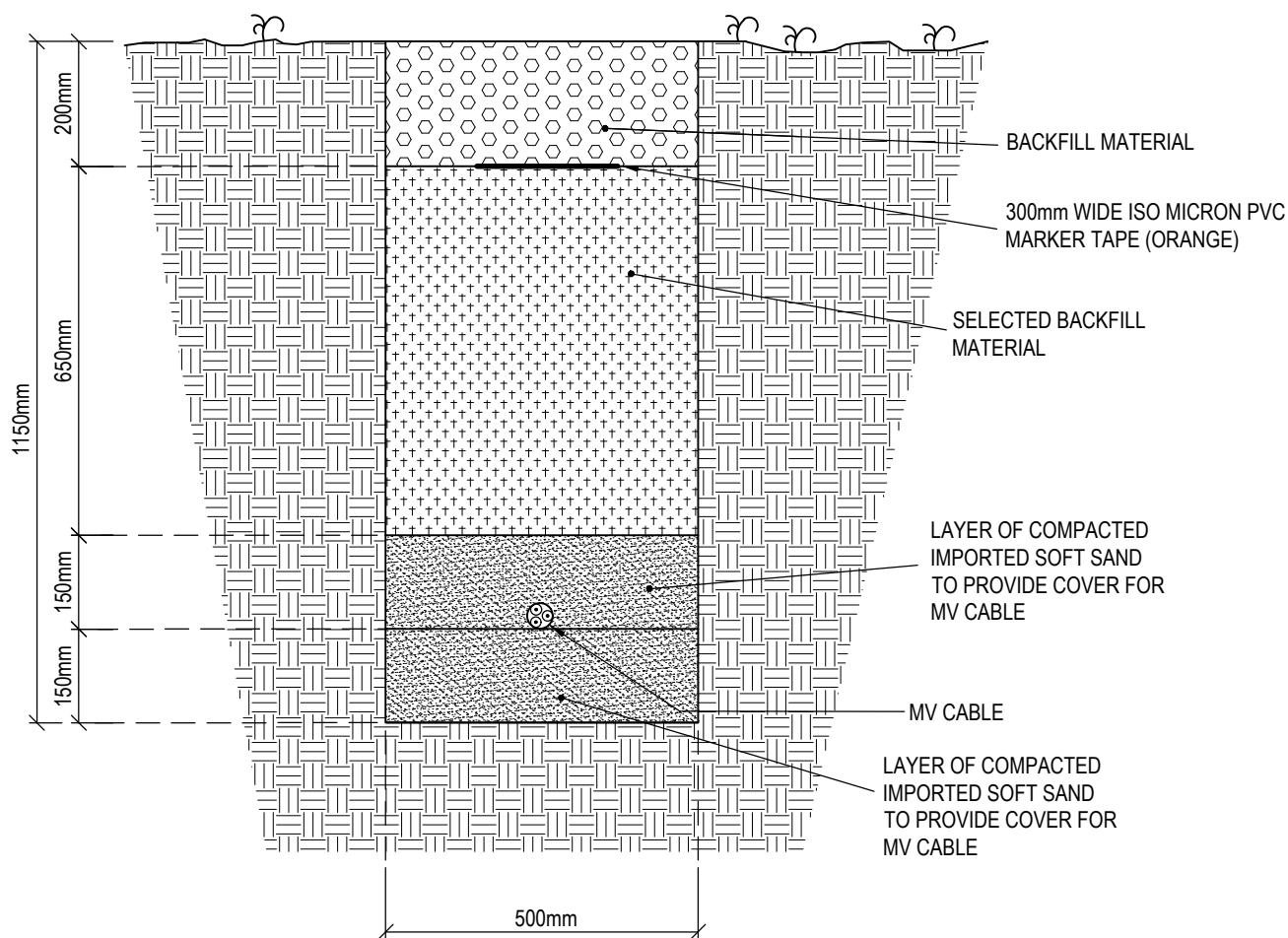
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PROJECT
**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQUBELA, ROBERTSON**

DRAWING TITLE
MV ABC STRAIN

DRAWN MvM	DESIGNED JdV	CHECKED JdV	APPROVED
SCALE N.T.S.	DATE 28/01/2022	CAD REF No. 10541-E-DET	DWG-SIZE A4
DRAWING NO 10541/E/26			REVISION



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LANGEBERG MUNICIPALITY

PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQUBELA, ROBERTSON**

DRAWING TITLE

TYPICAL TRENCH DETAIL FOR MV CABLE

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

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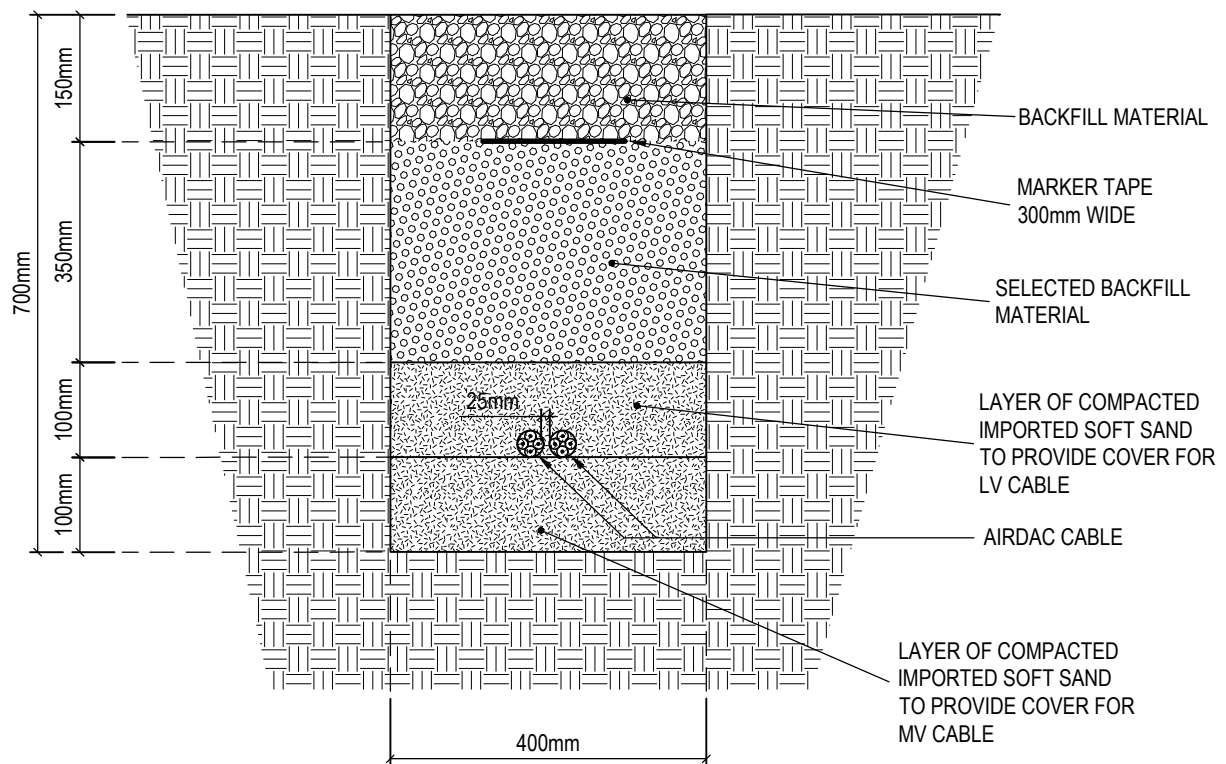
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PROJECT

**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQBELA, ROBERTSON**

DRAWING TITLE

TYPICAL TRENCH DETAIL FOR LV CABLE

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

CAD REF No.

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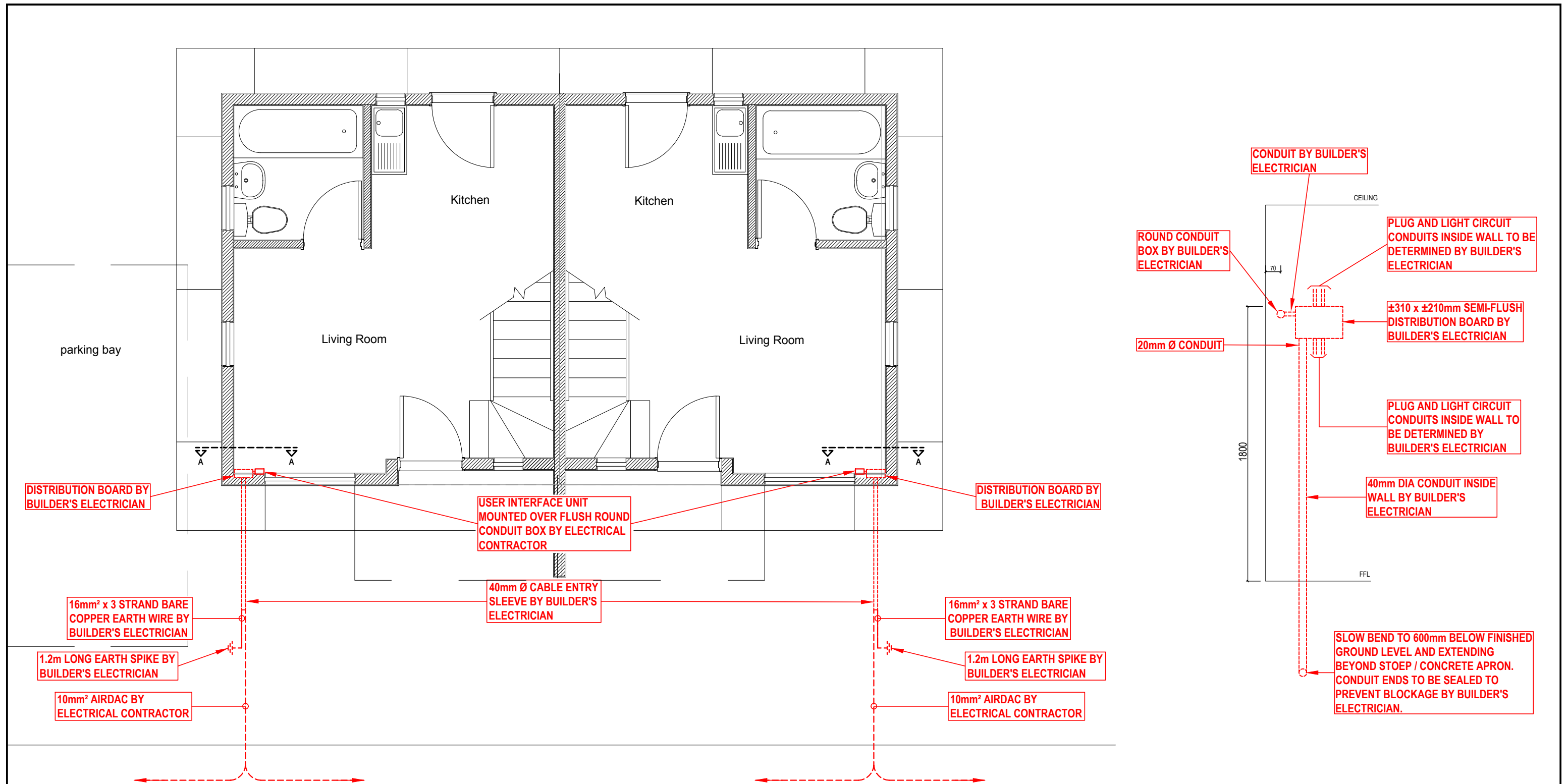
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DRAWING NO

10541/E/28

REVISION



PLAN LAYOUT
SCALE 1:50

SECTION A-A
SCALE 1:20

NOTES:

- ALL SLEEVES, CONDUIT, ROUND CONDUIT BOX, DISTRIBUTION BOARD AND EARTHING TO BE SUPPLIED AND INSTALLED UNDER THE BUILDER'S CONTRACT.
- THE USER INTERFACE UNIT WILL BE SUPPLIED BY THE BUILDER, BUT INSTALLED UNDER THE EXTERNAL ELECTRICAL CONTRACT.

cmb
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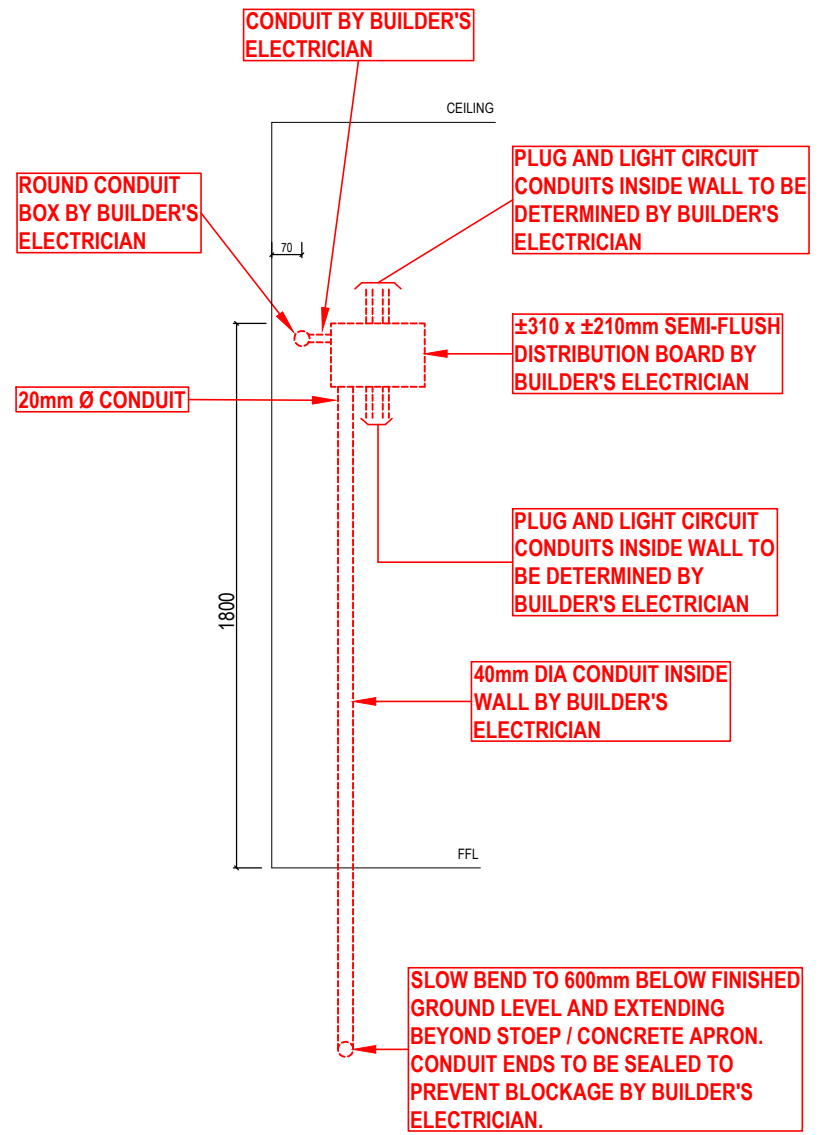
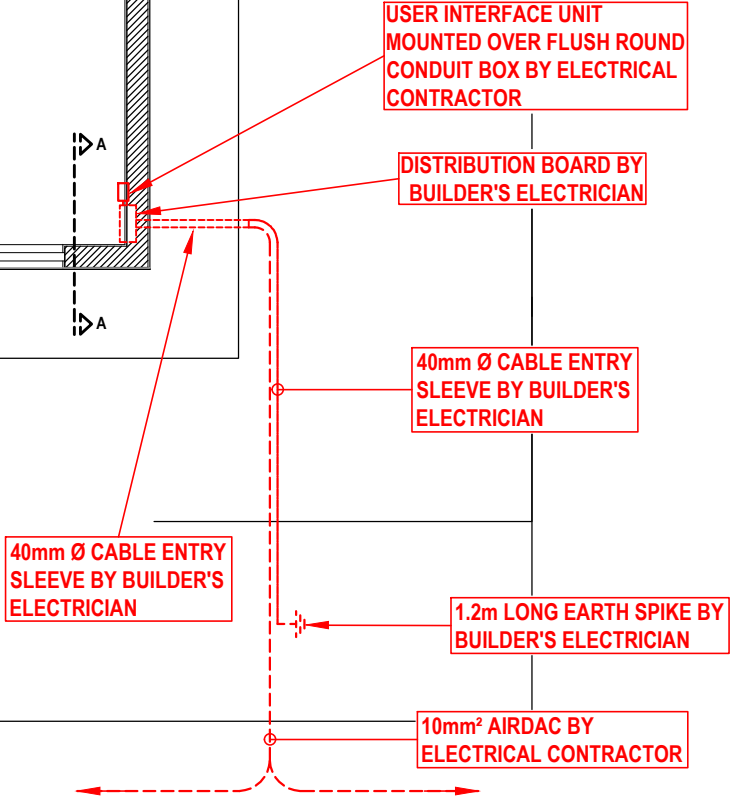
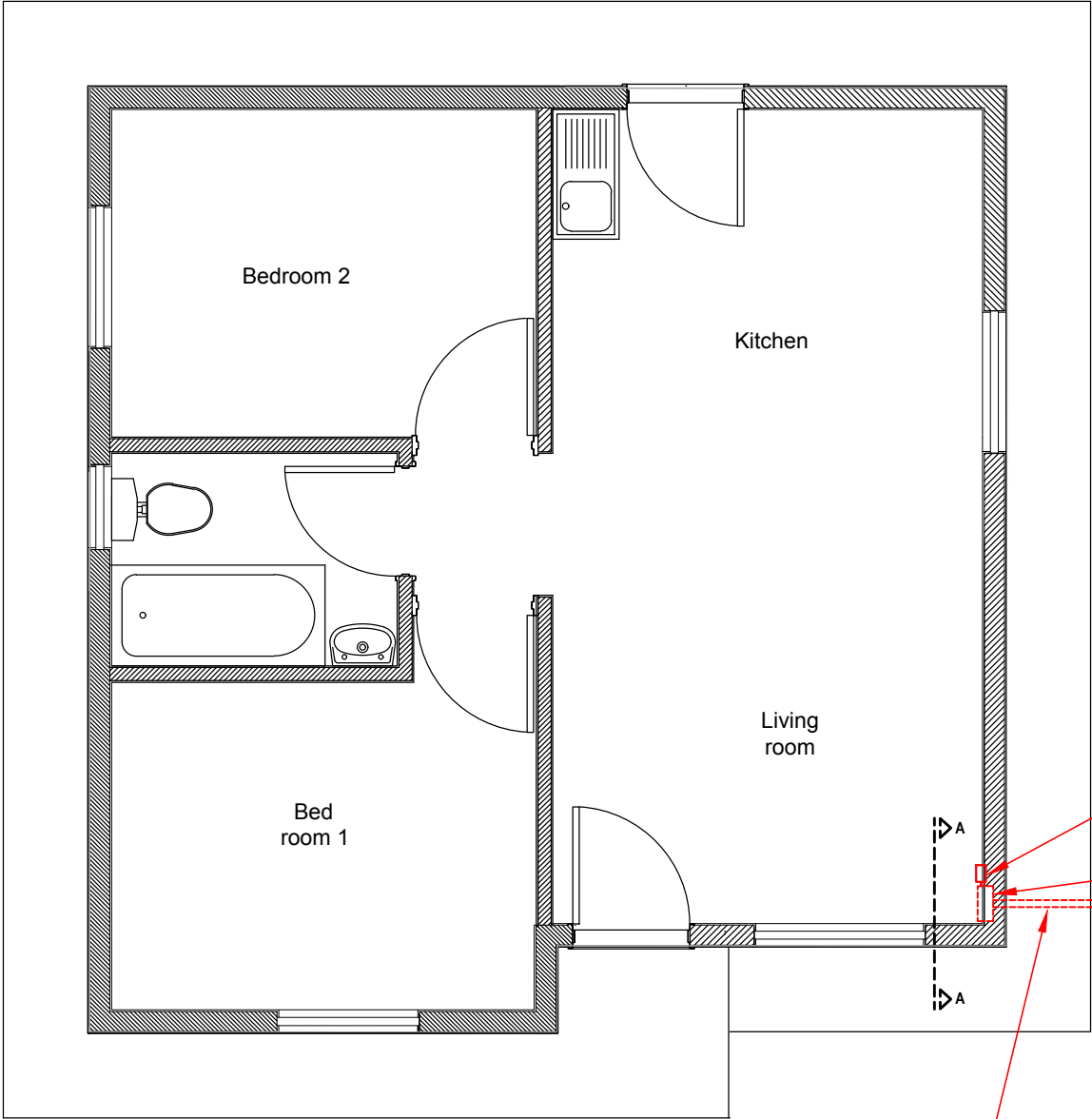
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CLIENT
LANGEBERG MUNICIPALITY

PROJECT
**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQUBELA, ROBERTSON**

DRAWING TITLE
**TYPICAL HOUSE INSTALLATION FOR
TYPE DS4 DUPLEX**

DRAWN MvM	DESIGNED JdV	CHECKED JdV	APPROVED
SCALE AS SHOWN	DATE 28/01/2022	CAD REF No. 10541-E-DET	DWG-SIZE A3
DRAWING NO 10541/E/29			REVISION



PLAN LAYOUT
SCALE 1:50

SECTION A-A
SCALE 1:20

NOTES:

1. ALL SLEEVES, CONDUIT, ROUND CONDUIT BOX, DISTRIBUTION BOARD AND EARTHING TO BE SUPPLIED AND INSTALLED UNDER THE BUILDER'S CONTRACT.
2. THE USER INTERFACE UNIT WILL BE SUPPLIED BY THE BUILDER, BUT INSTALLED UNDER THE EXTERNAL ELECTRICAL CONTRACT.



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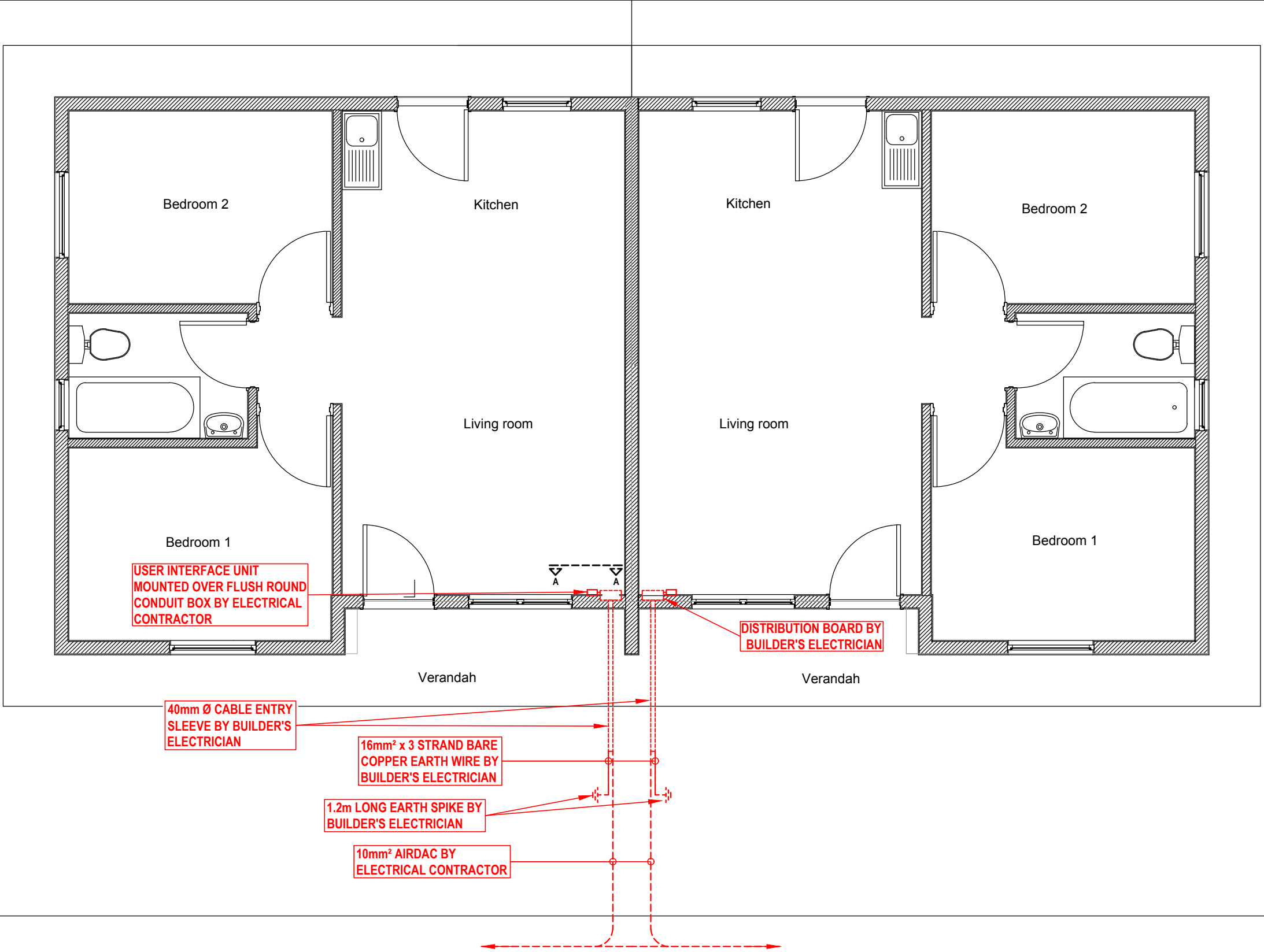
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CLIENT
LANGEBERG MUNICIPALITY

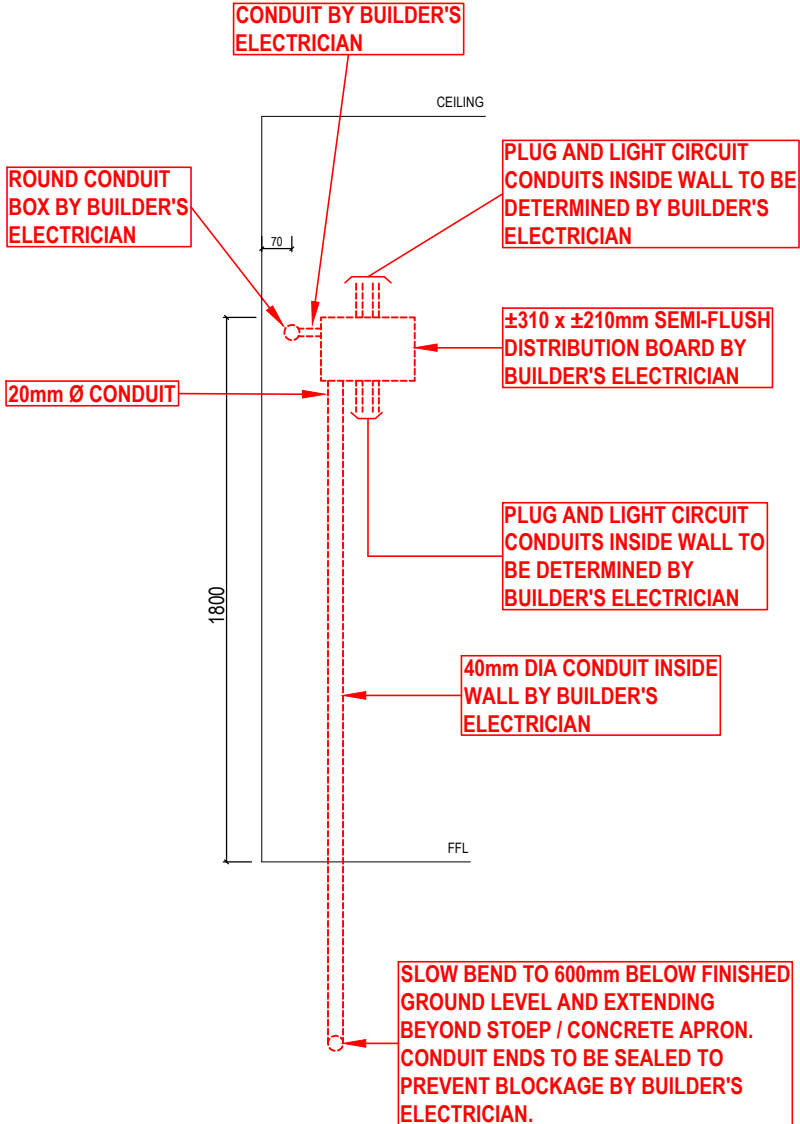
PROJECT
**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQUBELA, ROBERTSON**

DRAWING TITLE
**TYPICAL HOUSE INSTALLATION FOR
TYPE 4RA CONVENTIONAL**

DRAWN MvM	DESIGNED JdV	CHECKED JdV	APPROVED
SCALE AS SHOWN	DATE 28/01/2022	CAD REF No. 10541-E-DET	DWG-SIZE A3
DRAWING NO 10541/E/30			REVISION



PLAN LAYOUT
SCALE 1:50



SECTION A-A
SCALE 1:20

NOTES:

- ALL SLEEVES, CONDUIT, ROUND CONDUIT BOX, DISTRIBUTION BOARD AND EARTHING TO BE SUPPLIED AND INSTALLED UNDER THE BUILDER'S CONTRACT.
- THE USER INTERFACE UNIT WILL BE SUPPLIED BY THE BUILDER, BUT INSTALLED UNDER THE EXTERNAL ELECTRICAL CONTRACT.



cmb
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CLINKSCALES MAUGHAN-BROWN (SOUTH) (PTY) LTD (2012/075708/07)

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CAPE TOWN
WINDHOEK
CE S A
Consulting Engineers South Africa

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CLIENT
LANGEBERG MUNICIPALITY

PROJECT
**LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQUBELA, ROBERTSON**

DRAWING TITLE
**TYPICAL HOUSE INSTALLATION FOR
TYPE 4SS CONVENTIONAL**

DRAWN MvM	DESIGNED JdV	CHECKED JdV	APPROVED
SCALE AS SHOWN	DATE 28/01/2022	CAD REF No. 10541-E-DET	DWG-SIZE A3
DRAWING NO 10541/E/31			REVISION

ANNEXURE B

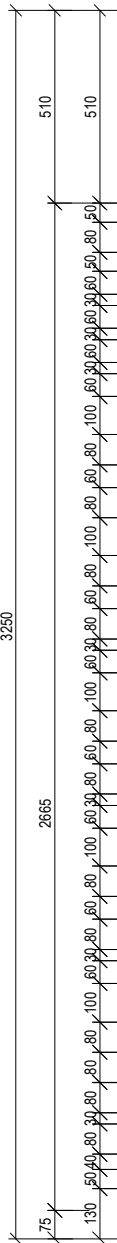
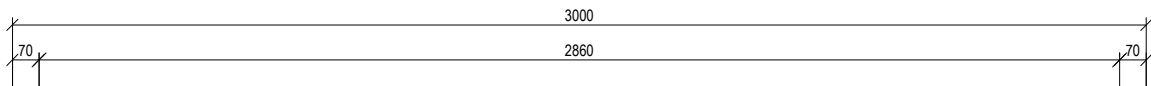
Project Notice Board

The following drawings of the project notice board are bound into this Document and must be used when constructing and erecting the engineer's project notice board.

Drawing No

Description

10541/E/32	Project Notice Board
10541/E/33	Support Structure Detail for Project Notice Board



LANGBERG MUNICIPALITY ELECTRIFICATION OF 172 FORMAL HOUSES AT NKQUBELA, ROBERTSON

PROJECT NAME

**LANGBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKQUBELA, ROBERTSON**

CLIENT

LANGBERG MUNICIPALITY

CONSULTANTS



CLINKSCALES MAUGHAN-BROWN

TEL: 044 874 1511

CONTRACTOR

.....
TEL:

HEALTH & SAFETY CONSULTANT



DEVAC

TEL: 081 559 6471

FUNDER

AMOUNT



**DEPARTMENT OF MINERAL
RESOURCES AND ENERGY**

TEL: 021 446 3308

R



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CLIENT

LANGBERG MUNICIPALITY

PROJECT

**LANGBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL HOUSES
AT NKQUBELA, ROBERTSON**

DRAWING TITLE

PROJECT NOTICE BOARD

DRAWN

MvM

DESIGNED

JdV

CHECKED

JdV

APPROVED

SCALE

N.T.S.

DATE

28/01/2022

CAD REF No.

10541-E-DET

DWG-SIZE

A4

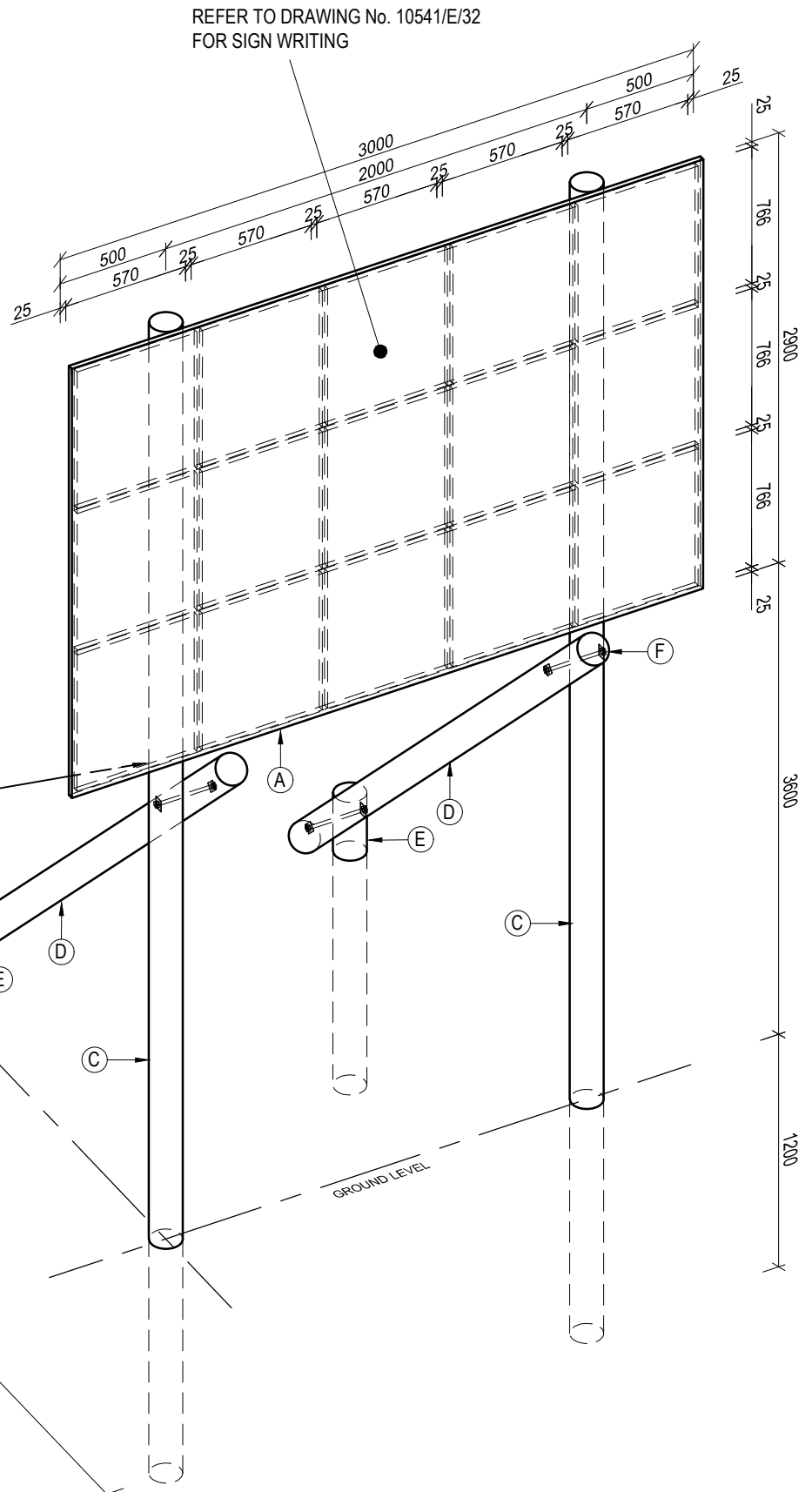
DRAWING NO

10541/E/32

REVISION

LEGEND

- (A) 3250mm x 3000mm, 1mm THICK SHEET METAL BOARD SECURED TO 25mm x 25mm GALVANISED STEEL SQUARE TUBING FRAME USING 4,8mm Ø x 10mm LONG ALUMINIUM REVITS.
- (B) FRAME FIXED AGAINST TARRED WOODEN POLES USING 76,2mm WIDE GALVANISED STEEL CLAMPS SUITABLE TO FIT IN UNISTRUT IN ITEM G ON THIS DRAWING.
- (C) 7000mm LONG TARRED WOODEN POLE MIN. 140mm DIAMETER.
- (D) 3500mm LONG TARRED WOODEN PROP POLE MIN. 140mm DIAMETER.
- (E) 1500mm LONG TARRED WOODEN PROP POLE MIN. 140mm DIAMETER.
- (F) 300mm LONG M20 GALVANISED STEEL BOLT WITH TWO NUTS AND WASHERS.
- (G) GALVANISED STEEL 76,2mm x 25mm UNISTRUT WELDED IN BETWEEN SQUARE TUBING.



NOTE:

SUPPORT STRUCTURE TO BE INSTALLED SO THAT PROJECT NOTICE BOARD IS FACING ONCOMING TRAFFIC AT AN ANGLE OF 45° RELEVANT TO THE ROAD.

ANNEXURES C, D AND E

Local Content Declaration – Summary Schedule

- Steel Pipe Fittings and Specials: Galvanised
- Power Cables: Medium and Low Voltage
- Designated Hardware Components

Imported Content Declaration – Supporting Schedule to Annexure C

- Steel Pipe Fittings and Specials: Galvanised
- Power Cables: Medium and Low Voltage
- Designated Hardware Components

Local Content Declaration – Summary Schedule to Annexure C

- Steel Pipe Fittings and Specials: Galvanised
- Power Cables: Medium and Low Voltage
- Designated Hardware Components

Annex C

Local Content Declaration - Summary Schedule

(C1) Tender No. 06/2022

(C2) Tender description: Langeberg Municipality: Electrification of 172 formal houses at Nkqubela, Robertson.

(C3) Steel Pipe Fittings and Special : Galvanised.

(C4) Tender Authority: Langeberg Municipality

(C5) Tendering Entity name:

(C6)

(C7) Specified local content 100%

Note: VAT to be excluded from all calculations

US Dollar EU GBP

Calculation of local content							
Tender item no's	List of items	Tender price - each (excl VAT)	Exempted imported value	Tender value net of exempted imported content	Imported value	Local value	Local content % (per item)
(C8)	(C9)	(C10)	(C11)	(C12)	(C13)	(C14)	(C15)
Bill 2, Item 22.0	Kickerpipe						
Bill 3, Item 20.0	Kickerpipe						
Bill 4, Item 17.0	Kickerpipe						
Bill 4, Item 20.2	Kickerpipe						
Bill 4, Item 20.3	Kickerpipe						
Bill 4, Item 20.4	Kickerpipe						
Bill 5, Item 8.0	Kickerpipe						

Tender summary			
Tender Qty	Total tender value	Total exempted imported content	Total Imported content
(C16)	(C17)	(C18)	(C19)

Signature of tenderer from Annex B

Date: _____

(C20) Total tender value	
(C21) Total Exempt imported content	
(C22) Total Tender value net of exempt imported content	
(C23) Total Imported content	
(C24) Total local content	
(C25) Average local content % of tender	

Annex D

Imported Content Declaration - Supporting Schedule to Annex C

(D1) Tender No.	06/2022	Note: VAT to be excluded from all calculations	
(D2) Tender description:	Tender description: Langeberg Municipality: Electrification of 172 formal houses at Nkqubela, Robertson.		
(D3) Designated Products:	Steel Pipe Fittings and Special : Galvanised		
(D4) Tender Authority:	Langeberg Municipality		
(D5) Tendering Entity name:			
(D6) Tender Exchange Rate:	Pula	EU	GBP

A. Exempted imported content

Calculation of imported content										Summary	
Tender item no's	Description of imported content	Local supplier	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Exchange Rate	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl VAT	Tender Qty	Exempted imported value
(D7)	(D8)	(D9)	(D10)	(D11)	(D12)	(D13)	(D14)	(D15)	(D16)	(D17)	(D18)
(D19) Total exempt imported value										R 0	

This total must correspond with Annex C - C 21

B. Imported directly by the Tenderer

Calculation of imported content										Summary	
Tender item no's	Description of imported content	Unit of measure	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Rate of Exchange	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl VAT	Tender Qty	Total imported value
(D20)	(D21)	(D22)	(D23)	(D24)	(D25)	(D26)	(D27)	(D28)	(D29)	(D30)	(D31)
(D32) Total imported value by tenderer										R 0	

C. Imported by a 3rd party and supplied to the Tenderer

Calculation of imported content										Summary	
Description of imported content	Unit of measure	Local supplier	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Rate of Exchange	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl VAT	Quantity imported	Total imported value
(D33)	(D34)	(D35)	(D36)	(D37)	(D38)	(D39)	(D40)	(D41)	(D42)	(D43)	(D44)
(D45) Total imported value by 3rd party										R 0	

D. Other foreign currency payments

Calculation of foreign currency payments					Summary of payments	
Type of payment	Local supplier making the payment	Overseas beneficiary	Foreign currency value paid	Tender Rate of Exchange	Local value of payments	
(D46)	(D47)	(D48)	(D49)	(D50)	(D51)	
(D52) Total of foreign currency payments declared by tenderer and/or 3rd party						

Signature of tenderer from Annex B

(D53) Total of imported content & foreign currency payments - (D32), (D45) & (D52) above R 0

Date:

This total must correspond with Annex C - C 23

Annex E

Local Content Declaration - Supporting Schedule to Annex C

(E1)	Tender No.	06/2022	Note: VAT to be excluded from all calculations
(E2)	Tender description:	Tender description: Langeberg Municipality: Electrification of 172 formal houses at Nkqubela, Robertson.	
(E3)	Designated products:	Steel Pipe Fittings and Special : Galvanised	
(E4)	Tender Authority:	Langeberg Municipality	
(E5)	Tendering Entity name:		

Local Products (Goods, Services and Works)	Description of items purchased	Local suppliers	Value
	(E6)	(E7)	(E8)
(E9) Total local products (Goods, Services and Works)			R 0

(E10) **Manpower costs** (Tenderer's manpower cost) R 0

(E11) **Factory overheads** (Rental, depreciation & amortisation, utility costs, consumables etc.) R 0

(E12) **Administration overheads and mark-up** (Marketing, insurance, financing, interest etc.) R 0

(E13) Total local content R 0

This total must correspond with Annex C - C24

Signature of tenderer from Annex B

Date: _____

Annex C

Local Content Declaration - Summary Schedule

(C1) **Tender No. 06/2022**

(C2) **Tender description: Langeberg Municipality: Electrification of 172 formal houses at Nkqubela, Robertson.**

(C3) **Designated product(s): Power Cables: Medium and Low Voltage**

(C4) **Tender Authority: Langeberg Municipality**

(C5) **Tendering Entity name:**

(C6)

(C7) **Specified local content 90%**

Note: VAT to be excluded from all calculations

US Dollar EU GBP

Calculation of local content								Tender summary			
Tender item no's	List of items	Tender price - each (excl VAT)	Exempted imported value	Tender value net of exempted imported content	Imported value	Local value	Local content % (per item)	Tender Qty	Total tender value	Total exempted imported content	Total Imported content
(C8)	(C9)	(C10)	(C11)	(C12)	(C13)	(C14)	(C15)	(C16)	(C17)	(C18)	(C19)
Bill 2, Item 16.0	MV Bundled Conductor										
Bill 2, Item 33.0	MV Table 18 Cable										
Bill 2, Item 34.0	MV Table 18 Cable										
Bill 3, Item 15.0	LV PVCAS Cable										
Bill 4, Item 11.2	LV Bundled Conductor										
Bill 4, Item 11.3	LV Bundled Conductor										
Bill 4, Item 11.4	LV Bundled Conductor										
Bill 4, Item 12.2	LV PVCAS Cable										
Bill 4, Item 12.3	LV PVCAS Cable										
Bill 4, Item 12.6	LV PVCAS Cable										
Bill 4, Item 21.2	LV PVCAS Cable										
Bill 4, Item 21.3	LV PVCAS Cable										
Bill 4, Item 21.6	LV PVCAS Cable										
Bill 5, Item 7.0	LV Airdac cable										
Bill 5, Item 9.0	LV Airdac cable										
Bill 5, Item 4.0	LV Airdac cable										
Bill 6, Item 2.0	LV Airdac cable										
Bill 7, Item 1.0	LV Airdac cable										

Signature of tenderer from Annex B

Date: _____

(C20) Total tender value

(C21) Total Exempt imported content

(C22) Total Tender value net of exempt imported content

(C23) Total Imported content

(C24) Total local content

(C25) Average local content % of tender

Annex D

Imported Content Declaration - Supporting Schedule to Annex C

(D1) Tender No. 06/2022

(D2) Tender description: Tender description: Langeberg Municipality: Electrification of 172 formal houses at Nkqubela, Robertson.

(D3) Designated Products: Power Cables: Medium and Low Voltage

(D4) Tender Authority: Langeberg Municipality

(D5) Tendering Entity name:

(D6) Tender Exchange Rate: Pula EU GBP

Note: VAT to be excluded from all calculations

A. Exempted imported content

Calculation of imported content										Summary	
Tender item no's	Description of imported content	Local supplier	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Exchange Rate	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl VAT	Tender Qty	Exempted imported value
(D7)	(D8)	(D9)	(D10)	(D11)	(D12)	(D13)	(D14)	(D15)	(D16)	(D17)	(D18)

(D19) Total exempt imported value R 0

This total must correspond with Annex C - C 21

B. Imported directly by the Tenderer

Calculation of imported content										Summary	
Tender item no's	Description of imported content	Unit of measure	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Rate of Exchange	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl VAT	Tender Qty	Total imported value
(D20)	(D21)	(D22)	(D23)	(D24)	(D25)	(D26)	(D27)	(D28)	(D29)	(D30)	(D31)

(D32) Total imported value by tenderer R 0

C. Imported by a 3rd party and supplied to the Tenderer

Calculation of imported content										Summary	
Description of imported content	Unit of measure	Local supplier	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Rate of Exchange	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl VAT	Quantity imported	Total imported value
(D33)	(D34)	(D35)	(D36)	(D37)	(D38)	(D39)	(D40)	(D41)	(D42)	(D43)	(D44)

(D45) Total imported value by 3rd party R 0

D. Other foreign currency payments

Calculation of foreign currency payments					Summary of payments	
Type of payment	Local supplier making the payment	Overseas beneficiary	Foreign currency value paid	Tender Rate of Exchange	Local value of payments	
(D46)	(D47)	(D48)	(D49)	(D50)	(D51)	

(D52) Total of foreign currency payments declared by tenderer and/or 3rd party

(D53) Total of imported content & foreign currency payments - (D32), (D45) & (D52) above R 0

This total must correspond with Annex C - C 23

Signature of tenderer from Annex B

Date:

Annex E

Local Content Declaration - Supporting Schedule to Annex C

(E1)	Tender No.	06/2022	Note: VAT to be excluded from all calculations
(E2)	Tender description:	Tender description: Langeberg Municipality: Electrification of 172 formal houses at Nkqubela, Robertson.	
(E3)	Designated products:	Power Cables: Medium and Low Voltage	
(E4)	Tender Authority:	Langeberg Municipality	
(E5)	Tendering Entity name:		

Local Products (Goods, Services and Works)	Description of items purchased	Local suppliers	Value
	(E6)	(E7)	(E8)
(E9) Total local products (Goods, Services and Works)			R 0

(E10) **Manpower costs** (Tenderer's manpower cost) R 0

(E11) **Factory overheads** (Rental, depreciation & amortisation, utility costs, consumables etc.) R 0

(E12) **Administration overheads and mark-up** (Marketing, insurance, financing, interest etc.) R 0

(E13) Total local content R 0

This total must correspond with Annex C - C24

Signature of tenderer from Annex B

Date: _____

Annex C

Local Content Declaration - Summary Schedule

(C1) **Tender No. 06/2022**

(C2) **Tender description: Langeberg Municipality: Electrification of 172 formal houses at Nkqubela, Robertson.**

(C3) **Designated product(s): Hardware Components**

(C4) **Tender Authority: Langeberg Municipality**

(C5) **Tendering Entity name:**

(C6)

(C7) **Specified local content 100%**

Note: VAT to be excluded from all calculations

US Dollar EU GBP

		Calculation of local content						Tender summary			
Tender item no's	List of items	Tender price - each (excl VAT)	Exempted imported value	Tender value net of exempted imported content	Imported value	Local value	Local content % (per item)	Tender Qty	Total tender value	Total exempted imported content	Total Imported content
(C8)	(C9)	(C10)	(C11)	(C12)	(C13)	(C14)	(C15)	(C16)	(C17)	(C18)	(C19)
Bill 2, Item 4	Single Stay										
Bill 2, Item 6	A-frame										
Bill 2, Item 7	A-frame										
Bill 2, Item 9	Steel cross-arm										
Bill 2, Item 10	Strain Insulators										
Bill 2, Item 11	Intermediate Insulators										
Bill 2, Item 12	O/H Line Conductor										
Bill 2, Item 12	O/H Line Conductor										
Bill 2, Item 14	Pre-formed dead-ends										
Bill 2, Item 15	Pre-formed twin-ties										
Bill 2, Item 17	Strain Clamp										
Bill 2, Item 18	Suspension Clamp										
Bill 2, Item 19	Steel cross-arm										
Bill 2, Item 21	Earth Conductor										
Bill 2, Item 23	Earth spike										
Bill 2, Item 37	Strain Clamp										
Bill 2, Item 38	Strain Clamp										
Bill 3, Item 5	Steelwork										
Bill 3, Item 6	Insulators										
Bill 8, Item 8.1	Insulators										
Bill 8, Item 8.2	O/H Line Conductor										
Bill 3, Item 10.1	LV Distribution board.										
Bill 3, Item 10.2	LV Distribution board.										
Bill 3, Item 11	Earth Conductor										
Bill 3, Item 12	Earth Conductor										
Bill 3, Item 13	Earth Conductor										
Bill 4, Item 6	Stay										
Bill 4, Item 7	Flying Stay										
Bill 4, Item 13	Strain Clamp										
Bill 4, Item 14	Suspension Clamp										
Bill 4, Item 16	Earth Conductor										
Bill 4, Item 19	Piercing Connectors										
Bill 4, Item 23	Piercing Connectors										
Bill 5, Item 5.1	IPC Connectors										
Bill 5, Item 5.2	IPC Connectors										
Bill 6, Item 3	Streetlight Steel bracket										

Signature of tenderer from Annex B

Date: _____

(C20) Total tender value

(C21) Total Exempt imported content

(C22) Total Tender value net of exempt imported content

(C23) Total Imported content

(C24) Total local content

(C25) Average local content % of tender

(D1)	Tender No.	06/2022	
(D2)	Tender description:	Tender description: Langeberg Municipality: Electrification of 172 formal houses at Nkqubela, Robertson.	
(D3)	Designated Products:	Designated Hardware Components	
(D4)	Tender Authority:	Langeberg Municipality	
(D5)	Tendering Entity name:		
(D6)	Tender Exchange Rate:	Pula	

Date: _____

Annex E

Local Content Declaration - Supporting Schedule to Annex C

(E1)	Tender No.	06/2022	Note: VAT to be excluded from all calculations
(E2)	Tender description:	Tender description: Langeberg Municipality: Electrification of 172 formal houses at Nkqubela, Robertson.	
(E3)	Designated products:	Designated Hardware Components	
(E4)	Tender Authority:	Langeberg Municipality	
(E5)	Tendering Entity name:		

Local Products (Goods, Services and Works)	Description of items purchased	Local suppliers	Value
	(E6)	(E7)	(E8)
(E9) Total local products (Goods, Services and Works)			R 0

(E10) **Manpower costs** (Tenderer's manpower cost) R 0

(E11) **Factory overheads** (Rental, depreciation & amortisation, utility costs, consumables etc.) R 0

(E12) **Administration overheads and mark-up** (Marketing, insurance, financing, interest etc.) R 0

(E13) **Total local content** R 0

This total must correspond with Annex C - C24

Signature of tenderer from Annex B

Date: _____

ANNEXURE F

Baseline Risk Assessment and Specification prepared by Messrs Devac (Pty) Ltd.

 LANGEBERG MUNISIPALITEIT MUNICIPALITY MASIPALA	DOC. NAME	SITE SAFETY HEALTH AND SAFETY SPECIFICATION (SSHSS)		
	CLIENT	Langeberg Municipality	DOC NO	518
	PROJECT NAME	CMB / 10541	COMMENCE DATE	04 February 2022
	ADRESS	Langeberg Municipality 28 Main Street, Ashton		

REVISION STATUS		
REVISION DATE	DESCRIPTION OF REVISION	DETAIL:
2022/02/04	REVISED AND CUSTOMIZED FOR THE PROJECT TAKING PLACE AT:	Electrification of Nqubela Housing

AUTHOR OF THIS DOCUMENT (SSHSS)	
CLIENT	
NAME OF CLIENT	LANGEBERG MUNICIPALITY
RESPONSIBLE DEPARTMENT	Legal Department
APPROVAL DATE	Friday, 04 February 2022
PAGES INCLUDED IN THIS DOCUMENT	68
SIGNATURE OF APPROVAL	

RECEIPT BY CONTRACTOR	
CONTRACTOR	
NAME OF CONTRACTOR	
DOCUMENT REFERENCE	Legal / Compliance
ACCEPTANCE DATE	Friday, 04 February 2022
PAGES INCLUDED IN THIS DOCUMENT	68
SIGNATURE OF APPROVAL	

Index

Cover Page & Document Control Sheet

Table of Content

Introduction

Table of Content

1. Project information

2. Clients requirement for H&S management on the project

- 2.1. H&S Responsibilities
- 2.2. H&S goals
- 2.3. Hazard identification and risk assessments (RAMS)
- 2.4. Design information
- 2.5. Communication and consultation
- 2.6. Co-operation between contractors
- 2.7. H&S Monitoring
- 2.8. H&S Inspections
- 2.9. H&S Review
- 2.10. Training Attestation
- 2.11. Purchasing
- 2.12. Site rules
- 2.13. Permits
- 2.14. Site security, access and transport arrangement
- 2.15. Deliveries
- 2.16. Construction employees' facilities
- 2.17. Waste
- 2.18. Personal Protective Equipment
- 2.19. Working hours
- 2.20. Notice boards
- 2.21. Emergency and first aid
- 2.22. Medical certificates
- 2.23. Medical surveillance
- 2.24. Reporting fatality, permanent injury and occupational diseases
- 2.25. Method statements (RAMS)
- 2.26. H&S file

3. Environmental restrictions and existing on-site risks arrangements

- 3.1 Fall protection
- 3.2 Fall prevention
- 3.3 Roof work
- 3.4 Falling objects
- 3.5 Structures
- 3.6 Temporary works
- 3.7 Excavations and Ground Conditions

- 3.8 Demolition works
- 3.9 Tunnelling
- 3.10 Scaffolding
- 3.11 Suspended platforms
- 3.12 Rope access work
- 3.13 Material hoists
- 3.14 Bulk mixing plant
- 3.15 Explosive actuated fastening device
- 3.16 Cranes
- 3.17 Construction vehicles and plant
- 3.18 Electrical installations and machinery
- 3.19 Flammable and hazardous materials
- 3.20 Water environments
- 3.21 Housekeeping and general safeguarding
- 3.22 Stacking and storage
- 3.23 Fire precautions
- 3.24 Construction employees' facilities
- 3.25 Contaminated land
- 3.26 Client activities (risks)
- 3.27 Manual handling of materials
- 3.28 Noise and vibration
- 3.29 Working near fragile materials
- 3.30 Traffic planning
- 3.31 Control of dust and mud
- 3.32 Monitoring of noise, silica and dust levels
- 3.33 Confined spaces
- 3.34 Hand tools
- 3.35 Registers & Checklists
- 3.36 Legal Appointments
- 3.37 Health and Safety Budgets

4. H&S File requirements

- 4.1. H&S Practitioner preparing the file
- 4.2. Contact detail to H&S Practitioner
- 4.3. Copy of CWP / NC
- 4.4. Complete Contact details for parties
- 4.5. Physical Address for construction site and site office
- 4.6. Nature of the work describe
- 4.7. Commencement and completion date
- 4.8. List of Contractors appointed by PC
- 4.9. Procedures to ensure PC maintain H&S file
- 4.10. Updated record of "as-built" drawings and plans
- 4.11. Criteria for design loadings for structural elements
- 4.12. Detail of potential hazard included in structure eg. tension beams or slabs
- 4.13. General details of construction methods and materials
- 4.14. Equipment and maintenance of facilities within the Structure

- 4.15. Maintenance procedures and requirements provided for the Structure
- 4.16. List and proof of appointments of each contractor
- 4.17. Procedures to approve, monitor and review all Contractors H&S files for the project
- 4.18. Manuals for operating, maintenance procedures & schedule for plant and equipment
- 4.19. Details of location and nature of utilities and services (emergency and fire-fighting)
- 4.20. Responsible for “as-build” drawings
- 4.21. Procedures for marking-up drawings to as-build
- 4.22. Procedures to pass on residual risk information to those who need such
- 4.23. General Record Keeping
- 4.24. Unanticipated Hazards (Inclusive of adverse weather such as strong winds)
- 4.25. Occupational Health and Safety Signage
- 4.26. Occupational Safety
- 4.27. General Machinery
- 4.28. CIDB Health and Safety Plan Audit
- 4.29. HIV/Aids Programme (when applicable)
- 4.30. Non-Compliance to set requirements
- 4.31. Handling conflict of interest
- 4.32. Penalties
- 4.33. Project Close - Out Requirements

5. Project Review

- 5.1 Provision for project review and applying lessons learned (continuing evaluations of contractor competence)

Annexure 1 – Professional team and information on this project

Annexure 2 - Notification of Construction work

Annexure 3 - Organogram

Annexure 4 - Legal Appointments

Annexure 5 - Registers & checklists

Annexure 6 - Returnable Documents

BASELINE Risk Assessment

OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION

Introduction

A responsible Occupational Health and Safety management is **essential** to protect the client, consultants, contractors, employees, visitors and the public to provide a work environment that encourages a health and safety culture.

Purpose

The purpose and objectives of this Specification is to ensure that all Contractors (herein referred to as the “*Contractor*” (including Principal Contractor, Contractors, Subcontractors, Service Providers, Consultants or similar) shall enter into a **contractual agreement** / relationship with Langeberg Municipality (herein referred to as the “*Client*”). Such Contractor

shall achieve and maintain an acceptable level of Occupational Health and Safety performance whilst conducting work for or on behalf of the Client.

These health and safety specifications (“*specifications*”) have been prepared in terms of the Occupational Health & Safety Act, Act 85 of 1993 (hereinafter referred to as the “*OHS Act*”) and the regulations promulgated there under and as amended, in particular the Construction Regulations 2014 and guidelines published there under and **must be complied with**.

It is a **requirement** that Contractor’s shall **provide a safe and healthy working environment** and to direct his activities in such a manner that his employees and any other persons, who may be affected by his activities, are not exposed to hazards to their health and safety, maintain OHS Act legislative compliance and minimize the risks of incidents, injuries, contracting diseases and damage to the employees’ health, environment, assets or property of the Client.

Scope

This **document is part of** the tender requirement with all contracts, principal agreements, applicable service level **agreements** and legal **appointments** entered into with Langeberg Municipality and a Contractor or service provider.

The Contractor is required to use and apply it when **developing** Health and Safety documentation for implementation on sites. This document will carry equal weight to the contracts, principal agreements, service level agreements and legal appointments as far as enforcement, compliance and breach is concerned.

These **specifications form an audit guideline** and management tool for the use of the Contractor to **ensure compliance with the OHS Act and Regulations, Directions, Directives, Notices and Guidelines** promulgated there under and updated from time to time. **Covid-19 and other communicable diseases compliance requirements is included in the OHS Direction as published.**

Any **contradiction** between these specifications and the OHS Act, the OHS Act take preference except where explicitly stated. When these specifications do not cover specific health and safety requirement, the **OHS Act must be used as the standard requirement**.

Adherence

The specifications are **mandatory before the commencement** and for the duration of any contract works to be conducted on any Langeberg Municipality premises (owned or leased). These specifications shall be implemented and be subject to audits, without prior announcement from time to time.

It is the responsibility of the contractor to familiarise himself with the **contents of this specification** and any subsequent updates hereto. The latest version should always be kept in the contractors file on site.

Failure to adhere to this specification may result in disciplinary action, penalties and a breach being raised in the event of continuous non-conformances.

Reputational impact

Any action or inaction taken relevant to this Specification which may have potential to incur reputation risk for Langeberg Municipality , i.e. likely to result in material criticism and / or censure of Langeberg Municipality by key stakeholders or opinion formers (including clients, market counterparties, regulators, government officials, law enforcement agencies, media or NGOs) should be escalated to the appropriate committee.

Penalties

Penalties may be implemented for continuous non-compliance to sample provisions set out later in this specification.

Interpretation

The SSHSS contains clauses that are generally applicable to building / construction / civil work and to impose pro-active controls associated with activities that impact on human Health and Safety as it relates to plant and machinery.

Compliance to the requirements of the OHS ACT is in addition to the requirements of the SSHSS and is part of the Contractor's responsibility. The CLIENT will monitor that the Contractors comply with the requirements of the OHS ACT and will not prescribe to the Contractor how such compliance is achieved.

Definitions

For the purpose of this SSHSS some of the definitions / acronyms given hereunder have been extracted (but not limited) from the Construction Regulation shall apply:

"Construction Work" (as defined in the Construction Regulations, 2014) means any work in connection with –

- a) The construction, erection, alteration, renovation, repair, demolition or dismantling of or an addition to a building or any similar structure; or
- b) The construction, erection, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system; or the moving of earth, clearing of land, the making of excavation, piling, or any similar civil engineering structure or type of work.

"Hazard Identification, Risk Assessment and Risk Control" means a documented plan, which identifies hazards, assesses the risks and detailing controls.

"Site" means the area in the possession of the Principal Contractor after site hand-over for the construction of the works. Where there is no demarcated boundary it will include all adjacent areas, which are reasonably required for the activities for the Principal Contractor, and approved for such use by the Client's representatives / Engineer.

"The Act" means, unless the context indicates otherwise, the Occupational Health and Safety Act, 1993 (ACT NO. 85 of 1993) and Regulations promulgated there under.

"Client" means Langeberg Municipality.

"Hazard" means a source of or exposure to danger (source which may cause injury or damage to persons or property)

“Risk” means the probability or likelihood that a hazard can result in injury or damage

“*Principal Contractor’s Responsible Person*” means any person appointed in writing by the Principal Contractor to supervise construction or building work. The appointment shall be as required by the OHS ACT which shall stipulate Health and Safety responsibilities, area of responsibility and the proposed duration of the project.

“*Employer’s Personnel*” means any Employee of the Principal Contractor, Contractor or Sub Contractors.

“SSHSS” means Site Specific Health and Safety Specifications / Occupational Health and Safety Specification.

Health and Safety Plan

The Contractor shall be required to develop and provide for review and approval by the client’s representative, a comprehensive site and project specific Health and Safety Plan, prior to work commencement.

Such plan shall be specific to the scope of work of the contractor including his sub-contractor scope of work, addressing the requirements set out in this specification.

Such plan must follow this specifications layout and shall detail the Contractor’s planned methods of management on site for the duration project. The detail required shall provide the client with a clear indication of how the Contractor (as well as his sub-contractors) intends to address, implement and manage the requirements of this specification in terms of his own scope of works.

The contractor’s health and safety plan must include a **Table of Content (INDEX)**.

The CIDB has gazette a best practice Standard for Health and Safety Plans and auditing requirements (Grade 2 to 9), Vol 641 9 November 2018 No 42021. The potential principal contractor should adopt such **standard for the layout of the Principal Contractor’s Health and Safety Plan**.

Such health and safety plan audit standard were gazetted by the CIDB to ensure that every contractor’s health and safety plan is evaluated fairly.

1. Project information

This health, safety and environmental specifications have been prepared for the preparation of construction work. Thereafter the enforcement of these specifications will be applicable during the construction phases. The appointed contractor’s health and safety plan cannot override the client’s specifications.

A general description of the type of work activities involved in the project.

This description of the works is not necessarily complete and shall not limit the work to be carried out by the principal contractor and contractor under this contract.

EMPLOYER'S OBJECTIVES

The scope of the work includes the following, as detailed in the technical drawings and described as follow:

- (i) The electrification of 172 low cost houses at Nkqubea, Robertson;
- (ii) The supply and installation of a new MV overhead line (150m);
- (iii) MV underground cable (50m);
- (iv) LV ABC conductor for the Main LV overhead Reticulation;
- (v) LV underground cables for the underground service connections to 172 formal houses; and
- (vi) The testing and commissioning of the complete installation.

OVERVIEW OF THE WORKS

The project comprises of the electrification of 172 low cost houses which include various installation methods and the extension and connection to MV and LV underground and overhead lines.

GENERAL INTENT

The general intent of this Contract is that the Contractor shall procure all items necessary for construct and complete the Works in accordance with the terms of Contract, in a workman-like and expeditious manner, and shall have full authority over all the Works.

The Engineer shall have the right to verify that all work is carried out in accordance with this Contract and to approve or reject materials supplied and work undertaken by the Contractor or approved subcontractors.

EXTENT OF THE WORKS

The Works in general include but is not restricted to the following:

1. Site clearance;
2. Excavation and lay of electrical reticulation in ground;
3. Digging of holes for extension of overhead line and connection with existing MV / LV points;
4. Connecting households to new infrastructure; and
5. The testing and commissioning of the complete installation.

During the course of the project, the contractor shall take all necessary steps to protect the wellbeing of community surrounding the site. The contractor shall also take care of surrounding properties, existing services as well as accommodating the traffic.

LOCATION OF THE WORKS

The Works is located in **Nqubela, Robertson**.

SCOPE OF PRINCIPAL CONTRACT

The scope of the work includes the following, as detailed in the technical drawings and described as follow:

- (i) The electrification of 172 low cost houses at Nqubela, Robertson;
- (ii) The supply and installation of a new MV overhead line (150m);
- (iii) MV underground cable (50m);
- (iv) LV ABC conductor for the Main LV overhead Reticulation;
- (v) LV underground cables for the underground service connections to 172 formal houses; and
- (vi) The testing and commissioning of the complete installation.

NATURE OF GROUND AND SUBSOIL CONDITIONS

All works shall be carried out next to existing roads and intersections and should not extend deeper than the existing sub-base depth. Where the cables are laid deeper than sub-base caution must be taken in protecting the existing road structures integrity. It is therefore only anticipated that no hard rock will be encountered during the excavation works portion of the works.

TREATMENT OF EXISTING SERVICES

The treatment of existing services, i.e. their termination, diversion of continued use, either temporarily or permanently, is shown on the relevant drawings. Any services encountered on site which are not on the drawings, must be pointed out to the Employer's representatives. The Employer's representatives will issue further instructions with regard to the treatment of these services.

Construction activities shall include the following:

- Detection and adjustment of existing services;
- Site clearance;
- Training, supervision and provision of equipment for local labourers;
- Trenching / Excavation for electrical cable and poles;
- Installation of electricity to the 172 low cost houses;
- Lock-out and Earthing of existing cables when new connection is made; and
- The testing and commissioning of the complete installation.

Activities may also include, but are not limited to:

- a. Public safety and security;
- b. Protection of environment;
- c. Site Organization, Establishment and Barricading / Hoarding;
- d. Site handover meeting and progress meetings;
- e. Deliveries and other Construction Vehicles;
- f. Manual Handling of Material and Equipment;
- g. Earthworks (Excavation);
- h. Backfilling;
- i. Compacting and Filling;
- j. Road Signs and - markings;
- k. Installation of Services;
- l. Electrical Reticulation;
- m. Steel reinforcing;

- n. Concrete Works;
- o. Roof works;
- p. Scaffolding & Working on ladders;
- q. Working in elevated positions;
- r. Welding and gas cutting;
- s. Fire prevention;
- t. Hoisting and lifting Operations;
- u. Landscaping; and
- v. Subcontractors and Visitors on site.

Throughout the construction process it is required that the contractors are compliant to the require regulations.

Health and Safety is everyone's responsibility, report Unsafe Acts and Unsafe Conditions to your superior immediately.

Project program or schedule details, including start and finish dates, showing principal activities and intermediate stages.

i. Project Program / schedule details

The completion period must include the normal days of inclement weather as specified in the Specification Data and special non-working days listed in the Contract Data, excluding the standard builders' holidays, if applicable.

The Contractor will be required to develop and maintain for the full duration of the contract, a works programme whose purpose will be to ensure that the work is carried out and controlled in such a way that the contract is completed within the time stated in the tender or in the time extended by the Engineer in writing.

Inclement weather allowance will be as set standard and must be documented at each monthly progress meeting. (+/- 2 working days / month with 4 working days during seasonal raining season.)

The Contractor shall take all aspects regarding the conditions on site, access, transportation, restricted working space, the availability of material, machines and labour into account during the tender stage and the compiling of a construction programme.

ii. Start and finish dates

Once an appointment has been made the official starting date will be confirmed with the contractor and site handover arrange once all documentation work, including the approval of the health and safety plan and the site-specific health and safety file, has been approved.

iii. Principal Activities

Within the Scope of Works section, a general list of activities was described. These activities form part of the Hazard identification process

iv. Intermediate stages

This SSHSS was prepared for incorporation during stage 4 to form part of the Tender documentation to ensure that the potential contractor make provision for these requirements during Stage 5 and 6. Stage 5 is the construction phase and stage 6 the close-out stage. Within the construction period different progress stages may also be defined by the professional team.

2. Client's requirements for health and safety management on project.

2.1 Health and Safety Responsibilities

The principal contractor's health and safety responsibility are delegated following an organizational structure whereby the involvement of management, contractor's and employees are coordinated through both their skills, training and experiences to be acceptable **competent persons** to perform their delegated duties.

A diagrammed **Organogram** (See annexure below as sample) must be included in the Contractor's health and safety plan and kept up to date in the health and safety file on site. When a **change of management** occurs, the client must be notifying and supplied with the required CV, which shall include the qualification and health and safety training for such person, for approval. Legal appointments must be updated when a change of management occur.

Each appointment letter shall indicate:

- a. Legal reference to the appointment (Please note: one legal reference one appointment. E.g. CR 8. (1) cannot be appointed as CoVid-19 Compliance Officer on the same document with only indicating additional duties);
- b. The name of the person appointing and his / her designation;
- c. The name of the company who this person represents;
- d. The name of the appointee and the appointment;
- e. The detail of the site / address
- f. Period of validity of such appointment (not longer than 3 year);
- g. Signature of the Company's representative making the appointment & date of signature;
- h. Duties or reference to requirements in regulations (to include Checklists & Registers);
- i. Acceptance of appointment;
- j. Signature of acceptor and date; and
- k. Designation.
- l. Training certificate (where applicable)

All contractors including the professional team members has to ensure that an arrangement is in place to ensure all their employees have valid medical certificates of fitness.

2.2. H&S goals

The project team and contractor's management must commit to the implementation of Health, Safety & Environmental standards from management down.

During the following goals need to be adhered:

- Site supervisor must be on Site at all times;

- Employees and client employees required to comply by wearing minimum required PPE – Personal Protective Equipment;
- Construction Supervisors to ensure all employees were supplied PPE as Job Category register to ensure employees work safe;
- Work safely;
- Report all Near-Hits to the Client;
- Comply with SHE Management System;
- Comply with site-specific Work Rules;
- Prevent and/or correct unsafe behaviours;
- Prevent and/or correct unsafe work conditions;
- Implement Specifications;
- Security required at site entrance;
- Will be managed through Monthly site audits and Weekly inspections, PTO's, SWP, DSTI's.
- Site Manager and Safety Managers to supervise this on a daily base.

To achieve such goals the contractor must **monitor and review** these goals, targets, key performances indicators, etc.

2.3. Hazard identification and risk assessments

Baseline Risk Assessment

The client prepared a baseline risk assessment to cover all the possible identified risks on the project as required by Construction Regulation 5. (1)(a). **The Principal Contractor shall recognise, take cognisance and incorporate this baseline risk assessment into their construction risk assessment.**

The Contractor shall submit their “construction” **risk assessment** (can also be referred to as a project “**method statement**” with reference to a project schedule / plan) for the project, which shall form part / addendum when submitting the Health and Safety plan and place in the health and safety file. The above incorporate “RAMS” (Risk Assessment and Methodology Statement) methodology.

The Risk Methodology applied should follow the hierarchy of controls mitigation and must form part of the Risk Assessment, and be included in the Health and Safety File. Within such documentation and **in the health and safety plan** the Principal Contractor **shall address risk rating** strategy (Matrix) used.

Should the Principal Contractor commence work without approval of the risk assessment, or should the risk assessment not reflect the activities being undertaken, the CLIENT may instruct the work to be immediately halted, and the Principal Contractor **will have no claim** against the CLIENT in such a case for lost time or costs, irrespective of whether it can be demonstrated that the work was being safely undertaken

The risk assessment should include the following:

- (a) The identification of the risks and hazards to the Health and Safety to which persons may be exposed;
- (b) The analysis and evaluation of the hazards identified;
- (c) A documented plan and safe working procedures to mitigate reduce or control the risks identified;

- (d) The **monitoring and review plan** of the risks and hazards; and
- (e) The relevant personal protective equipment or clothing.

The Principal Contractor shall ensure that all persons entering the site are informed of all hazards on site; record of this is to be kept on the Health and Safety File.

The risk assessment should take into consideration the following key processes for this project, but are not limited (nor exhausted) to:

- Site Establishment inclusive of long-lasting hoarding separating construction area with the operations of the other contractors
- Identification of existing services, exposure and protection thereof
- Access Control of Public, including Students, to site
- Backfilling of trenches
- Bricklaying
- Brush / Bush Cutting
- Chainsaw use
- Compacting and Filling
- Compacter Operations
- Cutting of Concrete, Road Surfaces or Kerbs
- Cutting of Steel
- Demolition
- Electrical Tools and Electrical Installations
- Electrical works and connection/disconnection of electricity to municipal supply or other
- Excavating of trenches / foundations (hand and mechanical)
- Fire
- Flammable Liquids / Gas
- Fragile materials
- Goods - / Material - / Passenger Hoist Operations
- Hand Tools
- Hazardous Bio-waste
- Hazardous Chemicals
- Hygiene requirements
- Hot Works
- Kerb Laying
- Lifting Operations
- Manhole Rings and Pipes Storage
- Manual Handling of General Items
- Members of Public, including Students
- Movement (transport) of Construction Vehicles (Inclusive of light vehicles)
- Noise and dust
- Overhead Services
- Painting
- Paving
- Plant / Vehicle and Equipment operations
- Plastering
- Plumbing
- Precast slabs
- Road Construction / - Marking
- Road Working

- Rope Access Work
- Scaffolding (Erection / Inspection and Dismantling)
- Site Strip
- Skipping of concrete with hoist / crane
- Temporary Works (Shoring / Scaffolding or False Works)
- Tower Cranes
- Traffic Management
- Underground Services
- Working at Heights
- Working during inclement weather
- Working near sewage water
- Working near water environments
- Work near underground services

All health hazards that can be present during any of the above activities should include individual, dusts, gases, fumes, vapours, noise, extreme temperatures, illumination, vibration and ergonomic hazards.

Preventative measures must first address the elimination of the hazard or risk. Should PPE be required to reduce risk then appropriate equipment or clothing must be used and be SABS approved.

Issue Based Risk Assessment

As circumstances and needs arise, separate risk assessment studies will need to be conducted. These will be associated with a system for the management of change. An additional risk assessment will need to be conducted and submitted to the CLIENT for verification when for example:

- (a) A new machine is introduced onto site;
- (b) A system for work is changed or operations altered;
- (c) After an accident or a 'near miss' has occurred
- (d) New knowledge comes to light and information is received which may influence the level of risk to employees on site.

Continuous Risk Assessment

This is the most important form of risk assessment which should take place continually, as an integral part of day-to-day management.

This should be conducted by Construction Manager on site and it is essential that formal **training** be provided to enable this process to be efficient.

The Principal Contractor shall be responsible for making sure that all employees under his / her control are conversant with the content of the Risk Assessment and what appropriate measures have been put in place to either eliminate or reduce the identified risks. The Principal Contractor shall outline to employees what role they are expected to play in the Risk Assessment and control measure process. Records are to be kept of this communication. Such information can also be communicated through Safe Work Procedure (SWP), Safe Operation Procedure (SOP), Toolbox talks, Job Base Analysis (JBA) or Task Bases Assessment (TBA).

Continuous Risk Assessment is also commonly known as a Daily Safe Task Instruction (DSTI's).

2.4. Design Information

In terms of Construction Regulation (2014), regulation 6.(1)(c&d), the designer must -

- Make available in a report all relevant health and safety information about the design, the geotechnical-science aspects and loading that the structure is designed to withstand; and
- Inform the client in writing of any known or anticipated dangers or hazards relating to the construction work, and make available all relevant information required for the safe execution of the work upon being designed or when the design is subsequently altered.

An alteration in the design requires the principle contractor to review the *management of change* procedure to anticipate if any hazards may arise due to such alterations.

- a. Relevant existing records available on services would either be obtained through the Project Implementing Agent or from the Municipality's building Inspectorate.
- b. Surveys, site-investigations and Geotechnical reports conducted on behalf of the client can be requested through the Project Implementing Agent should it be available.
- c. "As-built" drawings could be sourced from the appointed Architect.
- d. The municipality has traffic flow statistics should density and traffic flow information be of relevance to a project.
- e. Should any change of design occur the contractor must address how this will be received on site, recorded and distributed. Liaison with the PIA on design changes must be recorded. The latest version of any new design must always be available on the site.
- f. The line of communication is discussed under a later section, but the principle contractor should note this in his plan at this point as well.
- g. An arrangement how on-site changes, potential health and safety implication of variation orders (VO's), Request for Information (RFI's and site Instructions to be explained.
- h. Due to the institution's continuous use of facilities all areas need to be available most of the time. Should areas be demarcated permission must be sought and approved through the PIA.
- i. Should new work "packages" be handed over during the project the incorporation of such work package be into the existing programs to be indicated.
- j. An arrangement for continuous interaction with the client representatives must be indicated where the design is on-going.

2.5. Communication and Consultation

2.5.1 Communication: Client

The Contractor must provide the client with their client communication procedure that shall include:

- a. Reporting prior to work commencement on any client site with:
 - i. an approved health and safety plan;
 - ii. an in-dated letter of good standing;
 - iii. stamped Notification of Construction work (each contractor); and

- iv. Certificate of Compliance (COC) to commence after the implemented health and safety file has been audited.
- b. Reporting site mobilisation and site establishment for a site inspection;
- c. Reporting of review and approvals of appointed sub-contractors to perform work on the client site (in line with a.i-iv above);
- d. Notifying the client if there is any change to the site management;
- e. **Notify the client immediately** of any incidents, accidents or served notices by any regulatory authority while on site and during the project;
- f. Reporting to the client site inspection and audit findings;
- g. Report corrective and preventative actions (non-conformance close-out) within 48 hours;
- h. Advise the client in writing of any emergencies including actions taken.

2.5.2 Communication: Workforce

The Contractor must provide the client with their workforce consultation and communication procedure that shall include, but not limited to:

- a. CoVid-19 hygiene, sanitising, awareness and PPE;
- b. Medical conditions, restrictions or recommendations;
- c. Health and Safety Rules;
- d. Incident and near miss reporting;
- e. Report findings and corrective actions in incident investigations;
- f. Lessons from non-conformances and audits;
- g. Communicating of Risk Assessments for the work to be performed;
- h. Awareness (posters) & Toolbox Talks;
- i. DSTI communication
- j. OHS meetings to initiate, promote, maintain and review measures of ensuring the health and safety of persons on site. Note that this may be included in the progress or site meetings as an agenda item.

2.6. Co-operation between contractors

The contractor must coordinate and make arrangements:

- a. Identifying where works by one contractor and their assessment and control of risks may affect the works of another contractor;
- b. Between all contractors such as where the type and frequency of health and safety meetings are described;
- c. For preventative and control measures where more than one contractor may be exposed to the same risk; and
- d. for Health and safety surveillance and/or assistance between various contractors.

2.7. H&S Monitoring

A contractor must document:

- a. How the Health and Safety performance on site is going to be monitored?
- b. How the Health and Safety performance of others especially contractors are going to be measured and monitored?
- c. **Who, on the site, will stop unsafe acts by contractors and employees?**

2.8. H&S Inspections

General Inspection, Monitoring and Reporting

A table of intended inspections (with the stipulated frequency) are to be included in the Health and Safety plan and placed on a Site Calendar for ease of reference. Inspection registers and checklists must be kept in the Health and Safety File.

Internal Audits

The Principal Contractor shall conduct monthly Health and Safety audits of the project Health and Safety Management System, including the sub-contractor records, to ensure compliance with the OHS Act and OHSS. Records of audits must be kept and non-conformance reported, investigated and corrective action must be taken and reported to prevent re-occurrence to the client. Proof hereof recorded as a non-conformance close-out must be submitted to the client's agent within 24 hours after the non-conformance was reported on an internal audit report.

External Audits

The CLIENT, or its relevant Representative, shall conduct monthly Audits on site. All documentation held by the Principal Contractor shall be available for inspection. The Principal Contractor shall provide any additional information required. The Principal Contractor is required to (must) participate in the Audit and adheres to the section of these specifications.

A copy of the Close-out report must be submitted to the client's representative within 48 hours of audit report placed in Principal Contractors Health and Safety File. The Principal Contractor has 3 (three) working days after hard copy of audit was placed in contractors file to rectify any non-conformances.

As information the full process of health and safety documentation approval is stipulated as follow:

- a. Invited contractor's health and safety file be electronically submitted and approved;
- b. Evaluation of health and safety plan of potential contractor during tender evaluation;
- c. Discuss, negotiate and approve health and safety plan after appointment of contractor;
- d. Evaluate the implementation of the health and safety file on site with site establishment;
- e. Conduct monthly audits and where required bi-weekly site visits. Reports on such must be documented and provided by auditor in hard copy to the site within 7 days after the audit was conducted signed by auditor and a site supervisor who were present during the visit;
- f. Audit close-out report on findings documented and distributed to client's representative within 3 days after the documented hard copy of audits / visit was placed in contractors file;
- g. Final project close-out, when zero working hours are reached, submitted to the client to include:
 - i. Withdraw, close, retract and cancel all legal appointments;
 - ii. Consolidated list of contractors (Name, Area of work, Contact number & email)
 - iii. Final month's Health and Safety audit report and Certificate of Compliance
 - iv. Minutes of the Health and Safety Committee meetings (when applicable)
 - v. Summary of Incidents & IOD report (Incidents on Duty)
 - vi. Summary of WCA /COIDA Claims

- vii. Total project Man-hours and DIFR (Disable Injury Frequency Rate / 200,000 hours)
- viii. Environmental rehabilitation status
- ix. Current or outstanding Health and Safety Non-conformances.
- x. Ensure that all registers and checklist are closed with the last sentence being on the document marked as "CLOSED" with the applicable date and "closed" marked across the full page.

2.9. Health and Safety Review

Contractors must ensure that health and safety documentation included in the health and safety file be reviewed **monthly** or when any change of management occur. The responsibility of review lies with the contractor's management and the responsibility must be designated.

The results of such review must be submitted for approval by the client.

2.10. Training

Health and Safety Training

The Construction Regulation requires that ***"A Client must ... ensure that potential principal contractors submitting tenders have made adequate provision for the cost of health and safety measures"***.

The Principal Contractor shall at project start-up conduct a training needs analysis (**training / skill matrix**) to ascertain what Health and Safety training is required and what already exist. The training needs should specifically be based on the scope of work in relation to supervision with daily risk assessment qualification / experience, first aider, incident investigation, ladder inspection and tool inspection competencies.

The single page in tabular format as intended plan of action should be drafted and included in the Health and Safety file and **submitted with the tender**.

Once the identified people have attended training, the Principal Contractor must ensure copies of the certificates are kept in the Health and Safety File.

Where a Part-time OHS Practitioner is appointed the Construction Managers and / or - supervisors are required to have, as minimum, **legal liability training** with SAQA US certificates. SAQA US for CIVIL is 120344.

Excavation supervisors and construction manager must have a SAQA US 365183 competency certificates.

The following skills training to be considered:

- a. Legal Liability;
- b. Excavation Supervisors;
- c. Fall Protection;
- d. Fire Equipment Inspector;
- e. Fire Marshal;
- f. First Aider;
- g. Formwork & Support;

- h. Hand Tool Inspector;
- i. Health and Safety Representatives;
- j. Legal Liability Training for Management;
- k. Machine Operator;
- l. Scaffolding Erectors;
- m. Scaffolding Inspectors;
- n. Stacking & Storage Supervisor;
- o. Welder, grinding / cutting machine operator;
- p. Working at heights;

Induction

The Principal Contractor shall conduct Site Specific Inductions to all new employees and visitors on site. Proof of inductions in a form of attendance registers must be kept in the Health and Safety File.

Should any new equipment or plant be brought to site employees should be inducted on such ensuring the understanding, **blind spots, risks** and coordination when these units are being used.

Within the Contractor's Health and Safety Plan a layout of such induction to be performed should be indicated that will include Safety Rules. An attendance register must be kept and signed by all attendees.

Awareness

The Principal Contractor shall conduct, on site, periodic toolbox talks, preferably weekly or before any hazardous work takes place. The talks shall cover the relevant activity and an attendance register must be kept and signed by all attendees.

A record of who attended and the content of the topic will be kept in the site Health and Safety file as evidence of training.

Competency

After the Principal Contractor has identified the training to be conducted, based on the Hazard Identification & Risk Assessment (HIRA); he/she shall send the relevant persons on appropriate courses and keep the accredited certificates of training for reference in the site health and safety file. A maximum grace period of 30 days from the start of the project are provided for this training to be conducted and proof must be submitted to the client's representative.

2.11. Purchasing

The contractor has to ensure that the purchasing procedure include the evaluation of competencies and adequate resources of the contractors, suppliers and manufacturers. No Principal Contractor may appoint a specialist contractor who then appoints a subcontractor for such services.

2.12. Site rules

The Contractor shall ensure that all persons working under his control observe the health and safety rules of the client at all times and shall not permit any person who is not directly associated with the work from entering the site.

These specifications express various rules and other restrictions on contractors, suppliers and manufacturers such as permit-to-work procedures and arrangements for compliance by others with the rules herein and those of the contractor's health and safety plan.

2.13. Permits

The Contractor must implement a permit system for high risk activities, but not only limited to:

- a. Concrete pouring;
- b. Confined spaces;
- c. Electricity and other energy sources;**
- d. Excavations;
- e. Explosive, corrosive or toxic gases or atmospheres;
- f. Extreme temperatures;
- g. Hazardous substances or Radioactive material;
- h. Hot work or Steam;
- i. Isolation of the fire alarm or fire suppression;
- j. Lifting operations;
- k. Night work;
- l. Operations requiring lockout**
- m. Possibility of drowning in bulk material / tanks;
- n. Restricted access, exit and movement
- o. Welding, grinding or any other operation that could result in sparks;
- p. Working at heights, - isolation;
- q. Working in close proximity to water environment
- r. Working on live/pressurized equipment
- s. Working on public holidays, weekends and during a shutdown period; and
- t. Implementation of wayleave conditions.**

The permit shall include the arrangements for competence and authority for issuing, acceptance, renewal (validity) and clearance of permits to work.

The Contractor shall ensure that work for which a permit is required by legislation, this specification or own permit to work procedure, is not performed by his employees prior to obtaining such permit. The Contractor shall additionally also ensure that Langeberg Municipality or the Municipalities permit for specific work procedure (way leave) is prior obtained and complied with on site, for the duration of the project.

2.14. Site security, access and transport arrangement

Security

The Principal Contractor shall ensure that each person working on or visiting a site, and the surrounding community, shall be made aware of the dangers likely to arise from on-site activities and the precautions to be observed to avoid or minimise those dangers.

The construction area should be permanently hoarded-off to prevent access of non-construction staff into the construction area. This should further be able to prevent excessive dust. Appropriate Health and Safety signage shall be posted at all times.

The Principal Contractor have a duty in terms of the OHS ACT to do all that is reasonably practicable to prevent members of the public and others being affected by the construction processes to be aware and put preventative measures in place.

The visitors to site shall go through a visitor's Health and Safety induction detailing hazards and risks they may be exposed to and what measures are in place to control these hazards and risks. A proof of such induction must be kept on the safety file for audit purposes.

Each of the Contractor's employees must be issued with a company identification card which must be displayed on his/her person at all times whilst on site (card only when required).

Such identification **cards** shall include as a minimum:

- a. Company Logo;
- b. Employee name and surname;
- c. Employee photo; and
- d. Identity number.

A list of employees with their next of kin must always be available on site (COID requirement as well).

The Contractor acknowledges that its employees, vehicles as well as that of its agents, subcontractors and service providers may be subject to security searches at any time, and the Contractor shall ensure the aforementioned parties co-operate fully with such searches.

Access

The Contractor is required at all times to be aware of all subcontractors on site and ensure that they have means of identification and proof to verify their authorization to be on site. It is important to note that failure to produce such means of authorization for site work will result in the immediate eviction of the subcontractor from the site.

The road surface of all public and private roadways and pavements/pedestrian walkways must remain in a reasonably clean state, free of excessive sand, stone, water or other construction related materials – daily inspections to be conducted by the Contractor with action to be taken without delay.

The Contractor must upon site establishment identify and **demarcate** designated walkways. Signage should be displayed indicating it as a designated and safe to use walkway. Walkways should be safe to use in terms of distances from hot works, works with electrical tools, overhead work, and trenches and should be of such that persons using the walkway do not disturb any work activities taking place in the area.

Transport of Workers

The Principal Contractor shall refer and comply with the requirements set in the National Road Transport Regulations, 2000. The Principal Contractor shall, and not be limited to:

- Not transporting persons together with goods or tools unless there is an appropriate area or section to store them;
- Not transport persons in a non-enclosed (top) vehicle, e.g. truck, there must be a proper canopy (properly covering the back and top) with suitable sitting area. Workers shall not be permitted to stand or sit at the edge of the transporting vehicle;
- Not transporting workers on the back of open light motor vehicles;
- Provision of a serviced portable fire extinguisher in vehicles at all times;
- Driver must have a valid PDP license transporting people; and
- Adequate seating arrangement specifically in respect of social distances.

2.15. Deliveries

The contractor must make arrangement and get approval from the client for deliveries, any restriction such as delivery times, demarcation, reserved storage areas, loading and unloading areas, and working area for prefabrication to be put in place. Banksmen / direct supervision from contractor's side must be present receiving, offloading and departure of delivery vehicles.

2.16. Construction employees' facilities

The Principal Contractor shall provide facilities for

- a. Safekeeping, e.g. lockers etc.;
- b. Temporary shaded structure to serve as a mess room or eating area;
- c. Sufficient toilets for each gender (1 toilet per 30 workers);
- d. Hand washing facilities;
- e. Soap and toilet paper;
- f. Disposable paper hand drying material;
- g. Where there is a risk of exposure to HCS separate lockers shall be provided for clean and soiled/ contaminated clothing for each employee;
- h. **COVID-19 requirement;**
- i. Waste bins must be strategically placed around the site and emptied regularly but no less than weekly;
- j. Workers must not be exposed to HCS while eating and must be provided with adequate, sheltered eating areas complete with benches and tables separated from the work areas; and
- k. Stores may not double up as change rooms, mess areas or eating areas.

The weather conditions might be unsuitable for workers to be exposed to, e.g. in rainy season.

2.17. Waste

The responsibility to ensure that all Contractors enforce, in terms of their waste management, environment sustainable methods, the disposal, keep sufficient waste containers for different waste types as described below and record such in a waste management plan.

Contractor to reduce the amount of waste that is generated and where waste is generated ensures that useable waste is re-used / recycled or recovered in an environmentally sound manner before being safely treated and disposed of.

Any waste of material value the client needs to be informed and when and where possible handed over to the client.

Waste will be classified in the following categories and these requirements incorporated into the contractor's waste management plan:

LIQUID WASTE:

- a. When mobile toilets are used it must be serviced on a weekly basis and waste dispose by the service provider in an acceptable manner;
- b. Service records must be documented;
- c. Cleaning of the inside of the toilets are part of the hygiene requirement and recording must be daily conducted;
- d. The contractor must provide sufficient toilet paper for such toilets as required by the facilities regulation;
- e. Cleaning of paint buckets / brushes and disposal of paint may not be through the storm water system;
- f. Run-off from wash bays must be intercepted
- g. Chemical spills must be contained and cleaned

SOLID WASTE:

- a. Any littering is prohibited;
- b. Bins must be provided and cleaned on regular basis, preferably by end of each week or whenever possible;
- c. Disposal must be to a legal dumpsite;
- d. Sites must be swept of material that could cause injury or damage to persons or vehicles;
- e. Hand mixing of cement is only permitted inside a batch mixing bucket (brimmed area) or on the footprint of a construction area.
- f. Contaminated ground / soil must be treated or be removed and the area rehabilitated immediately.

HAZARDOUS WASTE:

- a. Hazardous materials may only be disposed of at an appropriately permitted landfill or disposal sites for hazardous material;
- b. Dedicated containers clearly marked for Hazardous waste must be used and only be used for designated purpose as designed; and
- c. Hazardous waste registers to be maintained.

GENERAL WASTE REQUIREMENTS

- a. Disposing of waste must be conducted as soon as possible at a legal dumpsite, skip or on permitted municipal landfill site;
- b. Contractor must monitor the presence of litter on the work sites;
- c. Waste must not be allowed to stand on site to decay resulting in bad odours;
- d. Poisonous or material capable of fermentation, putrefaction or constituting a nuisance shall be treated or disposed of by methods approved by the local authorities.

2.18. Personal Protective Equipment

Personal Protective Equipment (PPE)

A PPE needs analysis is to be conducted in accordance with the HIRA. PPE is to be issued free of charge. The Principal Contractor is to indicate procedure for Lost or Stolen and Worn Out or Damaged PPE.

At the beginning of the project each employee to receive two three ply cloth masks. Such cloth masks need be washed regularly and damaged masks be replaced immediately.

The following PPE shall be used on site as minimum required for everyone on site:

- Steel-Toe Safety Shoes/Boots;
- Hard-hat;
- Two Piece Overalls;
- Protective gloves where required; and
- Hi-Viz Vest **in cases where visibility is impaired.**
- Employees working at access points need to wear cloth masks and **face shield** when recording employees and visitors entering the site.

2.19. Working hours

The regional sectorial requirement in terms of the BCEA should be complied with. Contractor must document their working hours and breaks. Total working hours per week not to be exceed legislative requirement.

An arrangement for working at night, after hours, over weekends and during holidays **with supervision** must be documented in **health and safety plan** and respectively be approved by the client each time it occurs.

All works will be supervised on site.

Where accelerate work programs are implemented adherence to undisturbed weekly or two weekly rest period (BCEA 15.(1) & 15.(2)) should be adhered to (weekly is 36 consecutive hours and fortnight basis is 60 hours).

Night Work

The Principal Contractor shall not undertake any night work without prior arrangement and a written authorization from the CLIENT. The Principal Contractor shall ensure that adequate lighting is provided for all night work and failure to do so shall result in work being stopped.

All works must be supervised directly by management on site.

NB: risk assessment to be revised should night works be approved.

2.20. Notice boards

Different notice board may be required depicting the following information on a site:

The professional team involve in the project (external Organogram); and

Displaying health and safety pictographs, access control, PPE requirement and contact details to the site management (Internal Organogram).

A layout for the professional team will be provided by the Consulting Engineer / Program Implementing Agent **that must include all the specific members in the professional team**. Only approved erecting locations may be used. The requirement and provision for the implementation of Notice Boards will be indicated within the Bill of Quantity.

2.21. Emergency and first aid

Emergency Procedures

The Principal Contractor shall submit a detailed Emergency Procedure for approval by in the Health and Safety File.

The procedure shall detail the response plan including the following key personnel:

- List of key personnel,
- Details of emergency services,
- Actions or steps to be taken in the event of the emergency; and
- Information on hazardous material / situation, including each material's / hazardous potential impact or risk on the environment or human and measures to be taken in the event of an accident.

Emergency procedure(s) shall include, but not be limited to, fire, spills, accidents to employees and use of hazardous substances.

A contact list of all service providers (Fire department, Ambulance, Police, Medical and Clinic, etc) must be maintained and available to site personnel.

First Aid Box and First Aid Equipment

General Safety Regulations 3.(2) Where more than 5 employees are employed .. provide a first aid box ... at or near the workplace. (4) Where more than 10 employees are employed, ... at least one person is readily available.

The Principal Contractors shall provide an on-site First Aid Box, adequately stocked (19 items as prescribed) at all times, and ensure that the First Aid Box is accessible and fully controlled by a qualified First Aider.

2.22. Medical certificates

The contractor has to ensure that an arrangement is in place to ensure all the management and employees have valid medical certificates of fitness specific to the construction work to be performed.

2.23. Medical surveillance

OCCUPATIONAL HYGIENE

- a. Proper health and hygiene measures must be put in place to prevent exposure to hygiene hazards.
- b. Prevention should include the prevention of accidental inhalation, ingestion, and absorption of any hazardous substance or high noise level exposure.

MEDICAL SURVEILLANCE

The Contractor shall provide in the OHS Plan for the management of employee medical surveillance and ensure that:

- a. All employees on site to undergo routine medical examinations specific to the work to be performed taking into account the hazard and risk exposures;
- b. This should address pre-employment examination, periodic monitoring and exit examinations;

- c. Exit examination will be compulsory for employees working with hazardous chemicals;
- d. A declaration should be noted in the close-out report declaring all employees fit on completion of the project;
- e. All employees performing work on site must be declared medically fit for the work they are to perform (especially for working at heights);
- f. Employees will be notified the results of their medical examinations and any concerns made available that may become evident from medical examinations;
- g. Copies of valid medical certificate of fitness must be available on site as a duty of care towards employees to ensure employees are made aware of any health conditions or health restrictions which may have resulted from or may be aggravated by work activities on site.
- h. The consultation, notification and communication with the employee should, with the employees' written consent, be made available upon request for verification by the client, regulatory authority or their representatives.

CONTACT TRACING

- a. Records kept on site of employees and visitors entering the site for contract tracing purposes.

2.24. Reporting fatality, permanent injury and occupational diseases

The Contractor shall provide in the OHS Plan a summarized section providing information pertaining to his incident management procedure which should include at least the framework of the procedure and noting the requirements set out below.

Incident management procedure

In addition to the above the Contractor shall be required to prepare a comprehensive incident management procedure to be implemented on the client's sites. The procedure should address at least, but not limited to:

- a. Incident classifications;
- b. Incident and near miss reporting process;
- c. Incident reporting timeframes;
- d. Investigation teams;
- e. Investigation techniques/methods to be used;
- f. Investigation timeframes;
- g. Investigation reporting;
- h. Investigation documentation; and
- i. Corrective action implementation

Without derogating from the generality of the above, the Contractor shall ensure incidents are investigated by, where appropriate, a competent multidisciplinary team within 7 days. The Contractor shall ensure all incident and investigation records shall be available in the OHS File.

The following documents must be included (noted in the H&S Plan) and made available during an incident / accident investigation:

- a. Notification of Construction works;

- b. Proof of Induction training;
- c. Proof of training on Risk Assessment;
- d. Safe Work Procedure;
- e. Method Statement / DSTI's;
- f. Medical Record (Annexure 3);
- g. Checklist / registers;
- h. Pictures of scene;
- i. Sequence of events;
- j. Witness statements;
- k. Report to Department of Employment and Labour;
- l. Annexure 1 / W.Cl.2;
- m. Chain of Command;
- n. Proof of incident communication to Supervisor, Client's representatives; and
- o. Lesson learned;

Investigation report must be aligned with SAQA 244518 detailing:

- 1. Particulars;
- 2. Description of Incident;
- 3. Evidence;
- 4. Incident Causation;
- 5. Corrective action; and
- 6. Report review.

The Contractor shall notify the client of any incidents, accidents and notices served by any regulatory authority while on site. The client shall further be provided with copies of any written documentation relating to any incident. The Contractor will be responsible to inform the relevant authorities of any Reportable Incidents which may occur in terms of the applicable legislation.

All correspondence with the relevant authorities regarding these incidents must be copied and kept in the OHS File.

Incident management documentation

The Contractor shall note in the OHS Plan the incident management supporting documentation which should provide for and include, at least:

- a. Legislative reporting and recording documents
- b. Contractor's own reporting and recording forms (near miss to be provided for)
- c. First aid kit contents list
- d. First aid kit inspection checklist
- e. First aid dressing register / treatment register

Medical procedure – CoVid-19

The following documentation should be submitted to the Compensation Commissioner

- a. Employer Report of an Occupational Disease (W.CL.1)
- b. Notice of an Occupational Disease & Claim for Compensation (W.CL.14)
- c. Exposure and Medical Questionnaire
- d. First Medical Report in respect of an Occupational Disease (W.CL.22) (Should list the diagnosis as U 07.1 ICD-10 code for COVID-19)

- e. Exposure history (W.CL.110) and/or any other employment history
- f. A medical report from Dr and/or Specialist
- g. Progress medical reports (W.CL.26)
- h. Final medical report (W.CL.26) once MMI reached

2.25. Method statements

Method statements, Safe Work Procedures (SWP), Safe Operating Procedures (SOP), Daily Safe Task Instructions (DSTI's)

Certain changes have been made in the Construction Regulation of 2014 in these regards and are extracted below to indicate current requirements.

Extractions from the Construction Regulations where reference to “**method(s) or method statements**” appear:

QUOTE

Construction Regulation 2003

“**method statement**” means a written **document detailing the key activities** to be performed in order **to reduce** as reasonably as practicable the **hazards identified in any risk assessment**;

Construction Regulation 2014

“**Method statement**” The description of a Method Statement was removed from definition section. ...

Risk Assessment for construction work 9.(1) ... (b) ... documented **method**;

Fall protection Plan 10.(1) ... (2) ... procedures and **methods** used to address all the risks ...

Temporary works 12.(1) ... (3) A contractor must ensure that - ... (n) a temporary works drawing or any other relevant document includes construction sequences and **methods statements**; ...

Excavation 13 (2) A contractor who performs excavation work – ... (k) must, where the excavation work involves the use of explosives, appoint a competent person in the use of explosives for excavation, and must ensure that a **method statement** is developed by that person in accordance with the applicable explosives legislation; and ...

Demolition work 14. ... (2) A Contractor must ensure that before any demolition work is carried out, and in order to ascertain the method of demolition to be used, a detailed structural engineering survey of the structure to be demolished is carried out by a competent person and that a **method statement** on the procedure to be followed in demolishing the structure is developed by that person. ...

(11) Where the demolition work involves the use of explosives, a **method statement** must be developed in accordance with the applicable explosive legislation, by an appointed person who is competent in the use of explosives for demolition work ...

Cranes 22. A contractor must, in addition to compliance with the driven Machine Regulations, 1988 ensure that where tower cranes are used – ... (b) a relevant risk assessment and **method statement** are developed and applied; ...

UNQUOTE

It is therefore a legal requirement that method statements be prepared for:

- a. Temporary Works;
- b. Excavation;

- c. Demolition Work; and
- d. Cranes.

Anywhere else, but not exhausted, where method(s) is used the contractor must prepare at least the applicable SWP / SOP or DSTI for such method statement.

2.26. Health and Safety File

Based on the scope of work the health and safety file shall include and address, but not limited to, the items set out in the relevant specifications as stipulated by Langeberg Municipality.

2.27 Hand tools

The purpose of this procedure is to ensure employees understand and practice the general safety requirements when using hand tools.

There is a big variety of hand tools in the market. The objective of this is to cover the basic safety principles of a hand tool. The responsibility lies with the Contractor to ensure employees are aware of the safety requirements on any given specific hand tool

Hazards / Risks

- Hand injury from broken or homemade tools.
- Hand injury from incorrect storage of hack saw / "Stanley" knife.
- Eye injury from using a hammer and chisel.
- Hand/body injury from forcing tools beyond their stress capability.

Control Measures to Minimize Risks

- Fitter/leather Gloves to prevent cuts from sharp edges.
- Safety glasses to prevent eye injuries when using tools that can projectile foreign objects (Chisel, Copper hammer, etc.)
- Routine inspections to ensure tools are in safe working order.
- × Never throw a tool to another person.
- × Never leave your tools lying around.
- × Never use a hammer with a loose head.
- × Never use none insulated tools for live electrical work.
- × Never use tools which have been declared unfit/unsafe.
- × Never use another spanner as leverage on a spanner.
- × Never leave tools lying on ladders.
 - a) Always keep your work area clean and neat.
 - b) Always wear safety glasses and gloves if you are going to work with a hammer, metal file, hand saw and any tool that might produce flying objects and sharp edges.
 - c) Always report damaged or worn tools by end of shift.
 - d) Always grind off mushroom heads on chisels and copper hammers.

Pre-Start Procedure

1. Check the condition of the tool before use.
2. Make sure the tool is the correct tool for the job. (Example: correct size and fitment)

Job Steps

1. Inspect tool for wear and damages.
2. Put your gloves, safety glasses and long sleeve overalls on if necessary.
3. Store the toolbox or tool bag out of walkways.
4. Select a tool that is appropriate for the job.
5. Do the job safely
6. Place tool in a carry container until the tool is going to be used again.

2.28 Registers & Checklists

A tabular layout should be included in the contractor's Health and Safety Plan. It is important that the legal required frequencies are adhered to and must therefore be stipulated. (Sample included in Annexure below)

2.29 Legal Appointments

A tabular layout should be included in the contractor's Health and Safety Plan to correspond with the contractor's organogram depicting a list of legal appointments. (Sample included in Annexure below.) Section 2.1 above depict the layout of such appointments.

2.30 Health and Safety Budgets

Construction Regulation 5.(1)(g) requires that the client must ensure that a potential contractor has made adequate provision for the cost of health and safety measures. This includes the following, but not only limited to: Medicals, PPE, Fire-fighting, First Aid, Health and safety personnel, Facilities, Fall Protection, Vehicle and equipment upgrade for use on site, Lifting machinery and equipment, Insurance, First Aid, Training, Signage, Electrical & Plant and Scaffolding.

A contractor should prepare and submit, in tabular form as an annexure, their health and safety budget.

Should a contractor exclude various items as noted above or indicate a no costs, in his own discretion, to an item it will be understood that such costs are included in the contractor's tender costs.

Re-useable items (equipment) costed and claimed in such Budget and approved by the client, e.g. road cones, testing equipment, fire extinguishers, etc., become the ownership of the client after the project has been completed.

3. Environmental restrictions and existing on-site risks arrangements

3.1 Fall protection

Where a fall protection plan is required a competent fall protection planner with SAQA US 229994 certificate must be made available with such plan.

Where employees then work at heights / elevated positions those employees should be trained with a SAQA US 120362.

The person(s) erecting scaffolding must proof competencies with a SAQA US 263205 and for a scaffolding inspector SAQA US 263205.

Where fall arrest systems are implemented SAQA US 229995 and SAQA US 229998 be required.

- a. An additional pre-emptive Risk Assessment will be required for any work to be carried out where there is a fall risk and will be classified as "Working at Heights".
- b. As far as is practicable, any person working in an elevated position will work from a platform, ladder or other device that is at least as safe as if he/she is working at ground level and whilst working in this position, as required by the risk assessment contemplated above, shall wear and use a full body harness that will prevent the person falling from the platform or other device utilised. This safety harness will be, as far as is possible, secured to a point away from the edge over which the person might fall and the double lanyard must be of such length that the person will not be able to move over the edge.
- c. Any platform, slab, deck or surface forming an edge over which a person may fall must be fitted with suitable guard rails at two different heights as prescribed in SABS 10085-1 Code of Practice for the Design, Erection, Use and Inspection of Access Scaffolding.
- d. Where the requirement above is not practicable, the person will be provided with a full body harness that will be worn at all times and shall be attached above the wearer's head at all times. The lanyard must be fitted with a shock-absorbing device or the person must be attached to a fall arrest system (anchorage connector; body wear; and connecting device).
- e. Where the requirements above are not practicable, a suitable catch net must be erected. Employees working at heights must be trained to work without risk to their health and safety or that of others and be declared medically and psychologically fit to perform work at elevated positions. Proof of medical fitness and working at heights training must be maintained in the Contractor's OHS File.
- f. Where work on roofs is carried out, a risk assessment must be performed and take into account the possibility of persons falling through fragile material, i.e. skylights and openings in the roof. The Risk Assessment shall place specific emphasis on the placing and handling of roofing materials such as IBR Sheeting or similar materials, (including contingency safety measures), which when exposed to windy conditions represents a serious safety hazard.
- g. The Contractor shall ensure a comprehensive fall protection plan and rescue procedure is drafted by an appointed competent person who is trained and knowledgeable in the development of such plans.
- h. All employees required to perform work in elevated positions shall be trained and conversant with the requirements of the fall protection plan and the rescue procedure.

Fall Arrest Equipment:

- a. Each employee required to perform work at elevated positions shall be issued with a body harness for his/her exclusive use. No harnesses should be shared
- b. Fall arrest equipment shall be inspected prior to use by a competent person
- c. Fall arrest equipment must be stored in such manner as to not compromise the integrity of the equipment
- d. Employees required to use fall arrest equipment shall be sufficiently trained in the correct use thereof
- e. Records of training and inspections shall be maintained in the OHS File.

3.2 Fall prevention

Elevated positions including roof work

The Principal Contractor shall ensure that a detailed fall protection plan, rescue plan and HIRA has been undertaken and submitted for approval to the CLIENT before commencement of such activity on site. Such plan shall include (but not limited or exhausted) to: Introduction, Scope, Goals, Definitions, Worksite Information, Fall Protection Risk Assessment, Designations and Responsibilities, Training Management, Employee Health Management, Equipment Management, Operating Procedures, Rescue Procedures, Document Review and Amendments, Records – Training, Records – Medical Certificate of Fitness, Records – Inspection Registers & Records – Staff Register and Personal Details.

Where working on roofs take place the slope of the roof may cause edge protection to be implemented.

Working at heights

The Principal Contractor shall ensure that a detailed fall protection plan, rescue plan and HIRA has been undertaken and submitted for approval to the CLIENT before commencement of such activity on site.

All work at height must be:

- Appropriately supervised;
- Properly planned; and
- Carried out in a manner which is safe.

A detailed risk assessment and a fall protection plan that is site and task specific must be approved before working at height may be done. Please ensure that supervision is conducted as per Construction Regulation section 10, a competent person qualified for fall protection development.

Suitable and sufficient means must be provided to prevent workers falling from height. This must include the following measures supplied by the contractor appointed on the project:

- a. Scaffolding to allow safe access, both externally and internally;
- b. Scaffolding to be signed off weekly and after inclement weather;
- c. Internal Scaffolding to be erected for roof work acting as a working platform;
- d. Suitable working platforms to ensure safe access to all elevated areas;
- e. Suitable fall protection for worker working at height (harness); and
- f. Lifelines.

Ladders must only be allowed when it is not possible to use other more suitable access equipment (Scaffolding or platform / podium steps) for access or work of short durations (less than 10 minutes) and where 3 points of contact can be maintained at all times by the person working on the ladder. Suitable platforms must be used where both hands are required to be free and only in cases where it is not possible to use other more suitable access equipment e.g. scaffolding.

Where a slab is being prepared solid edge protection should also be put in place at a height of 1m above floor level.

Ladders and Ladder work

The Principal Contractor shall ensure that all ladders are numbered and inspected regularly keeping record of inspections. It should be noted that Aluminium ladders are preferred to wooden ladders. Ladders must be selected as suitable for the work to be performed.

3.3 Roof work

When working at heights during the roof erection work scaffolding will be erected in the inside of the structure to prevent the employees from falling to the ground.

Again, the employees working at height are required to make use of safety harnesses and fall prevention techniques to be put in place like safety cables / attachment slings.

Where work on roofs is carried out the Risk Assessment must take into account the possibility of persons falling through fragile material, skylights, soffits and openings in the roof, steel support work trusses and purlins so designed to support the roof structure.

The Risk Assessments shall place specific emphasis on the placing and handling of roofing materials which when exposed to windy conditions represent a serious safety hazard or overload factor.

Where working on roofs take place the slope of the roof may cause edge protection to be implemented.

All life lines and secure/anchor points must be designed and signed off by a competent appointed person or Design Engineer.

Life lines, fall arrest equipment and fall prevention equipment must be inspected prior to use and have a SWL displayed and the SWL certificate must be kept on site.

All fall arrest and fall prevention equipment shall be subject to inspections and tests as required by the Regulations and SANS standards and records of such inspections and tests kept in the site health and safety file.

3.4 Falling objects

Erect a catch platform or net above an entrance or passageway or above a place where persons work or pass under, or fence off the danger area if work is being performed above such entrance, passageway, or place so as to ensure that all persons are kept safe where there is a danger or possibility of persons being struck by **falling objects**.

3.5 Structures

Existing structures

Contractor will always have in place an emergency plan. The prevention of fire damage, fragility and stability of existing structures is of utmost importance to complete this project in time.

Existing structures with recognized hazard will be reported to the client and Contractor will assist the client to improve the quality of compliance to structural integrity of such structure.

New Structures

During construction Contractor will adhere to the design specifications of the appointed engineering consultant. Pre-cast inspections of steel lay down are implemented in the registers and engineers have to approve pre-cast registers on site. Contractor will adhere to the removal of supports in accordance to the requirements to prevent any uncontrolled collapse of such structure.

When environmental conditions create bad conditions employees will not be allowed to use such uncompleted structure as a hiding place during inclined weather.

3.6 Temporary works

Contractor will adhere to the erection and removal of temporary structures for the casting of slab supports in accordance to the requirements to prevent any uncontrolled collapse of such structure. The engineering design or competent person will stipulate safe removing of such support and document such in the register.

3.7 Excavations and Ground Conditions

Excavation

Survey must be done to determine soil conditions, compaction and location of underground services. Where the uncertainty pertaining to the stability of the soil exists, the decision (documented) from a professional engineer or a professional technologist competent in excavation shall be decisive and such a decision shall be in writing and signed by both the excavation supervisor and the professional engineer or technologist as the case may be.

Excavation supervisors and / or construction manager must have a SAQA US 365183 competency certificates (or obtain one within the first month after appointment).

The following conditions should also be complied with for excavation:

- a. Excavation should be sloped to prevent collapse;
- b. Excavation should be shored / braced to prevent caving / falling in;
- c. Soil dumped at least 1m away from edge of excavation
- d. On sloping ground soil should be dumped on lower side of excavation;
- e. Use of stop blocks and signs for dumpers and place a banksman;
- f. If more than 2-meter-deep shoring must be used and safe access be provided and must be seen as a confined space entry;
- g. Protect vehicles from falling into excavation;
- h. Provide barriers and signage and lights at night;
- i. Beware of undermining adjacent structures integrity;
- j. Appoint only a competent person as excavation supervisor;
- k. Ensure that no load or plant is placed near excavated areas; and

Work strictly according to the plans provided by the client when searching for current and existing services. Stop work when the current or existing services have not been found within a radius of 1 meter and consult the client's representative before commencing. Preliminary safety talks will be noted and the potential hazards explained to all employees prior to works. Digging will commence with hand tools at all times when looking for existing services.

Caution should be taken and emergency measure put in place when digging in areas where flooding may occur

The Excavation Supervisor to inspect:

- I. Daily, prior to each shift;
- II. After an unexpected fall of ground;
- III. After any damaged to supports, bracing or shoring;
- IV. After Rain

3.8 Demolition works

The Contractor must ensure that before any demolition work is carried out, and in order to ascertain the method of demolition to be used, a detailed structural engineering survey of the structure to be demolished is carried out by a competent person and that a method statement on the procedure to be followed in demolishing the structure is developed by that person.

The Contractor is required to appoint a competent person to supervise and control all demolition work on site. During demolition, the competent person must inspect the structural integrity of the structure at intervals determined in the method statement, in order to avoid any premature collapses.

Contractors who perform demolition work must ensure that:

- a. no floor, roof or other part of the structure is overloaded with debris or material in a manner with regard to a structure being demolished;
- b. Sufficient steps to ensure that all reasonably practicable precautions are taken to avoid the danger of the structure collapsing would render it unsafe;
- c. When any part of the framing of a framed or partly framed building is removed or when reinforced concrete is cut would render it safe; and
- d. Precautions are taken in the form of adequate shoring or other means that may be necessary to prevent the accidental collapse of any part of the structure or adjoining structure.

Further:

- a. Ensure that no person works under overhanging material or a structure which has not been adequately supported, shored or braced;
- b. Ensure that any support, shoring or bracing contemplated above, is designed and constructed so that it is strong enough to support the overhanging material.
- c. Where the stability of an adjoining building, structure or road is likely to be affected by the demolition work on a structure, take steps to ensure the stability of such structure or road and the safety of persons;
- d. Ascertain as far as is reasonably practicable the location and nature of electricity, water, gas or other similar services which may in any way be affected by the work to be performed, and must before the commencement of demolition work, take the steps necessary to render circumstances safe for all persons involved.
- e. Cause every stairwell used and every floor where work is being performed in a building being demolished, to be adequately illuminated by either natural or artificial means.
- f. Cause convenient and safe means of access to be provided to every part of the demolition site in which persons are required to work.
- g. Erect a catch platform or net above an entrance or passageway or above a place where persons work or pass under, or fence off the danger area if work is being performed above such entrance, passageway, or place so as to ensure that all

persons are kept safe where there is a danger or possibility of persons being struck by falling objects.

- h. Ensure that no material is dropped to any point, which falls outside the exterior walls of the structure, unless the area is effectively protected.
- i. Ensure that every chute used to dispose of rubble is designed and managed in accordance with the relevant section for waste management of this specification.

3.9 Tunneling

Where tunnelling work encounter the Contractor will appoint a competent tunnelling supervisor and have the required documentation / registers in place. No work will be conducted in tunnels with a height dimension smaller than 800mm.

3.10 Scaffolding

Scaffolding

The Principal Contractor shall ensure that a detailed fall protection plan and HIRA has been undertaken and submitted for approval to the CLIENT before commencement of such activity on site. The Principal Contractor shall appoint and train scaffolding inspectors and erectors to ensure all scaffolding is erected according to SANS 10085.

Form and Support Work for Structures

Should the design require this type of work, the Principal Contractor shall ensure that formwork and support work structures are examined and checked for suitability by a competent Person, Structural Engineer, before use, during and after placement of concrete. Records of such examinations are to be kept on the Health and Safety file.

3.11 Suspended platforms

If suspended platforms are used a competent person will be appointed to design such requirement that will provide a designer's health and safety report and certificate for the design. A competent person will be appointed to erect such platform following an operational compliance plan developed by a competent person.

Copies of the design and competent certificates for the suspended platform will be delivered to the regional Chief-Inspector for recognition.

3.12 Rope access work

Where rope access is used the contractor must ensure compliance to section 18 of the Construction Regulation and ensure that a competent person is appointed in writing as a rope access supervisor with the duty of supervising all rope access work on the site, including ensuring health and safety compliance in respect of rope access work.

In addition to the required of section 10 of the Construction Regulation, fall protection, the contractor shall provide a site, work and environment specific fall protection plan for rope access work developed by a competent person prior to the commencement of the work.

The fall protection plan contemplated above shall include:

- a. Risk assessment;
- b. Procedure to evaluate employee's medical fitness;
- c. Training for the work to be conducted;
- d. Procedure addressing the inspections, testing and maintenance of equipment; and
- e. Rescue plan.

3.13 Material hoists

The Principal Contractor shall ensure that lifting machinery and tackle is inspected before use and/or on a monthly basis. The Principal Contractor shall have lifting machinery and tackle inspector who will inspect the equipment daily or before use, taking into account that:

- All lifting machinery and tackle have a safe working load clearly indicated;
- Records of inspections and load testing certificates are kept on site.
- There is proper supervision in terms of guiding the loads which includes a trained banks man to direct and check lifting tackle if it is safe for use.

3.14 Bulk mixing plant

Where bulk mixing plants is used the contractor shall ensure compliance to Construction Regulation 20 for the construction, maintenance and operation of a bulk mixing plant on site.

Only competent and trained supervisors and operators shall be appointed in writing as bulk mixing plant operators. No person may be authorised to operate a bulk mixing plant that is not declared competent.

Safety devices provided to prevent the accidental starting of the bulk mixing plant are to be maintained and operational at all times. All machinery and dangerous moving parts of the mixer shall be adequately guarded or fenced and no such guard or fence shall be removed or modified.

Compliance to General Safety Regulation section 5 for confined spaces entry shall be adhered to when as a precautionary measure when entering any silo.

3.15 Explosive actuated fastening device

Where explosive actuated fastening devices are used the Contractor shall ensure that all the requirements and provisions of Construction Regulation 21 are implemented and maintained for explosive actuated fastening devices.

Controllers, inspectors and operators of explosive actuated fastening devices are to be competent persons appointed in writing and specifically trained and proof of training held on record.

Operators shall be issued with suitable protective equipment and the use thereof enforced. A cartridge issue and return register shall be maintained by the appointed person and cartridges shall be kept in a lockable facility and under the control of the appointed person at all times.

Warning signage to be prominently displayed in areas where explosive actuated fastening devices are used on site and such area shall be demarcated to prevent access of unauthorised persons.

3.16 Cranes

Projects classified as a CIDB Category C project may require the use of mobile cranes or truck mounted cranes.

Referencing Construction Regulation 22, Construction Regulation 27, Driven Machinery Regulation 18 and SANS 12480- 1, cranes and lifting equipment must be designed and constructed in accordance with generally accepted technical standards and operated, used, inspected and maintained in accordance with the requirements of the Driven Machinery Regulation.

The requirements of Construction Regulation 22 and Driven Machinery Regulation 18 are to be stringently applied and maintained in respect of all tower cranes, mobile cranes, lifting tackle and lifting operations. SANS 12480 shall further be applicable for the installation and use of tower cranes.

If required, the Contractor shall notify the Civil Aviation Authority of the erection of a tower crane or use of a mobile crane that exceeds the allowable limits.

3.17 Construction vehicles and plant

Construction Plant

“Construction Plant” encompasses all types of plant including but not limiting to, cranes, cherry pickers, piling frames, boring machines, and excavators, draglines, dewatering equipment and road vehicles with or without lifting equipment.

It is envisaged that such plant will be used on this project and where the need arise the Principal Contractor shall ensure that all such plant complies with the requirements of the OHS Act. The Principal Contractor shall inspect and keep records of inspections of the tools and equipment used on site. Only authorised persons are to use machinery under proper supervision. All operational manuals requirements should be complied with and checklists duly completed. Appropriate PPE and clothing and as specified by the HIRA, shall be provided and maintained in good condition at all times.

Where construction plant (hired included) operates with a joystick a “joystick protection bar” should be installed to protect the operational mechanisms from objects falling on or persons falling on the operational mechanism in case of a slip. Should a contractor not comply with this requirement the principal contractor will be fined in terms of section 4.32 as a severe non-conformance.

Hired Plant and Machinery

The Principal Contractor shall ensure that any hired plant and machinery brought to site is safe for use. The necessary requirements as stipulated by the OHS ACT as well as those that are stipulated by this OHS Specification, shall apply (see *Construction Plant* above).

The Principal Contractor shall ensure that operators hired with machinery (seen as a contractor) have proof of competency to operate the machinery, proof of medical certificate of fitness and undergo a Health and Safety induction, appropriate tool box talks and be issued with the necessary PPE.

3.18 Electrical installations and machinery

High Voltage Electrical Equipment and any electrical works

The Principal Contractor shall ensure that, where the work is under, on or near high-voltage electrical equipment that a SWP is drafted and approved by a competent person and the client's representative and that such approval document to be kept in the Health and Safety File.

Such SWP shall include relevant risk management procedures (e.g. **Lock-out Procedure**). The Principal Contractor shall communicate with and receive approval from the relevant representatives prior to commencement of any **live** or tie-in electrical works.

Portable Electrical Tools / Explosive Power Tools

The Principal Contractor shall ensure that use and storage of all explosive powered tools and portable electrical tools are in compliance with relevant legislation. The Principal Contractor shall consider that:

- A competent person undertakes routine inspections;
- Only authorised persons use the tools;
- There are safe working procedures applied;
- Awareness training is carried out and compliance is enforced at all times; and
- PPE and clothing are provided and maintained.

Telescopic Link sticks or Hotsticks

Telescopic Link sticks or Hotsticks are used by linesman to open and close solid links (open/close circuits) on overhead lines. Linesman use telescopic link sticks to carry out maintenance operations on links, fuses, live line surge arrestors and rocker isolators. These are used to provide restoration of power to sectionalised sections of overhead networks without having to climb poles.

The cylindrical shaft provides mechanical strength to the unit. Fibreglas units are foam filled at the end section for the first meter. The remaining sections are fibreglass with the telescopic buttons.

It is important to observe the minimum working distances between the operator and the live conductor. Although the telescopic link stick is tested to standards all instruments are manufactured from the highest grade electrical rated fibreglass to meet or exceed all applicable industry performance criteria including ASTM F711, ASTM F1826, and OSHA 1926.951(d). Eskom approved link sticks are manufactured to **SAP 021 2806 number D-DT-12600 standards**.

Valid Test certificates should accompany this equipment and be available in Safety files.

3.19 Flammable and hazardous materials

Hazardous Chemical Substances (HCS)

In addition to the requirements in the HCS Regulations, the Principal Contractor must **provide proof in the Health and Safety Plan** that:

- A list of flammable liquids is recorded;
- Containers is labelled accordingly;
- Safety Data Sheets (SDS's) of the relevant materials/hazardous chemical substances are available prior to use by the Principal Contractor. Mention should be made how the Principal Contractor is going to act according to special/unique requirements made in the relevant SDS's. All SDS's shall be available for inspection by the agent at all times.
- Risk assessments are to be done when new HCS are introduced on site.
- How the relevant HCS's are being / going to be controlled by referring to:
 - a) Limiting the amount of HCS;
 - b) Limiting the number of employees;
 - c) Limiting the period of exposure;
 - d) Substituting the HCS;
 - e) Using engineering controls; and
 - f) Using appropriate written work procedures.
- The correct PPE is being used.
- HCS are stored and transported according to SABS 072 and 0228.
- Training with regards to these regulations is conducted.

The Health and Safety plan should make reference to the disposal of hazardous waste on classified sites and the location thereof (where applicable) which include CoVid-19 waste.

The First Aider must be made aware of the SDS and how to treat HCS incidents appropriately.

Asbestos (Not to be used on new construction site)

The Principal Contractor/Contractor shall comply with the Provisions of Asbestos Abatement Regulations should they encounter asbestos related materials.

No new asbestos contained material should be use on this project.

3.20 Water environments

Unless water is accumulated within excavations the Contractor need to ensure that any water entrapment where public could gain access be barricaded and access restricted to such environment.

However, should such areas exist on the site the Contractor will have a trained first aider on site to assist with medical conditions as, when and where possible.

3.21 Housekeeping and general safeguarding

Contractor will provide proper storage of materials for housekeeping. In the waste management plan the disposal procedures for waste is described. No materials be place where it would interference with other operations.

Where chutes are required when waste is removed from higher levels (3 levels 9m) Contractor will install the required mechanisms.

When internal waste storage area is provided it will be fenced off and will have access control via a lock. No waste bins or other collection articles will be place at entrances or passageways, but rather on an outside wall or under an overhead screen.

The construction manager and all other employees must ensure and maintain at all time during work that;

- a. A housekeeping supervisor will be appointed
- b. Housekeeping will be managed on a **daily basis**

The appointed person will make use of daily/weekly and Monthly checklists.

- ◆ Housekeeping is continuously implemented and maintained;
- ◆ Materials and equipment are properly stored;
- ◆ Scrap, waste and debris is removed;
- ◆ Materials placed for use are placed safely and not allowed to accumulate or cause obstruction to the free-flow of pedestrians and or other employees;
- ◆ An unimpeded work space is maintained for every employee;
- ◆ Every workplace is kept clean, orderly and free of tools, materials and the like that are not required for the work being done;
- ◆ As far as is practicable, every floor, walkway, stair, passage and gangway is kept in good state of repair, skid-free and free of obstruction, waste and materials

3.22 Stacking and storage

Stacking of Materials

The Principal Contractor shall ensure that there is an appointed stacking and storage supervisor for all materials, scaffolding and all equipment that are stacked and stored in accordance with legislation.

All materials shall be neatly stacked in a designated lay down area within the confines of the Principal Contractor's allocated construction area.

3.23 Fire precautions

The importance of fire protection and precautionary measures is recognised and arrangements shall be implemented to ensure that adequate procedures are adopted to **prevent risk** of injury or damage from fire.

Non-Smoking signs will be places in close proximity of the stores and where any flammable materials are stored.

Good maintained fire-equipment will be place at appropriate intervals.

Sufficient number of employees will be trained with fire equipment.

Contractor will be reliant on the existing Escape plan of the institute or otherwise put in place its own Escape and evacuation plan.

Competent **Fire Fighter must be appointed** for this project and will manage all Hot works and any other task that may result in possible fire. Such competent person should carry the correct SAQA qualification. Additionally, to a Fire Fighter a **Fire Equipment Inspector** must also be appointed with at least a similar qualification as the Fire Fighter.

Fire prevention procedures require HOT work Permits to be in place with the required Fire Equipment available on site, Site require trained employees when any Hot work is required.

Once Hot Work Permit is signed and in place work may commence.

Smoking will be limited to smoking area.

No open flames are allowed in or near site.

All electrical equipment will be checked for loose wires.

All flammable substances are removed from hot works area.

Fire Extinguishers and Fire Fighting Equipment

The Principal Contractor shall provide adequate regularly serviced fire extinguishers located at strategic points on site. The Principal Contractor shall keep spare serviced portable fire extinguishers. Safety signage shall be posted up in all areas where fire extinguishers are located.

Employees should be trained on using the correct type extinguisher for the correct application (electrical, wood, chemicals, etc).

The Principal Contractor shall have adequate persons trained or competent to use the Fire Fighting Equipment.

3.24 Construction employees' facilities

Where the client does not authorize the use of existing facilities the Contractor will provide at least 1 shower for each 15 employees on site. Contractor will provide at least one sanitary facility for each sex and for every 30 employees. There will be changing facility for each sex. A temporary shelter eating area will be erected and made available to employees.

3.25 Contaminated land

Any contaminated land will be handled through the environmental management plan.

3.26 Client activities (risks)

The client may have ongoing lectures or students occupying residential facilities there for the Contractor will accommodate such activity. Where major work is required adjacent to such lecture rooms Contractor will pre-warn the facility of such activities and mutually agree upon action to be taken.

3.27 Manual handling of materials

Manual material handling will occur and Contractor will find the most **ergonomic** manner to work with such requirement ensuring that no employees stand chance for injuries.

3.28 Noise and vibration

Noise Induced Hearing Loss (NIHL)

Where noise is identified as a hazard, the requirements of the NIHL regulations must be complied with and means of compliance is to be stipulated in the Health and Safety Plan.

The Contractor is to ensure that noise is minimised to acceptable levels and try to conduct noisy activities at times where it would not make any nuisance to the institution. Proper planning and finding means of reducing noise levels with regards to these activities is highly encouraged. (See also section 3.31)

Vibration:

Any excessive vibration can cause Hand-arm vibration syndrome (Raynaud's phenomenon).

Employees working on vibrating equipment must take regular breaks.

When working on vibrating equipment a kidney belt and approved gloves is to be worn where applicable.

3.29 Working near fragile materials

Cautionary manners will be implemented when working in close proximity of fragile materials. A no-smoking - and use of mobile phone policy must be in place.

3.30 Traffic planning

The contractor must ensure that all the necessary traffic/vehicle and pedestrian accommodation safety measures are taken into account to ensure the safety of personnel and members of the public (including site visitors) both on site and adjacent to site.

Such measures must be in accordance with recognized practices and be pre- approved by the Client and if required by the local municipality and traffic authority.

The contractor must place the necessary emphasis on safe pedestrian walkways and routings throughout the construction stage. The site is located in a densely populated area with pedestrian walkways on two sides of the site.

Roadways are situated directly behind these walkways. Traffic and pedestrian accommodation drawings must be available on site as a source of reference and to assist with daily inspections and enforcement.

During construction the contractor must ensure that dust suppression through watering is utilized. When mud damage to the adjacent roads is due to the construction on site the contractor will remove these obstacles from the adjacent roads.

3.31 Monitoring of noise, silica and dust levels

Contractor need to implement sufficient precaution to ensure that the construction activities reduce their noise to the lowest possible level.

Silica and dust levels are kept to an acceptable level and that it does not pose a threat to the Health and Safety of employees, adjacent residents or the public on the premises.

3.32 Confined spaces

Areas identified as confined spaces as defined in General Safety Regulation GNR 1031 of May 1986 are (but not limited to):

- All tank manholes;
- Dispenser Sumps;
- Trenched less than 1m wide and deeper than 1.5m;
- Ceiling crawl space;
- Canopy crawl space;
- Chambers;
- Sewer Pipes;
- Pipes;
- Pit;
- Container;
- Calve;
- Pump Sump or Construction equipment, machinery, dangerous liquids or dangerous concentration of gas; and
- Any object where a dangerous vapour, dust fumes may be present.

Entering and working in a confined - or enclosed space requires a Confined Space Permit. The Principal Contractor shall provide his supervisor / contractor with the permit authorized through the Client's representatives with the work procedure for authorized persons prior to work commencement.

The responsibility for safe work procedures, both at the time of entry and during the entire operation of entering and working in confined spaces, rests with the Contractor.

3.32.1 The Contractor shall ensure that:

- a. All persons working in a confined space or managing entry to a confined space are appropriately trained;
- b. Adequate steps are taken to eliminate or control hazards. Before working in an area that contains dust, the area is to be ventilated and hosed down to settle and dampen the dust; and
- c. All necessary equipment to manage confined spaces, including all necessary monitoring and rescue equipment (such as tripods, breathing equipment and the like) made available.

3.32.2 Records to be maintained by the Contractor:

- a. Confined space entry permits;
- b. Confined space entry registers;
- c. Safety harness registers; and
- d. Atmospheric monitoring results.

3.32.3 Compulsory requirements during work in and entry to a confined space:

- a. Continuous supervision and monitoring;
- b. Adequate ventilation;
- c. Communication (radio) and
- d. Trained emergency rescue teams

3.32.4 Safety equipment where applicable, but not limited to:

- a. Employees issued with gas monitoring equipment, safety harnesses and self-rescuers;
- b. Trained with the safe use of the proper safety equipment;
- c. Upon entering an excavation, the requirements of work in confined spaces, must be observed;
- d. Any confined space may only be entered after the air quality has been tested to ensure that it is safe to breathe and does not contain any flammable or noxious air mixture;
- e. The confined space must be purged and ventilated of any hazardous or flammable gas, vapour, dust or fumes if and when such hazardous or flammable gas, vapour, dust or fumes have been identified;
- f. The safe atmosphere must be maintained and, where necessary;
- g. Employees are to be provided with breathing apparatus and must wear a safety harness with a rope with the free end of the rope being continuously attended to by a person outside the confined space;
- h. An additional person, trained in resuscitation, to be in full-time attendance immediately outside the confined space;
- i. Additional serviceable breathing and rescue apparatus is kept immediately outside the confined space for rescue purposes;
- j. All pipes, ducts etc. that may leak into the confined space to be blanked off sufficiently to prevent any leakage or seepage;
- k. The contractor must ensure that all employees have left the confined space after the completion of work; and
- l. Where flammable gas is present in a confined space no work may be performed in close proximity to the flammable atmosphere.

4. H&S File requirements

4.1 H&S Practitioner preparing the file

Contractor must provide detail of the Practitioner who prepared the health and safety plan in this section that includes skills, experience and if any base is use in preparing such document.

4.2 Contact detail to H&S Practitioner

Contractor must provide contact detail of the Practitioner who prepared the health and safety plan in this section.

4.3 Copy of Construction Work Permit (CWP) / Notification of Construction Work

Where a CWP is required the client will prepare and submit such application 30 days before work is to commence. CWP must be conspicuously display at all entrances to the construction site.

Each Contractor must submit a Notification of Construction work, where the conditions specified under regulation 4. (1)(a-d) is triggered, 7 days prior to commencing on site to the department of employment and labour's provincial office.

An appendix added to the specifications give a sample layout of the required notification also found in the Construction Regulation. An electronic copy of this document may also be available from the project manager.

4.4 Complete Contact details for parties

The contractor shall place a tabular sheet in their health and safety plan that depict the detail of the Client, Professional team and Contractors management involve on the project (Annexure 1).

4.5 Physical Address for construction site and site office

This information will be depicted in the tender document and must be noted in Annexure 1 of the contractor.

4.6 Nature of the work describe

The full scope of work for the project are described in the tender documents and need to be recorded in the contractor's health and safety plan.

4.7 Commencement and completion date

Once a contractor has been appointed this information will discussed and made available.

The appointed contractor is required to provide a work schedule for the project and submit for approval before work may commence on site.

4.8 List of Contractors appointed by PC

Principal Contractor must have a list of the entire appointed contractor in the H&S file on site where it also indicates the status of each contractor in respect of man-days / month, LOG, H&S Plan approval, Notification date, Audits Conducted, etc.

4.9 Procedures to ensure PC maintain H&S file

Client's representatives will perform CR 5.1.o-p requirement audit and documentation verification on all contractors, as specified in the definition above.

4.10 Updated record of “as-built” drawings and plans

Any changes in design will be communicated to client and as build drawings for the responsible area communicated.

4.11 Criteria for design loadings for structural elements

The Client normally contract a consulting engineer for the design to handles such responsibility. Should this not be the case the principal contractor should inform the client immediately of any loading requirements to ensure all structures has the capacity to withhold the increased load capacity.

4.12 Detail of potential hazard included in structure eg. Pre- or Post –tension beams or slabs

The Client normally contract a Civil Engineer for the design to handles such responsibility. Should this not be the case the principal contractor should inform the client immediately of any encountered potential hazards.

4.13 General details of construction methods and materials

Matter expert contractors are contracted for specific scope of works. No contractor may appoint a 3rd party as matter expert to perform their contracted scope of works. Where a conflict to the contracted **contractor’s competencies and resources** occur, the detail must be declared to the Client’s representatives before approval may be granted.

4.14 Equipment and maintenance of facilities within the Structure

Contractor depends on the client’s available equipment and maintenance of facilities in the structure. When a contractor completed his scope of works any residual risk must be convened to the client’s representative in writing and communicated with the relevant facility maintenance management.

4.15 Maintenance procedures and requirements provided for the Structure

Contractor depends on the client’s maintenance procedures of facilities in the structure. Should it be found that additional requirements be implemented the contractor must inform the client in writing through the client’s representative (facility managers).

4.16 List and proof of appointments of each contractor

Contractor will include in the H&S file a list of appointed contractors. Refer to 4.8 & 4.13 above as well.

4.17 Procedures to approve, monitor and review all Contractors H&S files on site for the project

The Principal Contractor shall implement a Contractor Management System to ensure compliance to the OHS Act and OHS Specifications. The Contractor Safety Management System procedures are to be stipulated in the Health and Safety Plan.

Contractor will implement the following process for contractor evaluation:

- a. Provide the Contractor with the Client's Health and Safety Specifications (this specifications);
- b. Provide the Contractor with the Principal Contractors Health and Safety Plan;
- c. Negotiate and approve the contractors Health and Safety plan;
- d. Approve Contractors competencies, resources & budget;
- e. Approve Contractors implementation of Health and Safety file to site by issuing a Certificate to Commence ("CCC");
- f. Monthly compliance documentation verification and site audit ("Periodic Site Audit");
- g. Submit a **hard copy** to the contractor within 7 days (CR 5.(1)(p))
- h. Issue PSA certificate on audit;
- i. Site visit reports and closure of audit findings; and
- j. Close-out report and indicate man-days of project per contractor.

4.18 Manuals for operating and maintenance procedures and schedule for plant and equipment

Contractor will keep Risk Assessment; operational manuals & Checklist accompanied any plant or equipment.

When a contractor completed his scope of works any residual risk must be convened to the client's representative in writing and communicated with the relevant facility maintenance management.

4.19 Details of location and nature of utilities and services (emergency and fire-fighting systems)

The Client will ensure that the contractor be inducted on site indicating access to all the arrangements, utilities and services on the site.

Should this not be the situation then the Contractor will prepare an induction and provide this to its employees and appointed contractors.

4.20 Responsible for “as-build” drawings

Any changes in design will be communicated to the client and as build drawings for the responsible area communicated and handed over to the client after the project is completed.

4.21 Procedures for marking–up drawings to as-build

The Client contracted a Civil Engineer for the design and handles such responsibility.

4.22 Procedures to pass on residual risk information to those who need such

In accordance to section 6. (1)(d) of the Construction Regulation the designer are responsible to document in a report to the client the residual risk of the design before the project goes out on tender.

Any changes in design need to be communicated to the client and as build drawings for the responsible area communicated.

4.23 General Record Keeping

The Contractor shall keep and maintain Health and Safety records to demonstrate compliance with the OHSS and the OHS Act in the frequency describe in the contractor’s health and safety plan. The contractor shall ensure that all records of incidents, spot fines, training etc. are kept on site.

All documents shall be available for inspection by the CLIENT, his nominated representative or the Department of Employments and Labour’s Inspectors.

4.24 Unanticipated Hazards (Inclusive of adverse weather such as strong winds)

Any contractor shall immediately notify the CLIENT of any hazardous or potentially hazardous situations arising during the performance of activities. **CoVid-19 is known hazard.**

A record must be minute in the monthly progress meetings regarding **rainfall and working days lost.**

4.25 Occupational Health and Safety Signage

The Contractor shall ascertain and provide adequate on-site Warning, Prohibition, Mandatory and General Signage and adhere to those instated by the Client.

The Contractor shall be responsible to maintain the quality and replacement of signage.

4.26 Occupational Safety

4.26.1 Site Access, Speed Restrictions and Protection

The Contractor shall ensure that a separate entrance/exit to the construction site is opened and erected for the sole use of construction activities.

The exact opening shall be discussed and agreed upon with the client representatives. The Contractor shall ensure that all persons in their employ and all those that are visiting the site are aware and comply with the site speed restriction(s).

The speed limit is set to not exceed 20km/h when entering grounds/site.

4.26.2 Pressure Equipment or Gas Bottles Including Operations

Should such equipment be used, the Principal Contractor shall comply with Pressure Equipment Regulations, including:

- Providing competency and awareness training to the operators;
- Providing PPE or clothing;
- Providing and maintain appropriate signage in areas where Pressure equipment are used;
- Inspect equipment regularly and keep records of inspections;
- Providing appropriate firefighting equipment (Fire Extinguishers).

4.27 General Machinery

The Principal Contractor shall comply with the Driven Machinery Regulations, which include inspecting machinery regularly, appointing a competent person to inspect and ensure maintenance, issuing PPE or clothing and training those that use machinery and enforce compliance.

As a precautionary matter it is a requirement that a **protective bar** be placed over the joystick / control of movement of machinery to prevent any uncontrolled operation of the machinery if a person or material falls on top of the controls.

The Principal Contractor shall report in the minutes of the progress meeting the type of machinery on site.

4.28 CIDB Health and Safety Plan Audit

The CIDB has gazette a best practice Standard for Health and Safety Plans and auditing requirements (Grade 2 to 9), Vol 641 9 November 2018 No 42021 and the principal contractor should adopt such layout as **standard for the layout of the Principal Contractor's Health and Safety Plan to ensure a fair evaluation.**

4.29 HIV/Aids Programme (when applicable)

Client commits itself to providing guidance and leadership in the implementation of HIV and AIDS, TB and Sexually Transmitted Infections (STI) programmes by all stakeholder organisations. It is a requirement that Principal Contractors shall provide HIV/Aids awareness training and roll out an HIV/Aids Programme for all employees.

The HIV/Aids Awareness Programme Requirements:

- HIV Programme Coordinator appointed (part-time)
- Appoint and train Peer Educator/s (Part-time)
- Male condom dispensers, sufficient male condom available and is it placed in high trafficked areas.

- Female condom dispenser, sufficient female condoms available and is it in high trafficked area
- All types of HIV/Aids related posters displayed in a high trafficked area and in a good condition.
- HIV/Aids Awareness workshops/tool box talk
- HIV/Aids Prevention Measures
- HIV/Aids Care and Support
- Free voluntary HIV testing

Duties of the HIV/AIDS Coordinator:

- Ensure on-site programme implementation
- Ensure Peer Educators are elected, trained and active and supported
- Ensure Voluntary Counselling and Testing takes place
- Ensure awareness talks and education initiatives take place
- Posters, awareness materials and condoms are freely available on site
- Ensure that evidence of programme implementation is readily available
- Facilitate Site Management commitment

No Principal Contractor shall require an employee, or an applicant for employment, to undertake an HIV test in order to ascertain that employee's HIV status. As provided for in the Employment Equity Act, employers may approach the Labour Court to obtain authorisation for testing.

All Personnel must be encouraged to undertake voluntary testing. Voluntary Testing and Counselling (VCT) must be encouraged by all Principal Contractors.

4.30 Non-Compliance to set requirements

Should it be found that the principal contractor is in non-compliance with the specifications or their approved Health and Safety Plan, the Occupational Health and Safety Practitioner has the responsibility and authorization to stop any activity or all construction until compliance has been reached. The cost of stoppage on site due to non-compliance will be borne by the principal contractor / contractor

In the event of extra audits being done by the OHS Practitioner due to ongoing non-compliance, non-availability of Safety File or an audit score less than 80%, the **cost of that additional audit will be borne by the principal contractor** / contractor and will be equal to the amount as stipulated in the agreement with the client.

The appointed Safety Officer for the principal contractor will be required to draft a **close-out report** after each audit. The close-out report must address all non-conformities identified during the audit and highlight the measures taken to rectify the non-conformity. This report must be forwarded to the OHS practitioner **within 24-72 hours of receiving** date of the audit.

Should the construction work run longer than the anticipated project period the Principal Contractor / Contractor will be liable for the cost of the additional health and safety audits.

4.31 Handling conflict of interest

The following is accepted during the course of the contract:

The potential Principal Contractor may appoint only one construction manager for the project and various construction supervisors on each area of responsibility should work be active on more than one area.

The client's health and safety practitioner can assist the Principal Contractors management to ensure the health and safety requirements, as set out by these specifications and the Health and Safety Plan of the Principal Contractor, are complied with at a cost to the Principal Contractor.

Should the Principal Contractor appoint a contractor these contractors can request the client's health and safety practitioner to assist with their required documentation for health and safety compliances on this project without any conflict of interest.

4.32 Penalties

Should, at any time, the works, or part of the works, be stopped due to unsafe acts or non-compliance with the Clients or PCs OHS Plan; neither the PC nor any other Principal Contractor or Contractor shall have a claim for extension of time or any other compensation.

In cases of any **repetitive non-conformances**, the non-conforming party shall be penalised as per the table below:

The following constitute examples of the types of non-conformances that will attract penalties:

<u>Minor:</u> Fine: R1,000/count	<u>Medium:</u> Fine: R5,000/count and a non-conformance	<u>Severe:</u> Fine: R10,000/count, a non-conformance and/or activity stoppage
Non-use of basic PPE supplied (e.g. Overalls, Safety Shoes, Hardhats) per person	Toilets not supplied or regularly serviced; lack of drinking water	Principal Contractors working without OHS Plan approval
Non completion of registers for plant and equipment on site	Principal Contractors not audited	Workers transported in contravention of the OHS Plan or legal requirements
Lack of OHS signage at work areas	Working without training or the appropriate OHS SWP / HIRA	Invalid/expired Letters of Good Standing with licensed Compensation Insurer
Tools and equipment identified in poor condition during inspections	Non-conformances identified during the previous audit and not addressed within the agreed time frame	Allow people to work at heights without proper training and PPE

	No internal monthly Audit Report on file.	Fall Arrest Harness not tied off / worn when a risk of falling exists
	No Medical Certificates of Fitness for relevant workers	Threat to the OHS of persons
	Unsafe work at heights	3rd Offence on Unsafe Work at Heights
	Poor Housekeeping	Failure to submit consolidated Health and Safety report and relevant document.

All penalties shall be communicated to the Principal Contractor on a monthly basis.

The Principal Contractor will be expected to confirm receipt of such penalties. The total deductible amount as per penalties issued shall be tabled in the Monthly Progress Meeting for noting purposes. All monthly penalties shall be deducted from the Certified Certificates submitted by the Principal Contractor.

4.33 Project Close - Out Requirements

Upon completion of the project, the Principal Contractor shall submit a well-documented consolidated Health and Safety file (to be in electronic form) confirming the H & S history of the project.

The following **summary** of information is required in the file, but not limited to:

- Final closure of all registers and checklists;
- Monthly Health and Safety audit reports;
- Minutes of the Health and Safety Committee meetings (Min every 3 months);
- Summary of Incidents & IOD report;
- WCA /COIDA Claims;
- Total Man-hours and DIFR (0:200,000);
- Environmental rehabilitation status;
- Copies of Pre and Post Employment Medical Certificates of all employees that worked on the project (Medical surveillance and final declaration) where applicable;
- Health and Safety Non-conformances (current / outstanding); and
- Copies of all Hazardous Waste Disposal Certificates (where applicable)

Handover of the consolidated Health and Safety file can only commence once all personnel has been demobilized and **nil man-hours** are recorded. Electronic submission must be provided to the CLIENT, or its Health and Safety Advisor, who are required to store this information for 3 subsequent years.

The Health and Safety Advisor or - Agent will evaluate the Health and Safety performance of the Principal Contractor i.e. compliance, performance, quality and refer in a cover letter which will be added to the Principal Contractors consolidated file with the contractor's close-out report.

Acknowledgement:

I, _____ representing _____ as Contractor have satisfied myself with the content of the Occupational Health and Safety Specification (OHSS) and shall ensure compliance and that the personnel and other people visiting the site comply with all relevant obligations in respect thereof.

Signature of Principal Contractor

Date

Signature of Principal Agent

Date

Signature of Client

Date

Comments:

Annexure 1 – Professional team and information on this project

Annexure 2 - Notification of Construction work

Annexure 3 - Organogram

Annexure 4 - Legal Appointments

Annexure 5 - Registers & checklists

Annexure 6 - Returnable Documents

BASELINE Risk Assessment

Annexure 1 – Professional team and information on this project

<u>CLIENT:</u>	Name	Person	Email
Name of Client			
Address			
Project Name			
Client's Contact Person			
<u>DESIGN TEAM:</u>			
Consulting Engineer			
OHS Practitioner			
<u>PRINCIPAL CONTRACTOR</u>	<u>Tender</u>		
Name of PC:			
16.1			
16.2			
8.1			
8.7			
<u>CONTRACTORS</u>	To be announced	List of contractors will be in H&S file	
Plumbing			
Electrical			
<u>MAJOR SUPPLIERS</u>	To be announced	List of contractors will be in H&S file	
<u>EXTENT AND LOCATION OF:</u>			
Relevant existing records		To receive from client	
Surveys		To be conducted with appointment	
Site investigation & Geotechnical reports		To be conducted with appointment	
Records of "as-built" drawings		To received from client	
H&S File			In site office
Maps			

Annexure 2 – Notification of Construction Work

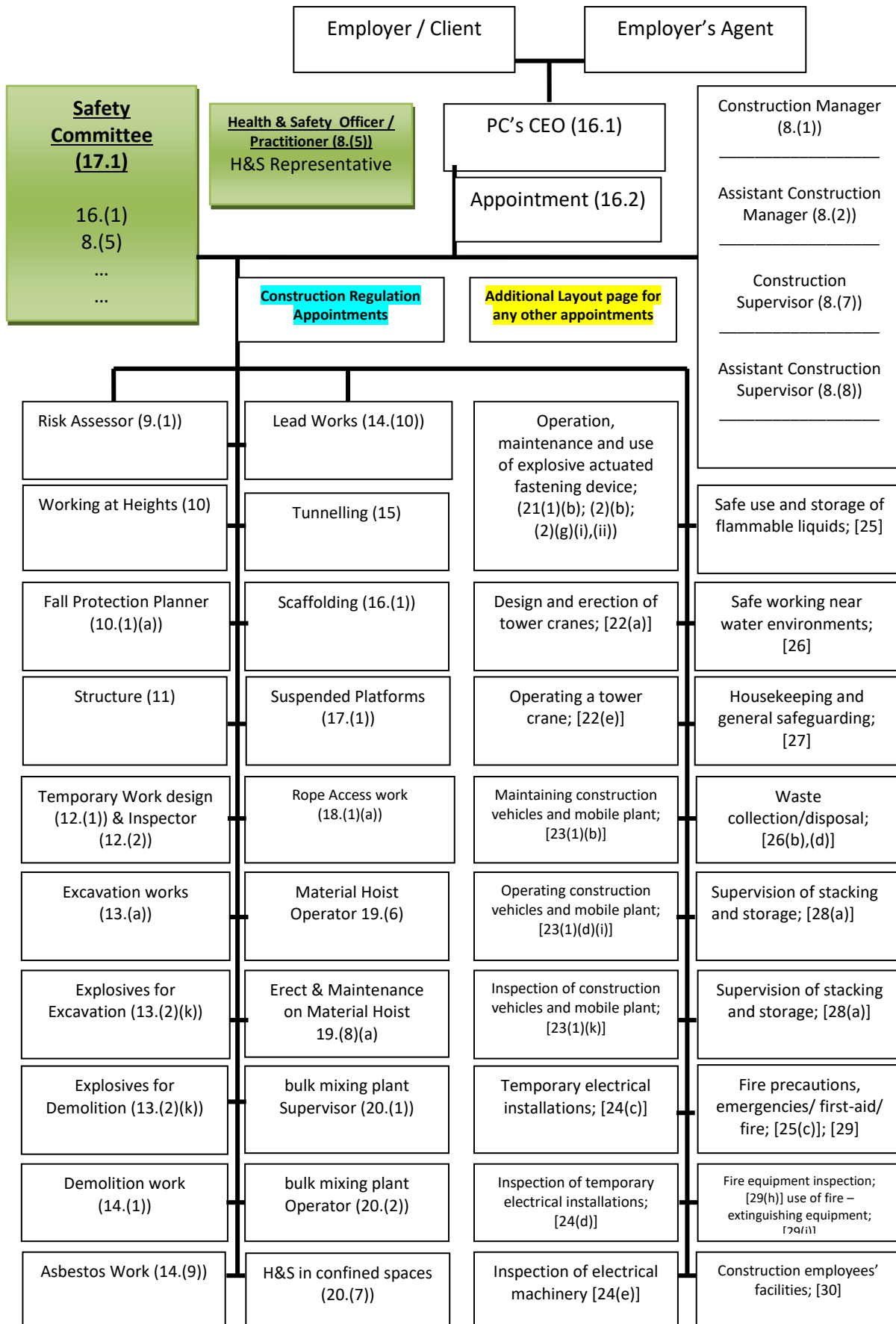
ANNEXURE A- NOTIFICATION OF CONSTRUCTION WORK**Regulation 4 of the Construction Regulations, 2014****Ref: Nqubela**

1 (a)	Name and postal address of principal contractor:	
(b)	Name and telephone number of principal contractor's contact person:	
2	Principal contractor's compensation registration number:	
3 (a)	Name and postal address of client:	Langeberg Municipality, 28 Main Street, Ashton
(b)	Name and telephone number of client's contact person or agent:	
4 (a)	Name and postal address of designer(s) for the project:	CLINKSCALES MAUGHAN-BROWN 39 Victoria Street, George, 6529
(b)	Name and telephone number of designer's contact person:	Johan De Villiers, 082-331.47.40, jdevilliers@cmbgeorge.co.za
5	Name and telephone number of principal contractor's construction manager on site appointed in terms of regulation 8(1):	
6	Name/s of principal contractor's subordinate managers on site appointed in terms of regulation 8(2):	
7	Exact physical address of the construction site or site office:	Nqubela, Robertson, 6700
8	Nature of the construction work:	Electrification of Low-Cost Housing
9	Expected commencement date:	
10	Expected completion date:	
11	Estimated maximum number of persons on the construction site:	Total: Male: Female:
12	Planned number of contractors on the construction site accountable to principle contractor:	
13	Name(s) of contractors already selected:	

Principal contractor_____
Date_____
Client's Agent (where applicable)_____
Date_____
Client_____
Date

THIS DOCUMENT TO BE FORWARDED TO THE OFFICE OF THE
DEPARTMENT OF LABOUR **PRIOR TO COMMENCEMENT** OF WORK ON SITE

Annexure 3 - Organogram



Annexure 4 – Legal appointments

Each appointment letter shall indicate:

- Legal reference to the appointment requirement;
- The name of the person appointing and his / her designation;
- The name of the company who this person represents;
- The name of the appointee and the appointment;
- The detail of the site / address
- Period of validity of such appointment (not longer than 3 year);
- Signature of the Company's representative making the appointment & date of signature;
- Duties or reference to requirements in regulations (to include Checklists & Registers);
- Acceptance of appointment;
- Signature of acceptor and date; and
- Designation.

All contractors including the professional team members has to ensure that an arrangement is in place to ensure all their employees have valid medical certificates of fitness.

Sample of tabular list to be included in health and safety plan (not limited or exhausted to only these

Appointment description (Safety File)	Appointment required in terms of	
Assistant to Chief Executive Officer	OHSACT Section 16(2)	
Principal contractor for each phase or project	Construction Regulation 5(1)(k)	
Construction Manager	Construction Regulation 8(1)	
Construction Supervisor	Construction Regulation 8(7)	
Assistant Construction Supervisor	Construction Regulations 8(8)	
CHS Officer registered with SACPCMP	Construction Regulation 8(5)	
Construction vehicle and mobile plant operator	Construction Regulation	
Construction vehicle inspector	Construction Regulations	
CoVid-19 Compliance Officer	Dept Labour and Employ. Guidelines	
CoVid-19 Manager	Disaster Management Act	
Demolition Supervisor	Construction Regulation	
Electrical installation and appliances inspector	Construction Regulation 24	
Emergency evacuation controller	Construction Regulation	
Excavation supervisor	Construction Regulation 13 (1)	
Explosive powered tool supervisor	Construction Regulation 21(2)	
Fall Protection Developer	Construction Regulation 8	
Fire Fighter	Construction Regulation	
Fire Fighting Equipment Inspector	Construction Regulation 27	
First-Aiders	General Safety Regulation 3	
Hand Tool Inspector	General Safety Regulations	
Hazardous chemical substances supervisor	Hazardous Chemicals Substances Regulations	
Housekeeping supervisor	Construction Regulation	
Incident Investigator	General Administrative Regulation 9(2)	
Ladder Inspector	General Safety Regulation 13(a)	
Occupational Health and Safety Committee	OHSACT Section 19	

Occupational Health and Safety Representatives	OHSACT Section 17	
Personal Protective Equipment Inspector	Construction Regulation	
Portable Electrical Equipment	Construction Regulation	
Risk Assessor	Construction Regulation 9(1)	
Safety Harness inspector	General Safety Regulations	
Scaffolding supervisor	Construction Regulation 14	
Stacking and storage supervisor	Construction Regulation 28	
Structures supervisor	Construction Regulation	
Supervisor demolition work	Construction Regulation	
Suspended platform supervisor	Construction Regulation 15	
Temporary electrical installations inspector	Construction Regulation	
Traffic management supervisor	OHSACT Section	
Vessels under pressure supervisor (Fire)	Vessels under Pressure Regulations	
Welding supervisor	General Safety Regulation	
Working on or next to water supervisor	Construction Regulation	

Sample

FIRST AIDER

OCCUPATIONAL HEALTH AND SAFETY ACT, Act 85 of 1993
General Safety Regulations 3.(4)

... (legal reference)

I, _____ (Employer Responsible Person), for _____
(Company) do hereby appoint _____ (Employee) as First Aider and to ensure
that all first aid boxes are maintained in accordance with General Safety Regulation 3 at
_____ (Site/Address).

This appointment is valid from ___ / ___ / 20__ to the completion of the stipulated construction
work. (Not more than 3 years)

Signature: _____ Date: _____

Your duties are to:

- Ensure that the first aid box or boxes under your control remain properly stocked to meet all foreseeable incidents which may occur in your designated area of responsibility;
- Perform kit inspection by documenting the content on the provided checklist;
- Attend to and report incidents / accidents to the supervisor immediately;

...

Acceptance

I, _____, the undersigned do hereby acknowledge receipt of, understand
the duties in this appointment, are competent to perform this appointment with regards to
First Aid.

Signature: _____, Date: _____ & Designation _____

Annexure 5 – Registers & Checklists (Sample)

Sample of tabular list to be included in health and safety plan (not limited or exhausted to only these registers & checklists)

Statutory Registers (Safety File)	Register Intervals	YES/NO
	Daily Before work commence	
Approval to Cast Concrete	Before Casting	Yes
Concrete and Mixer	Daily	Yes
Confined space entry		
Construction Vehicle inspection register	Daily	Yes
Daily Safe Task Instructions	Daily	Yes
Electrical installations Register	Daily before work commence	Yes
Electrical Tools Register	Monthly	Yes
Excavation Register	Daily, before each shift, etc	Yes
Explosive fastening device	Daily	Yes
Fall Protection Inspections Register	Daily before work commence	Yes
Fire Equipment Inspection Register	Monthly	Yes
First-Aid Box Content Register (vehicle)	Weekly	Yes
First-Aid Treatment Register	After each treatment	Yes
First-Aid Dressing Register	After each treatment	Yes
Formwork and support	Weekly	Yes
Hand Tool Inspection Register	Monthly	Yes
Hazardous Chemical Substances Register	After use of Substance	Yes
Health and Safety Rep Inspection Register	Monthly	Yes
Hygiene Inspection: Toilets	Daily	Yes
Induction training	Project Start	Yes
Ladder Inspection Register & Checklist	Monthly	Yes
Personnel Protective Equipment Issue Register	At start of project and at every issue	Yes
Personnel Protective Inspection Register	Weekly – Part of DSTI	Yes
Powered Tools Register	Daily before work commence	Yes
Safety Harness Inspection Register	At Start of project and then every month	Yes
Scaffold Inspection Register	Daily before work commence	Yes
Stacking and Storage Register	Weekly Per site	Yes
Structures Inspection Register	Weekly	Yes
toolbox talks	Weekly –	Yes

Annexure 6 - Returnable Documents

Health and Safety documents to be submitted with tender:

1. Health and Safety Plan

2. Health and Safety Budget (Construction Regulation 5.(1)(g))
3. Skills training / existing qualification matrix (Construction Regulation 5.(1)(h))

e.g.

a. Competencies for:

- Legal liability training (Min Construction Manager & Supervisor);
- Excavation Supervisor;
- First Aider on site;
- H&S Representative (CHSO/M qualification registration);
- Fire Fighter & Equipment Inspector,
- Risk Assessor;
- Incident Investigator;
- Fall Protection Planner / Developer; and
- Working on Heights

b. Resources evaluation:

- Scaffolding
- Mobile plant & construction vehicles
- Artisans registration (Plumbing / Electrical, etc)

 LANGEBERG MUNISIPALITEIT MUNICIPALITY MASIPALA	DOC. NAME	BASELINE RISK ASSESMENT (BRA)		
	CLIENT	Langeberg Municipality	DOC NO	518
	PROJECT NAME	CMB / 10541	COMMENCE DATE	04 February 2022
	ADRESS	Langeberg Municipality		

HIRA – Hazard Identification and Risk Assessment

TASK / ACTIVITY	HAZARD	RISK TO SAFETY, HEALTH & ENVIRONMENT	TYPE			RISK ANALYSIS			RESPONSIBLE ENTITY / PERSON
			H	S	E	L	E	C	
1. Project initiation and briefing session	- Appoint CHS Practitioner - Develop a health and safety brief for project - Determine the required competency for the matter expert consultants - Record scope of construction work project	- Non-compliance to construction regulation in later stages of project - Bad health and safety project profile	x	x	x	1	1	1	CLIENT / AGENT
2. Concept and feasibility study	- Attend to design and consultant meetings - Documenting project risk profile and health and safety policies that will affect cost estimation and budgeting for health and safety for project	- No records of decision making for health and safety implementation - Over / under calculation for health and safety budget requirements	x	x	x	2	2	4	CLIENT / AGENT
3. Design Development	- Prepare this Baseline Risk Assessment for intended construction work project. (CR 5.(1)(a)) - Prepare health and safety specification base on the this Baseline Risk Assessment (CR 5.(1)(b)) - Provide Designer with health and safety specifications as mentioned above. (CR 5.(1)(c)) - Receive the designers hazard report for use in tender process - Layout format of site health and safety file - Prepare health and safety plans for early works - Initial projects health and safety estimation / budgets	- To minimize design risk - Restrict legal liability exposure through constructability, maintainability and operability of structure - Non-compliance to construction regulation in later stages of project	x	x	x	2	2	4	CLIENT / AGENT

TASK / ACTIVITY	HAZARD	RISK TO SAFETY, HEALTH & ENVIRONMENT	TYPE			RISK ANALYSIS			RESPONSIBLE ENTITY / PERSON
			H	S	E	L	E	C	
4. Tender documentation and procurement	- Define procurement process for health and safety - Assemble records in preparation for the construction work permit. - Ensure that the health and safety specifications, including hazard report from designer, are issued to potential contractors tendering for the intended construction work project - Ensure that principal contractor to be appointed has the necessary competencies and resources to carry out the construction work safely - Prepare appointment documents for signature	- Non-compliance to construction regulation in later stages of project - Site Establishment delays due to construction permit issue - Non-clarifications on discrepancy in tender process - Appointment of non-compliant contractors - Delay in start of project	x	x	x	2	2	4	CLIENT / AGENT
5. Construction documentation and management	- Assess, discuss, negotiate and approve the implementation of plan - Apply for construction work permit - Ensuring Principal Contractors compliance to Construction Regulation and clients health and safety specifications - Ensure periodic audits are conducted - Design risk management	- Non-compliance to construction regulation in later stages of project - Liability exposure risk - Incidents / Accidents - Work stoppage - Financial lost due to delays	x	x	x	2	2	4	CLIENT / AGENT
6. Project close-out	- Recording of defects - Hand over Health and safety file to client - Close-out report	Non-compliance to construction regulation in later stages of project	x	x	x	2	2	4	CLIENT / AGENT
7. Site organization and establishment	- Insufficient infrastructure - Environmental impact assessment - Not sufficient or unknown location of services - Not enough hoarding - Access and traffic control - Creation of site office in containers - Erroneous off-loading - Inadequate facilities for staff - Stores - Unsecured storage of tools and materials - Excessive dust generated during site establishment	- unlawful persons entering site, grievance to people - Traffic disruption - Fatalities or injury to employees - Damage to property - Loss of time in maintenance	x	x	x	4	3	12	PRINCIPAL CONTRACTOR

TASK / ACTIVITY	HAZARD	RISK TO SAFETY, HEALTH & ENVIRONMENT	TYPE			RISK ANALYSIS			RESPONSIBLE ENTITY / PERSON
			H	S	E	L	E	C	
8. Deliveries and other construction vehicles	- Vehicles movement entering / leaving site - Inadequate traffic plan - Inadequate signals in place when reversing and offloading - impact with equipment - Spillages from trucks & materials	- Injury to employees - Traffic disruption, - Injury to visitors - Damage to property - Environmental damage, Waste generation	x	x	x	4	3	12	PRINCIPAL CONTRACTOR
9. Manual handling of materials & equipment	Carrying, lifting & positioning heavy & unmanageable pieces of material & equipment	- Injury to employees - Damage to property	x	x	x	4	4	16	PRINCIPAL CONTRACTOR
10. Excavations	- Unstable soil - Unsuitable access to working area Suitable access in and out of excavations not provided - Incompetent operators - Restricted view of driver - Employees assisting using hand tools when carrying out excavation work - Overcrowding of employees in trenches - Excavation conducted without supervision of competent person - Excavations not barricaded - Unidentified services - Unauthorised access - Extensive noise, Sparks operation in rocky soils	- Collapse of excavation and falling material - Machine getting stuck in wet soil condition - Properly planned escape routes not available - Collapsing of shoring - Employees injuries - Visitors or vehicles falling into excavations - Harm to property - Disruption of service supply to surrounding community - Damage to equipment	x	x	x	4	3	12	PRINCIPAL CONTRACTOR
11. Mobile Crane and tower-crane, lifting operations, rigging and lifting equipment	Incompetent crane operator Crane operator not medically fit Defective crane Crane not inspected before work commences Man machine interface Use of damaged slings/chains Incorrect slings used for load Crane and lifting equipment not load tested and certified not done No lifting/sling plan No work permit and task risk assessment No banksman available	Loss time injuries Fatalities Property damage							
12. Mobile Elevated Working Platforms (MEWP)	Collision with other vehicular traffic. Arcing or contact with overhead cables or other overhead obstructions. Fall of operative from platform. Materials falling from platform.	Muscular skeletal injuries. Back injuries							

TASK / ACTIVITY	HAZARD	RISK TO SAFETY, HEALTH & ENVIRONMENT	TYPE			RISK ANALYSIS			RESPONSIBLE ENTITY / PERSON
			H	S	E	L	E	C	
	Entrapment of persons in moving parts or mechanism. ▪ Overturning of the MEWP	Cuts, bruises and fractures Damage to property ▪							
13. Steel reinforcing	▪ Delivery vehicles on site ▪ wrong off-loading by untrained personnel ▪ Unsafe stacking and storage of reinforcing ▪ Overcrowding walkways and access ways ▪ Manual handling of heavy reinforcing ▪ Incorrect PPE required	▪ Disruption of road traffic ▪ Damage to property ▪ Injury to employees ▪ Injury to visitors	x	x		4	3	12	PRINCIPAL CONTRACTOR
14. Concrete works	▪ Delivery vehicles movement onto site ▪ Incorrect handling of concrete pump and chute during discharge ▪ Manual moving of concrete to remote location by wheel barrow or dumpster. ▪ Concrete spills during activities ▪ Environmental spillage due to washing out of ready mix delivery truck. ▪ Incorrect PPE required	▪ Disruption of road traffic ▪ Damage to property ▪ Injury to employees ▪ Injury to visitors ▪ Unauthorised / untrained operator ▪ Environmental damage, Waste generation	x	x	x	4	3	12	PRINCIPAL CONTRACTOR
15. Electrical Work	▪ Use of damaged hand tools when mixing plaster ▪ Cement powder emissions from mixing plaster ▪ Removal of rubble from area ▪ Climbing onto working scaffolding ▪ Spillages from cement and other materials	▪ Electrocuting or Injuries to employees ▪ Inhalation of excessive cement powder ▪ Environmental damage through Waste generation	x	x	x	4	3	12	CONTRACTOR
16. Welding & gas cutting	▪ Operating of equipment by unskilled personnel ▪ Poorly maintained equipment ▪ Welder not in constant control over equipment ▪ Incorrect earth on welding equipment ▪ No welding screens between operations and other employees ▪ No ventilation in welding areas ▪ Not sufficient welding PPE ▪ Argon / Oxygen pressure vessels free standing ▪ Welding spats & sparks not captured	▪ Injury to employees ▪ Inhalation of excessive gasses and fumes ▪ Electrocution, fire , burns, Shocks ▪ Arc eyes due to wrong PPE ▪ Explosions, deaths, injury to employees ▪ Damage to property	x	x	x	4	4	16	PRINCIPAL CONTRACTOR

TASK / ACTIVITY	HAZARD	RISK TO SAFETY, HEALTH & ENVIRONMENT	TYPE			RISK ANALYSIS			RESPONSIBLE ENTITY / PERSON
			H	S	E	L	E	C	
17. Fire prevention	- Untrained and emergency drills not done on regular basis - Equipment in store rooms and not distributed on site - Poorly maintained firefighting equipment - Safety signs not adequate or put up - Emergency exits obstructed - Emergency plan not communicated	- Damage to property as a result of fire - Death and/or injury to employees	x	x	x	4	5	20	PRINCIPAL CONTRACTOR
18. Hoisting and Lifting equipment	- Untrained riggers - Failure lifting equipment due to poor rigging methods - Movement of employees under suspended materials during crane operations - Unattended loads without supervision - Swaying of lifted materials without guide rope	- Damage to material. - Damage to property - Lost of load - Falling material - Injury to employees	x	x	x	4	4	16	PRINCIPAL CONTRACTOR
19. Sub-contractors on site	- No safety file for site - Unstructured employee force - Unskilled supervision - In experience employees - Not registered for COID - Foreign employees, language barrier - Poorly maintained equipment - Environmental disrespect	- Risk other employees - Delays due to non-compliance - Contravention notices - Delays in completion - Environmental risk due to uncontrolled dumping on sites	x	x	x	4	4	16	PRINCIPAL CONTRACTOR
20. Waste material removal	- Build-up of waste material - Combustible / flammable materials - Smoking near sources of ignition	- Muscular skeletal injuries. - Back injuries - Cuts, bruises and fractures - Damage to property - Fires	x	x	x	4	4	16	PRINCIPAL CONTRACTOR
21. Alcohol and Drugs	- Use of drugs that impair perception / vision - Working / on duty under the influence - Stress, tension, high blood pressure	- Muscular skeletal injuries. - Back injuries - Cuts, bruises and fractures - Damage to property	x	x	x	4	2	8	PRINCIPAL CONTRACTOR
22. Medical and / or Emergency	- Unclear location of first aid station / box - Visitors unaware of protocols - Unclear who is trained - Blood borne pathogens	- Muscular skeletal injuries. - Back injuries - Cuts, bruises and fractures - Damage to property	x	x	x	4	3	12	PRINCIPAL CONTRACTOR
23. Use of Ablution Facilities	- Insufficient WC / washing facilities - Not washing hands after use. Spread of germs, disease, etc.	- Muscular skeletal injuries. - Back injuries - Cuts, bruises and fractures	x	x	x	4	2	8	PRINCIPAL CONTRACTOR

TASK / ACTIVITY	HAZARD	RISK TO SAFETY, HEALTH & ENVIRONMENT	TYPE			RISK ANALYSIS			RESPONSIBLE ENTITY / PERSON
			H	S	E	L	E	C	
	Incorrect use of WC Spillage of fluids on the floor. Slips and falls	▪ Damage to property							
24. Pregnant Women	Difficulty in emergency and evacuation situations ▪ Stress and morning sickness	Muscular skeletal injuries. Back injuries Cuts, bruises and fractures ▪ Damage to property	x	x	x	2	2	4	PRINCIPAL CONTRACTOR
25. General and Miscellaneous	Young workers on site ▪ New and Inexperienced Workers	Muscular skeletal injuries. Back injuries Cuts, bruises and fractures ▪ Damage to property	x	x	x	2	2	4	PRINCIPAL CONTRACTOR

Severity (Consequences)	Risk Rating Matrix	Likelihood				
		<Low (1) Not credible i.e. the team have never heard of event occurring in industry	Low (2) Conceivable but would require multiple failures of systems and controls	Medium (3) Less than average i.e. easy to postulate a scenario for accident but considered unlikely	>Medium (4) More than average i.e. the team do not have direct knowledge but suspect that event may have occurred and represents a credible scenario	High (5) Likely to occur and the team have knowledge of a similar event
	High (5), Multiple deaths, lung diseases, permanent debility or fatality. Major pollution with long-term implication and very high restitution costs	5	10	15	20	25
	>Medium (4), Involving a single death or severe injury, poisoning, sensitization or dangerous infection. Damage to equipment resulting in production shutdown and significant production loss. Severe pollution with short-term localized implications incurring significant restitution costs	4	8	12	16	20
	Medium (3), Event leading to a Lost Time Incident or persistent dermatitis, acne or asthma. Localized damage to equipment requiring extensive repair, significant loss of function or production or moderate pollution incurring some restitution costs	3	6	9	12	15
	Low (2), Minor injury requiring first-aid treatment or headache, nausea, dizziness, mild rashes. Damage to equipment requiring minor remedial repair, loss of production or impact to the environment	2	4	6	8	10
	<Low (1), Negligible injury or health implications, no absence from work. Negligible loss of function or production with no damage to equipment or the environment	1	2	3	4	5
1 - 6	MAY BE ACCEPTABLE: however, review task to see if risk can be reduced further					
8 - 12	TASK SHOULD ONLY PROCEED after consultation with personnel and assessment team. Where possible, the task should be redefined to take account of hazards involved or the risk should be reduced further prior to task commencement.					
15 - 25	TASK MUST NOT PROCEED. Almost inevitable that an incident would result. It should be redefined or further control measures put in place to reduce risk. The controls should be re-assessed for adequacy prior to task commencement.					

Construction Manager's responsibility is to review, implementation and monitoring the site assessment.

This risk assessment was prepared on known construction work, but must be re-assessed by the Principal Contractor's Construction Manager by walking the site to confirm that all hazards have been correctly identified and appropriate control measures specified are in place.

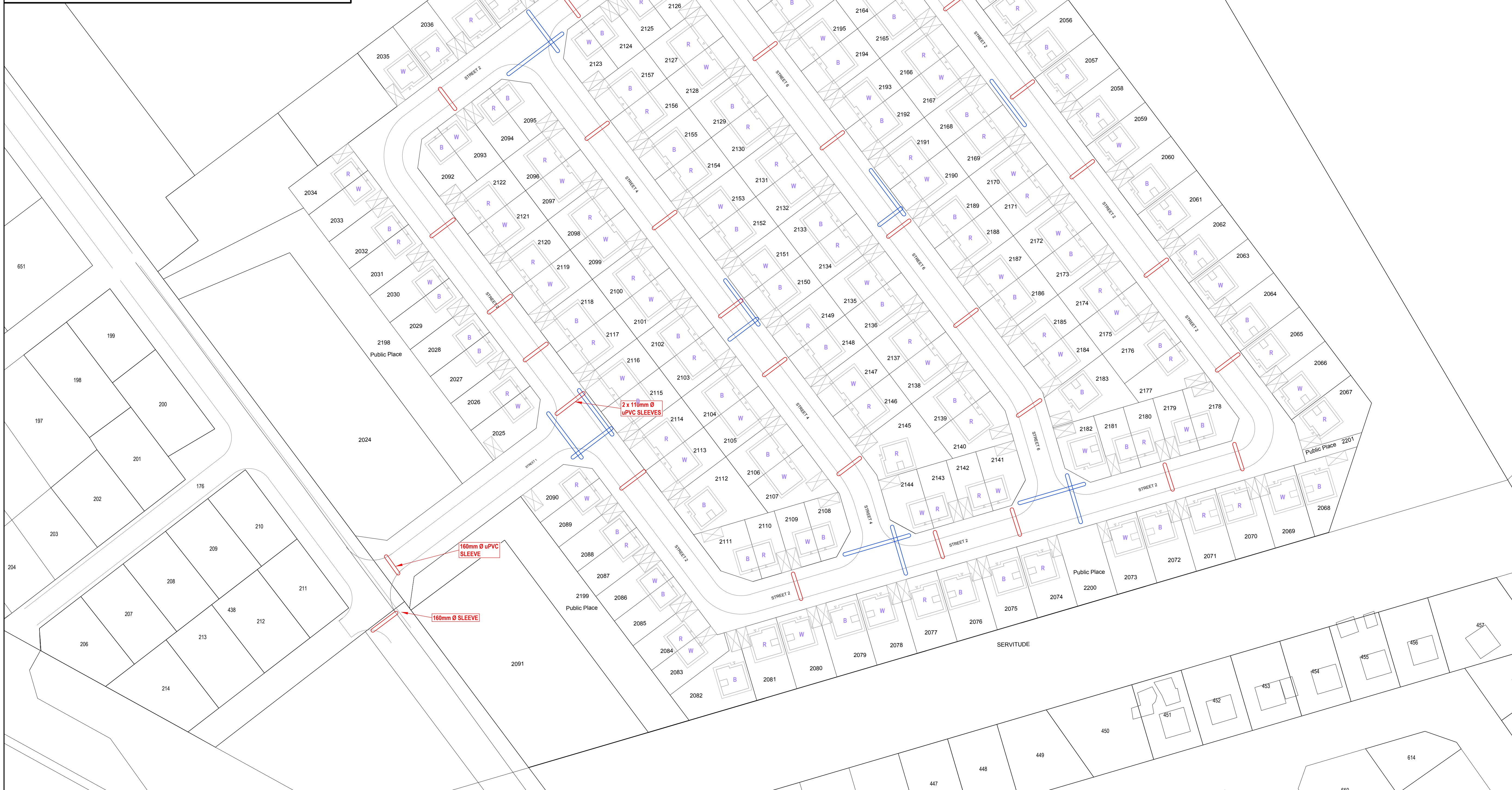
Employees are required to wear relevant PPE for tasks being performed.

All work to be carried out under a PERMIT TO WORK system is applicable to the specifications of that permit.

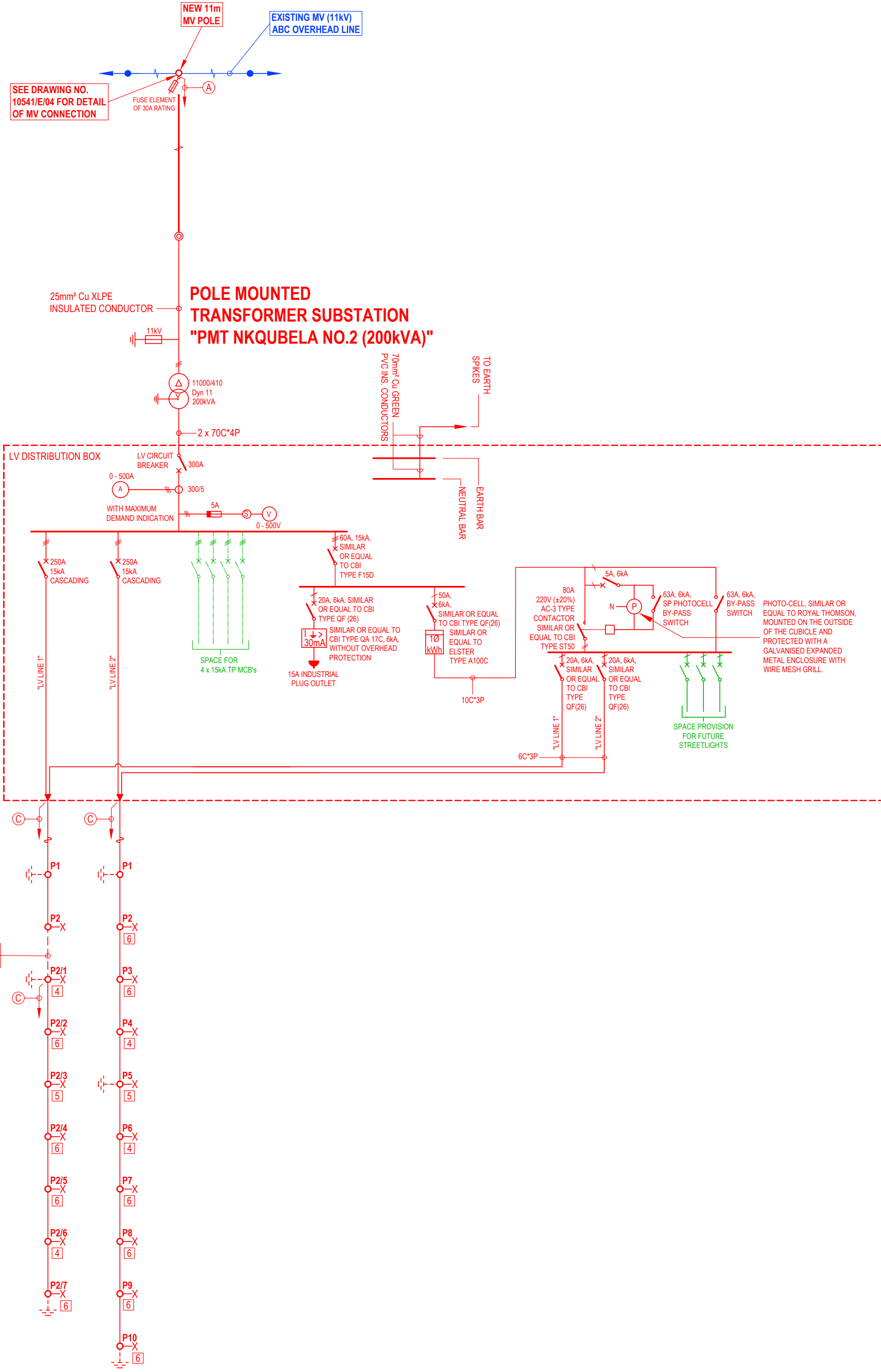
WHEN ACTIVITIES, HAZARDS OR RISKS CHANGES THE CONSTRUCTION MANAGER MUST –

- A. STOP THE JOB;**
- B. REVISE THIS RISK ASSESSMENT; AND**
- C. DISCUSS WILL RELEVANT EMPLOYEES.**

Team involved in the preparing of the risk assessment			
1. De Munck MENDEROI	2.	3.	4.
5	6.	7.	8.
PREPARED BY: De Munck Menderoi	POSITION: OHS PRACTITIONER	SIGNATURE: 	DATE: Friday, 04 February 2022
CHECKED BY:	POSITION:	SIGNATURE:	DATE: Friday, 04 February 2022
APPROVED BY:	POSITION: Construction Manager	SIGNATURE:	DATE:



1. ALL SLEEVES INDICATED ON THIS DRAWING TO BE INSTALLED BY ELECTRICAL CONTRACTOR.
2. SLEEVES TO BE INSTALLED BY USING THE TERMACHE-SOI DISPLACEMENT DIRECTIONAL DRILLING METHOD.
3. SLEEVES TO BE LAID AT A MINIMUM DEPTH OF 900mm BELOW ROAD SURFACE, UNLESS OTHERWISE SHOWN.
4. SLEEVES TO EXTEND 1m BEYOND ROAD EDGE.
5. EACH SLEEVE TO BE FITTED WITH A GALVANISED STEEL DRAW WIRE EXTENDING 1m BEYOND BOTH ENDS.
6. ALL SLEEVE ENDS MUST BE PLUGGED (SEALED) USING STANDARD DUCT PLUGS / DUCT END CAPS TO PREVENT THE INGRESS OF DIRT AND MOISTURE.
7. SLEEVE ENDS TO BE SEALED AFTER INSTALLATION OF CABLE.
8. ALL SLEEVES TO BE UPVC, 160mm DIAMETER SLEEVES FOR M4 AND 110mm DIAMETER SLEEVES FOR LV CABLES.



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THIS DRAWING IS TO BE USED FOR THE ENGINEERING SERVICE DEPICTED ONLY.

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LANGEBERG MUNICIPALITY

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CESA
Certified Electrical Safety Auditors

PROJECT
LANGEBERG MUNICIPALITY:
ELECTRIFICATION OF 172 FORMAL
HOUSES AT NKUBELA, ROBERTSON

DRAWING TITLE

SCHEMATIC DIAGRAM

DRAWN	DESIGNED	CHECKED	APPROVED
MvM	JdV	JdV	
SCALE	DATE	CAD REF. NO.	DWG-SIZE
N.T.S.	28/01/2022	10541-E-03	A1
DRAWING NO.			REVISION
10541/E/03			

DO NOT REPLACE ANY COMPONENT IN THE SYSTEM WITH A COMPONENT THAT IS NOT OF IDENTICAL TYPE AND RATING EXCEPT WHEN RECOMMENDED BY THE MANUFACTURER OF THE EXISTING COMPONENT, OR THE MANUFACTURER OF THE DISTRIBUTION BOARD, OR A PERSON COMPETENT TO EXPRESS AN OPINION ON SUCH REPLACEMENT.