PART A
INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE (LANGEBERG MUNICIPALITY)					
BID NUMBER:	**TENDER 20/2024**	**CLOSING DATE:**	**03 MAY 2024**	**CLOSING TIME:**	**12H00**
DESCRIPTION	**REPLACE 66KV TRANSFORMER AT THE ROBERTSON MAIN SUBSTATION**				
THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (MBD7).					

BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BOX SITUATED AT

LANGEBERG MUNICIPAL OFFICES
28 MAIN ROAD
ASHTON
6715

SUPPLIER INFORMATION					
NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE		NUMBER		
CELLPHONE NUMBER					
FAX NUMBER	CODE		NUMBER		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
TAX INCOME NUMBER					
TAX COMPLIANCE STATUS	TCS PIN:		**AND**	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 VAT INCLUSIVE**	**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	MR GEORGE LOTTER
CONTACT PERSON	Sabelo NGCONGOLO	TELEPHONE NUMBER	023 626 8200
TELEPHONE NUMBER	023 615 8000	FAX NUMBER	
FAX NUMBER	023 615 1563	E-MAIL ADDRESS	glotter@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) OR ONLINE**

1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2022, 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) 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

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

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.

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: ……..

TENDER 20/2024

Tenders are hereby requested for the **REPLACE 66KV TRANSFORMER AT THE ROBERTSON MAIN SUBTATION** as specified in the bid document.

Completed Bids, in sealed envelopes, clearly marked **"TENDER 20/2024: REPLACE 66KV TRANSFORMER AT THE ROBERTSON MAIN SUBSTATION"** should be placed in the tender box, at the Langeberg Municipal Office, 28 Main Road, Ashton, not later than **12:00 on 03 MAY 2024** 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 6EP or Higher.

COMPULSORY CLARIFICATION MEETING

THERE WILL BE A COMPULSORY CLARIFICATION MEETING ON THE 16 APRIL AT 10H00, AT THE ELECTRICAL DEPARTMENT (Muiskraalskop) IN WOLHUTER STREET, ROBERTSON.

PLEASE NOTE:

The official Bid document must be fully completed in black ink, all pages must be submitted and the document should preferably be bound.

Supporting documents must be submitted separately and must be stapled or bound.

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 **29 MARCH 2024,** on the Langeberg Municipal website: www.langeberg.gov.za

Please refer written enquiries to **MR G LOTTER** (glotter@langeberg.gov.za).

DP LUBBE
MUNICIPAL MANAGER
Private Bag X2
Ashton,
6715

TABLE OF CONTENTS

1. GENERAL CONDITIONS OF CONTRACT

1.1. Definitions:

The following terms shall be interpreted as indicated,

1.1.1. **"Closing time"** means the date and hour specified in the bidding advertisement for the receipt of bids.

1.1.2. **"Contract"** means the written agreement entered into between the purchaser and the supplier, as recorded in the contract form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.

1.1.3. **"Contract price"** means the price payable to the supplier under the contract for the full and proper performance of his contractual obligations.

1.1.4. **"Corrupt practice"** means the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.

1.1.5. **"Countervailing duties"** are imposed in cases where an enterprise abroad is subsidized by its government and encouraged to market its products internationally.

1.1.6. **"Country of origin"** means the place where the goods were mined, grown or produced or from which the services are supplied. Goods are produced when, through manufacturing, processing or substantial and major assembly of components, a commercially recognized new product results that is substantially different in basic characteristics or in purpose or utility from its components.

1.1.7. **"Day"** means calendar day.

1.1.8. **"Delivery"** means delivery in compliance of the conditions of the contract or order.

1.1.9. **"Delivery ex stock"** means immediate delivery directly from stock actually on hand.

1.1.10. **"Delivery into consignees store or to his site"** means delivered and unloaded in the specified store or depot or on the specified site in compliance with the conditions of the contract or order, the supplier bearing all risks and charges involved until the goods are so delivered and a valid receipt is obtained.

1.1.11. **"Dumping"** occurs when a private enterprise abroad market its goods on own initiative in the RSA at lower prices than that of the country of origin and which have the potential to harm the local industries in the RSA.

1.1.12. **"Force majeure"** means an event beyond the control of the supplier and not involving the supplier's fault or negligence and not foreseeable. Such events may include, but is not restricted to, acts of the purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.

1.1.13. **"Fraudulent practice"** means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of any bidder, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the bidder of the benefits of free and open competition.

1.1.14. **"GCC"** means the General Conditions of Contract.

1.1.15. **"Goods"** means all of the equipment, machinery, and/or other materials that the supplier is required to supply to the purchaser under the contract.

1.1.16. **"Imported content"** means that portion of the bidding price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or his subcontractors) and which costs are inclusive of the costs abroad, plus freight and other direct importation costs such as landing costs, dock dues, import duty, sales duty or other similar tax or duty at the South African place of entry as well as transportation and handling charges to the factory in the Republic where the goods covered by the bid will be manufactured.

1.1.17. **"Manufacture"** means the production of products in a factory using labour, materials, components and machinery and includes other related value-adding activities.

1.1.18. **"Order"** means an official written order issued for the supply of goods or works or the rendering of a service.

1.1.19. **"Project site,"** where applicable, means the place indicated in bidding documents.

1.1.20. **"Purchaser"** means the organization purchasing the goods.

1.1.21. **"Republic"** means the Republic of South Africa.

1.1.22. **"SCC"** means the Special Conditions of Contract.

1.1.23. **"Services"** means those functional services ancillary to the supply of the goods, such as transportation and any other incidental services, such as installation, commissioning, provision of technical assistance, training, catering, gardening, security, maintenance and other such obligations of the supplier covered under the contract.

1.1.24. **"Supplier"** means the successful bidder who is awarded the contract to maintain and administer the required and specified service(s) to the State.

1.1.25. **"Tort"** means in breach of contract.

1.1.26. **"Turnkey"** means a procurement process where one service provider assumes total responsibility for all aspects of the project and delivers the full end product / service required by the contract.

1.1.27. **"Written"** or **"in writing"** means hand-written in ink or any form of electronic or mechanical writing.

1.2. Application

1.2.1. These general conditions are applicable to all bids, contracts and orders including bids for functional and professional services (excluding professional services related to the building and construction industry), sales, hiring, letting and the granting or acquiring of rights, but excluding immovable property, unless otherwise indicated in the bidding documents.

1.2.2. Where applicable, special conditions of contract are also laid down to cover specific goods, services or works.

1.2.3. Where such special conditions of contract are in conflict with these general conditions, the special conditions shall apply

1.3. General

1.3.1. Unless otherwise indicated in the bidding documents, the purchaser shall not be liable for any expense incurred in the preparation and submission of a bid. Where applicable a nonrefundable fee for documents may be charged

1.3.2. Invitations to bid are usually published in locally distributed news media and on the municipality/municipal entity website.

1.4. Standards

1.4.1. The goods supplied shall conform to the standards mentioned in the bidding documents and specifications.

1.5. Use of contract documents and information inspection

1.5.1. The supplier shall not, without the purchaser's prior written consent, disclose the contract, or any provision thereof, or any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of the purchaser in connection therewith, to any person other than a person employed by the supplier in the performance of the contract. Disclosure to any such employed person shall be made in confidence and shall extend only as far as may be necessary for purposes of such performance.

1.5.2. The supplier shall not, without the purchaser's prior written consent, make use of any document or information mentioned in GCC clause 1.5.1 except for purposes of performing the contract.

1.5.3. Any document, other than the contract itself mentioned in GCC clause 1.5.1 shall remain the property of the purchaser and shall be returned (all copies) to the purchaser on completion of the supplier's performance under the contract if so required by the purchaser.

1.5.4. The supplier shall permit the purchaser to inspect the supplier's records relating to the performance of the supplier and to have them audited by auditors appointed by the purchaser, if so required by the purchaser.

1.6. Patent Rights

1.6.1. The supplier shall indemnify the purchaser against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the goods or any part thereof by the purchaser.

1.6.2. When a supplier developed documentation / projects for the municipality / municipal entity, the intellectual, copy and patent rights or ownership of such documents or projects will vest in the municipality / municipal entity.

1.7. Performance security

1.7.1. Within thirty (30) days of receipt of the notification of contract award, the successful bidder shall furnish to the purchaser the performance security of the amount specified in SCC.

1.7.2. The proceeds of the performance security shall be payable to the purchaser as compensation for any loss resulting from the supplier's failure to complete his obligations under the contract.

1.7.3. The performance security shall be denominated in the currency of the contract or in a freely convertible currency acceptable to the purchaser and shall be in one of the following forms:

1.7.4. a bank guarantee or an irrevocable letter of credit issued by a reputable bank located in the purchaser's country or abroad, acceptable to the purchaser, in the form provided in the bidding documents or another form acceptable to the purchaser; or a cashier's or certified cheque

1.7.5. The performance security will be discharged by the purchaser and returned to the supplier not later than thirty (30) days following the date of completion of the supplier's performance obligations under the contract, including any warranty obligations, unless otherwise specified.

1.8. Inspections, tests and analyses

1.8.1. All pre-bidding testing will be for the account of the bidder.

1.8.2. If it is a bid condition that goods to be produced or services to be rendered should at any stage be subject to inspections, tests and analyses, the bidder or contractor's premises shall be open, at all reasonable hours, for inspection by a representative of the purchaser or organization acting on behalf of the purchaser.

1.8.3. If there are no inspection requirements indicated in the bidding documents and no mention is made in the contract, but during the contract period it is decided that inspections shall be carried out, the purchaser shall itself make the necessary arrangements, including payment arrangements with the testing authority concerned.

1.8.4. If the inspections, tests and analyses referred to in clauses 1.8.2 and 1.8.3 show the goods to be in accordance with the contract requirements, the cost of the inspections, tests and analyses shall be defrayed by the purchaser.

1.8.5. Where the goods or services referred to in clauses 1.8.2 and 1. 8.3 do not comply with the contract requirements, irrespective of whether such goods or services are accepted or not, the cost in connection with these inspections, tests or analyses shall be defrayed by the supplier.

1.8.6. Goods and services which are referred to in clauses 1. 8.2 and 1.8.3 and which do not comply with the contract requirements may be rejected.

1.8.7. Any contract goods may on or after delivery be inspected, tested or analyzed and may be rejected if found not to comply with the requirements of the contract. Such rejected goods shall be held at the cost and risk of the supplier who shall, when called upon, remove them immediately at his own cost and forthwith substitute them with goods, which do comply with the requirements of the contract. Failing such removal the rejected goods shall be returned at the suppliers cost and risk. Should the supplier fail to provide the substitute goods forthwith, the purchaser may, without giving the supplier further opportunity to substitute the rejected goods, purchase such goods as may be necessary at the expense of the supplier.

1.8.8. The provisions of clauses 1.8.4 to 1.8.7 shall not prejudice the right of the purchaser to cancel the contract on account of a breach of the conditions thereof, or to act in terms of Clause 1.22 of GCC.

1.9. Packing

1.9.1. The supplier shall provide such packing of the goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing, case size and weights shall take into consideration, where appropriate, the remoteness of the goods' final destination and the absence of heavy handling facilities at all points in transit.

1.9.2. The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the contract, including additional requirements, if any, and in any subsequent instructions ordered by the purchaser.

1.10. Delivery and documents

1.10.1. Delivery of the goods and arrangements for shipping and clearance obligations shall be made by the supplier in accordance with the terms specified in the contract.

1.11. Insurance

1.11.1. The goods supplied under the contract shall be fully insured in a freely convertible currency against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery in the manner specified.

1.12. Transportation

1.12.1. Should a price other than an all-inclusive delivered price be required, this shall be specified.

1.13. Incidental Services

1.13.1. The supplier may be required to provide any or all of the following services, including additional services, if any:

1.13.1.1. performance or supervision of on-site assembly and/or commissioning of the supplied goods;

1.13.1.2. furnishing of tools required for assembly and/or maintenance of the supplied goods;

1.13.1.3. furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied goods;

1.13.1.4. performance or supervision or maintenance and/or repair of the supplied goods, for a period of time agreed by the parties, provided that this service shall not relieve the supplier of any warranty obligations under this contract; and

1.13.1.5. training of the purchaser's personnel, at the supplier's plant and/or on site, in assembly, start-up, operation, maintenance, and/or repair of the supplied goods.

1.13.2. Prices charged by the supplier for incidental services, if not included in the contract price for the goods, shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the supplier for similar services.

1.14. Spare parts

1.14.1. As specified, the supplier may be required to provide any or all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the supplier:

1.14.2. such spare parts as the purchaser may elect to purchase from the supplier, provided that this election shall not relieve the supplier of any warranty obligations under the contract; and in the event of termination of production of the spare parts:

1.14.3. advance notification to the purchaser of the pending termination, in sufficient time to permit the purchaser to procure needed requirements; and following such termination, furnishing at no cost to the purchaser, the blueprints, drawings, and specifications of the spare parts, if requested.

1.15. Warranty

1.15.1. The supplier warrants that the goods supplied under the contract are new, unused, of the most recent or current models, and that they incorporate all recent improvements in design and materials unless provided otherwise in the contract. The supplier further warrants that all goods supplied under this contract shall have no defect,

arising from design, materials, or workmanship (except when the design and/or material is required by the purchaser's specifications) or from any act or omission of the supplier, that may develop under normal use of the supplied goods in the conditions prevailing in the country of final destination.

1.15.2. This warranty shall remain valid for twelve (12) months after the goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the contract, or for eighteen (18) months after the date of shipment from the port or place of loading in the source country, whichever period concludes earlier, unless specified otherwise.

1.15.3. The purchaser shall promptly notify the supplier in writing of any claims arising under this warranty.

1.15.4. Upon receipt of such notice, the supplier shall, within the period specified and with all reasonable speed, repair or replace the defective goods or parts thereof, without costs to the purchaser.

1.15.5. If the supplier, having been notified, fails to remedy the defect(s) within the period specified, the purchaser may proceed to take such remedial action as may be necessary, at the supplier's risk and expense and without prejudice to any other rights which the purchaser may have against the supplier under the contract.

1.15.6. All Machinery must comply with the Occupational Health and Safety (OHS) Act and its applicable regulations and standards.

1.16. Payment

1.16.1. The method and conditions of payment to be made to the supplier under this contract shall be specified.

1.16.2. The supplier shall furnish the purchaser with an invoice accompanied by a copy of the delivery note and upon fulfillment of other obligations stipulated in the contract.

1.16.3. Payments shall be made promptly by the purchaser, but in no case later than thirty (30) days after submission of an invoice or claim by the supplier.

1.16.4. Payment will be made in Rand unless otherwise stipulated.

1.17. Prices

1.17.1. Prices charged by the supplier for goods delivered and services performed under the contract shall not vary from the prices quoted by the supplier in his bid, with the exception of any price adjustments authorized or in the purchaser's request for bid validity extension, as the case may be.

1.18. Variation orders

1.18.1. In cases where the estimated value of the envisaged changes in purchase does not vary more than 15% of the total value of the original contract, the contractor may be instructed to deliver the goods or render the services as such. In cases of measurable quantities, the contractor may be approached to reduce the unit price, and such offers may be accepted provided that there is no escalation in price.

1.19. Assignment

1.19.1. The supplier shall not assign, in whole or in part, its obligations to perform under the contract, except with the purchaser's prior written consent.

1.20. Subcontracts

1.20.1. The supplier shall notify the purchaser in writing of all subcontracts awarded under this contracts if not already specified in the bid. Such notification, in the original bid or later, shall not relieve the supplier from any liability or obligation under the contract.

1.21. Delays in the supplier's performance

1.21.1. Delivery of the goods and performance of services shall be made by the supplier in accordance with the time schedule prescribed by the purchaser in the contract.

1.21.2. If at any time during performance of the contract, the supplier or its subcontractor(s) should encounter conditions impeding timely delivery of the goods and performance of services, the supplier shall promptly notify the purchaser in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the supplier's notice, the purchaser shall evaluate the situation and may at his discretion extend the supplier's time for performance, with or without the imposition of penalties, in which case the extension shall be ratified by the parties by amendment of contract.

1.21.3. The right is reserved to procure outside of the contract small quantities or to have minor essential services executed if an emergency arises, the supplier's point of supply is not situated at or near the place where the goods are required, or the supplier's services are not readily available.

1.21.4. Except as provided under GCC Clause 1.25, a delay by the supplier in the performance of its delivery obligations shall render the supplier liable to the imposition of penalties, pursuant to GCC Clause 1.22.1, unless an extension of time is agreed upon pursuant to GCC Clause 1.22.2 without the application of penalties.

1.21.5. Upon any delay beyond the delivery period in the case of a goods contract, the purchaser shall, without canceling the contract, be entitled to purchase goods of a similar quality and up to the same quantity in substitution of the goods not supplied in conformity with the contract and to return any goods delivered later at the supplier's expense and risk, or to cancel the contract and buy such goods as may be required to complete the contract and without prejudice to his other rights, be entitled to claim damages from the supplier.

1.22. Penalties

1.22.1. Subject to GCC Clause 1.25, if the supplier fails to deliver any or all of the goods or to perform the services within the period(s) specified in the contract, the purchaser shall, without prejudice to its other remedies under the contract, deduct from the contract price, as a penalty, a sum calculated on the delivered price of the delayed goods or unperformed services using the current prime interest rate calculated for each day of the delay until actual delivery or performance. The purchaser may also consider termination of the contract pursuant to GCC Clause 1.23.

1.23. Termination for default

1.23.1. The purchaser, without prejudice to any other remedy for breach of contract, by written notice of default sent to the supplier, may terminate this contract in whole or in part:

1.23.1.1. if the supplier fails to deliver any or all of the goods within the period(s) specified in the contract, or within any extension thereof granted by the purchaser pursuant to GCC Clause 1.21.2;

1.23.1.2. if the supplier fails to perform any other obligation(s) under the contract; or if the supplier, in the judgment of the purchaser, has engaged in corrupt or fraudulent practices in competing for or in executing the contract.

1.23.2. In the event the purchaser terminates the contract in whole or in part, the purchaser may procure, upon such terms and in such manner, as it deems appropriate, goods, works or services similar to those undelivered, and the supplier shall be liable to the purchaser for any excess costs for such similar goods, works or services. However, the supplier shall continue performance of the contract to the extent not terminated.

1.23.3. Where the purchaser terminates the contract in whole or in part, the purchaser may decide to impose a restriction penalty on the supplier by prohibiting such supplier from doing business with the public sector for a period not exceeding 10 years.

1.23.4. If a purchaser intends imposing a restriction on a supplier or any person associated with the supplier, the supplier will be allowed a time period of not more than fourteen (14) days to provide reasons why the envisaged restriction should not be imposed. Should the supplier fail to respond within the stipulated fourteen (14) days the purchaser may regard the supplier as having no objection and proceed with the restriction.

1.23.5. Any restriction imposed on any person by the purchaser will, at the discretion of the purchaser, also be applicable to any other enterprises or any partner, manager, director or other person who wholly or partly exercises or exercised or may exercise control over the enterprise of the first – mentioned person, and with which enterprise or person the first – mentioned person, is or was in the opinion of the purchaser actively associate

1.23.6. .If a restriction is imposed, the purchaser must, within five (5) working days of such imposition, furnish the National Treasury, with the following information:

1.23.6.1. the name and address of the supplier and / or person restricted by the purchaser;

1.23.6.2. the date of commencement of the restriction

1.23.6.3. the period of restriction; and

1.23.6.4. the reasons for the restriction.

1.23.7. These details will be loaded in the National Treasury's central database of suppliers or persons prohibited from doing business with the public sector.

1.23.8. If a court of law convicts a person of an offence as contemplated in section 12 or 13 of the Prevention and Combating of Corrupt Activities Act, No. 12 of 2004, the court may also rule that such person's name be endorsed on the Register for Tender Defaulters. When a person's name has been endorsed on the Register, the person will be prohibited from doing business with the public sector for a period not less than five years and not more than 10 years. The National Treasury is empowered to determine the period of restriction and each case will be dealt with on its own merits. According to section 32 of the Act the Register must be open to the public. The Register can be perused on the National Treasury website.

1.24. Antidumping and countervailing duties and rights

1.24.1. When, after the date of bid, provisional payments are required, or anti-dumping or countervailing duties are imposed, or the amount of a provisional payment or anti- dumping or countervailing right is increased in respect of any dumped or subsidized import, the State is not liable for any amount so required or imposed, or for the amount of any such increase. When, after the said date, such a provisional payment is no longer required or any such anti-dumping or countervailing right is abolished, or where the amount of such provisional payment or any such right is reduced, any such favorable difference shall on demand be paid forthwith by the supplier to the purchaser or the purchaser may deduct such amounts from moneys (if any) which may otherwise be due to

the supplier in regard to goods or services which he delivered or rendered, or is to deliver or render in terms of the contract or any other contract or any other amount which may be due to him.

1.25. Force Majeure

1.25.1. Notwithstanding the provisions of GCC Clauses 1.22 and 1.23, the supplier shall not be liable for forfeiture of its performance supplier shall not be liable for forfeiture of its performance security, damages, or termination for default if and to the extent that his delay in performance or other failure to perform his obligations under the contract is the result of an event of force majeure.

1.25.2. If a force majeure situation arises, the supplier shall promptly notify the purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the purchaser in writing, the supplier shall continue to perform its obligations under the contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the force majeure event.

1.26. Termination for solvency

1.26.1. The purchaser may at any time terminate the contract by giving written notice to the supplier if the supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the supplier, provided that such termination will not prejudice or affect any right of action or remedy, which has accrued or will accrue thereafter to the purchaser.

1.27. Settlement of Disputes

1.27.1. If any dispute or difference of any kind whatsoever arises between the purchaser and the supplier in connection with or between the purchaser and the supplier in connection with or arising out of the contract, the parties shall make every effort to resolve amicably such dispute or difference by mutual consultation.

1.27.2. If, after thirty (30) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the purchaser or the supplier may give notice to the other party of his intention to commence with mediation. No mediation in respect of this matter may be commenced unless such notice is given to the other party.

1.27.3. Should it not be possible to settle a dispute by means of mediation, it may be settled in a South African court of law.

1.27.4. Notwithstanding any reference to mediation and/or court proceedings herein,

1.27.4.1. the parties shall continue to perform their respective obligations under the contract unless they otherwise agree; and

1.27.4.2. the purchaser shall pay the supplier any monies due the supplier for goods delivered and / or services rendered according to the prescripts of the contract.

1.28. Limitation of Liability

1.28.1. Except in cases of criminal negligence or willful misconduct, and in the case of Infringement pursuant to Clause 1.6;

1.28.1.1. The supplier shall not be liable to the purchaser, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs,

provided that this exclusion shall not apply to any obligation of the supplier to pay penalties and/or damages to the purchaser; and

1.28.1.2. The aggregate liability of the supplier to the purchaser, whether under the contract, in tort or otherwise, shall not exceed the total contract price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment.

1.29. Governing language

1.29.1. The contract shall be written in English. All correspondence and other documents pertaining to the contract that is exchanged by the parties shall also be written in English.

1.30. Applicable law

1.30.1. The contract shall be interpreted in accordance with South African laws, unless otherwise specified

1.31. Notices

1.31.1. Every written acceptance of a bid shall be posted to the supplier concerned by registered or certified mail and any other notice to him shall be posted by ordinary mail to the address furnished in his bid or to the address notified later by him in writing and such posting shall be deemed to be proper service of such notice.

1.31.2. The time mentioned in the contract documents for performing any act after such aforesaid notice has been given, shall be reckoned from the date of posting of such notice.

1.32. Taxes and duties

1.32.1. A foreign supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the purchaser's country.

1.32.2. A local supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted goods to the purchaser.

1.32.3. No contract shall be concluded with any bidder whose tax matters are not in order. Prior to the award of a bid SARS must have certified that the tax matters of the preferred bidder are in order.

1.32.4. No contract shall be concluded with any bidder whose municipal rates and taxes and municipal services charges are in arrears.

1.33. Transfer of contracts

1.33.1. The contractor shall not abandon, transfer, cede assign or sublet a contract or part thereof without the written permission of the purchaser

1.34. Amendment of contract

1.34.1. No agreement to amend or vary a contract or order or the conditions, stipulations or provisions thereof shall be valid and of any force unless such agreement to amend or vary is entered into in writing and signed by the contracting parties. Any waiver of the requirement that the agreement to amend or vary shall be in writing, shall also be in writing.

1.35. Prohibition of restrictive practices

1.35.1. In terms of section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, an agreement between, or concerted practice by, firms, or a decision by an association of firms, is prohibited if it is between parties in a horizontal relationship and if a bidder(s) is / are or a contractor(s) was / were involved in collusive bidding.

1.35.2. If a bidder(s) or contractor(s) based on reasonable grounds or evidence obtained by the purchaser has / have engaged in the restrictive practice referred to above, the purchaser may refer the matter to the Competition Commission for investigating and possible impossible of administrative penalties as contemplated in section 59 of the Competition Act No 89 of 1998.

1.35.3. If a bidder(s) or contractor(s) has / have been found guilty by the Competition Commission of the restrictive practice referred to above, the purchaser may, in addition and without prejudice to any other remedy provided for, invalidate the bid(s) for such item(s) offered, and / or terminate the contract in whole or part , and / or restrict the bidder(s) or contractor(s) from conducting business with the public sector for a period not exceeding ten (10) years and / or claim damages from the bidder(s) or contractor(s) concerned.

2. SPECIAL TENDER CONDITIONS

SPECIAL TENDER CONDITIONS
This tender is subject to the Supply Chain Management Policy of the Langeberg Municipality. The aim of the policy is to improve job opportunities and to stimulate prosperity in the municipal area. Broad Based Black Economic Empowerment (BBBEE) will receive preferential adjudication. Tenderers must take note that a tender will be granted on the ground of their performance capacity as well as a preference formula. For tenderers to qualify for the advantages of the policy, they must thoroughly complete the document. **If the schedules are not thoroughly completed the tender will not be considered.** Tenderers must take note that in the case of a false statement or submission of false information the tender will be disqualified with immediate effect and a possibility of criminal prosecution. The complete Supply Chain Management Policy is available for inspection at the Municipal Offices at Ashton and websites (www.langeberg.gov.za).

2.1 TENDER DOCUMENTS

Tender documents are obtainable and must be returned as described in the tender notice. The completed documents of the tender fully priced, extended and totalled, completed in all respects, signed and sealed in an envelope which is to be endorsed **"TENDER 20/2024: REPLACE 66KV TRANSFORMER AT THE ROBERTSON MAIN SUBSTATION",**

" must be placed in the tender box at the Municipal Offices, 28 Main Street, Ashton

2.1.1. Tenders submitted by fax, e-mail, telex or telegraphically will not be accepted. Postal Tenders will be accepted for consideration only if they are received in sufficient time to be lodged in the appropriate tender box by the closing time for such tenders. The Langeberg Municipality disclaims any responsibility for seeing that such tenders/ are lodged in the tender box.

2.1.2. Any tender delivered to an address other than the one stipulated in the tender notice will not be accepted. Tenders may not be handed in at other offices of the Langeberg Municipality.

2.1.3. Tenders will be opened in public, shortly after closing time of tenders. The name of the tenderer/bidder and the total tender/bid price will be announced to all tenderers/bidders present at the opening.

2.1.4. Tenders received after the closing date and time shall be declared invalid and will not be considered.

2.2 SOUTH AFRICAN CURRENCY

2.2.1 All payments from the Langeberg Municipality will be made in the currency of the Republic of South Africa (Rand). The tenderer/bidder shall specify clearly all matters and conditions regarding payments in the tender/bidder specifications.

2.2.2 Tenders shall indicate separately prices excluding value added tax and included value added tax (VAT) in the tender/bid rates and amounts.

2.3 INCOMPLETE TENDERS/BIDS

2.3.1 Tenders will be rejected in the event of incomplete offers and irregularities of any nature contained in the tender or in any of the completed tender schedules.

2.4 WITHDRAWAL OF TENDERS/BIDS

2.4.1 A tenderer/bidder may, without incurring any liability, withdraw his tender provided written advice to that effect reaches the Langeberg Municipality before the expiry of the time fixed in the tender/bid notice for receiving tenders/.

2.5 CHECKING OF TENDER DOCUMENTS

2.5.1 Before submitting a tender the tenderer/bidder shall check the numbering of the pages in the tender/bid documents and if any pages part of the tender/bid document is found to be missing or if any part of the documents is illegible or indistinct, he shall immediately notify the Langeberg Municipality.

2.5.2 The Langeberg Municipality will not be liable in any way for any claims arising through neglect of the Tenderer/bidder to comply with these requirements.

2.6 EXPENSES DUE TO PREPARATION AND SUBMISSION OF TENDER DOCUMENTS

2.6.1 The Langeberg Municipality shall not be liable for any expenses or losses incurred by the Tenderer/bidder due to visiting the site or municipal area and the preparation and/or submission of the tender/bid documents.

2.7 PERIOD OF VALIDITY

2.7.1 Tenders, whether for a part of or for the whole of the project, shall remain valid for a period as specified by the tenderer/bidder, which period shall be that period between the date upon which tenders/bids close up to the date upon which notice is given that the tender/bid has been awarded, but at least a period of **120 days**.

2.8 ACCEPTANCE OR REJECTION OF TENDERS/BIDS

2.8.1 The Langeberg Municipality is not compelled to accept the lowest or any tender/bid and reserves the right to accept any tender/bid.

2.9 PREFERENTIAL PROCUREMENT

2.9.1 Tenders/bids will be considered in terms of the Preferential Procurement Policy of the Langeberg Municipality.

2.10 REGISTRATION AS SERVICE PROVIDER

2.10.1 Only those tenderer/bidders that are registered on the Central Supplier Database as service providers, or are capable of being so prior to the evaluation of submissions, are eligible to submit tenders/bids. The Langeberg Municipality will only enter into a formal contract with a tenderer/bidder that is registered on this Database as service provider.

2.11 JOINT VENTURE AGREEMENTS (IF APPLICABLE)

2.11.1 Any Joint Venture Agreement must be submitted with the tender/bid document detailing the split of responsibilities in terms of the tender/bid specifications, i.e. percentage of work to be performed by each partner.

2.11.2 All parties to the Joint Venture Agreement must be registered and verified on the Western Cape Supplier Database. Only those that are registered and verified before the closing date of the tender/bid will qualify for preference points.

2.11.3 It must be noted that the order will be placed in the name of the BEE Partner as well as all financial administration that follows such an order/s. The Joint Venture Agreement must stipulate the BEE partner selected for this in the event of the Joint Venture been considered successful.

2.12 LOCAL BUSINESS/OFFICE:

2.12.1 A local office of a tenderer/bidder shall be deemed to be a physical address inside the demarcated boundaries of the Langeberg Municipality area.

2.13 TEST FOR RESPONSIVENESS

2.13.1 No Tender will be considered unless it meets the following responsiveness criteria:

2.13.2 The tender must be properly received in a sealed envelope clearly indicating the description of the service and the tender/bid number for which the tender/bid is submitted.

2.13.3 The tender must be deposited in the relevant tender box as indicated on the notice of the tender on or before the closing date and time of the bid

2.13.4 An Income Tax Number and a Tax verification pin (OTP) must be submitted with the tender/bid on or before the closing date and before the closing time.

2.13.5 A latest Municipal service account obtained from the local municipality must be submitted.

2.13.6 The official tender document must be fully completed in black ink, all pages must be submitted and should preferably be bound. Where information requested does apply to the bidder and the space is left blank, the tender document will be deemed as non-responsive.

2.13.7 If the entity submitting a bid is a Joint Venture or a Consortium or Partnership, each party to that formation must submit all the above information

2.13.8 The tenderer/bidder must be in good standing to do business with the public sector in terms of Regulation 38 of the Supply Chain Management Regulations (Government Gazette 27636 of 30 May 2005).

2.13.9 The tenderer/bidder must adhere to pricing Instructions

2.13.10 The tenderer/bidder must complete and sign all tender forms. Where indicated, forms must be signed and stamped by a Commissioner of Oaths.

2.13.11 All mandatory returnable forms and prescribed attachments must be completed and where applicable signed by a Commissioner of Oaths.

2.13.12 All tenders' conditions/specifications must be complied with.

2.14 PAYMENT OF INVOICES

2.14.1 All payments from the Langeberg Municipality will be made within 30 days of receipt of valid tax invoice for goods and services rendered to the satisfaction of the Municipality,

3. 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

4. MUNICIPAL SERVICE ACCOUNT

4.1 An original latest municipal account must be attached to this page.

4.2 It should be noted that the tender cannot be considered/evaluated if any municipal rates and taxes or municipal services charges owed by the bidder or any of its directors to the municipality or municipal entity, or to any other municipality or entity, are in arrears for more than three months,

4.3 If the bidder or any of its directors are not responsible for the payment of municipal rates of service charges to the municipality or municipal entity, or to any other municipality or entity, a sworn affidavit to this effect must be attached to this page.

5. PRICING SCHEDULE – FIRM PRICES (MBD 3.1) (PURCHASES)

NOTE: ONLY FIRM PRICES WILL BE ACCEPTED. NON-FIRM PRICES (INCLUDING PRICES SUBJECT TO RATES OF EXCHANGE VARIATIONS) WILL NOT BE CONSIDERED

IN CASES WHERE DIFFERENT DELIVERY POINTS INFLUENCE THE PRICING, A SEPARATE PRICING SCHEDULE MUST BE SUBMITTED FOR EACH DELIVERY POINT

Name of bidder: ……
Bid number: ……..
Closing Time 12:00
Closing date: ……...

OFFER TO BE VALID FOR …… DAYS FROM THE CLOSING DATE OF BID.

6. DECLARATION OF INTEREST MBD 4

6.1 Any legal person, including persons employed by the state[1], 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-

6.1.1. 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.

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

6.2.1 Full Name of bidder or his or her representative: ……

6.2.2 Identity Number: ……...

6.2.3 Position occupied in the Company (director, trustee, shareholder[2], member):

……

6.2.4 Registration number of company, enterprise, close corporation, partnership agreement or trust:

……

6.2.5 Tax Reference Number: ……

6.2.6 VAT Registration Number: ……....

6.3 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.

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

6.4.1 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:

……

……

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

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

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

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

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

……

……

……

6.4.7 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

6.4.8 If so, furnish particulars:

……..

……..

……...

6.4.9 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

6.4.10 If so, furnish particulars.

……...

……..….

6.4.11 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

6.4.11.1 If so, furnish particulars.

……...
……..….
……

6.4.12 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

6.4.12.1 If so, furnish particulars:

……
……
……

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

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

6.6 DECLARATION

I, THE UNDERSIGNED (NAME): .....
CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 6.2 and 6.5 ABOVE 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**

7. DECLARATION FOR PROCUREMENT ABOVE R10 MILLION (ALL APPLICABLE TAXES INCLUDED) (MBD 5)

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

1 **Are you by law required to prepare annual financial statements for auditing?**

1.1 If yes, submit audited annual financial statements for the past three years or since the date of establishment if established during the past three years. ***YES / NO**

.....

.....

2 **Do you have any outstanding undisputed commitments for municipal services towards any municipality for more than three months or any other service provider in respect of which payment is overdue for more than 30 days?**

***YES / NO**

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

2.2 If yes, provide particulars.

.....

.....

.....

.....

3 **Has any contract been awarded to you by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract?**

3.1 If yes, furnish particulars ***YES/ NO**

……

……

4. **Will any portion of goods or services be sourced from outside** ***YES / NO**

the Republic, and, if so, what portion and whether any portion of payment from the municipality / municipal entity is expected to be transferred out of the Republic?

4.1 If yes, furnish particulars

……..

……..

CERTIFICATION

I, THE UNDERSIGNED (NAME)

……

CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS CORRECT.

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

…….. ……..
Signature **Date**

…….. ……
Position **Name of Bidder**

MBD 6.1

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

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

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

---

1. GENERAL CONDITIONS

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

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

1.2 **To be completed by the organ of state**

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

b) the 80/20 preference point system will be applicable in this tender. The lowest/ highest acceptable tender will be used to determine the accurate system once tenders are received.

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

(a) Price; and

(b) Specific Goals.

1.4 **To be completed by the organ of state:**

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	**80**
SPECIFIC GOALS	**20**
Total points for Price and SPECIFIC GOALS	**100**

1.5 Failure on the part of a tenderer to submit proof or documentation required in terms of this tender to claim points for specific goals with the tender, will be interpreted to mean that preference points for specific goals are not claimed.

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

2. DEFINITIONS

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

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

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

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

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

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

3.1.1 Application of preference point system

3.1.1.1 The Municipality will, in the tender documents, stipulate —

(a) the preference point system applicable; and

(b) any specific goal as envisaged in section 2(1)(d) and (e) of the Preferential Procurement Act.

3.1.1.2 If it is unclear whether the 80/20 or 90/10 preference point system applies—

(a) in the case of a tender to generate income or to dispose of or lease assets, the highest acceptable tender; or

(b) in the case of any other tender, the lowest acceptable tender, must be used to determine the applicable preference point system.

3.1.2 Points for Price: 80/20 preference point system for acquisition of goods or services with Rand value equal to or above R30 000 and up to R50 million

3.1.2.1 The following formula must be used to calculate the points out of 80 for price in respect of a tender with a Rand value equal to or above R30 000 and up to a Rand value of R50 million, inclusive of all applicable taxes:

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

Where-

Ps = Points scored for price of tender under consideration;

Pt = Price of tender under consideration; and

Pmin = Price of lowest acceptable tender.

3.1.2.2 A maximum of 20 points may be awarded to a tenderer for the specified goals envisaged in section 2(1)(d) and (e) of the Act.

3.1.2.3 The points scored must be rounded off to the nearest two decimal places.

3.1.2.4 The contract must be awarded to the tenderer scoring the highest points.

3.1.3 . Points for price: 90/10 preference point system for acquisition of goods or services with Rand value above R50 million

3.1.3.1 The following formula must be used to calculate the points out 90 for price in respect of a tender with a Rand value above R50 million, inclusive of all applicable taxes:

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

Where-

Ps = Points scored for price of tender under consideration;

Pt = Price of tender under consideration; and

Pmin = Price of lowest acceptable tender.

3.1.3.2 A maximum of 10 points may be awarded to a tenderer for the specified goals envisaged in section 2(1)(d) and (e) of the Act.

3.1.3.3 The points scored must be rounded off to the nearest 2 decimal places.

3.1.3.4 The contract must be awarded to the tenderer scoring the highest points.

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

The following formula must be used to calculate the points for price in respect of a tender to generate income or to dispose of or lease assets, with a Rand value equal to, or above R 30 000 and up to a Rand value of R50 million, inclusive of all applicable taxes:

$$Ps = 80\left(1 + \frac{Pt - Pmax}{Pmax}\right)$$

Where-

Ps = Points scored for price of tender under consideration;

Pt = Price of tender under consideration; and

Pmax = Price of highest acceptable tender.

3.2.1 A maximum of 20 points may be awarded to a tenderer for the specified goals envisaged in section 2(1)(d) and (e) of the Act.

3.2.2 The points scored must be rounded off to the nearest 2 decimal places.

3.3.3 The contract must be awarded to the tenderer scoring the highest points.

3.3.4 Points for price:90/10 preference point system for tenders to generate income or to dispose of or lease assets with Rand value equal to or above R50 million

3.3.5 The following formula must be used to calculate the points for price in respect of a tender to generate income or to dispose of or lease assets, with a Rand value above R50 million, inclusive of all applicable taxes:

$$Ps = 90\left(1 + \frac{Pt - Pmax}{Pmax}\right)$$

Where-

Ps = Points scored for price of tender under consideration;

Pt = Price of tender under consideration; and

Pmax = Price of highest acceptable tender.

3.3.6 A maximum of 10 points may be awarded to a tenderer for the specified goals envisaged in section 2(1)(d) and (e) of the Act.

3.3.7 The points scored must be rounded off to the nearest 2 decimal places.

3.3.8 The contract must be awarded to the tenderer scoring the highest points.

4. POINTS AWARDED FOR SPECIFIC GOALS

4.1 The tendering conditions will stipulate the specific goals, as contemplated in section 2(1)(d)(ii) of the Preferential Procurement Act, be attained.

4.2 A maximum of 20 points (80/20) preference points system) or 10 (90/10) preference points system), will be allocated for specific goals. These goals are:

(a) contracting with persons, or categories of persons, historically disadvantaged by unfair discrimination on the basis of race, gender or disability (BBBEE);

(b) Promotion of enterprises located in the municipal area

4.3 Regarding par 4.2 (a) 50% of the 20/10 points will be allocated to promote this goal and points will be allocated in terms of the BBBEE scorecard as follows:

B-BBEE Status Level of Contributor	Number of Points for Preference (80/20)	Number of Points for Preference (90/10)
1	20	10
2	18	9
3	16	8
4	12	5
5	8	4
6	6	3
7	4	2
8	2	1
Non-compliant contributor	0	0

4.4 A tenderer must submit proof of its BBBEE status level contributor [scorecard].

4.5 A tenderer failing to submit proof of BBBEE status level of contributor –

4.5.1 may only score in terms of the 80/90-point formula for price; and

4.5.2 scores 0 points out of 10/5 BBBEE status level of contributor, which is in line with section 2 (1) (d) (i) of the Act, where the supplier or service provider did not provide proof thereof.

4.6 Regarding par 4.2 (b) 50% of the 20/10 points will be allocated to promote this goal. Points will be allocated as follows.

Locality of supplier	Points
Within the boundaries of the municipality	**10/5**
Outside of the boundaries of the municipality	0

4.7 The policy should not include Pre-qualification goals.

4.8 Any specific goal for which a point may be awarded, must be clearly specified in the invitation to submit a tender.

4.9 A tenderer failing to submit proof of required evidence to claim preferences for other specified goals, which is in line with section 2 (1) (d) (ii) of the Act.

4.9.1 may only score in terms of the 80/90-point formula for price; and

4.9.2 scores 0 points out of 10/5 of the relevant specific goals where the supplier or service provider did not stipulate.

4.10 The preference points scored by a tenderer must be added to the points scored for price.

4.11 The points scored must be rounded off to the nearest two decimal places.

4.12 The contract must be awarded to the tenderer scoring the highest procurement points.

Table 1: Specific goals for the tender and points claimed are indicated per the table below.

(Note to organs of state: Where either the 90/10 or 80/20 preference point system is applicable, corresponding points must also be indicated as such.

***Note to tenderers: The tenderer must indicate how they claim points for each preference point system.*)**

The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system) (To be completed by the organ of state)	Number of points allocated (80/20 system) (To be completed by the organ of state)	Number of points claimed (90/10 system) (To be completed by the tenderer)	Number of points claimed (80/20 system) (To be completed by the tenderer)
BBBEE preference points system	05	10		
Promotion of enterprises located in the municipal area	05	10		

5. DECLARATION WITH REGARD TO COMPANY/FIRM

Name of company/firm…….

5.1. Company registration number: ……...

5.2. **TYPE OF COMPANY/ FIRM**

- ☐ Partnership/Joint Venture / Consortium
- ☐ One-person business/sole propriety
- ☐ Close corporation
- ☐ Public Company
- ☐ Personal Liability Company
- ☐ (Pty) Limited
- ☐ Non-Profit Company
- ☐ State Owned Company

[TICK APPLICABLE BOX]

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

i) The information furnished is true and correct;

ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;

iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct;

iv) If the specific goals have been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have –

(a) disqualify the person from the tendering process;

(b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;

(c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;

(d) recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and

(e) forward the matter for criminal prosecution, if deemed necessary.

……

SIGNATURE(S) OF TENDERER(S)

SURNAME AND NAME: ……

DATE: ……

ADDRESS: ……

……

……

……

9 CONTRACT FORM - PURCHASE OF GOODS/WORKS (MBD 7.1)

THIS FORM MUST BE FILLED IN DUPLICATE BY BOTH THE SUCCESSFUL BIDDER (PART 1) AND THE PURCHASER (PART 2). BOTH FORMS MUST BE SIGNED IN THE ORIGINAL SO THAT THE SUCCESSFUL BIDDER AND THE PURCHASER WOULD BE IN POSSESSION OF ORIGINALLY SIGNED CONTRACTS FOR THEIR RESPECTIVE RECORDS.

PART 1 (TO BE FILLED IN BY THE BIDDER)

9.1 I hereby undertake to supply all or any of the goods and/or works described in the attached bidding documents to (name of institution)…….…… in accordance with the requirements and specifications stipulated in bid number……..…….. at the price/s quoted. My offer/s remain binding upon me and open for acceptance by the purchaser during the validity period indicated and calculated from the closing time of bid.

9.2 The following documents shall be deemed to form and be read and construed as part of this agreement:

9.3 Bidding documents, viz

- Invitation to bid;
- Tax clearance certificate;
- Pricing schedule(s);
- Technical Specification(s);
- Preference claims for Broad Based Black Economic Empowerment Status Level of Contribution in terms of the Preferential Procurement Regulations 2022;
- Declaration of interest;
- Declaration of bidder's past SCM practices;
- Certificate of Independent Bid Determination;
- Special Conditions of Contract;

9.4 General Conditions of Contract; and

9.5 Other (specify)

……

……

……

9.6 I confirm that I have satisfied myself as to the correctness and validity of my bid; that the price(s) and rate(s) quoted cover all the goods and/or works specified in the bidding documents; that the price(s) and rate(s) cover all my obligations and I accept that any mistakes regarding price(s) and rate(s) and calculations will be at my own risk.

9.7 I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this agreement as the principal liable for the due fulfilment of this contract.

9.8 I declare that I have no participation in any collusive practices with any bidder or any other person regarding this or any other bid.

9.9 I confirm that I am duly authorised to sign this contract.

NAME (PRINT) .....

CAPACITY .....

SIGNATURE .....

NAME OF FIRM .....

DATE .....

WITNESSES

1 .....

2. .....

DATE: .....

10 CONTRACT FORM - PURCHASE OF GOODS/WORKS (MBD 7.1)

PART 2 (TO BE FILLED IN BY THE PURCHASER)

10.1 I, DP LUBBE in my capacity as MUNICIPAL MANAGER,

10.2 accept your bid under reference number **TENDER 20/2024** dated……for the supply of goods/works indicated hereunder and/or further specified in the annexure(s).

10.3 An official order indicating delivery instructions is forthcoming.

10.4 I undertake to make payment for the goods/works delivered in accordance with the terms and conditions of the contract, within 30 (thirty) days after receipt of an invoice accompanied by the delivery note.

ITEM NO.	PRICE (ALL APPLICABLE TAXES INCLUDED)	BRAND	DELIVERY PERIOD	B-BBEE STATUS LEVEL OF CONTRIBUTION

10.5 I confirm that I am duly authorized to sign this contract.

SIGNED AT ……ON……..

NAME (PRINT) ……

SIGNATURE ……

OFFICIAL STAMP

WITNESSES

1. ……

2. ……

DATE

11 DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES (MBD 8)

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

11.2 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.

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

11.4 abused the municipality's / municipal entity's supply chain management system or committed any improper conduct in relation to such system;

11.5 been convicted for fraud or corruption during the past five years;

11.6 will-fully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or

11.7 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).

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

Item	Question	Yes	No
11.9	Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? (Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/Authority of the institution that imposed the restriction after the *audi alteram partem* rule was applied). **The Database of Restricted Suppliers now resides on the National Treasury's website(www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page.**	Yes ☐	No ☐
11.10	If so, furnish particulars:		
11.11	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 ☐
11.12	If so, furnish particulars:		
11.13	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 ☐

11.14	If so, furnish particulars:		
11.15	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 ☐
11.16	If so, furnish particulars:		
11.17	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 ☐
11.18	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**

12 CERTIFICATE OF INDEPENDENT BID DETERMINATION (MBD 9)

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

12.2 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.

12.3 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:

12.4 take all reasonable steps to prevent such abuse;

12.5 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

12.6 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.

12.7 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.

12.8 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 purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

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

13 CERTIFICATE OF INDEPENDENT BID DETERMINATION (MBD 9)

I, the undersigned, in submitting the accompanying bid:

_____
(Bid Number and Description)

in response to the invitation for the bid made by:

_____
(Name of Municipality / Municipal Entity)

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

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

13.1 I have read and I understand the contents of this Certificate;

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

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

13.4 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;

13.5 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:

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

13.6 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium[3] will not be construed as collusive bidding.

13.7 In particular, without limiting the generality of paragraphs 12.6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

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

13.8 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.

13.9 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.

13.10 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

14 CODE OF CONDUCT FOR SUPPLIERS

Langeberg Municipality is strongly committed in observing the highest ethical standards in all its procurement activities. As such, this Code of Conduct for Suppliers has been prepared to provide clear summary of Langeberg Municipality expectation form the suppliers in all procurement dealings, ensuring that internationally recognized procurement ethics are followed. Transparency and accountability should be strictly adhered to in all procurement activities.

Langeberg Municipality procurement ethics focuses on **zero tolerance on corruption, avoiding any form of interest and honest representation of supplier's capabilities.**

Suppliers are strongly urged to familiarize themselves with this Code of Conduct to ensure successful working relations with Langeberg Municipality.

Policy on Corruption and Position on Conflict of Interest

Langeberg Municipality expects all contracted suppliers and companies seeking to sell goods and services to conduct their business in accordance with the highest ethical standards. Suppliers or potential suppliers must strictly comply with all rules and regulations on bribery, corruption and avoid unacceptable business practices. Hence suppliers are expected to observe the following:

- Shall not, directly or indirectly, offer, give or agree or promise to give to any Langeberg Municipality staff any gratuity for the benefit of/or at the direction or request of any Staff or Langeberg Municipality;
- To immediately inform the Langeberg Municipality in the event that any Staff or Langeberg Municipality solicits or obtained or has made an attempt to obtain gratification for himself/herself or for any other persons.
- To immediately declare if any of the Company's staff and/or officers had or have any relative employed with Langeberg Municipality. Failure to make such declaration shall be construed as a conflict of interest and might result in the exclusion of the supplier from present and future procurement activities and/or other legal action as deemed fit by the Organization.

Representation from Suppliers

Langeberg Municipality expects all its suppliers to honestly declare and warrant that:

- It will comply with all rules, regulations and statutory requirements relating to the provision of the products/services to Langeberg Municipality;
- It will not act in concert with other suppliers or agents when participating in a bid;
- It is a duly authorized/certified provider of the supplied products/services and shall not, expressly or impliedly hold itself out to be an agent/representative of a third-party provider of the same products/services;
- It will only supply products that are certified to be of merchantable and satisfactory quality;
- The supplier processes the necessary capabilities, equipment and suitable place of business to perform its obligations;
- It shall not contract out of subcontract or outsource any portion of the products/services unless prior written consent from Langeberg Municipality has been obtained; and
- It shall maintain the highest standards of integrity and quality of work at all times.

Applicability of the Code of Conduct

This Code of Conduct shall apply to all Suppliers, sub-contractors and to other entities acting behalf of them (approval of Langeberg Municipality).

Monitoring compliance to the Code of Conduct

To facilitate the monitoring of suppliers' compliance with this Code of Conduct, Langeberg Municipality expects suppliers to:

- Develop and maintain all necessary documentation to support compliance with the described standards; such documentation must be accurate and complete;
- Provide Langeberg Municipality representatives with access to relevant records, upon Langeberg Municipality request;
- Allow Langeberg Municipality representatives to conduct interviews with the supplier's employees and with management separately;
- Allow Langeberg Municipality representatives to conduct announced and unannounced site visits of supplier locations; and
- Respond promptly to reasonable inquiries from Langeberg Municipality representatives in relation to the implementation of the Code of Conduct.

Secure Communication Channels

Langeberg Municipality has established a secure communication channel to enable the suppliers to raise their concerns confidentially and responsibly. If the supplier has questions about the Code of Conduct or wishes to report a questionable behaviour or possible violation of the Code of Conduct, the Supplier is encouraged and should contact Langeberg Municipality at:

Municipal Manager

28 Main Road

Ashton

6715

or contact at mm@langeberg.gov.za;

Langeberg Municipality will not tolerate any retribution or retaliation by anyone against a concerned Supplier who has, in good faith, sought out advice or has reported questionable behaviour and/or a possible violation. Langeberg Municipality will take disciplinary action up to and including termination of contract for anyone who threatens or engages in retaliation, retribution or harassment of the concerned individual. Identities and contents of all information or complaints will be rated strictly confidential.

SANCTIONS

Breach of the Code may result in actions being taken against that service providers, in addition to any contractual or legal remedies. The actions applied will depend on the nature and seriousness of the breach and on the degree of commitment shown by the service provider to resolve any issues stemming from the breach.
The range of actions to be imposed include but are not restricted to the following:

- Formal written warnings;
- Required disclosure of nature of breach in terms of the Policy;
- Immediate termination of contract;
- Criminal and/or civil action.

ACKNOWLEDGEMENT AND ACCEPTANCE

This is to certify that I have fully read the Supplier's Code of Conduct attached. Having fully read and understood the completed requirement of this Supplier's Code of Conduct, I hereby commit myself and my company to serve this Code of Conduct and to fully comply with all of its principles. I also certify that I am authorized by my company to sign and accept this document in its behalf.

Supplier: _____

Address: _____

Representative: _____

Signature: _____

Date: _____

15 TECHNICAL SPECIFICATIONS

REPLACE 66kV TRANSFORMER AT THE ROBERTSON MAIN SUBSTATION

EMPLOYER'S OBJECTIVES

The Employer is upgrading at the Robertson Main 66/11 kV substation.

The contract is let in one project.

This project comprises the design, supply, install, construction, test and commissioning of the 1 x 15 MVA 66/11 kV transformer with a new base, bund and oil containment dam and oil traps.

OVERVIEW OF THE WORKS

The project comprises the design, supply, install, construction, test and commissioning of the 66/11 kV substation upgrade.

a) Design, supply, erection and commissioning of 1 x 15 MVA transformer;

b) Removal of the existing transformer to allow the construction work for the new transformer plinth, bunding, and a separate 14,000 l oil spill retention tank,

c) Civil works, plinths and all steel bases for equipment;

d) Fences restoration where damaged;

e) Connection and recommission of the existing tap changer - and 66 kV control equipment;

f) Clean, test, repair and reconnection of all electrical conductors to power equipment;

g) Refurbishment of / repairs to one off 11kV feeder panel.

Generally all materials supplied shall comply with Eskom specification.

EXTENT OF THE WORKS

The general scope of works is described above.

LOCATION OF WORKS

The site is situated in Roberston, Western Cape Province.

Access to the site is via existing roads.

DELIVERY CONSTRAINTS

The project will be split across financial years, it will therefor be a multi-year project.

The project will be executed as budget becomes available in each financial year.

REQUIREMENTS

It is required that all works will be performed under the detailed supervision of the Langeberg Municipality. All works are to comply with SANS standards and municipal requirements.

It is further required that all manuals (technical, operational and maintenance) be provided in 1 x hard copy format, neatly bound for safe keeping in the Substation as well as 1 x soft copy on a USB drive. Appropriate induction / training on the equipment shall be provided to the Municipal staff where appropriate.

The Municipality may scale down the scope of the tender based on the availability of funds.

It is estimated that a **CIDB grading of 6EP** will be required for this tender.

COMPULSORY CLARIFICATION MEETING

There will be a **compulsory clarification meeting** at the Robertson Electrical Department (Muiskraalkop) from where the substation will be visited.

STANDARD DRAWINGS

Drawing No	Description
PV.002	Earth mat connection to column and tail for equipment earthing
PV.006	Typical power transformer surge arrestor/earthing detail
PBA 160	Trench measurements
PBA 162	Detail of cable trenches

PARTICULAR DRAWINGS

Drawing No	Description
301268-EL-DLP-0001-001	Locality Plan
301268-EL-DAL-0001-001	Existing Substation layout
301268-EL-DAL-0002-001	New Transformer Location
301268-EL-DSL-0001-001	Single Line Diagram of Existing Substation
301268-EL-DSL-0002-001	Single Line Diagram with New Transformer
301268-EL-DRD-0001-001	Oil Trap Details Typical.
301268-EL-DRD-0002-001	General Transformer Plinth Arrangement

PARTICULAR SPECIFICATIONS

PE: Substation Equipment and Official Notice

PI: Underground Cable Networks

PL: Protection

PV: Substation Earthing

SITE INFORMATION

1. SCOPE

The documentation included in this section describes the site as at the time of tender to enable the tenderer to price his tender and to decide upon his method of working and programming.

Only actual information about physical conditions on the site and its surroundings has been included in this section and interpretation is a matter for the tenderers.

2. SUBSOIL INVESTIGATIONS, BOREHOLE RECORDS AND TEST RESULTS

None available.

3. REPORTS OBTAINED BY THE EMPLOYER CONCERNING THE PHYSICAL CONDITIONS WITHIN THE SITE OR ITS SURROUNDINGS INCLUDING MAPPING, HYDRO-GRAPHIC DATA, AND HYDROLOGICAL INFORMATION

None

4. REFERENCES TO PUBLICLY AVAILABLE INFORMATION ABOUT THE SITE AND ITS SURROUNDINGS SUCH AS PUBLISHED PAPERS AND INTERPRETATIONS OF THE GEOTECHNICAL INVESTIGATION

None

5. INFORMATION ABOUT PIPED AND OTHER SERVICES BELOW THE SURFACE OF THE SITE FOR CONTRACTS INVOLVING GROUND WORKS, AND ABOUT HOOK-UP AND BOUNDARY DETAILS FOR CONTRACTS WITH PLANT INTERFACES, IN ADDITION TO ANYTHING ABOUT THE PHYSICAL SITE WHICH IMPACTS UPON THE CONTRACT

No services known.

6. INFORMATION ABOUT ADJACENT BUILDINGS AND STRUCTURES, AND ABOUT EXISTING BUILDINGS AND STRUCTURES ON THE SITE (RESTRICTIONS FOR HEAVY LOADS ETC.), AND

It is an existing substation with established road access.

All construction activity and vehicle traffic impacts to be submitted in a method statement for municipal approval.

7. ATMOSPHERIC AND ENVIRONMENTAL CRITERIA

Rainfall Data

Refer Worcester, Western Cape Province, weather records.

WORKS SPECIFICATION

1. Applicable SANS Standards

- The Statutory National Specification, referred to in the Occupational Health and Safety Act 85 : 1993, as amended shall apply.

2. Particular Specifications

As listed above.

3. Details of Contract

SECTION 1 : THE WORKS

PS.1 **DESCRIPTION OF THE WORKS**

Robertson Main Substation:

The project comprises the supply, delivery, installation and commissioning of electrical equipment and construction of some civil works to the existing 66 kV/11 kV Robertson Main Substation. This project specification calls for the following:

- Changes to the substation to replace one existing 15 MVA Dyn11 66/11 kV ONAN transformer with a transformer with a nominal impedance to match an existing unit, Transformer number 3.
- Existing HV, MV Switchgear and CT's shall be reused. All surge arrestors must be transformer installed and new.
- The outdoor transformer CT's will not be upgraded.
- The transformer design, manufacture, deliver, install and commission forms part of this contract.
- A thermal hot spot survey must be done on all transformers under load conditions. A particular focus is the circulation paths and all current carrying connections, internal and external.
- The existing transformers 1 and 2 oil samples shall be taken from the main tank and OLTC tank and laboratory analysed. The intent is to assess the impregnated paper winding insulation, by analysis of acidity, breakdown products and partial discharge.
  All testing shall be non-destructive on all components of the transformer.
- A temporary plinth, comprising wood sleepers, must be provided for the existing transformer, to allow preparation for civil works to the bund and foundation for the replacement transformer.
- All transport arrangements must be made by the contractor.
- The old transformer Nr 1 will need to be prepared for storage and placed on a temporary base with appropriate damp protection rubber sheet under it. Details of requirements of mothballing the transformer is given.
- The existing transformer must be relocated to Noree Substation, just off the R60 close to the Vink River Bridge. A concrete plinth must also be constructed for the transformer.
- All control wiring and cabling shall be reused from the marshalling box to the switchroom.

- Civil works, plinths, trenches and fencing, including the replacement of the existing fencing where disturbed;
- HV yard cleaning restricted to works area only, weed killing treatment and gravel replacement as necessary.
- The transformer oil trap bund walls to typical ESKOM design
- One underground oil tank to collect spill oil in the event of a transformer leak.
- Commission and test the installation.
- Hot spot survey and report of all new and disturbed connections
- Supervisory and control systems upgrade and integration.
- The Health and Safety Plan preparation, administration and reporting.

Generally all materials supplied shall comply with Eskom specifications.

PS.1.1 **POINT OF SUPPLY**

The substation is supplied from an ESKOM 66 kV overhead line feeding the Municipal 66 kV busbar of the Langeberg Municipality, Robertson Main substation. All authorisations, switching arrangements and shutdown programs must be arranged, approved and signed off by the Municipality and, where required, ESKOM.

Construction network outages:

A methodology and outage arrangement must be presented to the municipality and agreed.

Outages must be restricted to after business hours and must optimally be considered for night works, subject to agreement with the municipality. Social security and traffic control will be considered.

Generally the outages shall therefore be scheduled over weekends.

PS.1.2 **METHODS AND PROCEDURES**

Method statements must be prepared for transformer off-loading and for the 66kV transformer bay safety barriers, clearances to live equipment and switching.

PS.2 **LOCALITY AND ACCESS**

The site is the Robertson Main Substation alongside other Municipal services depots. The location is shown on drawing 301268-EL-DLP-0001-00

Access to the site is along existing roads. The Contractor shall be responsible for all timely traffic arrangements for major plant deliveries and rigging or crane equipment.

PS.3 **NATURE OF GROUND AND SUBSOIL CONDITIONS**

The tenderer shall familiarise themselves with ground conditions. Provisional allowance is made for medium soil conditions to be reviewed once the trial holes are done and the soil conditions confirmed.

No subsoil report is included.

Generally it can be taken as gravel soil, weathered rock and rock

No high water table risk is identified. Drainage during construction is the contractor's risk.

Altitude	:	200 m AMSL
Temperature:		
Maximum ambient	:	+44 °C
Minimum temperature	:	- 5 °C
Ground covering in the 66 kV yard	:	Established stable ground in substation yard with gravel cover
Lightning occurrence	:	Refer to SABS risk factor analysis (Worcester): No adjacent structures excluding the substation and it's lightning masts.
Pollution	:	Frequent dust from dry soil.

PS.4 DETAILS OF CONTRACT

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

The existing substation general layout arrangement is shown on drawing 301268-EL-DAL-0001-001.

The new transformer position, bund extent and oil sump is shown on drawing 301268-EL-DAL-0002-001.

PS.4.1 TRANSFORMER

One 66/11 kV 15 MVA Dyn11 ONAN transformer is required, to replace an existing transformer.

The unit must be supplied with all clamps, and fitted, breathers dry and clean, and surge arrestors.

The transformer design must provide a close impedance match with the existing unit number 3 to allow normal parallel operation.

Tap Changer

The tap changer shall be a Rheinhausen VACUTAP SF6 unit with SF6 pressure monitoring, alarm and lockout contacts to prevent tapping if the SF6 gas pressure is below design / operational levels or approved equivalent.

The existing tap change control unit shall be re-used

Two existing control panel for the transformer and the tap changer controls must be upgraded with the additional SF 6 lockout and alarm functions.

PS.4.1.1 Hold Points

The Contractor shall provide the following hold points on his construction programme.

- Pre-tanking inspections
- Post testing before de-assembly for transport

PS.4.1.2 Witness Points

The Contractor shall allow for the witnessing of manufacturing and assembly by representatives of the Client and indicate these on the construction programme.

- Core assembly (pre tanking) / tank construction.
- Electrical / mechanical tests.

- Loading / off loading on transport trailer.

PS.4.1.3 **Special Tests and Monitoring**

The following is required additional to the specified tests:

- Impact / G force monitor during transport (>1g [9.81 m/s^2]).
- Sweep frequency response analysis.
- Tank inert gas fill pressure.

PS.4.1.4 **Panels**

No new control panels are required. The existing units shall be reused

PS.4.1.5 **Wiring**

All wiring leaving the OLTC panel shall be terminated onto an identifiable terminal strip of spring loaded, bar mounted terminals. Screws must be suitable for flat or star screwdrivers.

Terminations shall be with crimped pin, spade or other type lug approved by the Project and Consulting Engineers.

PS.4.1.6 **Control Cabling**

The transformer and tap changer shall be wired to a marshalling kiosk mounted on the transformer. The control cabling to be used shall be 4 mm^2 or 2,5 mm^2 copper conductors insulated to 1 000 V, or as required.

PS.4.2 **BUSBARS AND STRUCTURES**

The existing busbar supports, PI's and HV circuit breaker shall be reused.
They will be temporarily removed for the civil works to be completed. The CT's and marshalling kiosk will require a new plinth.

The MV busbar and cable termination structure shall be removed for the removal of the transformer and new civil work's completion.

The phasing of all busbars and conductors shall be marked clearly in accordance with an acceptable colour code.

PS.4.2.1 **66 kV Busbars**

The existing busbars must be replaced with new.

PS.4.2.2 **Equipment Plinths**

The actual size and position of plinths shall be determined according to the design of steel structures and actual equipment size.

PS.4.3 **LABELS**

PS.4.3.1 **General**

All labels, warning and danger signs as prescribed by the "Code of Practice" and the "Occupational Health and Safety Act" shall be installed on the boards to the satisfaction of the Engineer.

It is the responsibility of the Contractor to ensure that, unless otherwise approved by the Engineer, all labels to be installed are in **English**, and is complete and descriptive. Should any doubt exist concerning the label descriptions, such doubts shall be cleared with the Engineer prior to the manufacturing of the labels.

"Traffolite" or other approved engraved type labels shall be used externally on all indoor type boards, as well as on the inside of all cubicles or kiosks.

Care shall be taken to ensure that all equipment is fully labelled in **English**

All statutory and deemed necessary safety warning and prohibition notices shall be in **English and IsiXhosa**.

Each piece of equipment shall have a **separate** label. Combined labels on long label strips, e.g. for single circuit breakers are not acceptable. Each label shall be separately removable.

Brass or stainless steel engraved labels only shall be used externally on all outdoor type boards, unless otherwise approved in writing by the Engineer.

All indication and descriptive labels shall have black letters on a white background, while danger labels will have white letters on a red background.

All labels shall be mounted in an approved manner by means of screws or rivets. Under no circumstances shall the labels be glued to the metal work.

All fuses, fuse switches, relays and contactors shall be separately labelled, clearly indicating the type, rating and functions.

One designation label shall be fitted to the front of the cubicle, one externally to the rear floor of each cubicle and a third inside the cubicle at the rear, to clearly indicate the panel designation when the doors are in the open position.

The Contractor shall supply a list of labels to the Engineer for approval before such labels are made.

All labels shall be replaced to match the existing. Descriptions shall not be changed.

PS.4.4 **CURRENT TRANSFORMERS**

The existing 66 kV CT's may need to be removed during construction and replaced on completion of the civil works:

It shall be replaced with a new plinth but with the original steelwork, properly earthed and recommissioned

PS.4.5 **PROTECTION PANEL (TRANSFORMER)**

The existing protection panel shall be reused.

PS.4.6 **EXISTING TRANSFORMER REMOVAL TO TEMPORARY STORAGE**

The existing transformer must be sealed though breathing to prevent any ingress of contamination.

Bushings must be sealed to prevent corrosion and contamination

The oil conservator may be drained and isolated. Oil may only be decanted into new clean drums for storage.

The unit must be rigged out and moved to a location in the Robertson Main substation. Suitable railway sleepers or treated wood beams must be provided and placed under the transformer, as appropriate, for temporary storage if the sequencing of work should require it. All fixtures and fixing material must be packed and marked

for reassembly when required. Smaller items must be delivered to the adjacent Electricity Department Store, with a delivery slip of all items.

All open glands, flanges, pipes and wiring openings must be suitably closed and sealed where required.

Inspection, acceptance and signoff documentation must be countersigned by the municipal representatives as identified during the contract duration.

PS.4.7 **TRANSFORMER CIRCUIT BREAKER**

The existing 66 kV transformer circuit breaker will be reused.

PS.4.□ **TRANSFORMER PROTECTION AND CONTROL**

PS.4.□1 **Panels**

The existing transformer protection and tap control panel will be reused. The existing protection relays are generally SEL equipment.

PS.4.□2 **Wiring**

All wiring leaving the OLTC panel shall be terminated onto an identifiable terminal strip of spring loaded, bar mounted terminals. Screws must be suitable for flat or star screwdrivers.

Terminations shall be with crimped pin, spade or other type lug approved by the Engineer.

PS.4.□3 **Control Cabling**

The existing control cabling shall be reused.

Where the cables are disturbed they must be inspected and any damages appropriately repaired before closing of trenches. All cores must be tested for insulation and continuity damage and repaired as required.

Any extensions required must be made in an approved above ground junction pillar. All cables between the existing marshalling kiosk and the transformer shall be new.

No joints shall be allowed in cables less than 5 meters in length. Such cables shall be replaced between the terminations with new cables.

PS.4.9 **EARTHING OF EQUIPMENT**

All equipment shall be earthed with 50 x 3 mm copper bars to the earth mat.

All joints shall be by means of Cadweld or copper welded.

PS.4.10 **ACCESS ROAD**

The access road shall be inspected to ensure that all major plant and equipment can be accommodated. Traffic plans must be submitted and agreed to by the traffic department.

PS.4.11 **EARTH MAT**

The existing substation earth mat must be replaced where disturbed by the civil works. Extensions to the earth mat shall consist of bare solid copper conductor with minimum conductor area of 70 mm^2. All connections between earth mat and earth conductors shall be exothermic (Cadweld) type welded joints. While installing the earth mat, care shall be taken not to damage existing power and control cables.

The Contractor shall conduct an earth resistivity test and test existing earth mat resistance to verify the integrity of the existing installation and submit the results to the Engineer.

All support structures, transformer and NER shall be connected to the earth mat with 70 and 35 mm^2 copper conductor.

The substation earthing shall be in accordance with Particular Specification PV : Earthing.

PS.4.12 **LIGHTNING PROTECTION**

Lightning protection shall be in accordance with requirements as described in SANS 10313:2005.

The existing Masts shown on the site layout drawing is deemed to provide appropriate shielding for the equipment. The earthing of the masts must be verified for integrity.

PS.4.13 **CABLE TRENCHES**

Cable trenches will be required inside the substation yard for the relocation of existing underground services.

PS.4.14 **LIGHTNING ARRESTORS**

Lightning arrestors (one per phase) shall be installed on the position and structures as shown on the drawings. It shall be of the metal-oxide type with ratings described in the data sheets.

PS.4.15 **AUXILIARY TRANSFORMER/NEUTRAL EARTHING RESISTORS**

No Neutral Earthing Resistors is presently used.

The Power transformers are solid earthed.

The auxiliary supply transformer is existing

PS.4.16 **11 kV POWER CABLE**

The existing single core 3 phase cables for the old Transformer shall be reused.

The existing 11 kV support and busbars must be temporarily removed for the construction activities and removal and replacement of the transformer.

The cables will not be replaced but only moved, protected and reinstated.

New clamps and surge arrestors must be provided.

New terminations shall be made at the 11 kV busbars.

Earthing is to be at the same end as the existing cables. Cable clamps shall be non magnetic or conductive material. Wood shall be appropriately impregnated treated and sealed.

PS.4.17 **EQUIPMENT PLINTHS**

Drawing 301268-EL-DAL-0002-001 shows the position of the new plinth, bund and marshalling kiosk position. foundations, existing and new. The actual size of new plinths shall be determined according to the design of steel structures and actual equipment size.

PS.4.1□ **HIGH VOLTAGE CIRCUIT BREAKER**

The existing circuit breaker is retained.

PS.4.19 **HIGH VOLTAGE ISOLATOR SWITCH**

The isolator switches with auxiliary contacts are existing and will not be changed.

PS.4.20 **PROTECTION RELAYS : 66 kV TRANSFORMERS**

The existing 66 kV transformer protection relays shall be retained.

Settings may be changed.

The commission of the new transformer shall require that all control and protection equipment and settings are tested for proper operation.

PS.4.21 **INDOOR SWITCHGEAR**

The existing circuit breaker shall be reused.

PS.4.22 **ALARMS AND SUPERVISORY INDICATION**

The Contractor shall test and ensure that the existing SCADA system is up to date with respect to the new transformer.

PS.4.22.1 **SCADA Software at Central (Control Room)**

All mimic alarm indications must be updated on existing system at central control room

PS.4.22.2 **RTU Specifications**

The RTU is an existing installation.

PS.4.23 **11kV UNDERGROUND CABLES**

The existing auxiliary transformer cable passing by the Transformer 1 location will be inside the new bund.

It is shown to be relocated along a new route along the fence.

It must be excavated and reinstalled in a new trench to the correct depth with a 100mm sand bedding and 100 mm sand blanket. Graded backfill must be used to 200 mm from the surface. The final finish shall be with gravel.

PS.4.24 **CRUSHED STONE**

The substation yard areas affected by the construction shall be covered with 25 mm crushed stone to a depth of 75 mm as shown on the drawings. Existing stone shall be recovered and screened and washed. It shall be reused with additional gravel to reinstate the gravel to the complete yard.

PS.4.25 **DC POWER SUPPLY AND BATTERIES**

The existing DC power supplies have a nominal voltage of 110 V.

PS.4.26 **FENCING**

The existing fencing must be reinstated where removed for the construction access.

Temporary fencing must be provided inside the existing boundary fence to maintain security of the substation and in particular the 66 kV yard. The panels must be earthed at no more than 10 m intervals to prevent any dangerous touch voltages occurring.

Safety barriers must be placed between the construction area and any live equipment, noting safety clearances. Highly visible Warning signs must be provided, prohibiting unauthorised access inside the construction area.

Security fence earths must not be connected to the substation earth mat but to a separate continuous earth conductor alongside the fence at 600 mm depth. The conductor shall be 70 mm^2 copper.

Gates must be bonded with flexible flat copper connections.

The following signs must be provided at no more than 20 m apart on the fence.

"EARTH CONDUCTORS ARE NOT SUITABLE FOR RE-MELT AND SCRAPANTI THEFT EARTHING CONDUCTOR"

PS.4.27 **SUBSTATION BUILDING**

The existing substation buildings requires minor builder's work

Damage to floors and finishes caused during construction must be repaired and finishes reinstated.

The substation buildings must be cleaned inside and out on completion.

PS.4.27.1 **AC/DC Distribution**

The AC/DC distribution panel is existing.

PS.4.2□ **TERMINAL BLOCKS**

Multi-core terminal blocks shall be provided inside the cubicles in an easily accessible position(s) for terminating all multi-core cable tails and for the connecting up with the internal wiring in the cubicles. Unless otherwise approved, terminal strips shall be of the rail mounted spring loaded insertion type, mounted vertically in order that ferrule numbers on wires may be read without difficulty. Each individual terminal strip or group of terminal blocks shall be clearly marked as per the design drawings.

Terminal blocks shall either be of the double ended insertion type or the linked double terminal stud type with suitable provision made for mounting the terminal blocks on terminal blocks or rails in rows or in strips. End brackets shall be used to prevent lateral movement of terminal blocks.

Terminal blocks of the insertion type shall incorporate separated spring loaded clamping yokes of plated steel which clamp the wire ends onto a silver or nickel plated separated current bar by means of plated steel clamping screws. The complete assembly shall be encased in a non-hygroscopic moulding of insulting material with high electrical and mechanical strength. "Klippon" RSF 1 type terminals are preferred. Equivalent alternative terminals may be submitted to the Engineer for approval.

Any springs used in the terminals shall be treated to withstand corrosion which might affect performance during their working life, and they shall be arranged not to carry any current.

The studs of stud type terminals shall be locked in the insulating base to prevent turning. The base shall be made of moulded non-hygroscopic insulating material of high mechanical and electrical strength, and suitable insulating barriers shall be provided between adjacent terminals. Each terminal stud shall be provided with two brass nuts and two brass washers. The minimum diameter of studs made of brass or copper shall be 5 mm. Phosphor bronze stud shall not be less than 4,5 mm in diameter and stainless steel studs not less than 3 mm in diameter. "Klippon" ST 5 terminals are preferred. Equivalent alternative terminals may be submitted to the Engineer for approval.

The materials used for terminal blocks or strips shall be self-extinguishing, non-hygroscopic and shall not carbonise when tested for tracking. The final moulding shall have a high impact strength, shall be mechanically robust and shall be dimensionally stable. Terminal boards or strips shall be mounted such as to allow sufficient space for cable tails and for working on cable glands without impeding across to any other equipment, and shall start 300 mm above the gland plate of the cubicle or kiosk.

Terminal boards or strip shall be wired with all internal or incoming wiring entering from one side and all outgoing or external connections (multi-core cable tails) leaving from the other side thereof.

Only one wire shall be connected to each one terminal. Jumper bars or bridge prices of the approved type shall be used as a busbar for multi-circuit connections on terminal trips.

At least 20 % spare terminals shall be provided on all terminal boards or strips.

Unless terminal blocks are of the totally enclosed type, covers of transparent insulating material shall be fitted to all terminal rows or banks where circuits are connected to with voltages in excess of 42 Volts, to prevent accidental contact with "live" equipment.

Each terminal shall be marked clearly, permanently and conspicuously and all terminal strips and boards shall be suitably identified with durable labels fixed in an approved manner.

PS.4.29 FUSES AND LINKS

Fuses and links shall be provided as required for the protection of circuits. The type and rupturing capacity to SABS 172 of fuses shall be indicated on the wiring and schematic diagrams to be submitted to the Engineer. Cartridge type fuses are preferred.

All fuse and link carriers and bases shall be moulded of high quality non-hygroscopic insulating material with high di-electrical and mechanical strength.

Fuse carriers and bases shall be suitably and permanently labelled displaying the designation and identification. Fuse current rating shall also be display. The labels shall not be fixed to removable parts of fuses or links. and shall be fixed to the mounting frame by means of screws.

Fuses and links shall be mounted vertically in horizontal rows and shall preferable be arranged for back connection.

PS.4.30 MOULDED CASE CIRCUIT BREAKERS

All moulded case type circuit breakers (MCB's) shall be of standard DIN rail mounting type and to SANS specification or authorised.

The preference of the employer shall be considered.

MCB's shall be of the flush-mounted type suitable for safe operation at a voltage of 600 V with a breaking capacity of 10 kA at a lagging power factor of 0,5.

MCB's fitted with magnetic tripping mechanisms shall be preferred. Alternatives may be submitted for approval.

Where MCB's are used in DC circuits these shall be suitable rated for current carrying, as well as fault current capacity and shall be to the full approval of the Engineer. Documentational prove of adequacy for the particular application shall be provided to the Engineer prior to the installation of any DC circuit breakers.

PS.4.31 PANEL WIRING

Panel wiring shall be insulated with a least 600 V grade insulation according to SABS 150.

All wiring that may come into contact with oil shall have oil resistant insulation.

On normal control and indication wiring the size of conductor to be used shall be either 2,5 mm^2 32 strand or 1,5 mm^2 multi-strand (at least 32 strands) copper conductor wiring to the full approval of the Engineer.

All current transformer circuits shall however be wired with 2,5 mm^2 multi-strand (at least 32 strands) copper

conductors to the full approval of the Engineer.

All wiring shall be terminated to terminal blocks by means of pre-insulated ring type or flat type crimping lugs. Crimping shall be in accordance with NRS 28 of 1993.

All wiring shall be done continuous between terminals. Under no circumstances shall wiring be jointed or "teed" into between terminals.

The ends of all wiring shall be terminated in approved pre-insulated crimping type terminals and ferrules which shall be applied or crimped with approved crimping tools of the correct applicable size and which unlatches only after completion of the total crimping action.

The correct and applicable terminal sizes shall be used, and under no circumstances shall conductor strands be cut to fit terminals.

Under no circumstances shall more than two wires be terminated to any equipment or instrument terminal. A separate sub-busbar shall be used for common multi-circuit termination.

Where earth and neutral conductors have been "looped in" to intermediate equipment or instruments between the main terminations, the two branches forming the "loop-in" shall be crimped together into one common terminal to ensure continuity of the circuit if the intermediate equipment is removed for any reason.

No strands shall be visible after a terminal has been crimped to a wired.

All bundles of wire to instrumentation, mounted on doors, shall be protected against any damage that may occur when opening the door by means of a flexible protection sleeve over the conductors. The bundles of wires shall be fixed, with clamps of the "screw on" type to both the door and the frame work. Under no circumstances will "glue on" type clamps be allowed. All such conductor bundles shall be so arranged to go through a twisting motion when the door is opened.

All wiring shall be arranged in horizontal rows and vertical columns without twisting and crossing of conductors in order to present a neat and uniform appearance. All such groups of conductors shall be bundled and bound together with an approved wire tie or channel system. Under no circumstances may PVC adhesive tape be used for the bunching or grouping of conductors or for colour identification of the conductors.

The main clamps or channels shall be screwed or riveted to the base frame. Systems glued to the base frame or doors shall not be accepted.

Where a wiring channel system is used, care shall be taken to ensure that such channels are not more than 60 % filled with wiring in order to allow for possible future extension.

At all positions where wiring passes through holes in the sheet metal (i.e. from one cubicle to another), such holes shall be provided with approved grommets to protect the wiring against damage.

All control, interlocking, metering and nay other circuit shall be terminated onto numbered "Klippon" or other type of terminal strip approved by the Engineer in writing. Such terminal strip shall be of the appropriate size for the relevant conductors and the conductor sizes and all wire number shall be recorded on "as installed" drawings and wiring diagrams. These terminals shall be grouped separately from any terminals of power circuits.

All conductors terminated on terminal blocks shall only be terminated with crimped blade type pre-insulated terminals. Round pin type terminals are not acceptable. Other methods of termination shall be approved by the Engineer in writing. Bare conductors shall not be terminated directly into any terminal strips or blocks.

PS.4.32 **POLARITY OF CURRENT TRANSFORMERS**

The direction of power flow, when defined, shall enter a current transformer at terminal "P 1".

When the direction of power flow is not defined, terminal "P 1" shall be nearest the primary busbar side.

In the case of neutral current transformers terminal "P 2" shall be nearest the transformer neutral, i.e. terminal "P 1" shall be nearest the neutral earth connection.

Where current transformers are starred directly on one side, this shall be the "S 2" side, i.e. corresponding to the "P 2" terminal of the current transformer.

NB: This gives the following standard arrangement : Where the direction of power flow is not defined, or important or is away from the busbars, the star point shall be on the cable side.

PS.4.33 **FIXED STARTING POINTS FOR NUMBERING CONNECTIONS**

Connections made directly to the secondary terminals of current transformers and to star points in current transformer circuits, shall take the lowest number in the group allocated for the purpose.

On current transformers the lowest even number be used for "S 2" terminal connections, and the lowest odd number for "1" terminal connections.

Numbering shall always be in ascending order from a point such as those defined above.

Where a starting point is defined as an odd or even number, the ascending number shall respectively be odd or even, only.

In current transformer circuits preference shall be given to commencing the ascending numbering from the "S" terminal side, and where phase and neutral current transformers are together in a circuit, phase current transformers shall take precedence.

Numbers shall be skipped where necessary for the possible future addition of items of equipment in series.

PS.4.34 **FERRULE MARKING**

The marking and colouring of small wiring shall comply strictly with BS 158 and with such ferrule marking as shown on schematic diagrams that may be issued with the enquiry, and applicable wiring diagrams supplied and approved the Engineer.

All wiring shall be ferrule marked to approval with suitable ferrules, preferable of the interlocking type. Alternative wire identification systems may be submitted to the Engineer for approval.

The type of ferrule markers to be used shall be to approval. Ferrule markers shall be of a durable insulating material having a reasonably glossy finish to prevent adhesion of dirt. Ferrule markers shall be marked clearly and permanently and shall not be affected by moisture or oil. Unless otherwise approved ferrules shall be white with black marking.

Wire marking and identification by means of "tape-on" type number trips will not be accepted.

PS.4.35 **EARTHING**

Each cubicle or kiosk shall be provided with a copper earth bar with minimum dimensions of 25 x 5 mm. Such earth-bar shall be mounted in an accessible position in the bottom of each kiosk, and shall be arranged to be continuous over the full length of a control board made up of various cubicles or kiosks.

The earth-bar shall be pre-drilled over its full length at 15 mm centres with holes with a minimum diameter of 5 mm. The above earth-bar shall be earthed to the main substation earth by means of an earth connection with a cross-section equal to the earth-bar.

All exposed instruments shall be effectively earthed to the earth-bar by means of copper conductors with a minimum cross-sectional area of 2,5 mm^2, which shall be insulated by means of green PVC insulation. Care shall be taken that the gland plate and screens of all incoming cables be connected to the above earth-bar to the approval of the Engineer.

PS.4.36 **BOLTS AND NUTS**

Unless otherwise approved all bolts and nuts shall be metric sizes complying with an approved international standard. The sizes used for each application shall be to approval. Terminal bolts or stud used for carrying current of more than 100 Amps shall not be less than 16 mm in diameter. All terminal bolts and studs used for electrical connections with diameters less than 4 mm shall be made from either stainless steel or phosphor bronze. Brass shall not be used.

Nuts and screws shall be adequately locked to prevent unintentional loosening. Wherever possible bolts shall be fitted in such a manner that in the event of the nut working loose and falling off, the bolt will remain in position. Self-tapping bolts and screws are not acceptable. All bolts, nuts and washers exposed to atmospheric conditions shall be suitable treated to prevent corrosion by means of either hot-dip galvanising or cadmium plating to the approval of the Engineer.

Bolts and nuts shall project a maximum of 4 thread and a minimum of 1 thread through their respective nuts.

Torque verification: All bolts and nuts must be torqued to the design limits and colour marked with an indelible pen once torqued. This is to be able to visually check for Quality Assurance compliance.

This does not apply to factory assembled and QA'd assemblies with attached verification certificates.

PS.4.37 **DRAWINGS FOR APPROVAL**

The contractor must compile a new switchgear and control panel arrangement and electrical schematics for the transformer nr 1 panels.

Available schematic records will be provided where available. These may be copies only and no electronic records may be available.

A set of three prints of shop drawings for the civil and electrical works shall be submitted to the Engineer for approval at least four weeks before manufacturing or construction starts.

This includes the transformer plinth, bund and new plinths for the 66 kV CT and 11 kV cable termination busbar structure must be submitted by the contractor

The oil sump design drawings as designed by a registered structural engineer must be submitted as early as possible to allow coordination of the site works.

The approval of drawings shall not relieve the developer of his responsibility to supply the control boards according to the requirements of this specification.

PS.4.3□ **WITNESSING OF FACTORY TESTS**

The Contractor shall inform the Engineer 14 days in advance of these tests so that a representative of the Engineer may be present to witness the factory tests. The Contractor shall include in his tender price for the travelling expenses for a representative from the Langeberg Municipality and the Engineer to the manufacturer's works and back. Any expenses relating to the above factory tests shall be for the Contractor's account.

It should be noted that inspections and witnessing of tests will not relieve the Contractor of this responsibility for meeting all the requirements of the specification, and will not prevent subsequent rejection if such materials or equipment is later found to be incorrect or defective.

PS.4.3□.1 **Factory Test Reports**

a□ A comprehensive factory test report containing all the relevant test results shall be submitted to the Engineer for approval prior to the delivery of any materials or equipment.

□□ The above factory test reports shall be submitted, irrespective of whether a representative of the Engineer was present during the testing or not.

PS.4.39 **SITE TESTING AND COMMISSIONING**

Site testing and commissioning may only commence after the following work has been completed:

a□ All equipment has been erected and the relevant busbars connected to and between the 66/11 kV transformer, MV switchboards/relay control panels.

□□ All high voltage and low voltage cables have been connected to the switchgear and related equipment.

c□ All the bus-wiring between switchboards/relays control panels have been connected.

d□ All the relevant equipment has been labelled correctly.

e□ The DC auxiliary supply has been connected to the equipment.

□□ All the necessary safety equipment (i.e. danger notices, fire fighting equipment and first aid equipment) have been fitted to the substation.

□□ The relevant high voltage pressure tests have been performed.

PS.4.39.1 **Preliminary Site Checks**

Prior to commencing any functional testing, the following preliminary checks shall be carried out:

a□ All new wiring done on site (i.e. bus-wiring, DC auxiliary supply wiring, connections to CT's on VT's and outdoor switchgear, marshalling kiosks etc) shall be checked against the drawing using an electronic "buzzer" to prove continuity.

□□ All new lead numbers and all new lugs shall be checked for secure crimping and proper electrical contact.

c□ All terminal strips shall be checked tightness and proper electrical contact.

d□ The DC auxiliary supply voltage shall be checked to ensure that the voltage is within the range of the protection relays and related equipment.

e□ All new wiring, as well as CT and VT circuits shall be insulation tested at 500 V DC with respect to earth, and the correct earthing of CT and VT circuits shall also be checked.

□□ The loop resistance of pilot wire cables (where applicable) shall be measured and noted in the site commissioning report.

□□ All pilot cable cores shall be insulation tested at 500 V DC with respect to earth and tests shall be done to ensure correct polarity of all pilot cores.

□□ All indication instruments shall be checked for damage and their pointers adjusted to zero.

PS.4.39.2 **Functional Tests**

Functional tests shall be carried out to ensure that all combinations of operation of the protection and control switching/selection results in the correct operation of circuit breakers, either by tripping or closing.

The following checks shall be carried out:

a□ All relays shall be operated in turn to trip or initiate auto-reclose of the breaker.

□□ All types of indication and alarms shall be checked for correct operation.

c□ The correct latching and resetting of master trip relays and other seal-in circuits shall be checked.

d□ Panel switches shall be checked for correct function and selection in all positions.

e□ Motor and transformer thermometers shall be checked for calibration and set point operation and the results noted in the site commissioning report.

□□ Buchholtz relays on transformers shall be checked for surge and gas operation and the results noted in the site commissioning report.

PS.4.39.3 **Secondary Current Injection Tests**

a□ All measuring type protection relays, particularly those using multiple inputs, shall be tested for operation at various points (not less than 5) on their operating characteristics by means of secondary injection tests.

□□ The total circuit from the tests block, up to and including the relay shall be tested by means of secondary injection and the results shall be noted in the site commissioning report.

c□ Only the characteristics of the required final relay settings should be checked and noted during commissioning tests.

PS.4.39.4 **Primary Current Injection Tests**

Primary current injection tests shall be done to prove the following:

□□ To ensure that CT secondary currents reach the protection relays correctly.

c□ That metering CT's saturate at the correct current levels.

d□ That CT ratios and polarity are correct and that CT's were not damaged during transit and installation.

e□ Stability of differential protection for through-faults and correct operation for internal faults.

The results of the above tests shall be noted in the site commissioning test report Circuit Breaker Trip Tests

PS.4.39.5 **Correction Of Drawings**

All alterations made on site to the equipment shall be marked up on the drawings. The marked up drawings shall be returned to the original draughting office for corrections of their masters and be re-issued as "as commissioned drawings".

PS.4.39.6 **Witnessing Of Commissioning Tests**

The Contractor shall inform the Municipality 14 days in advance of these tests so that a representative of the Engineer may be present to witness the site commissioning tests.

It should be noted that inspections and witnessing of the above tests will not relieve the Contractor of this responsibility for meeting all the requirements of the specification, and will not prevent subsequent rejection if such materials or equipment is later found to be incorrect or defective.

PS.4.39.7 **Site Commissioning Test Report**

a) A comprehensive site commissioning test report containing all the relevant test results shall be submitted to the Engineer after final commissioning has taken place.

b) The site commissioning test report shall also contain the testing and maintenance instruction manuals and minimum recommended spare requirements for each type of protection relay, circuit breaker and related equipment that has been commissioned.

c) The above site commissioning test report shall be submitted irrespective of whether a representative of the Engineer was present during the tests or not.

PS.4.39.□ **Calibration Of Test Equipment**

a) All testing equipment, instruments and injection test sets used during factory tests and site commissioning tests, shall carry a calibration stamp or sticker issued by a recognised calibration centre. (i.e. Eskom, CSIR, Bureau of Standards, etc.).

b) The date on the calibration stamp or sticker shall not be older than one year.

c) Tests performed with test equipment that do not comply with the above, shall be rejected and equipment tested with this testing equipment shall not be accepted by the Engineer.

PS.4.39.9 **Cable Tests**

When applicable, all cable joints and terminations shall be pressure and phase tested before commissioning may commence. The pressure test applied shall be 18 kV DC applied for 15 minutes.

PS.5 **ITEMS REQUIRING SPECIAL ATTENTION**

As the work progresses, the Contractor shall keep an accurate record of any variation or deviation from the original drawings as approved by the Engineer. The actual position of all equipment as installed on site shall be noted on the drawings. The completion certificate will not be issued unless these "as built" drawings have been submitted to the Engineer.

A representative of the Engineer shall be on site whenever he deems it to be necessary.

PS.6 **CABLE AND SERVICE CROSSINGS**

The Contractor shall take care during trenching not to damage any existing services and shall liaise with the Local Authority to establish exact positions of services prior to trenching. The Contractor shall perform all work after obtaining the necessary way-leaves and permits.

PS.7 **"AS BUILT" DRAWINGS**

The Contractor shall keep a set of drawings on which all deviations and final positions and relevant data are accurately recorded.

These drawings must be handed to the Engineer on completion in DXF format. The completion certificate will not be issued without these drawings.

PS.□ **MANUALS, DRAWINGS AND LITERATURE**

Three copies of the maintenance manual, operating instructions complete with associated wiring diagrams, layout drawings, etc. pertaining to the equipment, shall be supplied for each complete panel.

The drawings etc. shall be complete and to the satisfaction of the Client. All three copies shall be handed to the Consulting Engineer, who will examine same, and issue receipt therefor, and distribute to the officials concerned. These manuals and drawings must be supplied as soon as possible after receipt of order.

One set of sepias of the "As Built" circuit diagrams and general arrangement drawings shall also be provided.

Handbooks/Manuals shall be in **English**.

Handbooks shall cover at least the following:

a) system description and interconnection diagrams;

b) description with circuit diagrams, of each unit of equipment;

c) drawings of each unit of equipment showing component layout and identification;

d) component lists of all components, for each component, the circuit diagram identification, manufacturer's part number, component description and the supplier's code number, where applicable;

e) maintenance and setting-up instructions;

f) performance specifications and performance tests;

g) A complete set of schematic wiring diagrams on linen backed paper prints shall be provided in the glass fronted drawing frames to be mounted on a wall of the substation.

PS.9 GUARANTEE

All equipment must be guaranteed for a period of 12 months from date of commissioning, against defective materials and workmanship. Any such defects must be repaired free of charge by the contractor.

Equipment shall be adequately protected against possible damage during transportation, off-loading and handling on site.

PS.10 TEST CERTIFICATES

Certified copies of test certificates in respect of impulse level and fault rupturing capacity must be submitted with the tender. Certificates of all tests done on the equipment to be commissioned to be submitted to the Engineer before final commissioning takes place.

PS.11 TESTS IN THE MANUFACTURER'S WORKSHOP

The Contractor shall notify the Consulting Engineer at least two (2) weeks in advance of acceptance tests due to be carried out by the manufacturer, in order to enable him and/or a Representative of the Client to be present at such tests if he/they so desire.

PS.12 COMMISSIONING

The Contractor will be responsible for all testing and commissioning of the equipment by competent persons and the provision of all test equipment required to fulfil his obligations in this regard.

Testing shall be carried out in the presence of the Consulting Engineer.

At least five days notice shall be given of any such commissioning tests to be carried out.

The testing programme shall include for all items necessary to prove the safe and correct operation of all parts of the installation, and shall in particular cover the following:-

i) Cable insulation and continuity,

ii) Operational tests on all protection relays (transformer protection),

iii) Operational tests on the tap changer operation (Local and remote).

PS.13 INSTALLATION PROGRAMME

During the handing over of site a programme for the execution of the works by the Contractor shall be submitted

to the Engineer. Provision must be made for the inspection and/or tests by the Engineer during the following phases of the work.

a) Concept workshop drawings ready for approval;

b) Before and after installation of transformer core and windings in tank;

c) Factory test of transformer;

d) Installation of transformer on site;

e) Recommission of control equipment on site;

f) Test of the complete installation.

PS.14 SITE FACILITIES AVAILABLE

No services are available from the Municipality.

Site facilities and any services required by the Contractor such as sanitary and water facilities must be arranged with local contractors. Daily waste disposal must be provided.

PS.15 SITE FACILITIES REQUIRED

Provision shall be made for a site office and all necessary sheds, etc., for the proper storage of plant, tools equipment and perishable materials. All sheds etc. are to be moved from the site on completion of the services and the area properly cleaned.

The workmen will not be allowed to reside in the existing buildings, neither will temporary housing accommodation be allowed to be erected on the site.

Temporary latrine accommodation must be provided for workmen, kept clean and in sanitary condition and removed from the site on completion of the works.

The position where latrines must be placed, will be indicated by the Langeberg Municipality and the area on which the latrines were situated must be disinfected on removal thereof. Regular inspection of latrines must be carried out by the contractor who will be held responsible for the cleanliness of these latrines.

PS.16 STANDARDISED AND PARTICULAR SPECIFICATIONS

The following specifications form part of the contract but are not provided with this document:

ITEMS	DESCRIPTION	IEC	SANS/NRS
1	Power transformers	76	IEC 76-1
2	Bushings for alternating voltages above 1 000 V	137	
3	Oil		55
4	Current transformers		IEC 185
5	Tap changer	214	
6	Tests	52	IEC 60-1
6	Electrical relays	255	

SABS 1200 AA - GENERAL (SMALL WORKS)

SABS 1200 DA - EARTHWORKS (SMALL WORKS)

SABS 1200 DM - EARTHWORKS (ROADS, SUBGRADE)

SABS 1200 GA - CONCRETE (SMALL WORKS)

SABS 1200 LC - CABLE DUCTS

The latest edition at the time of tender of the above specifications shall apply.

In addition the following particular specifications shall apply:

PE : Substation Equipment and Official Notice
PI : Underground Cable Networks
PL : Protection
PV : Substation Earthing

SECTION 2 : VARIATION TO SPECIFICATIONS LISTED UNDER PS.16

Items are listed in the same order as for the standardised/particular specification and are numbered with the identifying numbers of the appropriate specification preceded by the letter PS.

PSPD 4.7.2 **Indication Of Cables And Wiring**

All cables shall at both ends be marked with PVC cable markers fitted below and above cable glands. High voltage cable shall only be marked below cable glands.

PSPD.4.12 **OPERATING MECHANISM**

The spring rewind motors shall be rated at 110V DC.

PS.PD 4.13 **CLOSING AND OPENING RELEASES**

The circuit breaker shall be equipped with a 110 V DC trip and closing coils.

PS.PE 4.15 **STORAGE CABINET FOR EQUIPMENT**

The storage cabinet is not required.

PS PF.3.0 **MATERIAL**

The clean metal surface shall be painted with a corrosion preventive caustic undercoat whereafter two layers of approved undercoats with different colour shall be applied. The final coat shall be a layer of alkyd enamel with colour Light Grey / Battleship Grey. Total paint thickness shall not be less than 125 µm.

The inside of control panels for the tap changer shall be painted with gloss spark suppression fire resistant enamel paint.

PS PF.4.11 **VOLTAGE CONTROL**

The tap changer must be equipped with an ODD/EVEN switch of which one of the contacts is only closed in the odd position while the other is only closed in the even position to provide an out-of-step indication. OLTC control panels shall match the protection panels in colour and size.

PS PF.5 **INSTALLATION**

Should parts be removed for transmit, the necessary blanking off must be done to obviate the need to dry

equipment on site. The fill of oil with inactive gas under positive pressure shall also be acceptable. In such a case pressure meters shall be required to monitor gas pressure. Any machined parts dismantled for transmit shall be covered with a protective layer to prevent erosion thereof.

PSPL.3.1 **ELECTRONIC EQUIPMENT**

Electronic equipment incorporated in, or auxiliary to, protection relays must conform to the following requirements:

- Equipment requiring built-in batteries is not acceptable unless approved by the Engineer, in writing;
- All semi-conductor devices must be of the silicon type;
- Where blocking diodes are required, external to relays, for the operation of the circuit, these must be of the silicon avalanche type having a rated PIV of 1 200 Volts minimum. They shall have a continuous current rating to match the maximum current which they will be required to carry in service. Their current rating should not be less than 5 amperes regardless of the circuit in which they are used. Heatshrinks shall be fitted when the current is to be carried by the diode continuously.
- DC/DC converters or approved equivalent means must be provided to furnish the required power supplies for static relays. These must provide galvanic isolation and protection against induced voltages surges of longitudinal or transverse mode. They are to operate over a range of ± 20 % of nominal voltage and be provided with healthy output indication and remote alarm facilities in the event of supply failure. The converters must be short-circuit proof and the output must recover automatically when the short-circuit is removed.

PSPL.3.3 **RELAY TERMINALS**

Terminals of the following type are not acceptable:

- Connectors of the "Fast on" (or equivalent) type;
- Terminals with clamping screws where the screws are in direct contact with the wire or crimped on terminations;
- Terminals of the wire wrap (or similar) type.

PSPL.3.3 **AUXILIARY REQUIREMENTS**

All control circuits both AC and DC shall be provided with MCB's for protection. This includes the LV side of VT's.

The MCB's shall be fitted with an auxiliary contact which makes when the MCB is open - for remote alarm purposes.

The MCB type and rating shall be selected to ensure co-ordination for faults causing current through two or more MCB's in series.

The MCB's shall be M&G "Multi-9" or approved equivalent.

PSPL.3.4 **OPERATION INDICATION**

Unless otherwise required or specified (e.g. No-volt relays), every relay which provides a trip or alarm output should either have an integral operation indicator or a separate unit which will clearly indicate the fact that the relay has operated. Each trip function of all relays is to have a separate operation indicator, and all indicators should be of the latching type. These operation indicators must only operate when the relay gives a trip output.

Preference will be given to relays whose indication have a memory so that the indication is not lost if the DC

auxiliary supply is switched off temporarily. Phase indication is desirable.

Measuring relays which initiate time delay relays must no operate their associated indicators until the time delay has expired.

Resetting is to be accomplished without opening the case.

Operation indicators must not operate incorrectly if the panel is subjected to vibration or shocks of any type.

All software required for communication, data access and manipulation shall be supplied as part of the protection scheme.

PSPL.3.4 **RELAY CONTACTS**

Contacts shall be available for external use and are to be individually wired. Hand reset relays shall be provided with an additional contact connected internally to interrupt the operating coil current. Electrically reset relays, if requested, shall also be provided with a contact connected internally to interrupt the resetting coil current. Electrically reset relays should preferably be fitted with hand reset features. "Make" contacts means contacts which are open when the relay is de-energised or reset. "Break" contacts means contacts which are closed when the relay is de-energised or reset.

All trip relays and master trip relays must be capacitor discharge proof, i.e. they must not operate when a capacitor of capacitance (C) mdf, charged to twice rated DC auxiliary supply voltage, is connected across the operating coil.

The capacitor and test voltages are to be as follows:

Nominal DC volts	Test volts	Capacitor C mfd
220	440	10
110	220	5
50	110	2,5

The discharge proofing can be built-in or provided by a separate shunt connected filter. It must not increase the relay operating time by more than 2 ms.

Contact must be able to perform the following duties:

- Tripping duty contacts must be capable of making and carrying 30A Dc for 200 ms in a circuit with a L/R time-constant in excess of 10 ms;
- Breaking duty contacts must be capable of breaking the current of the associated controlled device or the specified breaking current in a circuit with a L/R time-constant not exceeding 40 ms;
- Relay contacts must be capable of repeatedly making and, where the circuit renders it necessary, repeatedly breaking, the maximum current possible in the circuit they control, without deterioration. Where more than one set of contacts is provided, all contacts must operate simultaneously. Tripping contacts must not close due to vibration of any type, whether engendered by the normal or the fault operation of the associated circuit breakers, the closing of panel doors, swing frames or other shocks to the panel. Unless otherwise specified, the relays shall be fitted with self-resetting contacts. Where hand reset relays are specified, resetting shall be accomplished without opening the case.

PSPL.3.5 **AUXILIARY SUPPLY VOLTAGE**

All relays must be capable of operating of operating continuously over a range of ± 20 % of the nominal DC voltage and over an ambient temperature range 0 $\rightarrow$ 55 °C.

Relays providing short-circuit or earth-fault protection must be DC operated.

Relays shall have their power supplies derived from DC/DC converters, not internal batteries.

PARTICULAR SPECIFICATION: PE: SUBSTATION EQUIPMENT AND OFFICIAL NOTICES

PE.1 SCOPE

This sections deals with the standard equipment, as well as the statutory notices and signs which are to be provided in a substation.

PE.2 INTERPRETATION

Any variations to this particular specification in this contract, will be described in the "Pricing Data" or "Scope of Work"

Authorized person: A person who has, in writing, been delegated defined authority and responsibilities in terms of the relevant HV Operating Regulations, as described in NRS 040-3.

Other definitions shall be interpreted in NRS 040: HV Operating Regulations.

PE.3 STATUTORY REQUIREMENT

a The Occupational Health and Safety Act, 1993 (Act 85 of 1993) and subsequent amendments and regulations issued thereunder.

PE.4 SABS STANDARD SPECIFICATIONS AND CODES OF PRACTICE APPLICABLE

a)	SANS 1186-1:2011	Symbolic safety signs
b)	NRS 040-1	Part 1: HIGH-VOLTAGE OPERATING REGULATIONS
c)	NRS 040-3	Part 3 : HIGH-VOLTAGE OPERATING REGULATIONS

PE.5 MATERIAL

Not applicable.

PE.6 EQUIPMENT

PE.7 SWITCH ROOM

A dry type fire extinguisher must be fitted for each substation room. Each fire extinguisher must have a capacity of at least 2,72 kg and must be equipped with a long distance spray nozzle which must be suitable for use on electrical fires. The fire extinguishers will be mounted (tightly secured) near the door on a red painted wall or wall with a red background.

PE.7.1 **GLOVES**

One pair of rubber gloves will be supplied for the switch room. The gloves must be yellow according to the SABS requirements and must at all times be stored in a durable plastic bag. It must be suitable for using with a line voltage of 11 000 V.

PE.7.2 **BATTERY ROOM EQUIPMENT**

If lead-acid or nickel-cadmium batteries are offered, the following equipment must be supplied as part of the contract:

- Paper towels
- Suitable maintenance equipment rack
- Plastic face shield
- Rubber gloves (Acid proof)
- Acid resistant apron
- Plastic measuring jug
- Water must be available to clean acid spillage
- First aid box
- Hydrometer
- CO2 fire extinguisher mounted outside the room
- Some method of gas extraction

PE.7.3 **DANGER SIGNS/NOTICE BOARDS**

The switch room will be provided with three signs with the words "DANGER - DO NOT SWITCH ON". The size of the signboards will be 152,4 x 152,4 mm and will be made out of 6,35 mm thick glass fibre reinforced plastic (GRP). The letter size of the word "DANGER" will be approximately 12,55 mm. The letters will be red or black on a white background.

PE.7.4 **TOOLS**

All tools required for the normal operation of equipment must be supplied and mounted in a suitable location in the room. If applicable, tool functions must be shown.

Portable earths (sets of three) must be supplied to the quantity shown in the schedule of quantities.

PE.7.5 **LABELS**

All equipment where applicable, will be provided with appropriate name plates with lettering of approximately 6 mm. Letters will be engraved on labels and embossed PVC tape will not be accepted. Permanent fixing methods only will be accepted. These comprise rivets or screw and nut/threaded-hole fixing in steel assemblies. Self tapper screws are not acceptable. Adhesive tape fixing is not acceptable.

PE.7.6 STORAGE CABINET FOR EQUIPMENT

Fuses and all accessories to operating equipment will be stored in a wooden cabinet, floorstanding or wallmounted. The cabinet shall be fitted with doors and catches.

The cabinet shall be treated with two coats of high gloss varnish.

REFERENCE DESK

The reference desk is required for reference drawings or manuals to be opened on. It must be suitable for an A0 size drawing. Storage space for drawings and manuals is required either on a shelf underneath or inside the desk if a hinged work-top is provided.

PE.7.7 SWITCH YARD

Circuit designation labels must be provided at all line terminations, isolators, circuit breakers and transformers as described on the drawings.

Coloured phase indicators must be provided for each phase of an outdoor substation's above ground busbars/conductors

Labels shall be manufactured from aluminium with 50 mm lettering, covered with an epoxy resin material. Holders and brackets must be provided if necessary.

PE.□ INSTALLATION

PE.□1 INTERNAL NOTICES

All official notices in terms of the Electrical Machinery Regulations must be fitted in a suitable place on the wall in each substation room and where required, at entrances to these areas.

The following notices of an appropriate size, with black or red words and illustrations on white plastic sheet (filon board) are required. The choice of language shall depend on the region in which the project is executed.

a) Prohibition of unauthorised access

b) Prohibition of unauthorised handling or interfering with electrical machinery

Warning	:	Unauthorised handling of machinery and electrical apparatus prohibited.
Waarskuwing	:	Ongemagtigde hantering van masjinerie en elektriese apparaat is verbode.
Ulumikiso	:	Ukubanjwa noma ukusetyenziswa komashine ngaphandle kwamalungelo kungatyelwe.
Ulunyukiso	:	Nbobungozi bokuphata qomashine nezi
Xhobo	:	Zamsebenzi zegesi ngaphandle kwemvume

c) Directions and procedures in the event of fire

A notice with the complete instructions of how to react in the case of fire, in the following languages:

English

Afrikaans

Zulu

IsiXhosa

d) Directions on resuscitation in the event of electric shock

A notice with complete instructions regarding the procedures for first aid in the case of electrical shock, in the following languages:

English

Afrikaans

Zulu

IsiXhosa

PE.□2 **EXTERNAL SIGNS AND NOTICES**

The following notices must be screwed on to the outside of each substation building:

a) A triangular warning sign with a black lightning fork onto a yellow background with black outline. The warning sign must comply with the SANS standard 1186 -1 WW7. Recommended size 290 x 290 mm. Sign WW15 must be displayed if automatic CO_2 fire extinguishing systems are used in a room.

b) A notice which prohibits unauthorised entry, using the following words:-

Danger : Unuathorised entry prohibited

Gevaar : Ongemagtigde toegang verbode

Ingozi : Ukungena ngaphandle kwamalungelo kungatyelwe

Ingozi : Umtu umgena malungelo akanako ukungena apha

c) The name of the substation or room on white plastic (Filon) board using 50 mm letters.

d) A notice with all the telephone numbers in case of an emergency.

PE.9 **TOLERANCE**

Not applicable.

PE.10 **TESTS**

Not applicable.

PE.11 **MEASUREMENT AND PAYMENT**

According to the units in the schedule of quantities as measured on site.

PARTICULAR SPECIFICATION PI : UNDERGROUND CABLE NETWORKS

PI.1 SCOPE

PI.1.1 This specification covers the laying and joining of cables for underground high-voltage and low voltage systems.

PI.2 INTERPRETATION

PI.2.1 SUPPORTING SPECIFICATION

The following specifications are part of this specification.

a□	SABS 97	:	Electrical cables with impregnated paper insulation
□□	SABS 150	:	Electrical cables and flexible cords with poly-vinychloride (PVC) insulation
c□	SABS 0198	:	The choice, handling and installation of electrical power cables with a rating not exceeding 33 kV
d□	SABS 1200 C	:	The cleanup of the site
e□	SABS 1200 DA	:	Ground works (small jobs)
□□	SABS 1200 DB	:	Ground works (pipe trenches)
□□	SABS 1200 LB	:	Scatting (pipes)
□□	SABS 1200 LC	:	Cable ducts
□□	SABS 1339	:	Electrical cables with insulation of cross-linked polyethylene (XLPE) Insulated Electric Cables
□□	NRS 013	:	Medium voltage cable : Preferred types and sizes for applications in the electricity supply industry
k□	NRS 028	:	Cable lugs and ferrules for copper and aluminium conductors

PI.2.2 IMPLEMENTATION

This specification includes clauses which is in general applicable to underground network systems for electrical power supply. The interpretation of, and variations to this specification is explained in Section 2 of the project specification and shall meet the requirements of the data sheets in Part 6 of the document.

PI.2.3 TERMINOLOGY

The terminology in the applicable supporting specifications, as given in 2.1 and the following terminology applies to this specification.

Core

A single insulated conductor without any protective housing.

Screened cable

A cable in which every core is separately encased by a conducting layer to ensure that the conductor is surrounded by a radial electric field when it is energised.

Belted cable

It is a multi-core cable where a part of the insulation covers each conductor and the rest of the insulation covers the combined cores.

Pilot cable

A cable which is normally used for measuring (control) or safety or communication circuits or all three.

Phase sequence

The sequence in which the phase voltages of a multiphase system reach it's maximum values.

High voltage (HV)

Voltages with RMS value higher than 1 000 V.

Cable

A length of core (or a length of 2 or more cores, laid up) which, in total, can be provided with a mechanical housing.

Low voltage (LV)

Voltages with RMS value of 1 000 V or lower.

Mass impregnated non-draining cable (MIND)

A cable of which the surplus impregnated-agent was not removed during production because the cable is non-migrating at the conductor's working temperature.

Ambient temperature

The temperature of the air 400 mm above ground level at the bottom of the ditch, where applicable.

Thermal resistivity

The resistance against the flow of heat in a dielectric (Unit : K.m/W).

Consumer distribution unit (CDU)

A switch-box for LV service connections connecting the network and one or more consumer supply points.

PI.2.4 ABBREVIATIONS

The abbreviations in the applicable part of the specification given in 2.1 and the following abbreviations applies to this specification.

Al	:	Aluminium
Cu	:	Copper
HV	:	High voltage (see definition in 2.3)
CNE	:	Combined neutral and earth
LV	:	Low voltage (see definition in 2.3)
PME	:	Protective multiple earthing
MIND	:	Mass impregnated non-draining cable
PI	:	Plasticity index
PILC	:	Paper insulated, lead covered
PVC	:	Poly-vinychloride
CDU	:	Consumer distribution unit (LV - distribution connecting box) (see definition in 2.3)
XPLE	:	Cross-linked polyethylene cables

PI.3 MATERIAL

PI.3.1 GRADED BACKFILL MATERIAL

Graded backfill material must be used to cover the cable(s) and to ensure good embedding. The material must be earth with a low clay content, with a maximum PI of 6 and a maximum resistivity of 1,2 K.m/W and must be free of all plant materials, clots and stones with diameter bigger than 15 mm, except in situations where other limits are specified in the project specifications. Sea or river sand is not acceptable because of its high thermal resistivity.

PI.3.2 GRADING

Irrespective of the stipulation of subclause 3.7 of SABS 1200 DB, the Contractor may not waste excavated material that complies with 3.1 by removing it. The Contractor is not compelled to use selective methods of excavation. He is allowed, (but not forced) to sift the excavated material, treat or process the material in any other way to make it suitable to cover the cable(s) and to prevent material that is suitable for fill material or main fill material to become buried or contaminated.

If suitable material for graded backfill material is not freely obtainable from excavations, the Contractor must obtain material from other excavations on site or by opening quarries or by importing suitable material from commercial or other approved sources.

PI.3.3 CABLE ROUTE MARKERS

Cable route markers must be provided if required and according to the project specifications.

PI.3.4 CABLE JOINTS AND CABLE TERMINATIONS

Cable joints and cable terminations must be of an approved type, e.g. heat shrink or mechanical sealing type.

All high voltage cable joints must be done by an approved artisan. Paper insulated cable joints will be encased by a cast-iron joint box, designed for this purpose. The fill material must comply with BS 1858. XPLE cables must be jointed with heat shrink joints. The electrical continuity, screening and armament may in no way be negatively influenced by the joint.

All heat shrink terminations must be supplied as a unit, including all necessary parts. The termination must be designed for the specific cable and application. Outdoor terminations must be designed to prevent arcing under any pollution and weather conditions to which it may be subjected.

Cable glands shall be used according to the manufacturer's recommendations. All cable glands shall be manufactured from brass.

Cable shoes must be pressed onto the cable ends with a purpose made tool. Cable shoes must be encased with a heat shrink sleeve of which the colour corresponds with the phase of each cable core.

PI.3.5 PROTECTIVE CONCRETE SLAB

Where protective concrete slabs are required in the project specifications, it must have the following nominal measurements.

Length	:	1 m
Width	:	230 mm
Depth	:	50 mm

The slabs must be manufactured of 20 MPa concrete. Each slab must have one armament rod along the length and 3 across the width. The rods must be manufactured using mild steel with a nominal diameter of 8 mm. If not, the slabs must be manufactured as specified in the project specifications.

PI.3.6 PLASTIC WARNING TAPE

Plastic warning tape must consist of a strip of polyethylene, at least 0,04 mm thick and with a nominal width of 150 mm or 230 mm (as specified in the project specifications). The warning tape must be totally impregnated with pigment so that it corresponds with colour no. B26 (light orange) of SABS 1091 in a reasonable way. A black triangle and the flash symbol for electricity, which corresponds with sign WW7 of SABS 1186 as well as the words "DANGER, GEVAAR, INGOZI" must be printed on the full length of the tape with maximum intervals of 1 meter.

PI.4 CONSTRUCTION EQUIPMENT

PI.4.1 COMPACTION EQUIPMENT

Sufficient manual compaction equipment must be supplied for the compacting of the graded backfill material around and above the cables, sleeves and in trenches.

PI.5 INSTALLATIONS

PI.5.1 GENERAL

Trench excavations must comply with the requirements of SABS 1200 LC and SABS 1200 DA. No cables may be laid before the site is cleaned and the mass earthworks, which is done by others, is completed.

Every trench must be kept as straight as possible and must be dug to approved levels and measurements. The bottom must have an even contour.

Trenches dug close to railway lines, walls, roads, drains, pipes, cables, structures and on similar places where the danger of sagging exists, must be secured against such dangers and it must be done in such a way as to prevent possible injuries to construction personnel and the public. All these excavations must be done to the satisfaction of the Engineer and the public authorities concerned.

Bedding materials may not be laid until the trench has been approved by the Engineer. The Engineer might expect proof from the Contractor that the minimum depth of bedding material is provided before giving authority for the cables to be laid.

PI.5.2 GUARDING, BARRICADES, LIGHTING AND TRAFFIC INTERSECTIONS

The Contractor must arrange guarding, barricades, lighting and traffic intersections for work in public roads. This arrangement must comply with the applicable Road Traffic Ordinance, the requirements of the Occupational Health and Safety Act (Act 85 : 1993), the project specification and the applicable requirements of subclause 5.0 of SABS 1200 DA.

PI.5.3 PROTECTION OF STRUCTURES

In cases where work has to be done in the vicinity of buildings, bridges, tanks or other structures, the Contractor must take all the necessary precautions as required by the Occupational Health and Safety Act (Act 85 : 1993) and the Mines and Industries Act of 1956, (Act 27 : 1956). These precautions shall include shoring where necessary, to ensure the safety of structures which is subject to danger during installation.

PI.5.4 PROTECTION OF SURFACE AND UNDERGROUND SERVICES

The Contractor must take all the necessary precautions to protect all existing services (meaning services on the site, which is shown on the drawings) and he will be held responsible for all damages to these services, caused by his activities. All works and protection arrangements are subject to approval and it must only be done after consulting the owner(s) of the various services. Should a service be damaged, the Contractor must immediately inform the Engineer and the authorities concerned. The Contractor may not repair the damaged service, unless he is instructed to do so.

In cases where no underground services are shown on the drawings or recorded, but the possible presence thereof cannot be discarded, the Contractor must, in conjunction with the Engineer, establish if any such services exist within the applicable site area. The Contractor must in good time complete such investigation before construction may start on the area concerned. A report must be issued to the Engineer whom will make the necessary arrangements for the protection, removal or relaying of the services prior to the commencement of any construction work.

Upon the discovery an underground service previously not indicated on the drawings, this service will be classified as ‘n known service and the Contractor will be held responsible for any damages thereof during all further works. In cases where such service is damaged with the initial discovery, the Employer will cover the costs of repairing the service, except if the Employer can prove that the Contractor did not take the necessary precautions and that the damage could have been prevented.

Should the authorities concerned prefer to make the changes or arrangement for protection of services on their own expenses, the Contractor must co-operate with such authorities, and give reasonable access, working area and time

to complete the necessary work. Permanent changes to or permanent relaying of services which is necessary to complete the work and which is authorised, will be compensated for, there will be no compensation for work carried out and not previously investigated by the Engineer and for which no written instructions were issued.

PI.5.5 CONDUCT WITH RESPECT TO WATER ON SITE

The Contractor must give proper attention to water and remove it to ensure that the works are kept dry enough so the work can be properly executed. For this purpose he must provide, use and keep in order, pump equipment, water sand pens, pipes and other equipment that might be needed. He must also provide fresh drains, trenches, coffer-dams and other temporary works that might be necessary to keep damages, inconveniences and disturbances at a minimum.

PI.5.6 POLLUTION

The Contractor must take all reasonable precautions to the satisfaction of the Engineer to keep dust disturbance, pollution of streams and inconveniences or annoyances to the public (or others) because of the execution of the work, at a minimum.

PI.5.7 SAFETY

The Contractor must at all times provide proper and adequate precaution and safety arrangements on site. Should the Contractor fail to comply with this requirement, the Engineer will take the necessary steps to ensure that this requirement is met and any costs incurred will be for the Contractor's account. Complying with this requirement does not exonerate the Contractor of his responsibilities and duties in accordance with the Occupational Health and Safety Act (Act 85 : 1993) and mines and Industries Act of 1956, (Act 27 : 1956). Symbolic safety signs must comply with the applicable requirements of SABS 1186.

PI.5.□ MINIMUM BASE WIDTH OF TRENCHES

The minimum base width of each trench must be wide enough for the cable spacing which is specified in the project specifications. Each trench must be excavated in a way that half the specified width will be left on both sides of the designated centre line of the cable or group of cables. The trench width must be adequate for the proper compacting of the fill materials when backfilling is done. (In the case of trenches for cable sleeves or -ducts, see subclause 5.1.1 of SABS 1200 LC).

PI.5.9 CLEANING OF ROUTE

The Contractor must clean an area wide enough to ensure that his inspection is not obstructed along the cable trench as specified in SABS 1200 C. In cases where the cable trench falls within a servitude or passage-way of specified width, the damage to the vegetation of the named servitude or passage-way must be limited.

PI.5.10 BACKFILLING

PI.5.10.1 LV Cables

In trenches containing one or more low voltage cables, the approved fill material must be cautiously placed, in layers of 100 mm uncompacted depth, throughout the width of the trench and then compacted to a minimum compacted depth of 150 mm as specified in PI.5.10.3.

PI.5.10.2 HV Cables

In trenches containing one or more high voltage cables the approved fill material must be placed in the trench as specified in PI.5.10.3. Should the project specification require a layer of protective concrete slabs or plastic warning tape, this must cautiously be centred over the high voltage cable after the first layer of approved uncompressed fill material.

PI.5.10.3 Compaction

In areas subjected to road traffic and any other such area which is specified in the project specifications the trenches must be refilled in layers of maximum 150 mm depth (after compaction) and in case of soil sticking together (clay material) it must be compacted up to 93 % of the maximum AASHTO-density or in the case of non-sticky soil (sandy material) up to 98 % of the maximum AASHTO-density.

Machine compaction will not be permitted directly above the cable(s) or sleeve(s) before a layer of 300 mm depth fill material has been placed on top of the cable(s) or sleeve(s). The machine compaction must be conducted in such a way that the forces superimposed on the cable(s) or sleeve(s) does not exceed that superimposed by ordinary pedestrians or light vehicle traffic when the cover is already 1 m deep. If road traffic is involved, the cable(s) must be protected by a cable-way or -sleeve of at least 100 mm in diameter, through which the cable(s) can be drawn at any time. Cable-ways beneath subways must be cast in concrete in a suitable way, if it is required by the project specifications.

PI.5.10.4 Cables At Different Depths

In situations where cables are laid at different depths in a common trench, the same procedure for placing and compaction of the approved fill material beneath and on top of the upper cable applies as for the lower cable.

In situations where cables have to be laid on top of each other the high voltage cables must be laid under the low voltage cables. (See drawing LC-1 in SABS 1200 LC).

PI.5.11 CONDUCT WITH RESPECT TO OBSTRUCTIONS

In cases where obstructions are encountered during excavation that demands changes to the trench or a special kind of trench, the Contractor must have the Engineer's approval to implement such changes before laying the cable(s).

PI.5.12 EXCAVATED MATERIAL

PI.5.12.1 Stacking

The excavated material must be placed along the trench in such a way that it does not obstruct or damage adjacent fences, trees, drains, gate openings and other properties and must be heaped up in such a way that traffic is not obstructed. should this not be possible, the material must be removed from site, with the Engineer's approval and brought back later to backfill the trench after the cable(s) has been laid.

Surplus material must be removed by the Contractor and on the Contractors own expense.

PI.5.12.2 Removal Of Surplus Material

Surplus material excavated from trenches must be removed from the trenches side or the servitude to a scheduled area within 0,5 km of the source, as nominated.

PI.5.13 ADMITTANCE TO PROPERTIES ON CABLE ROUTES

Unless otherwise specified in the project specifications, the Contractor must (on his own expense) provide owners, inhabitant and their vehicles with reasonable access to their properties which may be situated adjacent or near the cable route(s).

PI.5.14 JOINTING CHAMBERS

Jointing chambers must be of approved size in order to make it possible for the cable jointer to work efficient and expeditiously. Every chamber must be adequately covered to as far as possible to prevent dust and moisture from penetrating and must be equipped with sufficient lighting, draining and ventilation for use during cable jointing.

PI.5.15 TRANSPORT OF CABLE DRUMS

Cable drums must be carefully transported to prevent damage to the cables and to prevent disturbing the cables. Damaged cables will be rejected. Drums may not be off-loaded by simply allowing them to roll off the back of the truck onto the ground. Drums may only be rolled in the direction as indicated by the arrow painted on the drum by the manufacturer. (This will ensure that the correct tension is maintained and prevent the cable from damage later). Every drum may only have one cable length on it. Proper attention must be given to where the drums are to be off-loaded in order to prevent unnecessary moving thereof, eg. at joint locations.

PI.5.16 HANDLING OF DRUMS ON SITE

Note: It is recommended that a correctly designed spreader must be used to load and unload the drums with a crane.

Every drum must be mounted on jacks or on a cable-drum trailer with a horizontal supporting beam of suitable size and strength to handle the width and weight of the drum. The drum may not be allowed to rotate freely when the cable is rolled off. (Free rotation causes the cable to twist and loosen the windings, which can cause the inside armouring/insulation of the cable to be stretched). The cable must enter the trench from the top of the reel. All cables ends including that left on the drum or in a trench must be sealed to prevent the penetration of moisture into the cable. The free cable end on the drum must be fastened to the side of the drum.

PI.5.17 ROLLERS

Rollers must be used when each cable is layed and must be carefully placed in the trenches to make sure the cable only lies on the rollers when it is pulled in.

PI.5.1□ COMMUNICATION

The Contractor must ensure good communication between the operators at the pulling end and at the reel end of the cable while laying the cable(s).

PI.5.19 PULLING OF CABLE

The cable may be pulled by hand or by a wrench, but the maximum tension in the cable as specified by the manufacturer, may not be exceeded. A cable grip must be used to pull the cable, but if specified by the project specification, a loop connected to the cable cores and sheathing must be used. A twist connection must be used between the loop and the rope used to pull the cable. In cases where cables have to be drawn around corners, well lubricated skid-plates or special corner rollers must be used. Skid-plates and rollers must be firmly secured and must be inspected regularly throughout the cable laying process to ensure that they work properly.

PI.5.20 **AMBIENT TEMPERATURE DURING CABLE LAYING**

PI.5.20.1 In accordance with the stipulations of 5.20.2, a cable may not be installed at an ambient temperature that:

a) in the case of paper insulated cables, is lower than 10 °C; OR

b) in the case of PVC-insulated cables, is lower than 0 °C.

PI.5.20.2 In situation where the ambient temperature is continuously at a low a temperature, the cable may be installed, with the written approval of the Engineer. Special arrangements are made to keep the cable temperature above the minimum temperature specified in 5.20.1 for at least 24 hours before installation.

PI.5.21 **CABLE BENDS**

No cable bend may have a smaller radius than the minimum radius specified by the cable manufacturer. This radius shall never be less than the radius prescribed by the relevant SABS specification.

PI.5.22 **CABLES LAYED IN SLEEVES, CABLE WAYS, ETC**

Cables laid under roads or railway lines, must be laid through sleeves or cable-ways that are strong enough to withstand the expected shock loads applied by traffic. The laying of cable-ways and sleeves must comply with the applicable requirements of SABS 1200 LB and SABS 1200 LC. After the cable-ways and sleeves had been laid, they must be cleaned thoroughly to remove roughness and sharp edges that can damage the cable. The ends of spares sleeves and cable-ways must be properly sealed and if the project specification requires a pull wire, this must be installed. The position of these sleeves and cable-ways must be identified in the project specifications.

PI.5.23 **SPACING BETWEEN CABLES AND OTHER SERVICES**

The minimum spacing between electrical cables and other services must be in accordance with the project specifications.

In case of trenches used for a number of electrical cables the minimum horizontal free space required to prevent de-rating of the cables, are as follows:

a) In the case of cables with a conductor size of not more than 70 mm^2 : 75 mm

b) In the case of cables with a conductor size of at least 70 mm^2 : 150 mm

PI.5.24 **THE JOINTING AND TERMINATION OF HV CABLES**

PI.5.24.1 High voltage cables must overlap by approximately 1 m for jointing purposes. The overlap must be sufficient to make it possible to easily joint the cables with appropriate equipment. The cable ends must be protected or sealed off against dust and moisture ingress.

PI.5.24.2 All joint work must be carried out in accordance with the schedule agreed to by the Engineer and the Contractor. Only experienced and skilled jointers may be employed by the Contractor for this specific task and the Contractor must deliver documented proof that the jointer's experience and skill meets the required standards.

PI.5.24.3 During every high voltage cable joint, a tent of clean waterproof canvas supported in a suitable way, must be used to cover the jointing chamber. If necessary, a trench must be dug around the joint chamber to prevent water from entering the work area. Should this be unsuccessful, a French drain must be dug in the bottom of the chamber to drain off the penetrating water. Every joint chamber must be kept as free as possible from dust and sand, and must be sufficiently lit and ventilated during the jointing operation.

PI.5.24.4 Joint boxes of approved material must be provided for the joints. Every joint box or set must be of the approved type and suitable for the cable being jointed. The cable conductors must be welded together or jointed by means

of suitable ferrules which must be hard soldered onto the conductors or jointed with other approved equipment, for example pressure equipment. In the case of low voltage cables the phase conductor of which the colour or number is the same, must be jointed together. A copper conductor with a minimum diameter of 70 mm^2 must be connected to both sides of the joint box to form a through joint across the whole joint box.

PI.5.24.5 If applicable, (that is on the type of cable being used) every joint box for a high voltage cable joint must be filled with an approved filling compound after the conductors have been jointed, insulated and properly spaced inside the box. In the case of a paper insulated high voltage cable, where the lead sheath and armouring forms the earth conductor, the cable must be connected to the copper scaling gland of the cable connector or lead sheath. If not, in case the Engineer demands it in this manner, the space between the lead sheath and the scaling gland on the termination box must be filled with epoxy resin to obtain an insulated mechanic seal. A bare copper conductor with a diameter of at least 16 mm^2 must be included in the wipe termination and must be provided with a copper connecting loop which is suitable to bolt to a convenient earth connector.

PI.5.24.6 The sheath or armouring (or both) of a high voltage cable must be earthed at both ends.

PI.5.24.7 High voltage cables must be terminated using an approved method. All terminations must be approved by the Engineer.

PI.5.25 **LV CABLE JOINTS**

No joints are `allowed in distribution cables, accept where it is specifically authorised. The low voltage cable in a continuous cable run must be of one size, except where a change in cable size is necessary, in which case the change must be approved by the Engineer.

PI.5.26 **MINIATURE SUBSTATIONS AND CONSUMER DISTRIBUTION UNITS (CDU'S)**

After a miniature substations or a CDU is placed in position, the trench excavations must be carefully planned to protect the foundations. After this the cables must be connected to the switchgear with proper consideration of the conductors phase rotation. Phase identification colours must clearly be indicated on the switchgear and other equipment with which the cables are connected. After the trenches around and under the miniature substations and CDU's are filled back (see 5.10), the cable inlets to the miniature substations and CDU's must be filled with a compound of 5:1 - sand/cement or with other material approved by the Engineer. In case of a steel miniature substation, the steel must be cleansed thoroughly of dust, oil and any other contaminators and the steel works must be painted as specified in the project specifications.

A miniature substation must be kept locked when unmanned.

PI.5.27 **PHASE ARRANGEMENTS IN CDU'S**

PI.5.27.1 When the busbars of a CDU is viewed from the front, they must be connected, from top to bottom or from left to right, in the following order - red, yellow and blue phase conductors and the neutral conductor, in this order.

PI.5.27.2 Detailed arrangements for branching and for the load balancing of household feeders must be as specified in the project specifications.

PI.5.2□ **MARKING OF CABLES**

An approved identification plate or label on which the following information is given, must be attached to every high voltage and low voltage cable in every substation, miniature substation and CDU -

a□ the size of the conductors;

□□ the number of phases;

c□ the route ("from" or "to");

d the system voltages.

PI.5.29 **REINSTATEMENT**

The reinstatement of areas over cable- and pipe trench excavations must be executed as specified in subclause 5.9 of SABS 1200 DB.

PI.5.30 **THE MARKING AND RECORDING OF CABLE ROUTES**

PI.5.30.1 If required by the Engineer the cable run must be marked in such a way that the underground position thereof can be traced at any time.

In case of straight runs, the cable route markers may be placed at intervals not exceeding 300 m or as specified by the Engineer.

PI.5.30.2 The Contractor must measure and indicate on plan all the detail of the installed cable, the position of each cable run, the depth of each cable, as well as all the joints and cable-ways which are installed. The name of the cable jointer and the date on which the joint was made must be indicated on the plans and, if specified by the project specifications, on the cables as well. Drawings of the cable routes "as built" must be supplied immediately by the Contractor to the Engineer after the Contractor has finished the work covered by the contract.

PI.6 **TOLERANCES**

PI.6.1 Degree of accuracy II applies to approved backfill material and the placing thereof.

PI.7 **TESTS**

PI.7.1 **DENSITY OF BEDDING AND BACK FILL MATERIAL**

PI.7.1.1 The Engineer may demand a density test to determine the grade of density at the bottom layer of the trench and of the approved back fill material.

PI.7.1.2 If the density is lower than specified (see 5.10.3.1) the Engineer may demand the removal of the material, replacing of the bottom layer or the back fill material with the same or other material, and the re-compaction, on the Contractor's own expense.

PI.7.1.3 The Contractor is responsible for all tests done as a result of the removing and replacing of material according to 7.1.2.

PI.7.2 **ELECTRICAL TESTS**

Every part of the cable network between CDU's and substations must be tested for electrical continuity and for insulation resistance. Acceptance tests must consist of the following.

a **Phase identification test**

A test must be done to determine if the connections between the end points are correct. All cables must be phased out before connected to the switchgear.

Insulation resistance test (Low voltage cables)

The resistance of the insulation of every core to earth and to every other core must be determined. These tests must be done with a 2 000 V insulation resistance tester on paper and PVC insulated cables.

DC Tests (High voltage cables)

All high voltage cables with a rated voltage of up to 22 000 V must be tested according to SABS 540 at the applicable voltages given in table 4 of SABS 97.

The results of tests (b) and (c) above must be noted down on test certificates and special attention must be given to thoroughly note down any leakage current during the test in (c) above.

PI.□ MEASURING AND PAYMENT

PI.□1 PRINCIPLES

PI.□1.1 The basic principals of measurement and payment for cable trench excavations is that the rate tendered for excavations covers the cost of excavations, the re-use of excavated material for back filling and the removal of all surplus material along the trench routes within 0,5 km from the source.

PI.□1.2 The rate for the laying of the cable covers the cost of the handling and placing of the cable in the approved trench, as well as any other costs concerning the laying of the cables.

PI.□1.3 Trench excavations for cables, etc. is measured volume wise, but can be measured according to length.

Except when differently stated in the project specification or differently demanded, the depth will be measured from the ground level, along the centre line of the trench, down to the bottom of the specified bottom layer. The ground level is that which was formed after mass ground works was completed, measuring the excavated level or the backfilled level, except where another execution sequence is demanded.

PI.□1.4 The source of the approved back fill material and the bottom layer is the Contractors own responsibility. He is free to use approved material excavated from the side of the trench or other excavations on site, providing such material meats the applicable requirements. He is also free to buy one or both the materials from commercial sources or to excavate along the cable route at his own cost.

Additional and separate payment for the backfill of over-excavations and the removal of surplus materials or any other unforeseen works will only be made if such works was specified by the Engineer.

PI.□1.5 The requirements of subclause 8.3.3 of SABS 1200 DA apply to additional transport distances. All additional distances will be measured only via the shortest route possible and only in one direction to the nearest 0,1 km measured and the volumes will be calculated as specified in 8.2.3.

PI.□2 CALCULATION OF QUANTITIES

PI.□2.1 The length used for calculations is the total length of the cable, cable trench, etc from one end to the other or from one structure face to the next structure face. No deductions will be made for any manholes, etc.

PI.□2.2 Excavations will be measured as if excavated with vertical sides, regardless of whether it was excavated with sloping sides.

PI.□2.3 If volumetric measurements are required, the volume will be measured from the depths shown on the drawings or to the bottom of the specified base, which ever is the largest, and a minimum base width of 450 mm in the case of high voltage cables and 300 mm in the case of low voltage cables.

PI.□2.4 The volume of the backfill will be calculated from the minimum base with of the trench and the depth of the backfill needed. No allowance shall be made for loss of volume of the compacted material.

PI.□2.5 Imported material as per 8.1.4 must be disposed of along the cable servitude within a distance of 50 m from the source unless specified otherwise by the project specifications. Additional transport of material if ordered must

be handled as specified in subclause 8.3.3.4 of SABS 1200 DB. Free haul as specified in subclause 5.2.6.1 of SABS 1200 DA shall be applied.

PI.□2.6 If supports are specified or ordered, the length of the supports will be measured for payment along the centre of the trench. This tariff includes works done as specified in 8.3.1.4(a).

PI.□3 **SCHEDULED ITEMS**

PI.□3.1 Route Clearance, Excavations, Etc.

PI.□3.1.1 Clearance Of The Route And Removal Of Topsoil

a□ **Removal of vegetation and trees with a maximum circumference of 75 mm ..... Unit : m**

Only the length of the cable trench that was excavated by order, will be measured for payment.

□□ **Removal of trees with a circumference of more than 75 mm and obstacles ..... Unit : Each**

The tariffs for items (a) and (b) covers the cost of cleaning all obstacles, vegetation and trash in the path of the cable run.

c□ **Removal of topsoil (given depth) ..... Unit : m^2**

The area measured for payment shall be calculated according to the length to which the removal was specified or ordered and the trench width as stipulated in 8.2.3.

The tariff covers the cost of stripping to the mentioned depth, storing and the prevention of dust as far as possible.

PI.□3.1.2 **Excavations**

d☑ **Excavation of all material for trenches, backfill, compaction and removal of excess material ..... Unit : m^3**

The volumes of the cable sleeve, cable ways and cable trench excavations must be calculated according to the length and depth as shown on the drawings or to the bottom of the specified bedding, whichever is the largest and to the minimum base width specified in 4.8. The tariff covers the cost to comply with safety and protection regulations of 5.9.12, except in the case of particular items listed to cover the cost of (see 5.5) of excavations, backfill and compaction as well as the removal of any excess material as specified in 5.12.1 and 5.12.2.

The tariff also covers the cost of the same works in tunnels if the Contractor wishes to use this method of excavation. No additional payment will be made for such tunnels and no deductions will be allowed for the decrease in the amount of excavation quantities.

a **Extra for item (a) above**

1) Intermediate excavations ..... Unit : m^3

2) Hard rock excavation .....Unit : m^3

3) Boulder excavation , class A ..... Unit : m^3

4) Boulder excavation, class B ..... Unit : m^3

Classification of material shall be as specified in sub-clause 3.1 of SABS 1200 DA.

Separate items shall not be supplied for in incremental depths. Volumes are calculated according to the width specified in 5.8 and the depth from the top of the intermediate or hard rock- or boulder excavations, class A or class B as applicable, to the bottom of the same material or to the bottom of the trench as specified in (a) above, whichever is the largest. This tariff covers the additional cost of excavations and the handling of the most difficult material and in the case of rock, the removal thereof within a distance of 0,5 km and the replacement of the unsuited material.

e **Excavation of extra unsuitable material from the bottom of the trench and the removal thereof (provisional) ..... Unit : m^3**

The volume shall be calculated according to the basic width of the trench as specified in sub-clause 5.8 and the additional depth that was ordered.

Pl. 3.1.3 **Additional transport**

Truck haul ..... Unit : $km.m^3$

Subclause 8.3.3.4 of SABS 1200 DB applies with regards to truck haul.

Pl. 3.1.4 **Special items**

Items (a) and (b) as mentioned below shall only be listed if it is required by the project specifications.

a **Shoring of trench ..... Unit : m^2**

The tariff covers the cost of the supply, placing, maintenance and removal of all timber and other support materials together with any cost due to the inconvenience of working in the supported trench as well as the cost of any risks inherent in the work.

Note : Wood or any other shoring material which must be left in place as ordered shall be paid for as daywork.

Temporary works

The control of the flow of water from …….. to …….:

5) Supply of equipment ..... Unit : Amount

6) Use and maintenance ..... Unit : Amount

7) Removal of equipment ..... Unit : Amount

These amounts to supply and remove the equipment covers the cost of the supply of the necessary equipment and material or both erected and in full working order on site, as well as the removal of such equipment and material and repairing the site to its original state after completion for the part of the contract for which the temporary works was erected.

The tariff for the use and maintenance covers the cost for the use and maintenance of the pumps, points of assembly, covering, dense timber works and other equipment, as necessary, 24 hours per day, seven (7) days per week, for the full time for which the facilities is needed as decided by the Engineer.

PI.□3.1.5 **Existing services (see sub-clause 5.1.3 of SABS 1200 DA)**

Should any special items in the other parts of this list be foreseen, the cost of the finding, exposing, protection and change shall be covered by such special items.

If no such special items is foreseen and there is no reason to believe that any such items would be encountered, the applicable items as listed in the project specifications shall comply.

PI.□3.1.6 **Repair of road surfaces complete with all layers**

a□ Gravel on shoulders ..... Unit : m^2

□□ Bitumen premix ……. mm thick in parking spaces ..... Unit : m^2

c□ Bitumen premix ……. mm thick in road ..... Unit : m^2

d□ Other premix ..... Unit : m^2

The area shall be calculated according to the finished road or the paved area as applicable. Payment for the finishing shall be additional to those for the excavations as listed in 8.3.1.2. The tariff covers the cost for excavation (inclusive of the equipment needed to break the original surface material, to remove and if needed to store the material) and the subsequent repair as specified in sub-clause 5.9 of SABS 1200 DB. This includes the risk that the cost of the repair of damage as specified in 5.10 of SABS 1200 DB shall be included in this tariff.

PI.□3.2 **The Installation Of Cables**

PI.□3.2.1 **Supply and installation of HV cables ..... Unit : m**

The cables shall be measured neatly as it was installed. No extras will be allowed for joints, overlaps and cable ends. Separate items are listed for each size and each type of cable installed.

The tariff covers the cost for the provision of the cable and the cost for the handling, transport, inspection, bedding, installation, cutting and testing of the cable.

PI.□3.2.2 **Supply and installation of control cable ..... Unit : m**

The cables shall be measured neatly as it was installed. No extras will be allowed for joints, overlaps and cable ends. Separate items are listed for each size and each type of cable installed.

The tariff covers the cost for the provision of the cable and the cost for the handling, transport, inspection, bedding, installation, cutting and testing of the cable.

PI.□3.2.3 **Supply and installation of cable sleeves ..... Unit : m**

The sleeves shall be measured linearly across the length it was installed. Separate items are listed for each different size and type of sleeve. The tariff covers the cost for the provision of the sleeve and the cost for the handling, transport, inspection, bedding, installation, cutting and testing of the cable.

PI.□3.2.4 **Concrete bedding or concrete cover for cable sleeves ..... Unit : m^3**

The volume of the concrete shall be calculated according to the specified width and depth and the measurement of the sleeve. The volume of the sleeve is deducted. The tariff covers the cost of any additional excavations which is necessary as well as the removal of surplus material, concrete and casing if used.

PI.□3.2.5 **Jointing and termination of HV cables ..... Unit : Each**

The tariff is an extra to the tariff for works covered by 8.3.2.1 and covers the cost of provision of sets, the cost of handling, fitting and cutting of the cables and the cost of testing the joints and termination (see 5.24).

PI.□3.2.6 **Supply and installation of LV cables ..... Unit : m**

The cables shall be measured neatly as it was installed. No extras will be allowed for joints, overlaps and cable ends. Separate items are listed for each size and each type of cable installed.

The tariff covers the cost for the provision of the cable and the cost for the handling, transport, inspection, bedding, installation, cutting and testing of the cable.

PI.□3.2.7 **Termination of LV cables and end boxes ..... Unit : Each**

The tariff is an extra to the tariff for works covered by 8.3.2.6 and covers the cost of the provision of tools, the cost of handling, fitting and the cutting of the cable and the cost for the testing of the joints and terminations (see 5.24).

PI.□3.2.□ **Protective concrete slab or plastic warning tape ..... Unit : m**

The tariff is extra to the tariff for works covered by 8.3.2.1 and covers the cost of the provision of protective concrete slab or plastic warning tape (where necessary) and the cost of handling and installation of the slabs or tape.

PI.□3.2.9 **Supply and installation of cable markers**

a□ Pole type mark above ground level ..... Unit : Each

□□ Road or pavement marker ..... Unit : Each

The tariff covers the cost of the provision of the cable markers and the cost of the handling and installation thereof.

PI.□3.2.10 **Cable record drawings ..... Unit : Amount**

The tariff covers the cost for the composition and provision of drawings as specified in 5.30.2.

PARTICULAR SPECIFICATION PL: PROTECTION

PL.1 SCOPE

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

PL.2 INTERPRETATION

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

BS EN 60255	:	Measuring relays and protection equipment
IEC 60051	:	Direct acting indicating electrical measuring instruments and their accessories.
SANS 1652	:	Battery Chargers – Industrial type
SANS 62485-2	:	Safety requirements for secondary batteries and battery installations. Part 2: Stationary batteries
IEC 896-2	:	Stationary Batteries – requirements for ventilation
IEC 60529	:	Ingress Protection Classifications
IEC 297	:	Mechanical Structures – Sizes for Electronic Equipment
IEC 61850	:	Standard design of electrical substation automation
IEC 60255	:	Electrical relays

Any variations to the particular specification as applicable on this contract, are shown in the variations to particular specifications set out in the scope of work or Project specification, and shall comply with the data sheets included in the pricing "Pricing Instructions" or "Data Sheets" of the document.

PL.3 MATERIAL

PL.3.1 GENERAL

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

PL.3.2 PANELS

Relays and control panels must be equipped with all indication meters, relays, control switches, push buttons, or indication lights and alarms only on the front thereof. The relay and control panels must have access from the front or rear with hinged doors and/or swing frame panels. No relay shall be mounted higher than 2 500 mm or lower than 300 mm above floor level.

PL.3.3 WIRING

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

the circuit. Split or test plugs for this purpose shall be provided with each protection panel or relay equipped with such test blocks.

All wiring shall be numbered at both ends with corresponding numbers with approved plastic ferrules. All such numbers shall be clearly indicated on drawings. It is important that all wiring to and from all instruments shall be shown on construction drawings.

All wiring shall be terminated with pin, spade or ring lugs approved by the Engineer.

PL.3.4 RELAYS

Only electronic relays are acceptable. Complete type test certificates according to BS EN 60255 shall be submitted to the Engineer for approval of all relays.

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

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

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

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

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

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

PL.3.5 DIRECT CURRENT POWER SUPPLIES (BTU)

PL.3.5.1 General

Except where specified differently in the project specifications, all close, trip, control and alarm circuits shall be supplied with 110 V DC.

Unless specified otherwiser in the project specification, the circuit breaker spring charging motors shall be operated from the BTU at the specified voltage.

PL.3.5.2 Arrangement

The BTU shall comprise of a battery charger and battery. The units may be arranged as fully enclosed systems comprising the charger, battery bank and DC distribution in a single enclosure, or a separate charger and distribution control cabinet with a separate battery bank on stands.

PL.3.5.3 Charger:

The battery charger shall have both normal and boost charge modes and be equipped with control circuits to protect the batteries and charger against over voltage and overcurrent conditions.

The charge control board shall be a dual system with automatic fail-over. The failure of any unit shall generate an alarm for processing in a SCADA system, and visual alarm indication on the charger unit.

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

The Battery Charger minimum requirements are:

Description	Specification
AC Voltage	400/231V +-10% 50 Hz
Protection	Main supply (3 pole MCB for 3 phase, double pole MCB for single phase) MOV surge protection. Fuse protection of electronic control boards.
DC Voltage	110V nominal
Ampere Hr Rating (10hr discharge rating)	To suit the substation switchgear and DC spring charging motor duty
Charge controller type	Constant Voltage Current limit (CVC)
Automatic Boost	The automatic boost function shall restore the battery to full charge from a low voltage discharged condition, or on a 28 day cycle to equalize cell voltages
Manual Boost	The momentary action manual boost switch shall allow testing of the boost function only for a set time not exceeding 10 minutes.
AC ripple on DC (Without battery connected)	<5% RMS
Voltage regulation	< 1%
DC Voltage limits	Dependant on switchgear but not exceeding 85V DC min and 132 V DC max.- Subject to approval of Engineer
Cell Voltage (Ni-Cd)	1.2V nominal
Float Voltage (Ni-Cd)	1.41 to 1.42 V
Boost Voltage (Ni-Cd)	1.48-1.6 V
Initial Voltage (Ni-Cd)	1.65V
Panel Indications	- Mains On - DC Voltage - DC Charge Current - DC load current - Visual alarm displays
Alarms (with voltage free change-over alarm contacts wired to marked terminals for telemetry/Scada). Audible alarm on panel with silence buttons)	- Mains AC Fail with 10 min delay - Charge Fail - Low DC(Battery Fail) - High DC voltage alarm level 1 - High DC voltage alarm level 2 –rectifier fail and shutdown - DC Earth fault (any of the DC poles having a low resistance to earth)
DC distribution	The panel shall have a sufficient DC distribution circuit breakers for each panel plus 20% spare positions.

Rating plates	The manufacturer's rating plate shall be permanently fixed to a fixed part of the enclosure, visible at all times. Specification, ratings, contact detail at time of delivery, and manufacturing date shall be shown.

An auxiliary supply shall be included in all schemes where electronic protection relays are used. It shall comprise of an AC to DC converter connected in parallel with the battery charger and batteries. (Generally this is the "BYPASS" function)

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

All DC circuits shall be protected with fuses or circuit breakers at the positive and negative supply rails. Individual feeds to different control, protection, alarm or metering circuits shall each be protected with dual fuses to minimise any effects of faults on the DC circuits.

DC fail alarm facilities, as specified in the project specification, shall be provided.

PL.3.5.4 **Enclosure**

The Charger enclosure requirements are :

Type	The charger shall be a floor standing steel enclosure including where possible the battery.
Protection	IP 32
Finish	Sheet steel, surface treated, epoxy powder coated and baked.
Film thickness	DFT 35 to 100 µm with nominal 50 µm
Colour	Light Orange (B26) to SANS 1091 for 110 V DC.
Gland plate	Removable undrilled gland plates shall be provided for bottom or side entry. The gland plate shall be split for the AC, Battery, DC distribution and Scada cabling.The gland plate locations shall be shown on the drawings submitted for approval.

PL.3.5.5 **Battery**

Battery cells shall be of the Ni-Cd type, except where otherwise specified in the project specification.

The battery ventilation shall comply with the requirements of:

SANS 62485-2 : Safety requirements for secondary batteries and battery installations. Part 2: Stationary batteries

IEC 896-2 : Stationary Batteries – requirements for ventilation

The ampere hour rating of battery shall be adequate to trip all circuit breakers twice and to close them once. It shall also be capable to carry the full load of the protection and control circuits of the substation for at least eight days, except where an auxiliary supply as described below, is installed.

The batteries shall be protected with diodes to ensure that it is not charged from the AC to DC (Bypass) converter.

The battery bank shall be protected against short circuits with HRC fuses, appropriate rated.

All batteries or single cells shall be marked with the ratings and date of manufacture.

Battery cells shall not require electrolyte top-up within at least 6 month intervals at the rated charging currents.

The battery life expectancy shall be for a design life of 25 years at 25^{o}C ambient and at float condition.

PL.3.5.6 **Drawings, approval, manuals and test records.**

The specification and drawings of the panel must be submitted for approval before manufacture.

Three bound copies of the instruction and maintenance manual shall be delivered with each BTU set. One set shall be held in a pocket to be provided for on the inside of the door.

A comprehensive test certificate is required for each BTU at date of comissioning.

Individual cell voltages and operational tests shall be recorded including alarms, voltage limits, boost charging and time limits, ventilation , load currents, charge currents.

Prior to commissioning the batteries shall be drained to 85% and the charge currents and time to full charge recorded.

PL.3.6 **CURRENT TRANSFORMERS SECONDARY CIRCUITS**

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

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

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

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

PL.3.7 OVERCURRENT AND EARTH FAULT RELAYS

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

PL.3.□ UNIT PROTECTION

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

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

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

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

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

Pilot cable inter-tripping relays shall be equipped with low pass filters to prevent incorrect operation due to induced AC voltages up to 5 kV on the pilot cable. Because common pair pilot wires are used for send and receive signals, contacts of the local inter-tripping send relay shall be wired to open the local receive relay. The master trip relay may be used to send inter-tripping signals.

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

PL.3.9 DISTANCE PROTECTION

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

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

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

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

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

The supplier shall indicate the impedance characteristic used by the relay; ie. MHO, QUAD or both.

PL.3.10 METERING AND INSTRUMENTATION

All measuring instruments shall be of the industrial switchboard type suitable for flush mounting. Construction and accuracy shall be in accordance with IEC 60051: for first grade instruments.

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

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

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

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

PL.4 AUTOMATION

Where automation according to IEC61850 is required the following is required:

a) Devices should have redundant Ethernet connections that are capable of failing over and using IEC 61850 MMS and IEC 61850 GOOSE on both ports

b) Subscription to multiple GOOSE messages from multiple devices should be allowed.

c) GOOSE configuration must allow network settings such as priority and VLAN settings as well as other settings.

d) GOOSE reception must support VLAN and priority settings.

e) GOOSE transmit must be able to transmit all data types in the data set (not just digitals).

f) GOOSE reception must support multiple data types (not just digitals). - This is a preferred option.

g) GOOSE messaging must comply with the IEC 61850 GOOSE and not the UCA2 GOOSE. i.e. flexible size of data set that is not limited as well as multiple data type support as per 4 and 5.

h) GOOSE timing must be at least equal to a hardwired interface. (Specify GOOSE timing)

i) Flexible device modelling that allows proper IEC 61850 logical node modelling. Device must allow user to select Logical Nodes that apply to the application and must not force you into a predefined model. This must be possible in the device ICD file and must not require firmware changes every time a model is changed.

j) Flexible data attribute modelling. User must be able to add new data attributes to a Logical Node as per the appendix of IEC 61850-7-4.

k) Extendible Logical Node modelling. User must be able to add new Logical Nodes as per the appendix of IEC 61850-7-4.

l) Preferably no GGIO logical nodes should exist in the network.

m) Devices must not impose arbitrary limits on naming conventions that are not in line with the specification.

PL.5 **CONSTRUCTION EQUIPMENT**

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

PL.6 **INSTALLATION**

Not applicable.

PL.7 **TOLERANCES**

Not applicable.

PL.□ **TESTS**

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

a) Visual inspection of wiring.

b) Polarity tests of current transformers.

c) Primary injection of all circuits for through faults and in zone faults.

d) Secondary injection of relays.

e) Insulation tests of circuits.

f) Functional tests of circuits including electrical interlocking

g) Testing of all automation functionality including virtual interlocking and SCADA

h) Live tests.

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

Type tests and factory tests according to IEC 60255 be conducted and test certificates shall be submitted to the Engineer.

All electronic relays shall comply with the requirements of IEC 60255 as follows:

a) **Insulation test voltage**

2 kV, 50 Hz, 60 seconds.

b) **Impulse tests**

5 kV, 1,2/50 microseconds, 0,5 joule.

c) **High frequency**

Common mode 2,5 kV, 1 MHz.

Transverse mode 1 kV, 1 MHz.

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

PL.9 **MEASUREMENT AND PAYMENT**

Not applicable.

PARTICULAR SPECIFICATION : PV : SUBSTATION EARTHING

PV.1 SCOPE

This specification contains guidelines and standards for the supply, connection, installation and testing of all earth mats, rods and associated equipment in substations.

PV.2 INTERPRETATION

The following documents should be read in conjunction with this specification.

In the event of any apparent contradiction, this particular specification shall take precedence.

NRS 076	:	Earthing of distribution substations with nominal voltages up to and including 132 kV
SANS 10199	:	The design and installation of earth electrodes
IEEE 80	:	IEEE guide for safety in a.c. substation grounding
NRS 083	:	Electromagnetic compatibility (EMC) in electricity utility networks.
BS 7354	:	Code of practise for design of high-voltage open–terminal substations
SANS 1063	:	Earth rods, couplers and connections.
SANS 61024	:	Protection of structures against lightning
SANS 62305	:	Protection against lightning

Any amendments to this particular specification applicable to this contract, is dealt with in project specification or "Scope of Work" and shall comply with the requirements stated in the Pricing data.

PV.3 DESIGN VERIFICATION

The contractor must arrange an earth resistivity survey of the site and identify any additional earthing requirements to the base design provision to ensure safe operational conditions for the plant and person in the event of a fault occurring on the system.

This survey must also note lightning induced surges and the earth system's design to prevent damage to the plant.

The step potential and fault earths must be designed separately but may be interconnected.

PV.4 MATERIAL

Material shall be corrosion resistant in the atmosphere or underground.

Electrolytic corrosion due to traction system return currents or galvanic effects must be considered.

Sacrificial earths may be employed if required (refer PV.4.1)

PV.4.1 EARTH CONDUCTOR AND STRAPS (TAILS)

The earth mat must consist of round solid conductor copper rods in the formation as shown on the project drawings. Connection from the earth mat can be made, as shown on the table below, with flat copper strap.

Where fault levels necessitate, more than one connection must be made to the earth mat by means of different earth straps, to prevent an overload during fault conditions.

Equipment which is earthed at various points, i.e. security fencing, can be connected with 40 x 3 mm flat copper strap to the earth mat.

For corrosive soil conditions, at least two sacrificial earth mat anodes will be installed at opposite sides of the main earth mat and connected to the main earth mat with 10mm^2 round copper conductor.

PV.4.2 EARTH RODS

Earth rods must be extensible where hammer blown, in normal soils. Maximum length shall be 1.2m for hand driven procedures.

Where holes are drilled for earth rods and filled with earth conductivity improved clay or chemical treatment, the rods may be the maximum length available.

Rods may not be shortened by cutting and exposing the steel core.

Rod couplers and terminations must be threaded, factory finished as specified in NRS 1063 clause 4.3.1.

PV.5 CONSTRUCTION EQUIPMENT

The earth mat of a substation should be laid at a depth of 1 m. All connections and crossings should be connected with exothermic welds such as “Cadweld”. Where the copper conductors are connected with bolts above ground surface, they should be tinned. Connections against galvanised structures should only be done on vertical surfaces. These areas should be greased or painted to prevent corrosion.

A vertical copper earth bar of 500 mm x 60 mm x 8 mm, is to be mounted on insulators with at least 4 kV isolation, in the 11 kV cable trench inside the switching station building. This earth bar should be linked to the main earth mat with two separate 50 mm x 3 mm copper straps.

Test links must be provided on the control building earth connections from the earth mat. The test links and bolting arrangement must maintain the conductor area. The link is to be provided with a tag “ EARTH MAT TEST LINK”. The commissioning report is to record the earth resistance readings at the link for future condition monitoring.

PV.6 INSTALLATION

PV.6.1 ARMOURING

All multicore armoured cables shall be earthed at both ends.

Aluminium armoured single core cables may only be earthed at the source end of the cable. The opposite end armour may be earthed with a surge arrestor that will limit sheath over-voltages but prevent circulating sheath currents.

PV.6.2 SPARE CONDUCTORS

All spare conductors in control cables, should be terminated on spare terminals at the end of the cable which feeds the controlling equipment. These terminals should be short circuited and earthed so that the cable is connected to the earth on one side only, to prevent earth return paths to equipment or induced standing voltages.

PV.6.3 CONTROL CABLES

Pilot and control cable armour may only be connected to earth at the fault source side to prevent fault current paths through control equipment.

All control cables with a metal foil or with separate earth conductors are to be earthed only at the end of the conductors or foil, which feeds the controlling equipment.

PV.6.4 FENCING

Security fencing must be connected to the earth mats. The earth mats should be 1 m underneath the fencing, to prevent a potential between the fencing and the surrounding surface. Reference must be made to the design drawings, and step potential earth conductors either in- or outside the fence must be noted.

All fences in the construction site, regardless of whether it is part of the substation fence, must be:

- Earthed if they cross under any overhead line;
- Must be isolated if it is a boundary fence coming up to the substation fence.

PV.6.5 ELECTRONIC RELAYS

Electronic relay covers should be connected to the relay panel with a stranded/braided earth conductor.

PV.7 TOLERANCE

The maximum voltage between the earth mat and earth mass must be 400 V at the system fault current.

Normal induced voltages may not exceed 50 V on any terminal.

PV.□ TESTS

All structures must be tested for a continuity of earth conductors after installation.

Acceptable techniques must be used when resistance between the earth mat and earth mass is tested.

PV.9 **MEASURING AND PAYMENT**

PV.8.1 **CONNECTION OF STRUCTURES AND EARTH MAT ..... Unit : Amount**

This tariff includes all conductors and other consumable materials.

PV.8.2 **INSTALLING OF EARTH MAT ..... Unit : Amount**

This tariff includes excavations, earth conductivity and earth mat resistivity tests.

PV.8.3 **INSTALLATION OF EARTH BARS IN CABLE TRENCH ..... Unit : Amount**

All consumables such as rods, insulators, bolts, nuts, copper etc, are included herein.

PRICING DATA

1. Schedule of Particulars

1. The specific requirements in this schedule are based on the National Rationalised Specifications as prepared by the SABS and should be read and completed in conjunction with NRS 003-1:1994; NRS 003-2:1993 and NRS 008:1991.

2. The following definitions apply to the schedule columns of this specification (schedule of particulars):

   * SCHEDULE A : Particulars of requirements
   * SCHEDULE B : Guarantees and technical particulars of equipment offered by tender

3. Where insufficient space is provided by Schedule B, particulars must be furnished on separate sheets clearly marked with the number of the item referred to in Schedule A.

4. Where reference is made to a specific brand or OEM, it shall mean any similar, approved product that satisfies the functioning of the specified product or component.

5. Alternative offers will not be accepted. Each tenderer shall only submit one offer that satisfies the requiements of the tender document.

6. The tender must clearly state all deviations (if any) in the Deviation Schedule and in Schedule B (if applicable).

7. No tender for any apparatus will be accepted unless the schedules below are fully completed.

□. Abbreviations specific to this schedule:

N/O	:	Normally open
N/C	:	Normally closed
max.	:	Maximum
min.	:	Minimum
L/M/H/VH	:	Low / Medium / High / Very high
O/H	:	Overhead
U/G	:	Underground

1. CONDITIONS

ITEM NO.	DESCRIPTION	UNIT	SCHEDULE A	SCHEDULE B
1.1	**ENVIRONMENT**			
1.1.1	Ambient air temperature range	°C	-5 to +45	
1.1.2	Average humidity	%	< 95	
1.1.3	Altitude	m	250	
1.1.4	Degree of pollution (SABS IEC 815) (L/M/H/VH)		Medium	
1.1.5	Application area		Outdoor	
1.1.6	Ventilation method		Natural	
1.2	**POWER SYSTEM**			
1.2.1	Number of phases		3	
1.2.2	Normal power frequency	Hz	50	
1.2.3	Nominal system voltage	kV	66 and 11	
1.2.4	System voltage range	pu	0.9 to 1.1	
1.2.5	System earthing : (Effective/Non effective)		Effective	
1.2.6	System fault levels (66kV):			
	(1 ϕ) max	kA	4	
	(3 ϕ) max	kA	4	
1.2.7	Network characteristics : (O/H or U/G)		O/H and U/G	

2. TRANSFORMER SPECIFICATION

ITEM	DESCRIPTION	SCHEDULE A	SCHEDULE B
2	**GENERAL TRANSFORMER SPECIFICATION**		
2.1	**Ratings**		
	Continuous rated power in MVA of main winding on any tapping with:		
	• ONAN cooling	15 MVA	
	Rated voltage ratio	66/ 11 kV	
	Rated current:		
	a) HV		
	b) MV		
	Number of phases	3	
	Vector Group	Dyn 11	
	Manufacturer		
	Type	Core	
	Number of limbs	Three	
	Transformer to comply with standard specification:		
	BS 171-1070	YES	
	Type of cooling (to BS 171-1970)	ONAN	
	Flux density in core in Tesla, at rated voltage and frequency on principle tapping	-	
	No load loss on principal tapping in kilowatts	-	
	Magnetising current, at rated voltage and frequency, on principal tapping, in percent of rated current	-	
	Current density in windings at rated MVA and rated voltage, in ampere per mm^2	-	
	Load loss (I^2R and stray) at 75°C and rated frequency based on max. rated power in percent	-	
	Leakage impedance at 75°C and rated frequency based on max rated power in percent		
	• On principal tapping		
	• On extreme plus tapping (Hi tap 66 kV bucking)	-	
	• On extreme minus tapping (Low tap 66 kV boosting)	-	
	Limits, on any tapping, of the impedance at 75°C and rated frequency based on max. rated power:		
	• Maximum		
	• Minimum		

ITEM	DESCRIPTION	SCHEDULE A	SCHEDULE B
	Temperature rise at site altitude in °C:		
	• Top oil		
	• Windings by resistance		
	Approximate oil quantities, in litres:		
	• Transformer tank		
	• Coolers and conservator		
	• Tap-changer	Rheinhausen Vacutap-SF6 or similar	
	• Total		
2.2	**Windings**		
	Connection	DELTA/STAR	
	Connections brought out:		
	• HV Phases	YES	
	• MV Phases	YES	
	Winding insulation:		
	• HV Phases	CLASS A	
	• MV Neutral	CLASS A	
	Min 60-sec separate source, withstand test voltage between windings under test and the remaining windings, core, frame and tank connected together and to earth, in kV r.m.s.	HV : 95 kV MV : 28 kV	HV - MV -
	Minimum induced over-voltage withstand test between line terminals in kV	HV : 140 kV MV : 127 kV	HV - MV -
2.3	**Bushings**		
	Open bushings		
	Min impulse withstand test voltage at sea level (1.2/50 micro-secs, full-wave) in kV crest.	HV : 380 kV MV : 200 kV	HV – MV -
	Plain Bushing provided with electro-tinned copper stem of:		
	• Min. diameter		
	• Min. length		
	Vertical orientation	YES	
	Oil filled condenser bushing provided	YES	
	Visual oil level indication	YES	
	Bushing manufacturers:		
	HV type		
	Manufacturer's name		

ITEM	DESCRIPTION	SCHEDULE A	SCHEDULE B
	MV type		
	Manufacturer's name		
	Neutral type		
	Manufacturer's name		
2.4	**Mass**		
	Approximately mass, in kg:		
	a) Core and windings kg		
	b) Total mass without oil kg		
	c) Total mass with oil kg		
	d) Heaviest transportation weight		
	e) Maximum dead weight of single unit (filled with oil where applicable) complete with all necessary attachments.		
	f) Filling medium for transport		
2.5	**Overall dimensions**		
	Complete unit		
	a) Height		
	b) Length		
	c) Width		
	Height through which core and windings must be hoisted to clear tank		
	Tank and cooler material thickness, in mm		
	a) Sides		
	b) Bottom		
	c) Top		
	d) Conservator		
	e) Cooler tubes		
	f) Pressed sheet radiators		
2.6	**Coolers**		
	a) Number of cooler units		
	b) Capacity of each cooler unit, in percent		
	c) Safe withstand vacuum, in mm of mercury, of (At sea level)		
2.7	**On-load tap changer**		
	On-load switching	YES	
	Tapping winding	HV	

ITEM	DESCRIPTION	SCHEDULE A	SCHEDULE B
	Tap changer control equipment suitable for:		
	a) Local / remote control	YES	
	b) Auto / manual control	YES	
	c) Parallel operation	YES	
	d) Single unit operations	YES	
	Ultimate no of transformers for which parallel control scheme to be suitable.	2	
	Time that transition contacts are in circuit	m/sec	
	Total time duration of tap-change	seconds	
	Tap change pressure relief	YES	
	Auxiliary supplies to tap-change motor drive	400 / 230 VAC	
	Alarm circuits	110 V DC	
	Trip circuits	110 V DC	
	HV / MV ratios provided by the tapping range, per unit of the ratio on the principal tapping		
	• Maximum	105 %	
	• Minimum	85 %	
	Number of approximately equal ratios	16	
	Approximately change per step % of the ratio on the principal tapping	1,25	
	Type of tap-changer (resistor, reactor)		
	Nominal voltage and current rating of tap-changer		
	Contacts:		
	Selector switch	kVA	
	Diverter switch	kV / A	
	Resistor	kV / A	
	What is the maximum overcurrent which the tap-changer can handle without damage?		
	• Driving motor inputs, in kW		
	• Type of driving motor, i.e. three-phase, split-phase		
	Tap-changer over-current protection:		
	• Over-current blocking facilities provided	YES	
	Diverter switch operating time, in seconds		
	Time from "point of no return" to parting of diverter switch contacts in seconds		
2.8	**Transformer Fittings Required**		

ITEM	DESCRIPTION	SCHEDULE A	SCHEDULE B
	Conservator tank with oil gauge	YES	
	Dehydrating breather	YES	
	Bucholz relay	YES	
	Pocket for top-oil check thermometer	YES	
	Dial type top-oil thermometer with trap contacts	YES	
	Drain valve	YES	
	Oil filtration connections	YES	
	Rating and diagram plate(s)	YES	
	Earthing terminal(s) (to be suitable for 50 mm x 10 mm flat copper strap)	YES	
	Lifting lugs	YES	
	Jacking pads	YES	
	Transformer base :Skid underbase for movement in any direction	YES	
	Pressure relief device	YES	
	Winding temperature indicator	YES	
	Oil temperature indicator	YES	
	Oil sampling device	YES	
	Radiators	YES	
	a) Are separate radiators offered?	N/A	
	b) Separate radiators to be supported independently	N/A	
	Transformer bushing CT's	YES	
	• Ratio	300/1, 300/1, 300/1	
	• Class	10P10	
	• Protection	-	
	• Location		
	Earthing:		
	• HV side	None	
	• MV side	Solid	
	Power cables:		
	Type of insulation		
	• Size	BUSBAR TO CABLE BREAKOUT SUPPORT STRUCTURE 2000 A	
	• Cores		
	• Rated voltage		
	• Armouring		

3. BUSBARS – REMOVE and REPLACE EXISTING

ITEM	DESCRIPTION	UNIT	SCHEDULE A	SCHEDULE B
3.1	66 kV busbar system			
3.1.1	Maximum system voltage	kV	66	
3.1.2	Lighting impulse withstand voltage (to earth and between phases)	kV	550	
3.1.3	Rated continuous current	A	1 250	
3.1.4	Insulator creepage	mm/kV	31	
3.1.5	Pollution		Dust agricultural	
3.1.6	Rated fault current (3 s)	kA	25	

4. MISCELLANEOUS

ITEM	DESCRIPTION	UNIT	SCHEDULE A	SCHEDULE B
4.1	**General**			
4.1.1	Guarantee period	month	12	
4.1.2	Maintenance trolley (if applicable)		Yes/No	N/A
4.1.3	Required period for spares	years	10	
4.2	**Documentation**			
4.2.1	Type test certificates	Sets	3	
4.2.2	Routine test certificates for each panel	Sets	3	
4.2.3	General arrangement as-built drawing	Sets	3	
4.2.4	Schematic and wiring diagrams	Sets	3	
4.2.5	Replacement part lists	Sets	3	
4.2.6	Operation & maintenance manuals	Sets	3	
4.2.7	Units used in Republic of South Africa		In tender/offer	
4.2.8	Project reference list, services to Eskom		In tender/offer	
4.2.9	Spare lists, if applicable	Sets	3	
4.2.10	Pack lists, if applicable	Sets	3	

5. LV RETICULATION CABLES

ITEM	DESCRIPTION	UNIT	SCHEDULE A	SCHEDULE B
5.1	Manufacturer			
5.2	Voltage rating		600/1000	
5.3	Conductors		COPPER 1, 2 or 4 CORE	
5.4	Type		PVC SWA PVC	
5.5	Marking		SABS	
5.6	Delivery period			
5.7	Additional information			

2. Pricing Instructions

1. Measurement and payment shall be in accordance with Clause 8 of the SABS 1200 Standardised Specifications for Civil Engineering Construction referred to in the Scope of Works, subject to the variations and amendments contained in the section "Applicable SABS 1200 standardised specifications".
2. Descriptions in the Bills of Quantities are abbreviated and comply generally with those in the Standardised Specifications. Clause 8 of each Standardised Specification, read together with the relevant clauses of the Scope of Work, set out what ancillary or associated activities are included in the rates for the operations specified. Should any requirements of the measurement and payment clause of the applicable Standardised Specification, or the Scope of Work, conflict with the terms of the Bill, the requirements of the Standardised or Scope of Work, as applicable, shall prevail.
3. The clauses in a specification in which further information regarding the Bill item can be obtained appear under "Reference clause" in the Bills of Quantities. The reference clauses indicated are not necessarily the only sources of information in respect of schedule items. Further information and set specifications may be found elsewhere in the contract documents. Standardised Specifications are identified by the letter or letters which follow SABS in the SABS 1200 series of specifications, e.g. G for SABS 1200 G.
4. Unless otherwise stated, items are measured nett in accordance with the drawings, and no allowance is made for waste.
5. The quantities set out in these Bills of Quantities are approximate and do not necessarily represent the actual amount of work to be done. The quantities of work accepted and certified for payment will be used for determining payments due and not the quantities given in the Bills of Quantities.
6. The prices and rates to be inserted in the Bills of Quantities are to be the full inclusive prices for the work described under the several items. Such prices and rates shall cover all costs and expenses that may be required in and for the execution of the work described, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the documents on which the tender is based, as well as overhead charges and profit. The prices will be used as a basis for assessment of payment for additional work that may have to be carried out.
7. It will be assumed that prices included in these Bills of Quantities are based on Acts, Ordinances, Regulations, By-laws, International Standards and National Standards that were published 28 days before the closing date for tenders. (Refer to www.stanza.org or www.iso.org for information on standards).
8. Where the Scope of Work requires detailed drawings and designs or other information to be provided, all costs associated therewith are deemed to have been provided for and included in the unit rates and sum amount tendered such items
9. A price or rate is to be entered against each item in the Schedule/Bills of Quantities, whether the quantities are stated or not. An item against which no price is entered will be considered to be covered by the other prices or rates in the Bills of Quantities. A single lump sum will apply should a number of items be grouped together for pricing purposes.
10. Except where rates only are required, the Tenderer shall insert all amounts to be included in his total tendered price in the "Amount" column and show the corresponding total tendered price.
11. The units of measurement described in the Bills of Quantities are metric units. Abbreviations used in the Bills of Quantities are as follows :

ha	=	hectare	h	=	hour
kℓ	=	kilolitre	kg	=	kilogram
km	=	kilometre	kW	=	kilowatt
km-pass	=	kilometre pass	MN	=	MegaNewton
kPa	=	kilopascal	MN.m	=	MegaNewton-metre
ℓ	=	litre	%	=	per cent
m	=	metre	PC sum	=	Prime Cost sum
mm	=	millimetre	Prov sum	=	Provisional sum
m^2	=	square metre	No.	=	number
m^2.pass	=	square metre-pass	R/only	=	Rate only
m^3	=	cubic metre	sum	=	lump sum
m^3.km	=	cubic metre-kilometre	t	=	ton (1 000 kg)
MPa	=	Megapascal	W/day	=	Work day

3. Bill of Quantities

A: MEDIUM VOLTAGE CABLE NETWORK

ITEM	REFER TO	DESCRIPTION	UNIT	QUAN-TITY	UNIT COST		TOTAL COST
					MATERIAL	LABOUR	
A.1	PS.4.23	3-Core 6,35/11kV PILCDSTA cable:					
		a) 95 mm² Cu (Relocate existing - excavations measured elsewhere)	m	1	N/A		RATE ONLY
		b) 95 mm² Cu	m	1		N/A	RATE ONLY
A.2		Cable joints for use on 11kV PILCDSTA cables complete with all accessories to join the following cables					
		a) 95 - 120 mm²	each	1			RATE ONLY
A.3		11kV Cable end box, pole mounted, complete with glands and bushings					
		a) With end box and compound	each	1			
A.4		Complete termination of 11kV cable on termination structure with all accessories, including cable supports.					
		a) Single core cable (300mm²)	each	6			
A.5	SABS 1200LC	110mm dia Cable sleeves with couplings and draw wire as specified	m	20			
A.6		Supply and install cable slabs as specified.	m	1			RATE ONLY
A.7		Supply and install with inscription, cable route and joint markers of pyramid type with plate insert on top.	each	4			
A.8		PVC warning tape (300mm)	m	30			
TOTAL CARRIED FORWARD TO SUMMARY							

B: EXCAVATIONS

ITEM	REFER TO	DESCRIPTION	UNIT	QUAN-TITY	UNIT COST		TOTAL COST
					MATERIAL	LABOUR	
B.1	SABS 1200LC	All prices below includes the excavation of trenches and holes, separation of stones and soil, rocks etc, levelling of trench beds, backfill, compacting and reparation of all surfaces to the original finish.					
		a) Excavating in soft soil without the assistance of pneumaitc tool	m^3	40			
		b) Intermediate excavations with the assistance of pneumatic tools	m^3	90			
		c) Excavating in hard rock that requires blasting	m^3	25			
		d) Provide sand or stone-free soil, handling cost included.	m^3	50			
		e) Remove waste material, handling cost included.	m^3	75			
B.2	SABS 1200DB	The following will apply where existing services are present:					
		a) Excavations done by hand to expose services	m^3	30			
B.3		Reparations to surfaces. Only standard trench widths shall be measured.					
		a) Concrete surfaces with a minimum thickness of 75 mm.	m^2				
		b) Tar surfaces according to SABS standards.	m^2				
		c) Concrete or brick paving.	m^2				
		d) Crushed stone (stockpiled)	m^2	40			
B.4		Demolish existing concrete to 400mm below finished ground level.	m^3	3			
TOTAL CARRIED FORWARD TO SUMMARY							

C: TELEMETRY AND SCADA SYSTEM

ITEM	REFER TO	DESCRIPTION	UNIT	QUAN-TITY	UNIT COST		TOTAL COST
					MATERIAL	LABOUR	
C.1	PS4.22	Site visits, site establishment, storage facilities, plant provision, contractual obligations etc.	sum	1			
C.2	PS4.22	Commissioning, reconfiguration or update of Complete system and/or expansion. Includes all disconnecting, reconnecting and wiring required	sum	1			
C.3	PS4.22	Documentation for complete system or expansion	sum	1			
TOTAL CARRIED FORWARD TO SUMMARY							

D: SUBSTATION CIVIL WORKS AND EQUIPMENT

ITEM	REFER TO	DESCRIPTION	UNIT	QUAN-TITY	UNIT COST		TOTAL COST
					MATERIAL	LABOUR	
D.1		Clear and grub- recover and stockpile existing crushed stone	m^2	20			
D.2		Demolish existing plinths including removal of rubble from site					
		a) Transformer	sum	1			
		b) Marshalling panel	sum	1			
D.3		Structural design, supply and construct new plinths and containment areas					
		a) Transformer plinth	sum	1			
		b) Marshalling panel plinth	sum	1			
		c) Transformer containment bund and screed to drain	sum	1			
		d) Main oil containment dam - 14 kl oil volume below outlets, complete with secondary oil traps, reinforced slab cover with lockable manhole cover and steps	sum	1			
D.4		Oil trap gravity ducts (160 dia) installed to slope for drainage. HDPE type, including joints	m	60			
D.5		Transformer oil bund gravel fill 19mm	m^3	10			
D.6		Precast kerb blocks on concrete bed.	m	20			
D.7	PS.4.6	Decommission, disconnect, remove and jack to temporary location on site, existing 15 MVA ONAN transformer and auxiliaries, and place on treated wood beams (sleepers), and mothball.	sum	1			
D.8		Relocate existing 15 MVA transformer to Noree Substation and install on concrete plinth	sum	1			
D.9		Recommission Tap changer and transformer control panels with all control wiring and cabling including transformer side connections.	sum	1			
D.10		Supply and install new marshalling panel, to match existing, including all cable extensions, joints, terminations, earthing etc. Includes the removal of existing panel.	sum	1			

D: SUBSTATION CIVIL WORKS AND EQUIPMENT

ITEM	REFER TO	DESCRIPTION	UNIT	QUAN-TITY	UNIT COST		TOTAL COST
					MATERIAL	LABOUR	
D.11	PS.4.11	Supply and install substation earthmat and earth connections as specified. Extensions from existing included. Includes all testing	sum	1			
D.12		Lightning protection masts earthing to be tested and verified	sum	1			
D.13		Hot spot survey tests as specified	sum	1			
D.14		Wire alarms to back of panel - reinstate	sum	1			
D.15		Supply and install all substation and panel labels as specified.	sum	1			
D.16		Supply, install and terminate all auxiliary cables from transformers, circuit breakers, instrument transformers and all status contacts on isolators to marshalling kiosk, if not included elsewhere.	sum	1			
D.17	PS.4.39	Commission complete substation as specified.	sum	1			
D.18	PS.8	Supply manuals, drawings and literature as specified	sum	1			
D.19		Replace busbar/jumpers from 66 kV circuit breaker to Transformer terminals. Including all terminations. Conductor to match existing	sum	1			
D.20		Remove 11 kV cable/transformer busbar support structure, busbars and reinstall	sum	1			
D.21		All arrangements and costs for extended outage and overtime work	sum	1			
D.22		Refurbish / Repair 11kV Feeder panel (RMU Load Control)	PC	1	150 000.00	150 000.00	300 000.00
D.23		Profit & attendance for item D.22	%	300 000.00			
TOTAL CARRIED FORWARD TO SUMMARY							

E: POWER TRANSFORMERS

ITEM	REFER TO	DESCRIPTION	UNIT	QUAN-TITY	UNIT COST		TOTAL COST
					MATERIAL	LABOUR	
E.1	PS.4.1	Design, manufacture, test, transport, offload and commission a 15 MVA 66/11 kV ONAN Dyn11 power transformer including OLTC. Refer to specification and data sheets.	sum	1			
E.2	PS4.1.3	Sweep frequency test	ea	1			
E.3	PS4.1.3	Accelerometer monitor during transport	ea	1			
E.4	PS4.1.3	Inert gas fill of transformer during transport	ea	1			
E.5	PS4.1.3	Gas pressure monitor	ea	1			
E.6		Oil test and filling with displacement of inert gas after assembly of all components removed for transport.	ea	1			
E.7	PS.4.14	Supply and install 66kV lightning arrestors on transformer.	ea	3			
E.8	PS.4.14	Supply and install 11kV lightning arrestors per phase and starpoint	ea	4			
E.9	PS.4.38	Factory acceptance tests of electrical equipment at manufacturers workshop. One trip for three municipal representatives	sum	1			
E.10		Oil tests of transfomers	each	3			
E.11	PS.8	Design, spares lists and maintenance manuals	sets	3			
E.12	PS.10 , PS.12	Test and commissioning certificates	sum	1			
TOTAL CARRIED FORWARD TO SUMMARY							

F: PROVISIONAL AND GENERAL ITEMS

ITEM	REFER TO	DESCRIPTION	UNIT	QUAN-TITY	UNIT COST		TOTAL COST
					MATERIAL	LABOUR	
F.1		Erection and removal of notice board. (2.4m x 1.5m)	sum	1			
F.2	SABS 1200 A Par.8.3	**Fixed-charge and Value-related items.**					
		a) Contractual requirements	sum	1			
		b) Erection of facilities on site.	sum	1			
		c) Removal of facilities from site.	sum	1			
F.3	SABS 1200 A Par.8.3	**Time-related Items**					
		a) Contractual requirements	sum	1			
		b) Useage and maintenance of facilities on site	sum	1			
		c) Supervision	sum	1			
		d) Company and Head Office overhead costs	sum	1			
F.4		**Health and Safety Regulations**					
		a) Cost of health and safety measures to be taken in respect of construction regulations, as amended	sum	1			
		b) Compilation and maintenance of the health and safety plan, including risk analysis, safe work procedures and methods	sum	1			
		c) Compilation and maintenance of the health and safety file	sum	1			
		d) Independent H&S consultant to audithealth and safety file & compliance	sum	1			
TOTAL CARRIED FORWARD TO SUMMARY							

SUMMARY

ITEM	DESCRIPTION	TOTAL COST
A	MV CABLE NETWORK	
B	EXCAVATIONS	
C	TELEMETRY	
D	SUBSTATION CIVIL WORKS AND EQUIPMENT	
E	POWER TRANSFORMERS	
F	PRELIMINARY AND GENERAL	
	S U B - T O T A L	
	CONTINGENCY AMOUNT : 10 % OF SUB-TOTAL	
	S U B - T O T A L	
	V A T : 1 5 % ON SUB-TOTAL	
	TOTAL (To be transferred to page 1 of this document)	

16. **Project Health and SafetySpecification**

In terms of Construction Regulations 2014

Client

Langeberg Municipality

Description of Project Works

REPLACE 66KV TRANSFORMER AT THE ROBERTSON MAIN SUBSTATION

Project Location

Robertson, Western Cape

PROJECT HEALTH AND SAFETY SPECIFICATION

TABLE OF CONTENTS

2.28 Use and Temporary Storage of Flammable Liquids on Construction Sites
2.29 Water Environments
2.30 Fire Precautions on Construction Sites
2.31 Construction Employees' Facilities
2.32 Fall Protection
2.33 Temporary Works
2.34 Excavation
2.35 Demolition Work
2.36 Tunnelling
2.37 Scaffolding
2.38 Bulk Mixing Plant
2.39 Rope Access Work
2.40 Hazardous Chemical Substances (HCS)
2.41 Noise Induced Hearing Loss
2.42 Explosives and Blasting
2.43 Personal Protective Equipment (PPE)
2.44 Asbestos
2.45 Pressure Vessels (Including Gas Bottles)
2.46 Fire Extinguishers and Fire Fighting Equipment
2.47 Lifting Machinery and Tackle
2.48 Ladders and Ladder Work
2.49 General Machinery
2.50 Portable Electrical Tools
2.51 High Voltage Electrical Equipment
2.52 Public Health and Safety
2.53 Night Work
2.54 Environmental Conditions and Flora and Fauna
2.55 Occupational Health
2.56 Suspended Platforms
2.57 Material Hoists
2.58 Explosive Actuating Fastening Devices
2.59 Confined Spaces
2.60 Alcohol and Drugs

Annexure A

- Task Completion Form

Annexure B

- Contractor's Responsible Persons

Baseline Risk Assessments

Health and Safety Specification Acknowledgement Receipt

1.0 SPECIFIC PROJECT INFORMATION

1.1 INTRODUCTION AND DEFINITIONS

PLEASE NOTE THAT THE REQUIREMENTS OF THE NEW CONSTRUCTION REGULATIONS 2014 HAVE BEEN IN EFFECT SINCE 7TH AUGUST 2014. THE NEW REGULATIONS PLACE ADDITIONAL LEGAL DUTIES UPON PRINCIPAL CONTRACTORS AND CONTRACTORS. ALTHOUGH THIS HEALTH AND SAFETY SPECIFICATION INCLUDES MUCH OF THE CONTENT OF THESE NEW REQUIREMENTS, THE CONTRACTOR WILL BE DEEMED TO BE FAMILIAR WITH THE REQUIREMENTS OF THESE REGULATIONS, AND TO HAVE FACTORED IN ALL THE DUTIES PLACED UPON CONTRACTORS AND PRINCIPAL CONTRACTORS IN THE TENDER. A COPY OF THE REGULATIONS CAN BE VIEWED ON THE DEPARTMENT OF LABOUR'S WEBSITE.

This Health and Safety Specification contains clauses that are generally applicable to construction activities, as well as imposing pro-active controls associated with activities that impact on Health and Safety as it relates to plant and machinery. Compliance to therequirements of the Occupational Health and Safety Act 1993 is in addition to the requirements of this Health and Safety Specification and is part of the Contractor's responsibility. The Client will monitor that the Contractors comply with the requirements of such legislation.

ALL REFERENCES TO CLIENT IN THIS HEALTH AND SAFETY SPECIFICATION ALSO REFER TO SAFETY AGENT, WHERE SO APPOINTED.

Definitions (as per the Construction Regulations 2014) applicable to this Health and Safety Specification:

"agent" means a competent person who acts as a representative for a Client;

"angle of repose" means the steepest angle of a surface at which a mass of loose or fragmented material will remain stationary in a pile on the surface, rather than sliding or crumbling away;

"bulk mixing plant" means machinery, appliances or other similar devices that are assembled in such a manner so as to be able to mix materials in bulk for the purposes of using the mixed product for construction work;

"client" means any person for whom construction work is being performed;

"competent person" means a person who has, in respect of the work or task to be performed, the required knowledge, training and experience and, where applicable, qualifications, specific to that work or task: Provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualification Framework Act, 2000 (Act No.67 of 2000), those qualifications and that training must be regarded as the required qualifications and training; and is familiar with the Act and with the applicable regulations made under the Act;

"construction manager" means a competent person responsible for the management of the physical construction processes and the coordination, administration and management of resources on a construction site;

"construction site" means a work place where construction work is being performed;

"construction supervisor" means a competent person responsible for supervising construction activities on a construction site;

"construction vehicle" means a vehicle used as a means of conveyance for transporting persons or material, or persons and material, on and off the construction site for the purposes of performing construction work;

"construction work" means any work in connection with-

- the construction, erection, alteration, renovation, repair, demolition or dismantling ofor addition to a building or any similar structure; or
- 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 civilengineering structure or type of work;

"construction work permit" means a document issued in terms of regulation 3;"contractor" means an

employer who performs construction work;

Note:

a) Includes organisations and or self-employed person that contracts with a client,principal contractor, or a contractor to carry out construction work.

"demolition work" means a method to dismantle, wreck, break, pull down or knock down of a structure or part thereof by way of manual labour, machinery, or the use of explosives;

"design" in relation to any structure, includes drawings, calculations, design details and specifications;

"designer" means a competent person who-

- prepares a design;
- checks and approves a design;
- arranges for a person at work under his or her control to prepare a design, including anemployee of that person where he or she is the employer; or
- designs temporary work, including its components;
- an architect or engineer contributing to, or having overall responsibility for a design;
- a building services engineer designing details for fixed plant;
- a surveyor specifying articles or drawing up specifications;
- a contractor carrying out design work as part of a design and building project; or
- an interior designer, shop-fitter or landscape architect;

"excavation work" means the making of any man-made cavity, trench, pit or depression formed by cutting, digging or scooping;

"explosive actuated fastening device" means a tool that is activated by an explosive charge and that is used for driving bolts, nails and similar objects for the purpose of providing fixing;

"fall arrest equipment" means equipment used to arrest a person in a fall, including personal equipment, a body harness, lanyards, deceleration devices, lifelines or similar equipment;

"fall prevention equipment" means equipment used to prevent persons from falling from a fall risk position, including personal equipment, a body harness, lanyards, lifelines or physical equipment such as guard-rails, screens, barricades, anchorages or similar equipment;

"fall protection plan" means a documented plan, which includes and provides for -

- all risks relating to working from a fall risk position, considering the nature of workundertaken;
- the procedures and methods to be applied in order to eliminate the risk of falling; and
- a rescue plan and procedures;

"fall risk" means any potential exposure to falling either from, off or into;

"health and safety file" means a file, or other record containing the information in writingrequired by these Regulations;

"health and safety plan" means a site, activity or project specific documented plan inaccordance with the Client's health and safety specification;

"health and safety specification" means a site, activity or project specific document preparedby the Client pertaining to all health and safety requirements related to construction work; "material hoist" means a hoist used to lower or raise material and equipment, excludingpassengers;

"medical certificate of fitness" means a certificate contemplated in regulation 7(8);

"mobile plant" means any machinery, appliance or other similar device that is able to move independently, and is used for the purpose of performing construction work on a construction site;

"National Building Regulations" means the National Building Regulations made under the National Building Regulations and Building Standards Act, 1977 (Act No. 103 of 1977), and promulgated by Government Notice No. R. 2378 of 30 July 1990, as amended by GovernmentNotices No's R. 432 of 8 March 1991, R. 919 of 30 July 1999 and R. 547 of 30 May 2008;

"person day" means one normal working shift of carrying out construction work by a personon a construction site;

"principal contractor" means an employer appointed by the Client to perform construction work;

"Professional Engineer or Professional Certificated Engineer" means a person holding registration as either a Professional Engineer or Professional Certificated Engineer in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000);

"Professional Technologist" means a person holding registration as a Professional Engineering Technologist in terms of the Engineering Profession Act, 2000;

"provincial director" means the provincial director as defined in regulation 1 of the General Administrative Regulations, 2003;

"scaffold" means a temporary elevated platform and supporting structure used for providingaccess to and supporting workmen or materials or both;

"shoring" means a system used to support the sides of an excavation and which is intended to prevent the cave-in or the collapse of the sides of an excavation;

"structure" means-

- any building, steel or reinforced concrete structure (not being a building), railway line or siding, bridge, waterworks, reservoir, pipe or pipeline, cable, sewer, sewage works, fixed vessels, road, drainage works, earthworks, dam, wall, mast, tower, tower crane,
  bulk mixing plant, pylon, surface and underground tanks, earth retaining structure orany structure designed to preserve or alter any natural feature, and any other similarstructure;
- any falsework, scaffold or other structure designed or used to provide support or means of access during construction work; or
- any fixed plant in respect of construction work which includes installation, commissioning, decommissioning or dismantling and where any construction work involves a risk of a person falling;

"suspended platform" means a working platform suspended from supports by means of one or more separate ropes from each support;

"temporary works" means any falsework, formwork, support work, scaffold, shoring or other temporary structure designed to provide support or means of access during constructionwork;

"the Act" means the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993);

"tunnelling" means the construction of any tunnel beneath the natural surface of the earth fora purpose other than the searching for or winning of a mineral.

Reference should be made to the following documentation in conjunction with this Safety Specification (including existing surveys, drawings and reports):

Tender documents **Drawings**

IMPORTANT NOTE:

This Health and Safety Specification has been prepared to comply with the requirements ofthe Construction Regulations 2014.

1.2 BACKGROUND TO THE HEALTH AND SAFETY SPECIFICATION

Historically, the Construction Industry has had a poor health and safety record. Due to the complex and potentially dangerous operations being undertaken, there is a high risk of incidents, accidents and injuries. In many instances poor adherence to the Act and Regulations has resulted in severe consequences for Health and Safety performance. The Client is determined that the highest Health and Safety standards will prevail throughout the Contract and that there will be full commitment from all parties involved.

To achieve this goal the Client has prepared this Health and Safety Specification. The Health and Safety Specification sets out guidelines and minimum levels of awareness and guidancefor Health and Safety requirements for the project. Contractual responsibility for adhering to these requirements rests with the Contractors. All employees are encouraged to be pro-active in compliance.

The Client is committed to ensuring the highest Health and Safety standards for all work undertaken within the Contract.

Contractors as employers are fully responsible and accountable for compliance with all Health and Safety requirements.

IMPORTANT NOTE:

Compliance with the Occupational Health and Safety Act and Regulations shall not be limited to this Health and Safety Specification and definitions contained in this document.

Contractors shall be conversant with the requirements and effects of Health and Safety legislation upon their activities, in particular the Construction Regulations, 2014, and the Occupational Health and Safety Act, 1993, and to have madeadequate resource in their tender

The Contractor's personnel will be responsible for the auditing of the implementation of the Health and Safety Specification and maintaining the document control and record systems associated with the Health and Safety Specification. The Client will conduct Health and Safety audits of the works too.

1.3 PURPOSE OF THE HEALTH AND SAFETY SPECIFICATION

The purpose of this site specific Health and Safety Specification is to comply with legal requirements and to provide health and safety information about specific project risks known by the Client, Designer and Safety Agent to be applicable to this project. This document also provides minimum health and safety requirements, standards and expectations that the principal contractor and contractors must adhere to.

The Contractor must take into account all information in this specification and ensure thattheir tenders include adequate resource and competence to deal with the matters detailed herein so that all relevant contents are dealt

with in a way which is in compliance with legislation and the ethical concerns for the safeguarding of employees, contractors and other persons affected by the construction activities.

The Health and Safety Specification will be implemented during construction of the works and any construction activity that the Client has control over.

This will also assist in ensuring that all the costs related to the compliance with Occupational Health Act 85 of 1993 and the Construction Regulations 2014, as well as this Health andSafety Specification, are taken into consideration at Tender stage.

No advice, approval of any document required by the Health and Safety Specification such as hazard identification and risk assessment action plans or any other form shall be construed as an acceptance by the Client of any obligation that absolves the Contractor from achieving the required level of performance and compliance with legal requirements.

Further, there is no acceptance of liability by the Client which may result from the Contractor failing to comply with the Health and Safety Specification unless the Client has issued an instruction to any requirement, i.e. the Contractor remains responsible for achieving the required performance levels.

1.4 IMPLEMENTATION OF THE HEALTH AND SAFETY SPECIFICATION

This Health and Safety Specification forms an integral part of the Contract, and Contractors shall make it an integral part of their Contracts with Contractors and Suppliers. Contractors employed by the Client are to ensure that the provisions of the Health and Safety Specification are applied both on the site and in respect of all off site activities relating to the project, in particular in transport activities and project dedicated off site fabrication works.

The Contractor shall enforce the provisions of the Health and Safety Specification amongst all Contractors and suppliers for the project.

The Contractor shall sign the acknowledgment on the last page of this safety specificationthat he/she has familiarized him/herself with the content of the Health and Safety Specification and shall comply with all obligations in respect thereof.

The successful Contractor will be required to compile a Health and Safety Plan based on the requirements of the Occupational Health Act 85 of 1993 and these Specifications, which will need to be approved by Client prior to commencement with construction work.

1.4.1 Client Duties

In terms of the Construction Regulations 2014 the Client (or their Agent, where appointed)has legal duties. Where an Agent (refer to “definitions” section of this document) is appointed in terms of this project, these Health and Safety duties assigned will also apply.

All references to “Client” will apply to their appointed “Safety Agent”, where so appointed, in this Health and Safety Specification.

The Client must:

- Prepare a baseline risk assessment for the construction work
- Prepare a suitable, sufficiently documented and coherent site specific Health andSafety specification for the intended construction work, based on the baseline risk assessment

- Include the health and safety specification in the tender documents
- Ensure that potential principal contractors submitting tenders have made adequate provision for the cost of health and safety measures
- Ensure that the principal contractor to be appointed has the necessary competencies and resources to carry out the construction work safely
- Take reasonable steps to ensure co-operation between all contractors appointed by the Client to enable each of those contractors to comply with the regulations
- Ensure, before work commences, that every principal contractor is registered and in good standing with the compensation fund, or with a licensed compensation insurer as contemplated in the Compensation for Occupational injuries and Diseases Act,
  1993 (Act no 130 of 1993)
- Appoint each principal contractor in writing for the project, or part thereof
- Discuss and negotiate with the principal contractor the contents of the principal contractor's safety plan and thereafter finally approve that plan for implementation
- Ensure that a copy of the principal contractor's health and safety plan is implemented and maintained
- Ensure that periodic health and safety audits and document verification are conducted at intervals mutually agreed upon between the principal contractor and any contractor, but at least once every 30 days
- Ensure that a copy of the health and safety audit report is provided to the principal contractor within 7 days after the audit
- Stop any contractor from executing a construction activity which poses a threat to the health and safety of persons which is not in accordance with the principal contractor's health and safety plan for site
- Where changes are brought about to the design or construction work, make sufficient health and safety information and appropriate resources available to the principal contractor to execute the work safely
- Ensure that the health and safety file is kept and maintained by the principal contractor.
- Where the Client requires additional work to be performed as a result of a design change or error in construction due to the actions of the Client, the Client must ensure that sufficient safety information and appropriate additional resources are
  available to execute the required work safely.
- Where more than one principal contractor is appointed, the Client must take reasonable steps to ensure co-operation between all principal contractors and contractors to ensure compliance with the Regulations
- Where the Client has appointed a Safety Agent for the project, their details for this project are contained in the Project Directory section of this health and safety specification.

1.4.2 Designer Duties

It must be noted that the Designer also has Health and Safety duties assigned in terms of the Construction Regulations. Where the contractor fulfils a design function in terms of this

project (refer to "definitions" section of this document), these duties will also apply. Pleaserefer to Regulation 6 of the Construction Regulations 2014.

Please note that the designer of temporary works must ensure that:

- all temporary works are adequately designed so that it will be capable of supporting all anticipated vertical and lateral loads that may be applied;
- the designs of temporary works are done with close reference to the structural design drawings issued by the contractor, and in the event of any uncertainty consult the contractor;
- all drawings and calculations pertaining to the design of temporary works are kept at the office of the temporary works designer and are made available on request by an inspector; and
- the loads caused by the temporary works and any imposed loads are clearly indicated in the design.
-

1.5 PROJECT DIRECTORY		
Project Client **Contact Person**	Langeberg Municipality52 Church Street Robertson 6705 George Lotter	**Tel:** 023 626 8200 **e-mail:** glotter@langeberg.gov.za
Project Manager **Contact Person**	Project Client	**Tel:** **e-mail:**
Consulting Engineer **Contact Person**	N/A	**Tel:** **e-mail:**
Architect **Contact Person**	N/A	**Tel:** **e-mail:**
Construction Safety Agent **Contact Person**	N/A	**Tel:** **e-mail:**
OTHER TBA **Contact Person**	N/A	**Tel:** **e-mail:**

OTHER PARTIES DIRECTORY

Department of Labour for submission of Annexure 2: Notification of Construction Work

WESTERN CAPE

Tel: N/A

e-mail: N/A

Department of Labour
https://www.labour.gov.za/Contacts/Labour-centres/Pages/default.aspx
Worcester
Tel: 023 346 5200

Telecommunications

Contractor to refer all queries on location and nature ofexisting services to the Project Manager / Client, etc.

OR

Contractor to apply for and refer to wayleave information from service providers for the nature and location of services. Refer all queries Project Manager.

Company: Telkom

Contact Name: unknown

Tel: 10210

Water

Company: Langeberg Municipality

Contact Name: TBA

Tel: 023 614 8000

Electricity

Company: Langeberg Municipality

Contact Name: George Lotter

Tel: 023 626 8200

Gas

Company: n/a

1.6 PROJECT DETAILS

Description of Works

This description of the works is not necessarily complete and shall not limit the work to becarried out by the Contractor under this Contract.

Disconnect and removal of existing 15MVA 66/11kV transformer from Robertson main suband storage,

- Civil works (including excavations) for plinths, bund wall and oil trap,
- Excavations and rerouting of 11kV and 400V underground cables,
- Supply and install new 15MVA 66/11kV transformer on the same position as old unit,
- Associated testing etc.

Anticipated Construction Duration

6 Months

Provisional Start Date

Nov 2024

Completion Date

June 2026

1.7 EXISTING ENVIRONMENT

Hazards particular to this project by virtue of location:

Main sub-station – electrical shockMembers of the public

Overhead, Above Ground and Underground Services crossing the site:Overhead: Yes - electrical

Underground: Yes - electrical

Ground level: Yes - electrical, transformers, electrical switchgear

Service Drawings available: Yes

Wayleaves required: Yes

Permits required: Yes, for electrical connections

Isolations required: Yes, for electrical connections

Existing structures and surrounding land use (with a significant impact on Health& Safety):

Main sub-station – severe electrical shock

Existing ground conditions and ground survey report:

Hard, level ground surface

Existing Traffic Systems

Condition: Good condition municipal roads

Restrictions to access: Gated property. **Speed**

restrictions: 20km/h

1.8 AVAILABLE DRAWINGS
Refer to tender documentation.

1.9 PROJECT HEALTH AND SAFETY REQUIREMENTS
Significant health and safety hazards identified by Designer and Safety Agent: Severe electrical shock

Other construction hazards expected are as follows:

Compacting and Filling
Compactor Operations
Electric Tools and Electrical Installations
Excavations
Fire
Flammable Liquids / GasHand
tools
Hazardous Substances
Lifting Operations
Manual Handling of General Items
Members of Public
Noise and Dust
Overhead Services (Working near)
Plant/Vehicle and Equipment Operation
Underground Services

NOTE: Please refer to end of this Health and Safety Specification for the baselinerisk assessment for these risks.

ACTIVITIES REQUIRING APPROVED METHOD STATEMENTS (FOR HEALTH AND SAFETY)

Site establishment

Safe Work Procedures for all connections

ACTIVITIES REQUIRING PERMITS (FOR HEALTH AND SAFETY PURPOSES)

Permit to Dig: No

Permit to Enter Excavations: Yes **Permit**

to Work with Electricity: Yes**Confined**

Space Permit: N/A

Hot Works Permit: N/A

Permit to Work under Power Lines: Yes

Blasting: N/A

Temporary Works: N/A

CONTRACTOR SAFETY OFFICER PROVISION

Records of safety audits undertaken by the Contractor's Safety Officer must be kept on sitein the safety file and non-conformances reported by the Safety Officer to the Contractor's management team. All non-conformances identified by the Safety Officer must be investigated and corrective action taken by the Contractor to prevent re-occurrence.

Please note that as from 7th August 2018 the safety officer must be professionally registered with the SACPCMP. Proof of registration with the SACPCMP must be provided.

If registered as a Candidate proof of mentorship and weekly visits by mentor must beavailable on site.

MEDICAL CERTIFICATE OF FITNESS

The contractor must ensure that their employees on site have a valid medical certificate of fitness, specific to the construction work being performed, issued by an occupationalhealth practitioner in the form of an Annexure 3 template.

MANAGEMENT AND SUPERVISION OF CONSTRUCTION WORK

A principal contractor must, in writing, appoint one full-time competent person as the construction manager with the duty of managing all the construction work on a single site, including the duty of ensuring occupational health and safety compliance, and in the absence of the construction manager an alternate must be appointed by the principal contractor. Proof of all-inclusive assessment of the Construction Manager's Competency in construction management and H & S competency must be available in the Safety File.

The Construction Manager and designated construction supervisor/s must, as a minimum, have training in Legal Liability, Construction Regulation 2014 and the OHS Act and Regulations.

TRAFFIC MANAGEMENT AND TRAFFIC SAFETY OFFICER PROVISION

The Traffic Management Plan must be approved by the Traffic Chief as per the National Road Traffic Act, No. 93 of 1996. The Traffic Safety Officer must have training as per UnitStandard 14561 or similar.

ENVIRONMENTAL CONDITIONS

Contractor must take into account adverse weather conditions on site activities and implement control measures to mitigate risk. This includes risk of exposure to excessive heat, cold, rain and wind.
The open nature of the site works will not preclude any of the above.

ARRANGEMENTS FOR ACCESS, PARKING, DELIVERIES, ETC.

Access to site by Construction Vehicles: Municipal roads

Access to site by Construction Workers and Visitors: Municipal roads

All service providers must sign a 37.2 Mandatory Agreement and must be inducted beforethey can be allowed on site.

ARRANGEMENTS FOR SITE CAMP, ABLUTIONS AND YARD

Site camp location and set up

- **Restrictions / requirements:**
- **Storage areas:**
- **Security:**

Contractor to advise in consultation with Engineer / Professional Team

Ablutions and Welfare Arrangements

Contractor to supply ablutions and facilities in line with the Construction Regulations 2014, refer to section 2.31 of this health and safety specification regarding the below. Pleasenote that toilets should be provided with built in facilities for hand washing:

- **Toilets:**
- **Washing facilities:**
- **Drinking Water:**

Contractor to provide as per Regulations

- **Shelter:**
- **Showers:**

PROTECTION OF SITE AGAINST UNAUTHORISED ACCESS BY PUBLIC

Excavation Fencing: Note that excavations accessible to public, or adjacent to public roads / thoroughfares, must have (1) barrier / fence of at least 1m in height, and (2) warning illuminants at night or when visibility is poor, or have other suitable precautionary measures if of both these are not practicable.

General Fencing of Site: Note that construction sites in built up areas adjacent to public way must be fenced off and have controlled access points.

Warning Notices: Construction Site – No Entry – Report to Office – Danger: High Voltage

Look Outs: N/A

PERSONAL PROTECTIVE EQUIPMENT (PPE)

The Client requires the Contractor to ensure that employees (and others underhis/her control) wear the following minimum PPE:

Overalls: Yes

Safety Harnesses: If working at height

Hard Hats: Yes

Reflective Vests: Yes

Goggles / gloves / ear defenders / respiratory protection: Where identified bycontractor's Risk Assessment

Safety Footwear: Yes

Specialist Equipment (e.g. for electrical work): Yes, as determined by the contractor'sRisk Assessment

HAZARDOUS SUBSTANCES

The following materials and substances have, or may have, to be used in the works and are identified as potentially posing special health and / or safety hazards during the project. Appropriate measures will need to be specified for their control:

Oil, fuel

1.10 INTERFACE AND RESTRICTIONS BY CLIENT

Contractor must note that the following Client activities will continue during construction: municipal duties and service delivery

The following Client safety rules and/or requirements are to be observed:
All workers are to receive induction prior to commencement of work on site.Other safety rules and requirements to be advised at induction.

Please also refer to tender document.

Restrictions on times, access or other restrictions by Client
Please refer to tender document.
Other restrictions may be advised at induction.

1.11 SAFETY FILE RETURN TO CLIENT

The Safety File for the Project is to be handed over by the Principal Contractor to the Clientupon Project Completion in a hard copy format.

2.0 FURTHER REQUIREMENTS

2.1 Duties of Principal Contractor / Contractor in terms of Construction Regulations 2014

A Principal Contractor must:

- provide and demonstrate to the Client a suitable, sufficiently documented and coherent site specific health and safety plan, based on the Client's documented health and safety specifications, which plan must be applied from the date of commencement of and for the duration of the construction work and which must be reviewed and updated by the principal contractor as work progresses;

- open and keep on site a health and safety file, which must include all documentation required in terms of the Act and these Regulations, which must be made available on request to an inspector, the Client, the Client's Safety Agent or a Contractor; and

- on appointing any other contractor, in order to ensure compliance with the provisions ofthe Act –

  - provide contractors who are tendering to perform construction work for the principal contractor, with the relevant sections of the health and safety specifications pertaining to the construction work which has to be performed;

  - ensure that potential contractors submitting tenders have made sufficient provision for health and safety measures during the construction process;

  - ensure that no contractor is appointed to perform construction work unless the principal contractor is reasonably satisfied that the contractor that he or she intends to appoint, has the necessary competencies and resources to perform the construction work safely;

  - ensure prior to work commencing on the site that every contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Injuries and Diseases Act, 1993;

  - appoint each contractor in writing for the part of the project on the construction site

  - take reasonable steps to ensure that each contractor's health and safety plan is implemented and maintained on the construction site;

  - ensure that the periodic site audits and document verification are conducted at intervals mutually agreed upon between the principal contractor and any contractor, but at least once every 30 days;

  - stop any contractor from executing construction work which is not in accordance with the Client's health and safety specifications and the principal contractor's health and safety plan for the site or which poses a threat to the health and safety of persons;

- where changes are brought about to the design and construction, make available sufficient health and safety information and appropriate resources to the contractor to execute the work safely;

- discuss and negotiate with the contractor the contents of their health and safety plan and finally approve that plan for implementation;

- ensure that a copy of both the principal contractor and contractor's health and safety planis available on request to an employee, an inspector, a contractor, the Client or the Client'sSafety Agent;

- hand over a consolidated health and safety file to the Client upon completion of the construction work, to include a record of all drawings, designs, materials used and other similar information concerning the completed structure;

- in addition to the documentation required in the health and safety file include and make available a comprehensive and updated list of all the contractors on site accountable to the principal contractor, the agreements between the parties and the type of work being done;

- ensure that all his or her employees have a valid medical certificate of fitness specificto the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.

A contractor must prior to performing any construction work-

- provide and demonstrate to the principal contractor a suitable and sufficiently documented health and safety plan, based on the relevant sections of the Client's health and safety specification and provided by the principal contractor, which plan must be applied from the date of commencement of and for the duration of the construction work and which must be reviewed and updated by the contractor as work progresses;

- open and keep on site a health and safety file, which must include all documentation required in terms of the Act and these Regulations, and which must be made available on request to an inspector, the Client, the Client's Safety Agent or the principal contractor;

- before appointing another contractor to perform construction work be reasonably satisfied that the contractor that he or she intends to appoint has the necessary competencies and resources to perform the construction work safely;

- co-operate with the principal contractor as far as is necessary to enable each of them to comply with the provisions of the Act;

- as far as is reasonably practicable, promptly provide the principal contractor with any information which might affect the health and safety of any person at work carrying out construction work on the site, any person who might be affected by the work of such a person at work, or which might justify a review of the health and safety plan.

Where a contractor appoints another contractor to perform construction work, the duties that apply to the principal contractor will apply to the contractor as if he or she were the principal contractor.

A principal contractor must take reasonable steps to ensure co-operation between all contractors appointed by the principal contractor to enable each of those contractors to comply with these Regulations.

No contractor may allow or permit any employee or person to enter any site, unless that employee or person has undergone health and safety induction training pertaining to the hazards prevalent on the site at the time of entry.

A contractor must ensure that all visitors to a construction site undergo health and safety induction pertaining to the hazards prevalent on the site and must ensure that such visitors have the necessary personal protective equipment.

A contractor must at all times keep on his or her construction site records of the health and safety induction training and such records must be made available on request to an inspector, the Client, the Client's Safety Agent or the Principal Contractor.

A contractor must ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3 (a template of which can be found in the Construction Regulations, 2014).

2.2 Management and Supervision of Construction Work

A principal contractor must, in writing, appoint one full-time competent person as the construction manager with the duty of managing all the construction work on a single site, including the duty of ensuring occupational health and safety compliance, and in the absence of the construction manager an alternate must be appointed by the principal contractor. Proof of all-inclusive assessment of the Construction Manager's Competency in construction management and H & S competency must be available in the Safety File. The Construction Manager must, as a minimum, have a Construction Regulation course. No contractors may be left unsupervised on site by the principal contractor.

A principal contractor must upon having considered the size of the project, in writing appoint one or more assistant construction managers for different sections thereof: Provided that the designation of any such person does not relieve the construction manager of any personal accountability for failing in his or her management duties in terms of this regulation.

Where the construction manager has not appointed assistant construction managers, or, in the opinion of an inspector, a sufficient number of such assistant construction managers have not been appointed, that inspector must direct the construction manager in writing to appoint the number of assistant construction managers indicated by the inspector, and those assistant construction managers must be regarded as having been appointed.

No construction manager appointed in terms of the Regulations may manage any construction work on or in any construction site other than the site in respect of which he or she has been appointed.

A contractor must, after consultation with the Client and having considered the size of the project, the degree of danger likely to be encountered or the accumulation of hazards or risks on the site, appoint a full-time or part-time construction health and safety officer in writing to assist in the control of all health and safety related aspects on the site: Provided that, where the question arises as to whether a construction health and safety officer is necessary, the decision of an inspector is decisive.

No contractor may appoint a construction health and safety officer to assist in the control of health and safety related aspects on the site unless he or she is reasonably satisfied that the construction health and safety officer that he or she intends to appoint is registered witha statutory body approved by the Chief Inspector and has necessary competencies and resources to assist the contractor

A construction manager must in writing appoint construction supervisors responsible for construction activities and ensuring occupational health and safety compliance on the construction site. Proof of all-inclusive assessment of the Construction Supervisor's competency in construction supervision and H&S competency must be available in the Safety File. The Construction Supervisor must, as a minimum, have a supervision course as per Unit Standard 262845 (Civil Engineering), 119080 (Building Construction) and 262884 (Civil Engineering).

A contractor must, upon having considered the size of the project, in writing appoint one or more competent employees for different sections thereof to assist the construction

supervisor, and every such employee has, to the extent clearly defined by the contractor inthe letter of appointment, the same duties as the construction supervisor: Provided that the designation of such employee does not relieve the construction supervisor of any personal accountability for failing in his or her supervisory duties.

Where the contractor has not appointed such an employee, or, in the opinion of an inspector,a sufficient number of such employees have not been appointed, that inspector must instruct the employer to appoint the number of employees indicated by the inspector.

No construction supervisor appointed may supervise any construction work on or in any construction site other than the site in respect of which he or she has been appointed: Provided that if a sufficient number of competent employees have been appropriately designated on all the relevant construction sites, the appointed construction supervisor may supervise more than one site.

2.3 Notification of Intention to Commence Construction Work

The Contractor shall notify the Provincial Director of the Department of Labour of the intention to commence construction work at least 7 days prior to the works commencing if the intended construction work will:

- Include excavation work
- Include work at height where there is a risk of falling
- Include the demolition of a structure, or
- Include the use of explosives to perform construction work.

If the construction work involves construction of a single story dwelling for a Client, and such Client will be residing in such dwelling upon completion, the contractor must also notify the Provincial Director of the Department of Labour at least 7 days before the works commence.

This must be done on a form similar to an Annexure 2 (template of which can be found in the Construction Regulations, 2014). A copy of the notification letter to the Provincial Director shall be forwarded to the Client for record purposes.

2.4 Construction Work Permit

A client who intends to have construction work carried out, must at least 30 days before that work is to be carried out apply to the provincial director in writing for a construction work permit to perform construction work on projects that will –

1. exceed 365 days and will involve more than 3600 person days of construction work; or
2. the tender value limit is grade 6 or higher of the Construction Industry Development Board(CIDB) grading.

A client may appoint a Construction Health and Safety Agent or Construction Health andSafety Manager to apply for this permit from the Provincial Director and construction workmay not commence until the permit has been issued by the Provincial Director.

A copy of this permit will be required to be kept in the principal contractor's safety file, and the site specific number issued by the Provincial Director must be displayed at the site entrance.

A client may appoint a Construction Health and Safety Agent, or Construction Health and Safety Manager based on the scope and risk profile of construction work to represent him/her

on matters of health and safety. Provided that, where the question arises as to whether a Construction Health Safety Agent or a Construction Health and Safety Manager is necessary, the decision of an inspector is decisive.

2.5 Assignment of Contractor's Responsible Persons to Manage Health andSafety on Site

The Contractor shall submit management and supervisory appointments as well as any relevant appointments in writing (as stipulated by the Construction Regulations 2014 and theOccupational Safety and Health Act 1993), prior to commencement of work (refer to **Annexure B** at the end of this Health and Safety Specification).

2.6 Competency for Contractor's Responsible Persons

The Contractor's responsible persons shall be competent in health and safety and be familiar with the Occupational Health and Safety Act 1993, and applicable regulations. Valid proof of pertinent health and safety courses attended by such persons will be required to be presented to the Client.

2.7 Compensation of Occupational Injuries and Diseases Act 130 of 1993(COIDA)

The successful Contractor shall submit to the Client a valid letter of good standing with the Compensation Insurer prior to appointment.

2.8 Occupational Health and Safety Policy

The Contractor shall submit their Health and Safety Policy, prior to construction commencement, signed by the Chief Executive Officer. The Policy must outline objectives and how they will be achieved and implemented within the company operations. The Policy must be communicated to all employees and proof thereof must be available in the Safety File.

2.9 Health and Safety Organogram

The Contractor shall submit an organogram, prior to construction commencement, outlining the Health and Safety Site Team that will be assigned to the project, if successful with the tender. In cases where appointments have not been made, the organogram shall reflect the position. The organogram shall be updated, when there is a change in the site team.

2.10 Risk Assessments

Baseline Risk Assessment

The Client shall cause a baseline risk assessment to be conducted by a competent personbefore the design process and tender process commence, and the assessed risks shall formpart of the health and safety specifications.

The Contractor must, before commencement of any construction work, and during construction work, have risk assessments performed by a competent person appointed in writing, which risk assessments form part of the health and safety plan to be applied on thesite and must include:

- The identification of the risks and hazards to which persons may be exposed to;
- An analysis and evaluation of the risks and hazards identified; based on a documentedmethod
- A documented plan and applicable safe work procedures to mitigate, reduce or controlthe risks and hazards that have been identified;
- A monitoring plan; and
- A review plan

The Contractor must ensure that, as far as is reasonably practicable, ergonomic related hazards are analysed, evaluated and addressed in a risk assessment.

The Contractor must ensure that all employees under his control are informed, instructed and trained by a competent person regarding any hazard and the related work procedures and/orcontrol measures **before any work commences** and thereafter **at the times determinedin the risk assessment monitoring and review plan of the relevant site.**

The Principal Contractor must ensure that all contractors are informed regarding any hazardthat is stipulated in the risk assessment **before any work commences** and thereafter **at the times determined in the risk assessment monitoring and review plan of the relevant site.**

The Contractor must consult with the health and safety committee or with a representative trade union or representative group of employees if no health and safety committee exists,on the monitoring and review of the risk assessments for the site.

The Contractor must ensure that copies of risk assessment for this site are available on sitefor inspection purposes by interested parties (inspector, the Client, Client's Safety Agent, any contractor, any employee, a representative trade union, a health and safety representative or safety committee member.

A Contractor must review the relevant risk assessment where changes are effected to the design and/or construction that result in a change to the risk profile, or when an incident has occurred.

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

In general, the Contractor must ensure that the Risk Assessment involves identifying the hazards present in a work activity on site. This is followed by an evaluation of the extent of the risk involved taking into account those precautions already being taken.

The following general principle should be followed when conducting a risk assessment:

- All relevant risks and/or hazards should be systematically addressed;
- The risk assessment should address what actually happens in the workplace during the work activity;
- All employees and those who may be affected must be considered, including maintenance staff, security guards, visitors and Contractors;
- The risk assessment should highlight those groups and individuals whomay be required to work alone or who have disabilities;
- The risk assessment process should take into account the existing safety measures and controls.
- The level of detail on a risk assessment should be appropriate to the level of risk.

2.11 Health and Safety Representative(s)

The Contractor shall ensure that Health and Safety Representative(s) is/are elected andtrained to carry out his / her functions. The Safety Representative(s) must be democratically nominated, elected and appointed in writing. The Health and Safety Representative(s) shall

carry out regular inspections, keep records and report to the supervisor to take appropriate action. The Safety Representative(s) shall attend Health and Safety Committee Meetings.The Health and Safety Representative shall be part of the team that will investigate incidents, accidents and non-conformances. The Safety Representative(s) must be (a) full time employee(s) who is/are acquainted with conditions and activities at that

workplace or section thereof. The Safety Representatives must have Safety Representative training and must be capable of performing their duties.

2.12 Health and Safety Committee

Where two or more health and safety representatives have been appointed on site, the Contractor shall ensure that monthly health and safety meetings are held with such representatives and minutes are kept on record. Meetings must be organized and chaired by the Contractor's Health and Safety Committee Chairperson. Minutes of these meetings mustbe available for the employees of the contractor to refer to.

2.13 Medical Certificate of Fitness

The contractor must ensure that their employees on site have a valid medical certificate of fitness, specific to the construction work being performed, issued by an occupational health practitioner in the form of an Annexure 3 template (refer to the Construction Regulations 2014 on the Department of Labour website for a sample of this form).

2.14 Health and Safety Training

The Contractor shall quarterly conduct a training needs analysis to ascertain what health and safety training is required. A plan of action should be devised and forwarded to the Client for records. Once the identified people have attended the training, the Contractor must provide the Client with copies of certificates obtained.

2.14.1 Induction

No Contractor may allow or permit any employee or person to enter site unless they have undergone health and safety induction training pertaining to the hazards prevalent on site at the time of entry. This includes visitors to site. The Contractor must ensure that visitors to site have the necessary protective equipment (PPE). A copy of attendance registers of all employees who attend inductions shall be kept.

2.14.2 Awareness

The Contractor shall conduct periodic toolbox talks on site, weekly or before any hazardous work takes place. The talks shall cover the relevant activity and an attendance register must be signed by all attendees. This record of who attended and the content of the topic will be kept on the site health a safety file as evidence of training.

2.15 Competency

After the Contractor has identified the training to be conducted as part of the competency requirement, and based on Risk Assessment, he shall send the relevant persons on appropriate courses and keep certificates of training for reference. Familiarity with the Health and Safety Act and Regulations is an integral part of the definition of competence.

2.16 General Record Keeping

The Contractor shall keep and maintain Health and Safety records to demonstrate compliance with the Health and Safety Specification and the Occupational Health and Safety Act. 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, or the Department of Labour's Inspectors.

2.17 General Inspection, Monitoring and Reporting

The Contractor shall carry out inspections as required by this Health and Safety Specification, as well as by health and safety legislation.

2.18 Emergency Procedures

The Contractor shall submit a detailed Emergency Procedure for approval by the Client priorto commencement on site. The procedure shall detail the response plan including the following:

- List of key personnel;
- Details of emergency services;
- Actions or steps to be taken in the event of the emergency; and
- Information on hazardous materials / situations, 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 shall not be limited to, fire, spills, accidents to employees, use of hazardous substances, dangers as a result of riot / service delivery protests

/ intimidation, etc. The Contractor shall advise the Client in writing of any on-site emergencies, together with a record of action taken, within 24 hours of the emergency occurring. A contact list of all service providers (Fire Department, Ambulance, Police, Medical and Hospital, etc.) must be maintained and available to site personnel.

2.19 First Aid Box and First Aid Equipment

The Contractor shall provide first aid box/es and appoint, in writing, First Aider(s) for this project in line with the results of the Contractor's risk assessment for the project, this health and safety specification as well as the provisions of the General Safety Regulations. The appointed First Aider(s) are to be sent for accredited first aid training before starting on site. Valid certificates are to be kept on site.

First Aid box/es must be adequately stocked at all time, accessible and be controlled by a qualified First Aider. If required by the Client, the Contractor shall have a stretcher on site to be used in case of a serious incident.

2.20 Accident / Incident Reporting and Investigation

The Contractor shall, in addition to the prescribed requirements of the Occupational Health and Safety Act and General Safety Regulations, investigate, record and report all Section 24 reportable incidents to the Client within

24 hours of the incident occurring. Incident investigations shall be conducted by the Contractor's appointed Accident Investigator – this Investigator must be a competent person or persons who have sufficient knowledge to carryout an investigation.

In the event of a fatality or a permanent disabling injury the Contractor must submit proof of reporting of incident to Department of Labour as well as proof of preventative measures tothe Client. The Client reserves the right to conduct investigations into any incidents that they deem fit and the Contractor is required to provide full co-operation in this regard.

2.21 Hazards and Potential Situations

The Contractor shall immediately notify other Contractors of any hazardous or potentially hazardous situations, which may arise during performance of the activities.

2.22 Occupational Health and Safety Signage

The Contractor shall ascertain and provide adequate on site health and safety signage. This signage shall include, but shall not be limited to, Hard Hat / Helmet Area; Safety Shoes to be worn on site; Dust Masks to be worn in areas where there might be exposure to excessivedust; Ear Plugs / Muffs to be worn where there might be noise exposure over 85 dB; Gloves; Safety Goggles; Safety Harness, Workers in Excavation, traffic management, etc. The Contractor shall be responsible to maintain the quality and replacement of signage. Signage must comply with the requirements of SANS.

2.23 Management of Contractors by Principal Contractor

The Principal Contractor shall ensure that all contractors under his control are complying with the respective Health and Safety Plans, as well as Health and Safety Legislation.

2.24 Stacking of Materials

In addition to the provisions for the stacking of articles in the General Safety Regulations, 2003, the contractor must ensure that –

- a competent person is appointed in writing with the duty of supervising all stackingand storage on a construction site;
- adequate storage areas are provided;
- there are demarcated storage areas; and
- storage areas are kept neat and under control.

2.25 Housekeeping and General Safeguarding on Construction Sites

A contractor must, in addition to compliance with the Environmental Regulations for Workplaces, 1987, promulgated by Government Notice No. R. 2281 of 16 October 1987,ensure that suitable housekeeping is continuously implemented on each construction site, including-

- the proper storage of materials and equipment;
- the removal of scrap, waste and debris at appropriate intervals;
- ensuring that materials required for use, are not placed on the site so as to obstruct means of access to and egress from workplaces and passageways;
- ensuring that materials which are no longer required for use, do not accumulate on and are removed from the site at appropriate intervals;
- ensuring that waste and debris are not disposed of from a high place with a chute, unless the chute complies with the requirements set out in the regulations;
- ensuring that construction sites in built-up areas adjacent to a public way are suitably and sufficiently fenced off and provided with controlled access points to prevent the entry of unauthorized persons; and
- ensuring that a catch platform or net is erected above an entrance or passageway or above a place where persons work or pass under or fencing off the danger area if work is being performed above such entrance, passageway, or place so as to ensure that allpersons are kept safe in the case of danger or possibility of persons being struck by falling objects.

2.26 Construction Vehicles and Mobile Plant

A contractor must ensure that all construction vehicles and mobile plant-

- are of an acceptable design and construction;
- are maintained in a good working order;
- are used in accordance with their design and the intention for which they weredesigned, having due regard to safety and health;
- are operated by a person who-
  - has received appropriate training, is certified competent and in possession of proof of competency and is authorised in writing to operate those construction vehicles and mobile plant;
  - has a medical certificate of fitness to operate those construction vehicles and mobile plant, issued by an occupational health practitioner in the form of Annexure 3.
- have safe and suitable means of access and egress;
- are properly organized and controlled in any work situation by providing adequate signaling or other control arrangements to guard against the dangers relating to the movement of vehicles and plant, in order to ensure their continued safe operation;
- are prevented from falling into excavations, water or any other area lower than the working surface by installing adequate edge protection, which may include guard-rails and crash barriers;
- are fitted with structures designed to protect the operator from falling material or frombeing crushed should the vehicle or mobile plant overturn;
- are equipped with an acoustic warning device which can be activated by the operator;
- are equipped with an automatic acoustic reversing alarm; and
- are inspected by the authorised operator or driver on a daily basis using a relevant checklist prior to use and that the findings of such inspection are recorded in a register kept in the construction vehicle or mobile plant.

A contractor must ensure that-

- no person rides or is required or permitted to ride on a construction vehicle or mobileplant otherwise than in a safe place provided thereon for that purpose;
- every construction site is organized in such a way that, as far as is reasonablypracticable, pedestrians and vehicles can move safely and without risks to health;
- the traffic routes are suitable for the persons, construction vehicles or mobile plantusing them, are sufficient in number, in suitable positions and of sufficient size;
- every traffic route is, where necessary, indicated by suitable signs;
- all construction vehicles and mobile plant left unattended at night, adjacent to a publicroad in normal use

or adjacent to construction areas where work is in progress, have
appropriate lights or reflectors, or barricades equipped with appropriate lights orreflectors, in order to identify the location of the vehicles or plant;

- all construction vehicles or mobile plant when not in use, have buckets, booms orsimilar appendages, fully lowered or blocked, controls in a neutral position, motors stopped, wheels chocked, brakes set and ignition secured;
- whenever visibility conditions warrant additional lighting, all mobile plant are equipped with at least two headlights and two taillights when in operation;
- tools, material and equipment are secured and separated by means of a physical barrier in order to prevent movement when transported in the same compartment with employees;
- vehicles used to transport employees have seats firmly secured and adequate forthe number of employees to be carried; and
- all construction vehicles or mobile plant travelling, working or operating on public roads comply with the requirements of the National Road Traffic Act, 1996.
- that all pant and vehicles are be fitted with amber rotating beacons and reverse alarms.

2.27 Electrical Installations and Machinery on Construction Sites

A contractor must, in addition to compliance with the Electrical Installation Regulations andthe Electrical Machinery Regulations, ensure that –

- before construction commences and during the progress thereof, adequate stepsare taken to ascertain the presence of and guard against danger to workers from any electrical cable or apparatus which is under, over or on the site;
- all parts of electrical installations and machinery are of adequate strength towithstand the working conditions on construction sites;
- the control of all temporary electrical installations on the construction site is designated to a competent person who has been appointed in writing for that purpose;
- all temporary electrical installations used by the contractor are inspected at least once a week by a competent person and the inspection findings are recorded in a register kept on the construction site; and
- all electrical machinery is inspected by the authorized operator or user on a daily basis using a relevant checklist prior to use and the inspection findings are recorded in a register kept on the construction site.

2.28 Use and Temporary Storage of Flammable Liquids on Construction Sites

A contactor must, in addition to compliance with the provisions for the use and storage offlammable liquids in the General Safety Regulations, 2003, ensure that –

- where flammable liquids are being used, applied or stored at the workplace concerned, it is done in a manner that does not cause a fire or explosion hazard, and that the workplace is effectively ventilated;
- no person smokes in any place in which flammable liquid is used or stored, and the contractor must affix a suitable and conspicuous notice at all entrances to anysuch areas prohibiting such smoking;
- an adequate amount of efficient fire-fighting equipment is installed in suitable locations around the flammable liquids store with the recognized symbolic signs;
- only the quantity of flammable liquid needed for work on one day is taken out of the store for use;
- all containers holding flammable liquids are kept tightly closed when not in actual use and, after their contents have been used up, are removed from the construction site and safely disposed of;
- where flammable liquids are decanted, the metal containers are bonded and earthed; and

- no flammable material, including cotton waste, paper, cleaning rags or similar material is stored together with flammable liquids

2.29 Water environments

Not thought to be applicable on this project

2.30 Fire precautions on Construction Sites

A contractor must, in addition to compliance with the Environmental Regulations forWorkplaces, 1987, ensure that –

- all appropriate measures are taken to avoid the risk of fire;
- sufficient and suitable storage is provided for flammable liquids, solids and gases;
- smoking is prohibited and notices in this regard are prominently displayed in all placescontaining readily combustible or flammable materials;
- in confined spaces and other places in which flammable gases, vapours or dust cancause danger-
  - only suitably protected electrical installations and equipment, including portablelights, are used;
  - there are no flames or similar means of ignition;
  - there are conspicuous notices prohibiting smoking;
  - oily rags, waste and other substances liable to ignite are without delay removed toa safe place; and
  - adequate ventilation is provided;
- combustible materials do not accumulate on the construction site;
- welding, flame cutting, and other hot work are done only after appropriate precautions

  have been taken to reduce the risk of fire;
- suitable and sufficient fire-extinguishing equipment is placed at strategic locations oras may be recommended by the Fire Chief or local authority concerned, and that such equipment is maintained in a good working order;
- the fire equipment contemplated above is inspected by a competent person, who has been appointed in writing for that purpose, in the manner indicated by the manufacturer thereof;
- a sufficient number of workers are trained in the use of fire-extinguishing equipment;
- where appropriate, suitable visual signs are provided to clearly indicate the escaperoutes in the case of a fire;
- the means of escape is kept clear at all times;
- there is an effective evacuation plan providing for all -
  - persons to be evacuated speedily without panic;
  - persons to be accounted for; and
  - plant and processes to be shut down; and
- a siren is installed and sounded in the event of a fire.

2.31 Construction Employees' Facilities

A contractor must, in terms of the Construction Regulations 2014, provide:

- Shower facilities after consultation with the employees or employees' representatives, or at least one shower facility for every 15 persons;
- at least one sanitary facility for each sex and for every 30 workers;
- changing facilities for each sex;
- and sheltered eating area.

A contractor must provide reasonable and suitable living accommodation for the workers at construction sites who are far removed from their homes and where adequate transportation between the site and their homes, or other suitable living accommodation, is not available.

2.32 Fall protection

The Contractor must:

- designate a competent person to be responsible for the preparation of a fall protectionplan
- ensure that the fall protection plan contemplated above is implemented, amendedwhere and when necessary and maintained as required; and
- take steps to ensure continued adherence to the fall protection plan.

A fall protection plan contemplated above must include-

- a risk assessment of all work carried out from a fall risk position and the proceduresand methods used to address all the risks identified per location;
- the processes for the evaluation of the employees' medical fitness necessary to workat a fall risk position and the records thereof;
- a program for the training of employees working from a fall risk position and the records thereof;
- the procedure addressing the inspection, testing and maintenance of all fall protection equipment; and
- a rescue plan detailing the necessary procedure, personnel and suitable equipment required to affect a rescue of a person in the event of a fall incident to ensure that the rescue procedure is implemented immediately following the incident.

A contractor must ensure that a construction manager appointed under regulation 8(1) is inpossession of the most recently updated version of the fall protection plan.

A contractor must ensure that all unprotected openings in floors, edges, slabs, hatchways and stairways are adequately guarded, fenced or barricaded or that similar means are used to safeguard any person from falling through such openings;

Also that no person is required to work in a fall risk position, unless such work is performed safely as contemplated in above and fall prevention and fall arrest equipment are approved as suitable and of sufficient strength for the purpose for which they are being used, having regard to the work being carried out and the load, including any person, they are intended to bear; and securely attached to a structure or plant, and the structure of plant and the means of attachment thereto are suitable and of sufficient strength and stability for the purpose of safely supporting the equipment and person who could fall, and fall arrestequipment is used only where it is not reasonably practicable to use fall prevention equipment.

2.33 Temporary works

A contractor must appoint a temporary works designer in writing to design, inspect and approve the erected temporary works on site before use.

A contractor must ensure that all temporary works operations are carried out under the supervision of a competent person who has been appointed in writing for that purpose.

A contractor must ensure that-

- all temporary works structures are adequately erected, supported, braced and maintained by a competent person so that they are capable of supporting all anticipated vertical and lateral loads that may be applied to them, and that no loads
  are imposed onto the structure that the structure is not designed to withstand;

- all temporary works structures are done with close reference to the structural design drawings, and where any uncertainty exists the structural designer should be consulted;
- detailed activity specific drawings pertaining to the design of temporary works structures are kept on the site and are available on request to an inspector, other contractors, the Client, the Client's Safety Agent or any employee;
- all persons required to erect, move or dismantle temporary works structures are provided with adequate training and instruction to perform those operations safely;
- all equipment used in temporary works structure are carefully examined and checkedfor suitability by a competent person, before being used;
- all temporary works structures are inspected by a competent person immediatelybefore, during and after the placement of concrete, after inclement weather or any other imposed load and at least on a daily basis until the temporary works structure
  has been removed and the results have been recorded in a register and made available on site;
- no person may cast concrete, until authorization in writing has been given by the competent person contemplated above*;*
- if, after erection, any temporary works structure is found to be damaged or weakenedto such a degree that its integrity is affected, it is safely removed or reinforced immediately;
- adequate precautionary measures are taken in order to-
  - secure any deck panels against displacement; and
  - prevent any person from slipping on temporary works due to the application of release agents;
- as far as is reasonably practicable, the health of any person is not affected through theuse of solvents or oils or any other similar substances;
- upon casting concrete, the temporary works structure is left in place until the concrete has acquired sufficient strength to safely support its own weight and any imposed
  load, and is not removed until authorization in writing has been given by thecompetent person
- the foundation conditions are suitable to withstand the loads caused by the temporaryworks structure and any imposed load in accordance with the temporary works design.
- provision is made for safe access by means of secured ladders or staircases for allwork to be carried out above the foundation bearing level;
- a temporary works drawing, or any other relevant document includes constructionsequences and methods statements;
- the temporary works designer has been issued with the latest revision of any relevantstructural design drawing;
- a temporary works design and drawing is used only for its intended purpose and for aspecific portion of a construction site; and
- the temporary works drawings are approved by the temporary works designer beforethe erection of any temporary works.

No contractor may use a temporary works design and drawing for any work other than itsintended purpose.

2.34 Excavation

A contractor must-

- ensure that all excavation work is carried out under the supervision of a competentperson who has been appointed in writing for that purpose; and
- evaluate, as far as is reasonably practicable, the stability of the ground beforeexcavation work begins.

A contractor who performs excavation work-

- must take reasonable and sufficient steps in order to prevent, as far as is reasonably practicable, any person from being buried or trapped by a fall or dislodgement of material in an excavation;
- may not require or permit any person to work in an excavation which has not been adequately shored or

braced: Provided that shoring and bracing may not be necessary where-

- the sides of the excavation are sloped to at least the maximum angle of repose measured relative to the horizontal plane; or
- such an excavation is in stable material: Provided that-
  - permission has been given in writing by the appointed competent person contemplated above upon evaluation by him or her of the site conditions; and
  - where any uncertainty pertaining to the stability of the soil still exists, the decision from a professional engineer or a professional technologist competent in excavations is decisive and such a decision must be noted in writing and signed by both the competent person and the professional engineer or technologist, as the case may be;

- must take steps to ensure that the shoring or bracing contemplated above is designed and constructed in a manner that renders it strong enough to support the sides of the excavation in question;
- must ensure that no load, material, plant or equipment is placed or moved near the edge of any excavation where it may cause its collapse and consequently endangers the safety of any person, unless precautions such as the provision of sufficient and suitable shoring or bracing are taken to prevent the sides from collapsing;
- must ensure that where the stability of an adjoining building, structure or road is likely to be affected by the making of an excavation, steps are taken to ensure the stability of such building, structure or road and the safety of persons;
- must cause convenient and safe means of access to be provided to every excavationin which persons are required to work, and such access may not be further than six meters from the point where any worker within the excavation is working;
- must 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 bythe work to be performed, and must before the commencement of excavation work that may affect any such service, take the steps that are necessary to render the circumstances safe for all persons involved;
- must ensure that every excavation, including all bracing and shoring, is inspected-
  - daily, prior to the commencement of each shift;
  - after every blasting operation;
  - after an unexpected fall of ground;
  - after damage to supports; and
  - after rain,

  by the competent person, in order to ensure the safety of the excavation and of persons, and those results must be recorded in a register kept on site and made available on request to an inspector, the Client, the Client's Safety Agent, any other contractor or any employee;
- must cause every excavation which is accessible to the public or which is adjacent to public roads or thoroughfares, or whereby the safety of persons may be endangered,to be –
  - adequately protected by a barrier or fence of at least one meter in height and as close to the excavation as is practicable; and
  - provided with warning illuminants or any other clearly visible boundary indicators at night or when visibility is poor, or have resort to any other suitable and sufficient precautionary measure where this is not practicable;
- must ensure that all precautionary measures stipulated for confined spaces as determined in the General Safety Regulations, 2003, are complied with by any person entering any excavation;
- 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
- must cause warning signs to be positioned next to an excavation within which or where persons are working or carrying out inspections or tests.

2.35 Demolition Work

A contractor must appoint a competent person in writing to supervise and control all demolition work on site.

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.

During a demolition, the competent person contemplated in above must check the structural integrity of the structure at intervals determined in the method statement contemplated in above, in order to avoid any premature collapses.

A contractor who performs demolition work must with regard to a structure being demolished, take steps to ensure that-

- no floor, roof or other part of the structure is overloaded with debris or material in a manner which would render it unsafe;
- all reasonably practicable precautions are taken to avoid the danger of the structure collapsing when any part of the framing of a framed or partly framed building is removed, or when reinforced concrete is cut; and
- 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;
- ensure that no person works under overhanging material or a structure which has not been adequately supported, shored or braced;
- ensure that any support, shoring or bracing contemplated above, is designed andconstructed so that it is strong enough to support the overhanging material;
- where the stability of an adjoining building, structure or road is likely to be affected by demolition work on a structure, take steps to ensure the stability of such structure or road and the safety of persons;
- 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 that may affect any such service, take the steps that are necessary to render circumstances safe forall persons involved;
- 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;
- cause convenient and safe means of access to be provided to every part of thedemolition site in which persons are required to work; and
- 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 areas 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.

A contractor must ensure that no material is dropped to any point, which falls outside the exterior walls of the structure, unless the area is effectively protected.

No person may dispose of waste and debris from a high place by a chute unless the chute-

- is adequately constructed and rigidly fastened;
- if inclined at an angle of more than 45 degrees to the horizontal, is enclosed on its foursides;
- if of the open type, is inclined at an angle of less than 45 degrees to the horizontal;
- where necessary, is fitted with a gate at the bottom end to control the flow of material;and discharges

into a container or an enclosed area surrounded by barriers.

A contractor must ensure that every chute used to dispose of rubble is designed in such a manner that rubble does not free-fall and that the chute is strong enough to withstand the force of the debris travelling along the chute.

A contractor must ensure that no equipment is used on floors or working surfaces, unlesssuch floors or surfaces are of sufficient strength to support the imposed loads.

Where a risk assessment indicates the presence of asbestos, a contractor must ensure that all asbestos related work is conducted in accordance with the Asbestos Regulations 2001.

Where a risk assessment indicates the presence of lead, a contractor must ensure that alllead related work is conducted in accordance with the Lead Regulations, 2001.

Where the demolition work involves the use of explosives, a method statement must be developed in accordance with the applicable explosives legislation, by an appointed personwho is competent in the use of explosives for demolition work and all persons involved in the demolition works must adhere to demolition procedures issued by the appointed person.

A contractor must ensure that all waste and debris are as soon as reasonably practicable removed and disposed of from the site in accordance with the applicable legislation.

2.36 Tunnelling

No person may enter a tunnel which has a height dimension of less than 800 mm.

2.37 Scaffolding

A contractor must appoint a competent person in writing who must ensure that all scaffolding work operations are carried out under his or her supervision and that all scaffold erectors, team leaders and inspectors are competent to carry out their work.

A contractor using access scaffolding must ensure that such scaffolding, when in use, complies with the safety standards incorporated for this purpose into these Regulations under section 44 of the Act and SANS 10085. Scaffold must be fully boarded and access to the scaffold should be from the inside ONLY, signage must be displayed to indicate if the scaffoldis safe or unsafe to use. Scaffold higher than 60 meters must be designed by an engineer.

2.38 Bulk mixing plant

Not thought to be applicable to this project.

2.39 Rope Access Work

Not thought to be applicable to this project.

2.40 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:

- Material Safety Data Sheets (MSDS's) of the relevant materials / hazardous chemical substances are available prior to use by the contractor. All MSDS's shall be available for inspection by the agent at all times.
- Risk assessments are done at least once every 6 months.
- Exposure monitoring is done according to OESSM and by an Approved Inspection Authority (AIA) and that the medical surveillance program is based on the outcomes of the exposure monitoring.
- How the relevant HCS's are being/going to be controlled by referring to:
  - Limiting the amount of HCS
  - Limiting the number of employees
  - Limiting the period of exposure
  - Substituting the HCS
  - Using engineering controls
  - 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 was given.

The Health and Safety plan should make reference to the disposal of hazardous waste on classified sites and the location thereof (where applicable).

The First Aider must be made aware of the MSDS and trained in how to treat HCS incidents appropriately.

2.41 Noise Induced Hearing Loss

Where noise is identified as a hazard the requirements of the NIHL regulations must be complied with and the following must be included / referred to in the Health and Safety Plan:

- Proof of training with regards to these regulations.
- Risk assessment done within 1 month of commencement of work.
- That monitoring carried out by an AIA and done according to SABS 083.
- Medical surveillance program established and maintained for the necessaryemployees.
- Control of noise by referring to:
- Engineering methods considered

- Admin control (number of employees exposed) considered
- Personal protective equipment considered/decided on
- Describe how records are going to be kept for 40 years.

2.42 Explosives and Blasting

Not thought to be applicable to this project.

2.43 Personal Protective Equipment (PPE)

The Contractor shall carry out PPE or clothing needs analysis in accordance with his risk assessment, to determine the necessary PPE or clothing to be used during construction. The Contractor shall make provision to keep adequate quantities of appropriate, SABS approved PPE or clothing on site at all times.

The Contractor must ensure that personnel are trained in the correct use of PPE to be used.

The Contractor must ensure that lost, stolen, worn out or damaged PPE is replaced asrequired and receipt signed for by employees on site.

2.44 Asbestos

Not thought to be applicable to this project.

2.45 Pressure Vessels (Including Gas Bottles)

The Contractor shall comply with Pressure Vessel Regulations, including:

- Providing competency and awareness training to the operators;
- Providing PPE or clothing;
- Providing and maintain appropriate signage in areas where pressure vessels are used,as applicable;
- Inspect equipment regularly and keep records of inspections;
- Providing appropriate firefighting equipment (Fire Extinguishers).

2.46 Fire Extinguishers and Fire Fighting Equipment

The Contractor shall provide adequate, regularly serviced fire extinguishers located at strategic points on site. The Contractor shall keep spare serviced portable fire extinguishers. The Contractor shall have adequate persons trained or competent to use the Fire Fighting Equipment.

Safety signage shall be posted up in all areas where fire extinguishers are located.

2.47 Lifting Machinery and Tackle

The Contractor shall ensure that lifting machinery and tackle is inspected before use and on a monthly basis. The Contractor shall have lifting machinery and tackle inspector who will inspect the equipment at intervals required by the Driven Machinery Regulations, taking into account that:

- All lifting machinery and tackle have a safe working load clearly indicated;
- Regular inspection and servicing is carried out;
- Records are kept of inspections and of service certificates;
- Thorough examinations are carried out by competent personnel at the frequenciesrequired by legislation
- There is proper supervision in terms of guiding the loads which includes a trainedbanks man to direct and check lifting tackle if it is safe for use.

2.48 Ladders and Ladder work

The Contractor shall ensure that all ladders are numbered and inspected regularly keeping record of inspections. It should be noted that Aluminum ladders are preferred to wooden ladders.

2.49 General Machinery

The 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.

2.50 Portable Electrical Tools

The Contractor shall ensure that use and storage of all explosive actuating fastening devices and portable electrical tools are in compliance with relevant legislation.

The 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 is provided and maintained.

2.51 High Voltage Electrical Equipment

The Contractor shall ensure that, where the work is under, on or near high-voltage electrical equipment the Electrical Installation Regulations, together with safety instructions (Regulations of the Owner of the Equipment) are complied with. Such equipment includes:

- Eskom and the Local Authority equipment
- The Contractor's own power supply; and
- Electrical equipment being installed but not yet taken over from a Contractor by TheClient.

2.52 Public Health and Safety

The 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 onsiteactivities and the precautions to be observed to avoid or minimize those dangers. Appropriate health and safety signage shall be posted at all times.

2.53 Night Work

Not thought to be applicable to this project.

2.54 Environmental Conditions and Flora and Fauna

The Contractor must be mindful of adverse weather conditions upon the health and safety of the workforce. This includes inclement weather, strong wind, heat stress, extreme cold, etc.

The Contractor's risk assessment process must take into account the risks associated withsuch weather conditions. The same is true when working in an environment where there is a risk to employees' health and safety from presence of poisonous flora, or wildlife (including bees, snakes, etc.). The Contractor's risk assessment process must take these risks into account.

2.55 Occupational Health

Exposure of workers to occupational health hazards and risks are very common in any work environment, especially in construction. Occupational health hazards and risks exposure is a major problem and all Contractors are to ensure that proper health and hygiene measures are put in place to prevent exposure to these hazards and risks.

The occupational hazards and risks may enter the body in three ways:

- Inhalation through breathing e.g. cement dust;
- Ingestion through swallowing maybe through food intake;
- Absorption through the skin (pores) e.g. painting or use of thinners.

The contractor is required to ensure that all his personnel are medically fit prior to being allowed onto the work site.

All Contractors should ensure that Occupational Hygiene surveys are conducted as per the Occupational Health and Safety Act to ensure employees are not exposed to hazards. Risk Assessments should identify areas where surveys are to be conducted.

2.56 Suspended Platforms

Not thought to be applicable to this project.

2.57 Material Hoists

Not thought to be applicable to this project.

2.58 Explosive Actuated Fastening Device

Not thought to be applicable to this project.

2.59 Confined Spaces

Confined space work must be closely monitored by a competent person appointed by the contractor, to include, but not restricted to, ensuring that the confined space is sufficiently ventilated prior to entry. Oxygen levels to be tested in confined space to ensure that it is safe for entry. Permit system to be in place to declare confined space safe for entry. PPE must be worn (such as proper masks) if air supply is insufficient or not of sufficient quality.

Sufficient training must take place in use of all confined space monitoring and access equipment prior to any works commencing in such confined space. It is strongly recommended that a tripod and winch system be in place to afford easy access and egress and for emergency evacuation from the confined space (manholes and chambers). Please also refer to GSR5 on safety requirements for Work in Confined Spaces.

2.60 Alcohol and drugs (GSR 2)

1. A contractor shall not permit any person who is or who appears to be under the influenceof intoxicating liquor or drugs, to enter or remain at a site.
2. No employee shall be under the influence of or have in his or her possession or partakeof or offer any other person intoxicating liquor or drugs.
3. An employer or a user, as the case may be, shall, in the case where a person is taking medicines, only allow such person to perform duties at the site if the side effects of such medicine do not constitute a threat to the health or safety of the person concerned or other persons at such site.

♦

Both the Client and the Contractor have a duty in terms of health and safety legislation to do all that is reasonably practicable to make members of the public and others being affected by the construction processes aware of possible risks and put preventative measures in place to mitigate the risks. The public and/or visitors shall go through a brief 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.

OTHER HEALTH AND SAFETY SPECIFICATION REQUIREMENTS

The contractor must be aware of the following additional requirements:

What	When	Output
Awareness training (Toolbox Talks)	At least weekly and before hazardous work is carried out	Attendance Register
Health and Safety Committee Meetings	Monthly	Minutes signed by the employer (Contractor) covering: a) Health and Safety Representative Checklist
Health and Safety Reports	Monthly	Report covering: a) Incidents/Accidents and Investigations b) Non-conformance c) Health and Safety Training d) HIRA Updates e) Internal and External Audits
General Inspections	As per Health and Safety Specification and OHSA	Report on Health and Safety Specification and OHSA compliance: a) Scaffolding b) Lifting Machinery c) Excavation
General Inspections	Monthly	Covering: a) Firefighting Equipment b) Portable Electrical Equipment c) Ladders
Record keeping	Ongoing	Covering: a) General complaints b) Fines c) General incidents d) MSDS e) Surveillance Medicals f) Inspection Register g) Dept of Labour Notices
Permits	Before commencement with certain activities	As stipulated by the Health and Safety Specification and the OHSA / Construction Regulations

Key: OHSA – Occupational Health and Safety Act, 1993

ANNEXURE A

The Contractor shall submit the info below in an Annexure 2 prior to constructioncommencement.

Item No.	Health and Safety Specification Requirement	OHSA Requirement	Submission date
1.	Notification of Intention to Commence Construction	Construction Regulations 2014	At least 7 days before commencement on site
2.	Construction Work Permit	Construction Regulations 2014(only with certain size and duration projects)	At least 30 days priorto project commencement
3.	Assignment of Responsible Person to Manage Building Work viaHealth and Safety Organogram	Construction Regulations 2014	Before commencement on site
4.	Competency for Health and Safety Positions	Client / Safety Agent requirement	Before commencement on site
5.	Compensation of Occupational Injuries and Diseases Act (COIDA) 130 of 1993	COIDA Requirement	Before commencement on site
6.	Occupational Health and Safety Policy	Client / Safety Agent requirement	Before commencement on site
7.	Risk Assessment, Safety Plan and Fall Protection Plan, Demolition Method Statement	Client / Safety Agent requirement	Before construction work commences

Chief Executive Officer (OSH Act 16(1)
Contract Director/Manager (OSH Act 16(2)
Construction Manager (CR 8(1)
Construction Supervisor (CR 8(7)
Assistant Construction Supervisor (CR 8(8)
Construction Safety Officer (CR 8(5)
Traffic Safety Officer
Safety Representative (where > 20 employees on site)
Temporary work Designer (CR 12(1)
Temporary work Supervisor (CR12(2)
Construction risk assessor (CR 9(1))
Excavation Supervisor (CR13(1)(a)
Demolition Supervisor (CR14(1)
Scaffold Supervisor (CR16(1)
Suspended Platform Supervisor (CR17(1)
Material Hoist Inspector (CR19(8)(a)
Material Hoist Operator (CR19(6)
Bulk Mixing Plant Supervisor (CR20(1)
Bulk Mixing Plant Operator (CR20(2)
Controller of Explosive Actuated Fastening Devices Nails, Cartridges or Studs Issue andCollection (CR21(2)(g)(1)
Construction Vehicle and Mobile Plant Operator (CR23(1)(d)(i)
Controller of Temporary Electrical Installations (CR24(c)
Stacking Supervisor (CR28(a)
Fire Extinguishing Equipment Inspector (CR29(h)
Fall Protection Plan Developer (CR 10(1)(a)
Incident Investigator (OSH Act 9(2)
Competent Person – Confined Spaces (GAR 5(1)

BASELINE RISK ASSESSMENT FOR PROJECT

Irrespective of the risk presented on site, it will be ensured that sufficient supervision is in place on site, that personnel are trained in accordance with legislation, including the requirement for site specific inductions on site to inform personnel on site of the risks and hazards applicable to the site. Site supervision is responsible for ensuring that the control measures required below are implemented on site.

	HAZARD	RISK	MINIMUM CONTROL MEASURES
1.	Bricklaying	Caustic contamination withmortar Contact with sharp bladed tools	· Use only trained personnel · Safe means of access to be provided · Safe/Suitable working platform required where working at height · PPE for mortar to include gloves where practicable and goggles/ masks where there is a risk of contamination
2.	Compacting andFilling	Contact with tipping materialsContact with moving plant Vehicles/personnel falling into excavations Contact with undergroundservices	· Trained banksman to control vehicles movement · Only trained personnel use plant · Personal Protective Equipment to be worn · Personnel to stand clear as materials are beingtipped · Use stop blocks and signs to warn vehicles ofexcavations, where applicable · Stand clear of plant whilst materials are beingcompacted · Establish position of underground services andprotect services from damage
3.	Compactor Operations	Crushing of feet	· Only trained and competent personnel to usethe machine · Ensure operative wears steel toe cap shoes orboots at all times
4.	Confine d Spaces	Suffocatio nFumes	· Ensure that confined space is sufficientlyventilated · Wear personal protective equipment such as proper masks if air supply insufficient or not ofsufficient quality · Test oxygen levels in confined space to ensurethat is safe for entry · Ensure that emergency procedures in place
5.	Demolition	Falling materials Prematurecollapse of structure	• Ensure there is a current method statement inplace • Ensure all emergency procedures are in placeand all details are displayed • Ensure that structural demolition has been approved by the designer and site management • Personnel must be competent • Ensure at all times there is a safe means ofaccess and egress • All personnel must wear suitable and sufficient Personal Protective Equipment, including

			head, eye and skin protection
6.	Electrical Commissioning	Electric shock	• Personnel to comply with permits to work issuedby Client • Personal protective equipment to be worn byemployees to prevent electric shock • First aid treatment to be readily available • Only competent and trained persons maydecommission or commission electrical equipment
7.	Electric Tools and Electrical Installations	Electric shockFire	· Electric tools and installations to be in goodcondition · Inspect electric tools before use · Do not use electric tools in wet/damp conditions · Use personal protective equipment such asinsulated gloves · Electrical installations register to be maintained,inspected by competent person
8.	Excavations (Working in andaround)	Toxic fumes Collapse of trench walls/trapping Falling into excavation Collapse of adjacent structures	· Deep excavations / monitor air for toxic fumes · Prevent collapse by battering back sides to asafe angle or install temporary support · Protect vehicles from falling into excavations –provide barriers, signage, etc. as necessary · Beware of undermining of other structures (e.g.buildings, scaffolds) · Record excavation inspections by competentperson on daily basis · Provide suitable means of access/egress in case of emergency. · Excavations formed by explosives must be accompanied by method statement approved byClient
9.	Fire	Injuries to workers, pedestrians, residents, road users, damage toproperty through fire	· No littering on site which could become firehazard, maintain site in clean condition. · No fires to be lit on site. Have a working fireextinguisher at hand at all times. · No smoking or naked flame near flammablesubstances or in unauthorised areas · Ensure proper storage/use of Petrol/diesel/flammable substances – post warning notices

10.	Flammable Liquids and Gases (Use of)	Fire Explosion	· No littering on site which could become firehazard, maintain site in clean condition. · Have a working fire extinguisher at hand at alltimes. · No smoking or naked flame near flammablesubstances or in unauthorised areas · Ensure proper storage/use of Petrol/diesel/flammable substances – post warning notices · Equipment must be in good condition,maintained · Personnel using substances must be trained insafe use and risks
11.	Hand tools	Injuries caused by use of handtool Impact with the tool Falls due toaccess problems Contamination with substancebeing worked	· Ensure: · Tool is correct for job · Tool is in good order and suitably sharp · Personnel must be competent/instructed in tool usage and tool safely · Lighting is sufficient · Access is safe, working platform is secure,leading edge is guarded · Operative is wearing all necessary PPE
12.	Hazardous Substances	Injuries to workers through use ofhazardous substances, e.g. injuries to eyes, skin, etc.	· Use substances in accordance with data sheet,particularly reference protective clothing required (example: gloves, goggles, etc.) · Know what First Aid measures are · Have welfare facilities available for washing ofhands, etc.
13.	Lifting Operations	Falling material Crushing by materials Hand injuries to the slingerToppling crane	· Check test certificate · Check examination certificate · Check inspection have been carried out · Check certificates for lifting equipment (chains,slings, shackles, etc.) · Ensure lifting gear is rated to carry load (SWL) · Ensure materials being lifted are properlypackaged and slung. · Be aware that there should be a minimum clearance of 600mm between any slewing partsof a crane and any fixed installation to prevent being trapped. · Access to the work area during lifting operationsis to be restricted to those involved with and trained in the work in hand. Do not allow members of the public to gain access to the area. · Only trained banksmen to be used. · The crane driver and the banksman are toensure that the signals given are clearly

			understood.
14.	Manual Handling of General Items	Muscular skeletal injuries if theload is too heavy or awkward Operative falling/ tripping Contamination from the substance being carried Fall of material being carried	· Personnel should be aware of safe manualhandling techniques · Personnel to wear Personal Protective Equipment when carrying items, e.g. safetyfootwear and gloves. · Ensure good housekeeping against tripping/fallhazards. · Operative to get assistance if load too heavy-team lift if necessary. · Utilise mechanical lifting and carrying aidswhere possible. · Personnel to ensure access equipment, ladderswill take weight of operative and load being carried. · Personnel to ensure item being carried is properly bonded or is not be liable to break apart whilst being manually handled.
15.	Members of Public – Protection of	Injury to member of public androad users from site works	· Barriers and signage to be in place · Workers must warn away any members of publicfrom the works · Footpaths and bridges which are open to publicmust be closed off if in area of works or otherwise made safe so that no injury occurs to members of public · Traffic turning into site – traffic managementand signage as required. · Signage to be on road at site entrance warningmotorists that construction traffic turning into/out of site access. Keep roads free of mud where possible · Refer to plant risk assessment for details onplant safety precautions · NOTE: SIGNAGE TO BE POSTED ON SITE TO WARN OF CONSTRUCTION TRAFFIC MOVEMENTS.SAFE MEANS OF ACCESS FOR BOTH CONSTRUCTION TRAFFIC TO SITE AND PRIVATEHOMEOWNERS MUST BE AGREED.

16.	Mobile Crane Erection and Dismantling andUse	Collapse of structure Overturning of structureFalling materials	· Ensure emergency procedures are in place andall operative are aware of the details · Only use trained and competent operators for the erection and dismantling and use of cranes · Ensure crane driver is trained and holds certification as proof. Must have valid medicalcertificate of fitness. · Ensure there is safe means of access availableat all times · Ensure the mobile crane driver has 360 vision if not ensure a fully trained banksman is used · Banksman to wear reflector vest to identifyhimself to the crane driver · Ensure all personnel wear suitable and sufficientpersonal protective equipment · Consider creating exclusion areas
17.	Noise and Dust	Breathing in dust can cause long term health problems, noise can damage hearing	· Wear respiratory and hearing protection · Dampen down and minimise dust wherepossible.
18.	Overhead Services (Working near)	Contact with live services causinginjury to personnel Damage caused to services	· Maintain safe clearance levels · Establish presence of any services via properwalk through survey of site and/or means of service drawings · Wear personal protective clothing · Ensure height of plant/vehicles does not compromise or exceed clearance levels for overhead services · Obtain information on clearance levels fromservice provider
19.	Painting	Contact with paint	· Refer to safety data sheet for usage instructions,hazards and precautions required. · When working at height, refer to risk assessmentaddressing this hazard below.
20.	Plant or Vehicles and Equipment Operation	Workers injured by passing trafficRoad users and pedestrians at risk from plant operation Noise	· Implement traffic protection measures · Trained and competent operators must be used · Check plant and vehicles on daily basis before use and record inspections. Maintain vehicles in safe condition. · Medical certificates of fitness required forconstruction plant. · Crossing of road by construction vehicles ormachines must be limited to the practical minimum · Plant and vehicles must be fitted with amberrotating beacons and reverse alarms. · Wear appropriate protective clothing/equipment, e.g. goggles, gloves, ear defenders, etc. as

			appropriate.
21.	Plastering	Falling materialsFall from height Contact with materials	· Ensure standard safety procedures are followed · Ensure there is a safe working area · Ensure safe access and egress · Ensure competent personnel are used
22.	Site Strip	Overturning Vehicles	· Follow standard safety procedures · Only use trained and competent personnel · Ensure there is a suitable and safe means ofaccess and egress · Ensure banksman used when required · Ensure all personnel wear suitable reflectorvests as required
23.	Undergrou ndServices	Striking of buried services	· Make all necessary enquiries to establish whatservices are in the area. Consult drawings and advice from service provider (e.g. Municipalityor ESKOM) when planning work. · Assume all service to be live (Unless confirmation is received to confirm that services are isolated or otherwise made safe). Do not work near live services without authorisationfrom site management. · Comply with the requirements of the safesystem of work for underground services. · Where available, locate services with a locator · Hand dig around services
24.	Working at Height	Personnel falling form heightFalling debris Those beneath being injured	· All access equipment is properly constructed(inspections record must be maintained) · Only trained personnel construct, dismantle orcontrol the access equipment · All access equipment must have full toe boardsand guardrails - comply with SANS 10085 on erection, use and dismantling of scaffolding · No access equipment may be loaded above thelevel of the guardrail · No access equipment to be loaded above its safeworking load · Where work involves leaning out on an open leading edge, then all personnel are to be fittedwith full body harness. The harness must be connected at all times · All fall arrest equipment to be correctlymaintained · Ensure if ladders are being used for access, they are either footed or tied. Also the ladder mustbe set at the correct level of 1 in 4 or

			approximately 75

ISSUE REGISTER

Date of Original Safety Specification Compilation	Compiled By	Issue Date	Revision Date
20 Mar 2024		20 Mar '24	

Acknowledgement:

I,_____representing

_____(Contractor), have satisfied myself with the content of this Health and Safety Specification and shall ensure that our employees and contractors on site comply with the requirements of this document, our safety documentation and health and safety legislation.

_____ _____

Signature of Contractor Date

Comments:

RETURNABLE SCHEDULE
PROOF OF CIDB REGISTRATION & GRADING

Vendors must attach proof of CIDB registration and grading 6EP.

Failure to submit proof of CIDB registration & grading, either with this tender or within any further time for submission stated in a written request from the Employer, will result in the Vendor's tender being rejected as non-responsive.

RETURNABLE SCHEDULE
PROOF OF COIDA REGISTRATION/INSURANCE

Vendors must attach proof of registration or insurance in terms of the Compensation for Occupational Injuries and Diseases Act, Act 130 of 1993, to this schedule. This can either take the form of a certified copy of a valid Letter of Good Standing issued by the Compensation Commissioner, or proof of insurance with a licenced compensation insurer, from either the Vendor's insurance broker, or the insurance company itself.

Failure to submit proof of COIDA registration or insurance, either with this tender or within any further time for submission stated in a written request from the Employer, will result in the Vendor's tender being rejected as non-responsive.

RETURNABLE SCHEDULE
PROOF OF PUBLIC LIABILITY INSURANCE

Vendors must attach to this schedule proof of Public Liability Insurance. This can either take the form of a warrant from the Vendor's insurance broker, or confirmation of insurance from the insurance company itself. Minimum insurance required R10 000 000.00.

Failure to submit proof of public liability insurance, either with this tender or within any further time for submission stated in a written request from the Employer, will result in the Vendor's tender being rejected as non-responsive.

RETURNABLE SCHEDULE
PREVIOUS EXPERIENCE

The tenderer shall insert in the spaces provided below a list of the tenderer's past work experience in terms of similar successfully completed projects. The value and scale of the projects indicated for these purposes must be supplied together with any other relevant information requested.

Similar projects relate to 66kV transformer works and similar value is that of R5 million (Incl VAT) and above.

Employer (Name and Contact No.)	Consulting Engineer (Name and Contact No.)	Similar projects (Tenderer needs to identify the type of work in a short description)	Value of Work (incl. VAT) (R million)	Date completed (Month and Year)

Attach additional pages if more space is required.

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

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

Tenderer .....

RETURNABLE SCHEDULE
EXPERIENCE OF KEY-PERSONNEL

The tenderer shall set out in the tables hereafter details of the relevant experience in similar successfully completed projects of the persons identified for each listed position.

Similar projects relate to 66kV transformer works and similar value is that of R5 million (Incl VAT) and above.

CONTRACT'S MANAGER				
Contact and Client	**NAME:** **EXPERIENCE IN ELECTRICAL CONSTRUCTION WORKS (YEARS):** **(ATTACH CV)**			
	Project Description	**Position held**	**Value of work (Incl. VAT) (R million)**	**Year completed**

Attach additional pages if more space is required.

GENERAL FOREMAN				
Contact and Client	**NAME:** ..... **EXPERIENCE IN ELECTRICAL CONSTRUCTION WORKS (YEARS):** ..... **(ATTACH CV)**			
	Project Description	**Position held**	**Value of work (Incl. VAT) (R million)**	**Year completed**

Attach additional pages if more space is required.

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

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

Tenderer .....

RETURNABLE SCHEDULE
SCHEDULE OF PLANT AND EQUIPMENT

Vendors must complete the following schedule of plant and equipment.

The information in this schedule will be used as part of the functionality evaluation process.

The tenderer shall set out in the tables hereafter details of the relevant items and/or equipment available for this project.

(a) Details of suitable vehicles (LDV) **owned** by the tenderer.

Quantity	**Description, Size, Capacity, etc**

Attach additional pages if more space is required.

(b) Details of **Jack Hammers with Compressors** that is owned by and immediately available for this contract.

Quantity	**Description, Size, Capacity, etc**

Attach additional pages if more space is required.

(c) Details of **personal protective equipment (PPE)** that is owned by and immediately available for this contract.

Quantity	**Description, Size, Capacity, etc**

Attach additional pages if more space is required.

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

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

Tenderer .....

1. EVALUATION CRITERIA –

1.1. Previous experience on contract of similar nature (maximum 20 points)

Points for the tenderer's past experience in terms of similar successfully completed contracts will be scored based on the information supplied by the Tenderer.

Points will be allocated according to the tables below:

Successfully completed projects with similar scope of work:	**Points**	**Score (A)**
4 projects or more	20 points	
OR Less than 4 projects	5 points per project	
(A minimum score of 10 Points (50%) must be scored) **Score (A)**		

1.2. **Experience of key personnel (maximum 40 points)**

Points for demonstrated experience of the tenderer's key personnel to be directly involved with this contract (if awarded) will be scored based on the information supplied by the Tenderer.

Points will be allocated according to the tables below:

CONTRACT'S MANAGER		
Experience as Contract's Manager on successfully completed similar projects	**Points**	**Score (B_1)**
Number of Projects		
5 projects or more	10	
OR Less than 5 projects	2 points per project	
Years experience in electrical construction works	**Points**	**Score (B_2)**
> 10 years experience	10	
OR < 10 years experience	8	
OR < 8 years experience	6	
OR < 5 years experience	4	
(A minimum score of 10 Points (50%) must be scored)	**Score (B_3)**	**$B_1 + B_2$ =**

GENERAL FOREMAN		
Experience as General Foreman on successfully completed projects	**Points**	**Score (B_4)**
Number of Projects		
5 projects or more	10	
OR Less than 5 projects	2 points per project	
Years experience in electrical construction works	**Points**	**Score (B_5)**
> 5 years experience	10	
OR 4 years experience	8	
OR 3 years experience	6	
OR 2 years experience	4	

(A minimum score of 10 Points (50%) must be scored)	**Score (B_6)**	**$B_4 + B_5$ =**	
	Score B	**$B_3 + B_6$ =**	

Note: One person only to qualify for each position listed above.

1.3. **Availability of resources (maximum 30 points)**

Points for demonstrated understanding of the scope of work of this specific contract and his/her associated resources to be allocated to this project, will be scored based on the information supplied by the Tenderer.

Points will be allocated according to the tables below:

Allocation of resources (Vehicles)	**Points**	**Score (C_1)**
Four suitable (LDV) vehicles indicated as owned by tenderer.	12	
OR Less than four suitable (LDV) vehicles indicated as owned by tenderer.	3 points per vehicle	
(A minimum score of 6 Points (50%) must be scored)	**Score (C_1)**	

Allocation of resources (Toolboxes)	**Points**	**Score (C_2)**
2 or more Jack Hammers with compressors suitable for rock excavations owned by tenderer	8	
OR 1 Jack Hammer with compressor suitable for rock excavations owned by tenderer	4	
(A minimum score of 4 Points (50%) must be scored)	**Score (C_2)**	

Allocation of resources (PPE)	**Points**	**Score (C_3)**	
PPE for 5 staff members indicated	10		
OR PPE for less than 5 staff members indicated	2 point per PPE		
(A minimum score of 5 Points (50%) must be scored)	**Score (C_3)**		
	Score (C)	**$C_1 + C_2 + C_3$**	

1.4. **Total points for functionality (maximum 90 points)**

Description of functionality criteria	Maximum possible score	Actual points scored	Percentage scored	
Previous experience on contract of similar nature	**20**			= A
Experience of key personnel	**40**			= B
Availability of resources	**30**			= C
Total points for functionality	**90**			**= A + B + C**

Note: A minimum final score of 60 Points must be achieved for functionality. Tender offers of Tenderers that fail to achieve the minimum score for functionality will **NOT** be eligible for further evaluation and will be rejected.

17. CERTIFICATION OF CORRECTNESS OF INFORMATION SUPPLIED IN THIS DOCUMENT

I/We the undersigned is/are duly authorised to do so on behalf of the firm certify that:

1. The information supplied is correct.
2. All copies of relevant information are attached.
3. The BBBEE points claimed are correct and based on owners/shareholders who are actively involved in the day to day management of the enterprise
4. I take note that payment will be effected 30 days after delivery was affected if delivered with an original invoice.
5. If I am classified as a dependant service provider/labour broker as stated in the fourth schedule of the Income Tax act I hereby authorise the LM to deduct PAYE and supply me with a yearly IRP 30 (only if no valid Labour Broker Certificate can be supplied).
6. None of the owners, directors, managers, shareholders or stakeholders of this entity is in the service of the state, or has been in the service of the state in the previous twelve months.
7. In case of a dispute the wording of the original approved Bid Specification Committee Document would prevail.

_____ _____

Signature of authorised person Date

Personal information in block letters

Name

Surname

Telephone No

Capacity

ON BEHALF OF THE (SUPPLIER'S NAME)

Signed and sworn to before me at …… on this the ……..

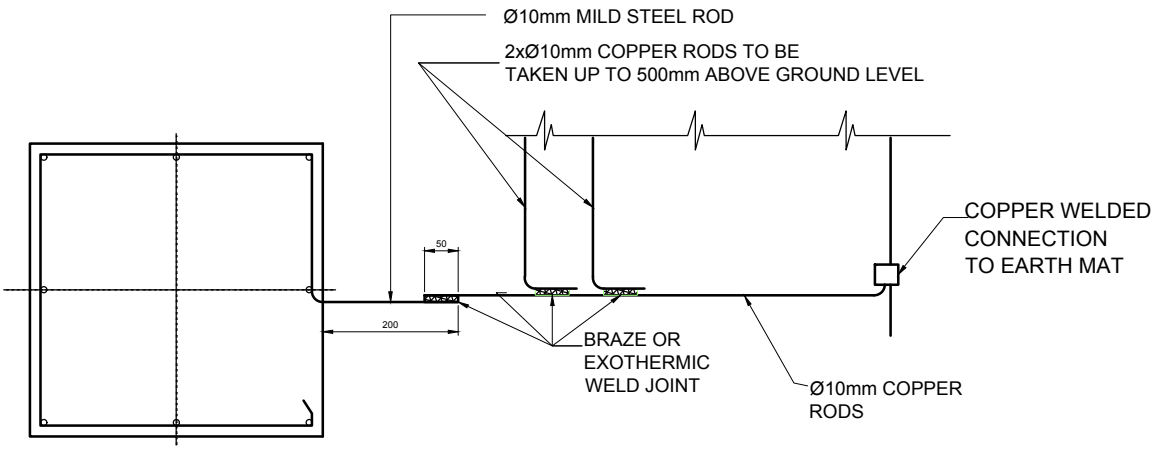
day of ……

By the Deponent, who has acknowledged that he/she knows and understands the contents of this Affidavit, that it is true and correct to the best of his/her knowledge and that he/she has no objection to taking the prescribed oath, and that the prescribed oath will be binding on his/her conscience.

_____

Commissioner of Oaths

TYPICAL EARTH MAT CONNECTION TO COLUMN AND TAIL FOR EQUIPMENT EARTHING



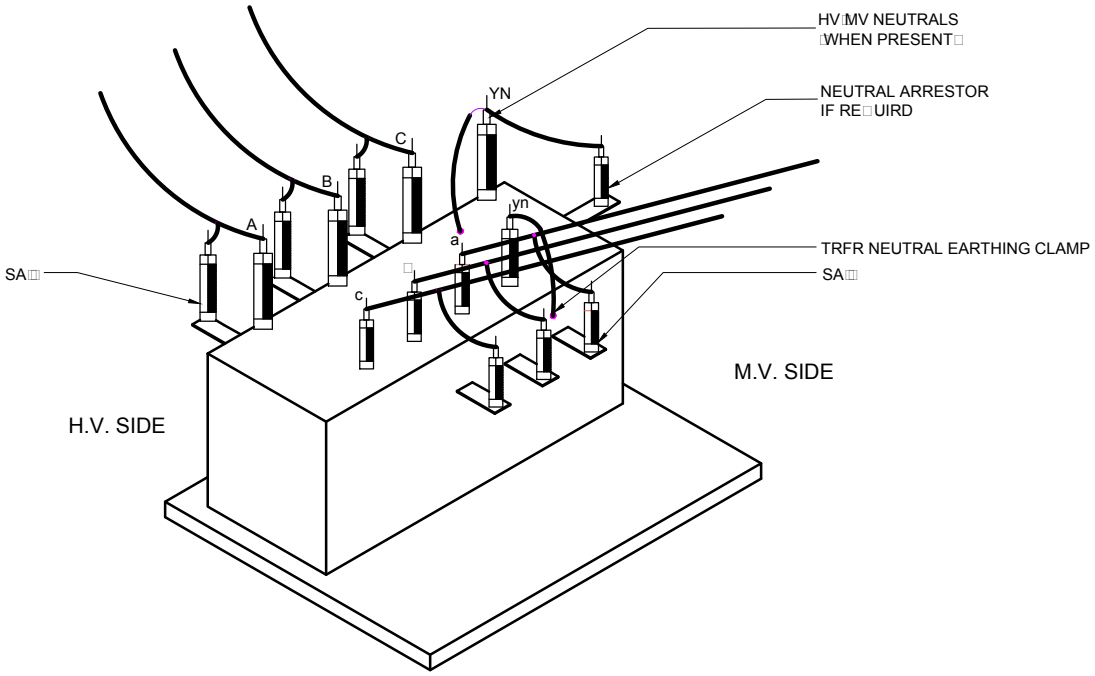
NOTE

1. ONE Ø10mm REINFORCING ROD TO BE CONNECTED TO MAJOR VERTICAL REINFORCING RODS BY MEANS OF BINDING WIRE AND TO SERVE AS EARTH CONNECTION
2. THE FREE LENGTH OF THE MILD STEEL ROD TO BE 200mm OUTSIDE THE CONCRETE. THIS TAIL MUST BE WRAPPED WITH DENSOMASTIC TAPE,OVERLAPPING BY HALF IT'S WIDTH, TO AT LEAST 50mm ON EITHER SIDE OF ITS PENETRATION POINT INTO THE CONCRETE.
3. BRAZE JOINT, OR EXOTHERMIC WELD.

iX engineers
Infrastructure Excellence

EARTH MAT CONNECTION TO COLUMN AND TAIL FOR EQUIPMENT EARTHING

Scale: Skaal:	NTS
Date : Datum:	July 2012
Plan No.	PV 002



TRANSFORMER

NOTES

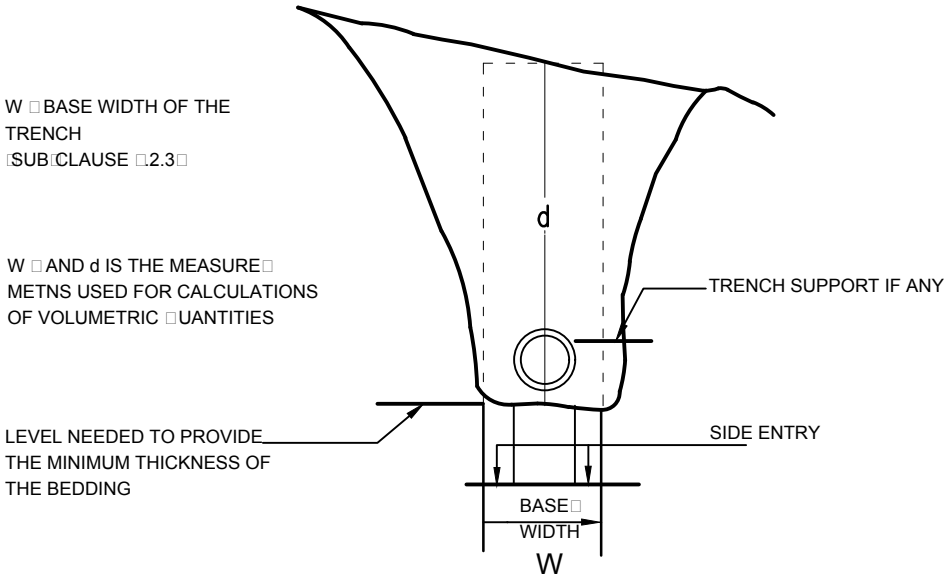
1. SA AND TRFR NEUTRAL EARTHING:
   S.ARR. BRACKETS AND TRFR TANK TO BE USED FOR EARTHING PATH. i.e. NO COPPER EARTH TAILS FOR SA

2. TRFR NEUTRAL EARTHING (DIRECT)
   WHEN REQUIRED. TRFR NEUTRALS MUST BE EARTHED INDIVUALLY VIA OWN EARTHING PAD USING 2 x 50mm x 3mm COPPER EARTHTING STRAPS LAID ONE UPON THE OTHER

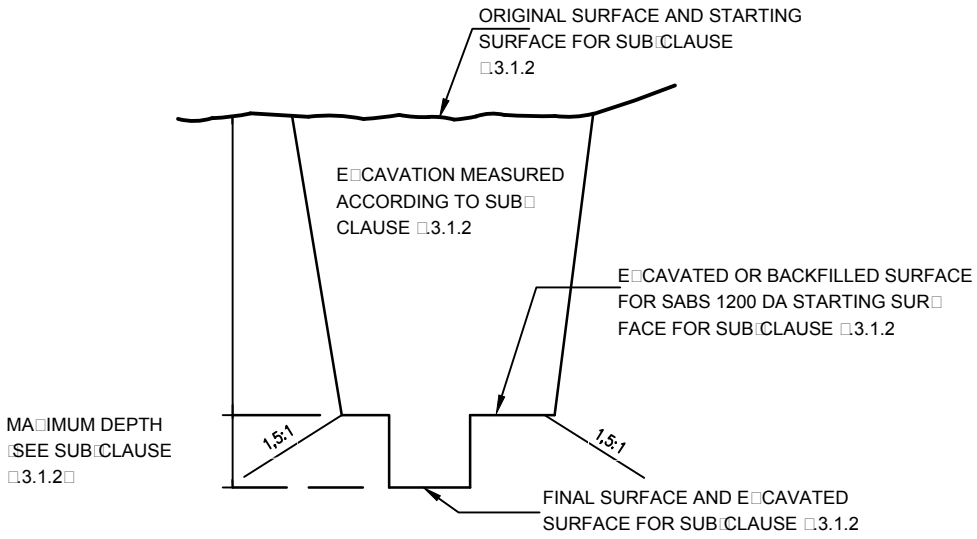
iX engineers
Infrastructure Excellence

TYPICAL POWER TRANSFORMER SURGE ARRESTOR EARTHING DETAIL

Scale: Skaal:	NTS
Date : Datum:	November 2016
Plan No.	PV 006

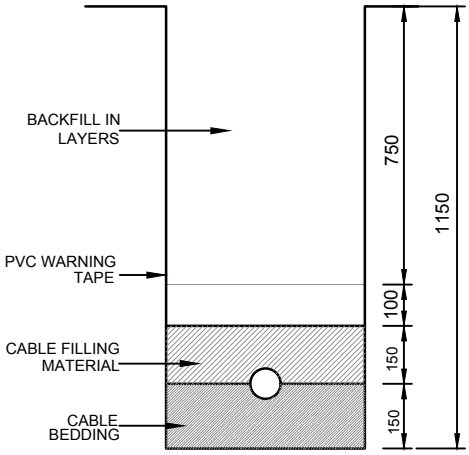


VOLUMETRIC MEASUREMENT OF TRENCH

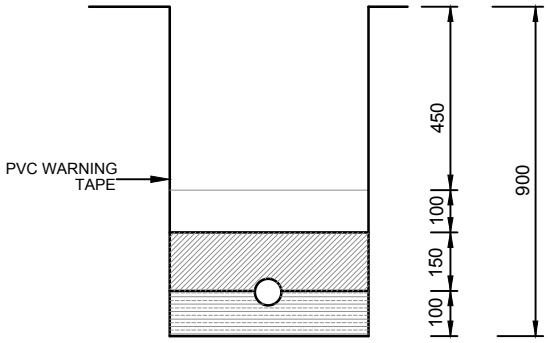


MEASUREMENT OF MASS AND TRENCH E□CAVATIONS

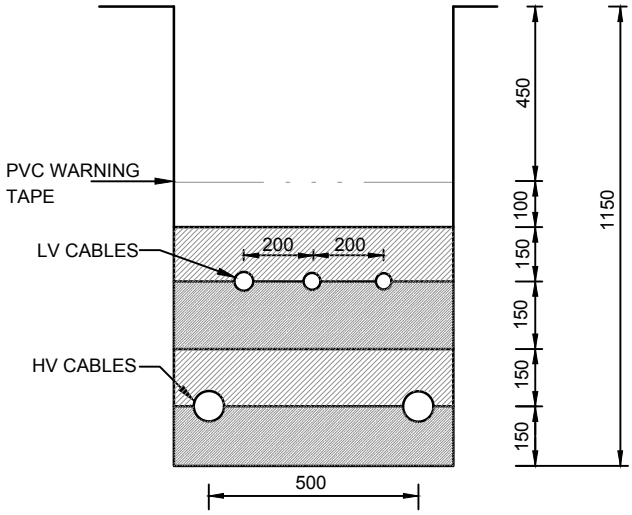
iXengineers Infrastructure Excellence	TRENCH MEASUREMENT	Scale: Skaal: NTS Date : Datum: July 2011 Plan No. PBA 160



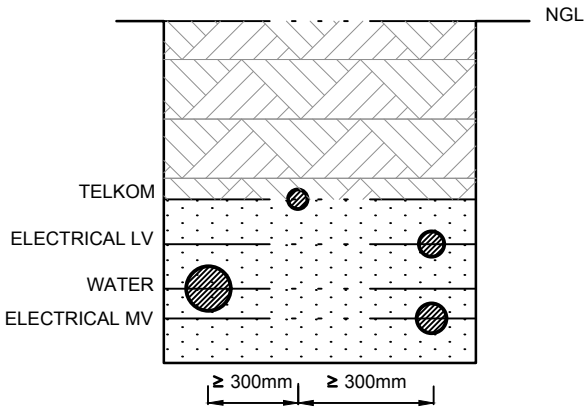
MEDIUM VOLTAGE CABLES ONLY



LOW VOLTAGE CABLES ONLY



MEDIUM AND LOW VOLTAGE CABLES



COMBINED TRENCHES : ELECTICAL OTHER SERVICES

iX engineers
Infrastructure Excellence

DETAIL OF CABLE TRENCHES

Scale: Skaal:	NTS
Date : Datum:	July 2012
Plan No.	PBA 162

SCALE FOR REDUCED PLAN

1 5 10 20 30 40 50

10mm ON ORIGINAL PLAN

NOTES

No	DATE	DESCRIPTION	DRW	CHK

REVISION SCHEDULE

CONSULTING ENGINEER

SIGNATURE	20050166 PR No	05/04/19 DATE

CLIENT

SIGNATURE		DATE

DESIGNED	DRAWN	CHECKED
WHK	SCS	WMS

FOR TENDER

CONSULTANT

iX engineers
Infrastructure Excellence
31 Allen Drive | Loevenstein | Cape Town | 7530
Tel: +27 (0) 21 912 3000 | Fax: +27 (0) 21 912 322
www.ixengineers.co.za

CLIENT

LANGEBERG
MUNISIPALITEIT MUNICIPALITY MASIPALA

PROJECT

ROBERTSON MAIN SUBSTATION REPLACEMENT OF 15MVA 66/11kV TRANSFORMER

DRAWING DESCRIPTION

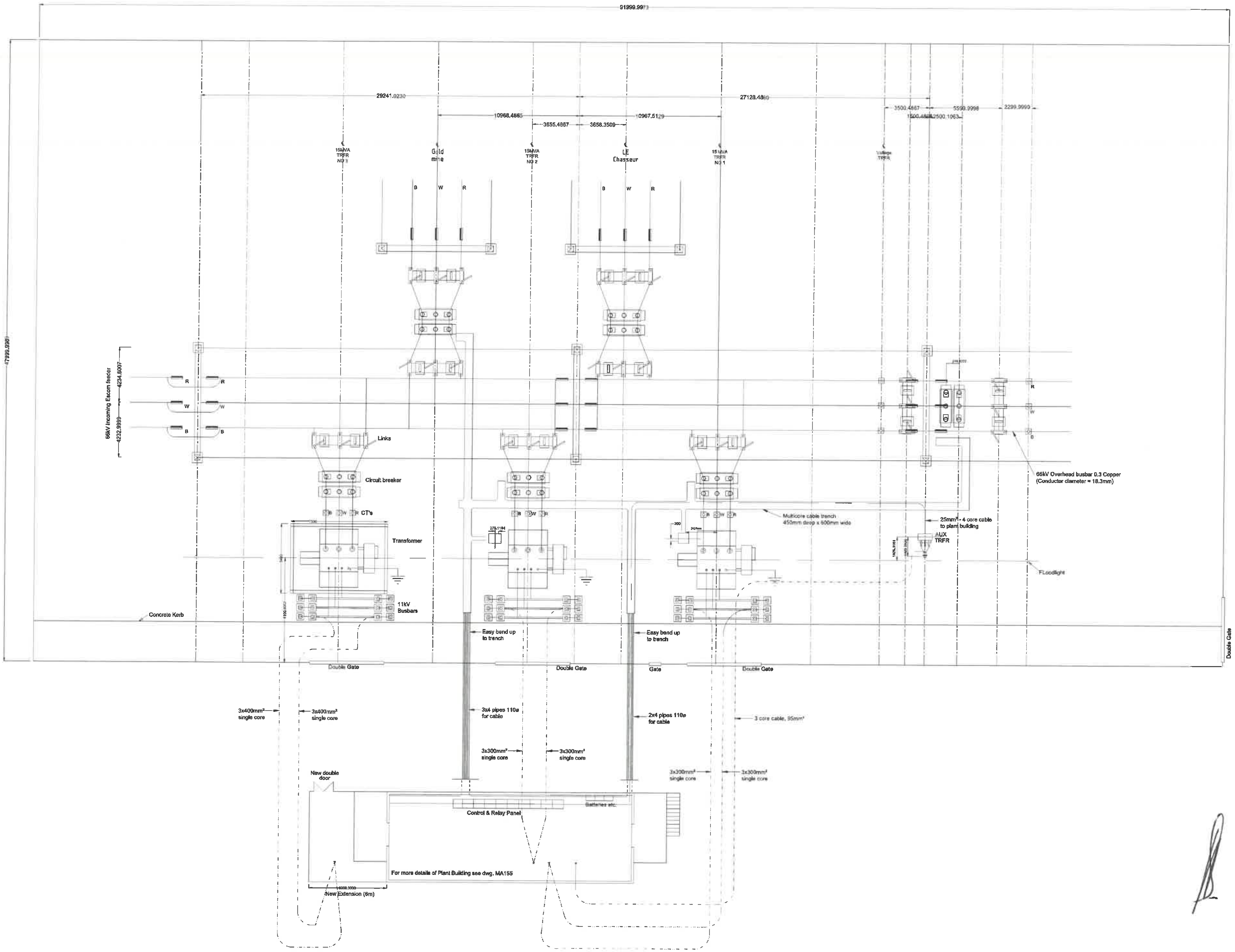
LOCALITY PLAN ROBERTSON MAIN SUBSTATION

DATE	SCALE	ORIGINAL SIZE
MARCH 2019	1 : 1000	A1

DRAWING NUMBER	REV
301268-EL-DLP-0001-001	0

P:\iX Projects\301268 - Robertson Replacement of 15MVA Transformer\06 Drawings\03 Autocad\301268_EL_DLP_0001 Rev 0 Locality Plan.dwg

24/05/2019 3:47:42 Printed By: Cecilia Sterrenberg (Cape Town)



SCALE FOR REDUCED PLAN

NOTES

No	DATE	DESCRIPTION	DRW	CHK

REVISION SCHEDULE

CONSULTING ENGINEER

SIGNATURE	PR No	DATE
	20050166	05/04/19

CLIENT

SIGNATURE	DATE

DESIGNED	DRAWN	CHECKED
WHK	SCS	WMS

FOR TENDER

CONSULTANT

iX engineers
Infrastructure Excellence

31 Allen Drive | Loevenstein | Cape Town | 7530
Tel: +27 (0) 21 912 3000 | Fax: +27 (0) 21 912 322
www.ixengineers.co.za

CLIENT

LANGEBERG
MUNISIPALITEIT MUNICIPALITY MASIPALA

PROJECT

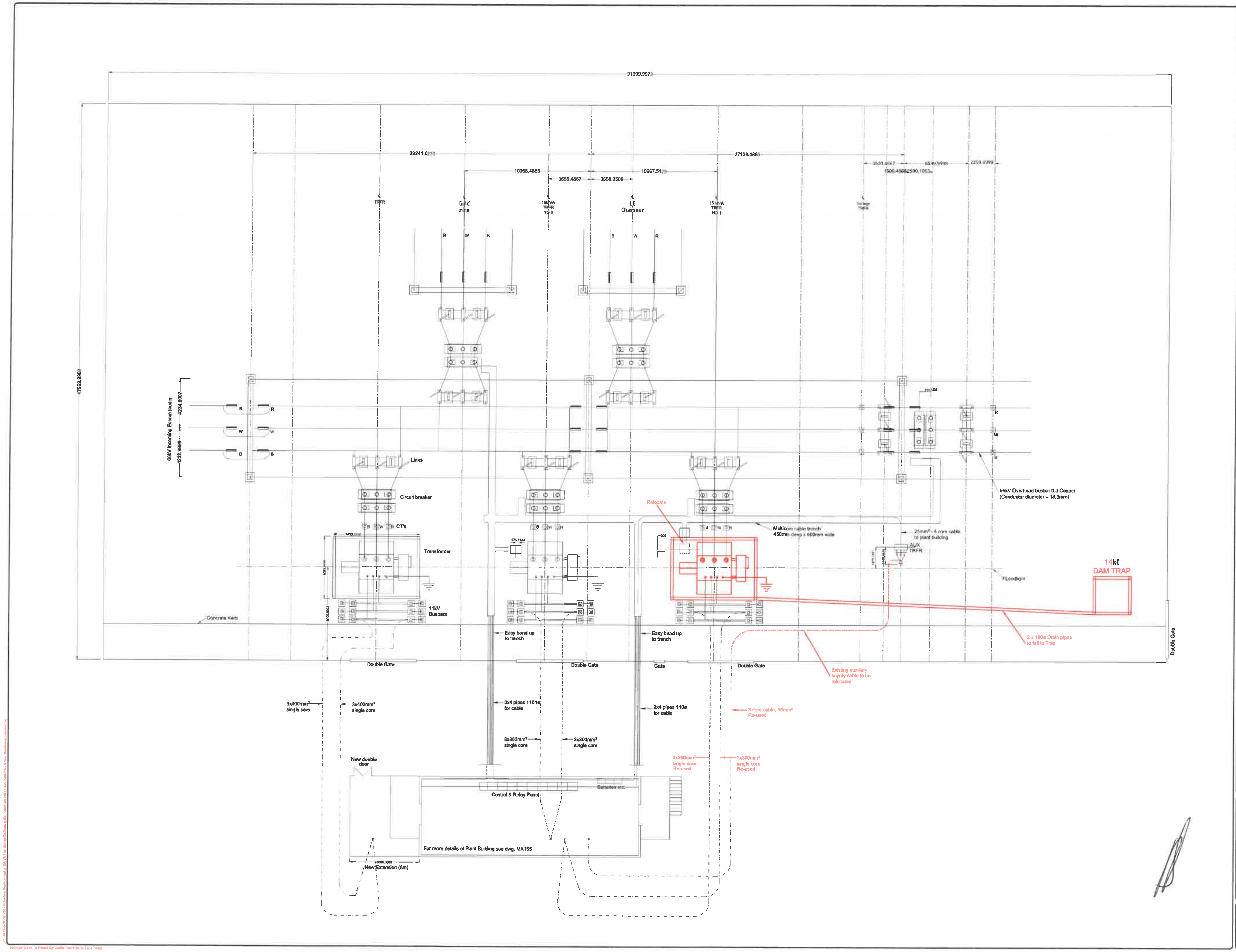
ROBERTSON MAIN SUBSTATION REPLACEMENT OF 15MVA 66/11kV TRANSFORMER

DRAWING DESCRIPTION

EXISTING SUBSTATION LAYOUT

DATE	SCALE	ORIGINAL SIZE
MARCH 2019	1: 100	A0

DRAWING NUMBER	REV
301268-EL-DAL-0001-001	0



SCALE FOR REDUCED PLAN

All dimensions must be verified on site before the work commence. Refer any discrepancies to the Engineer.

NOTES

No	DATE	DESCRIPTION	DRW	CHK

REVISION SCHEDULE

CONSULTING ENGINEER

SIGNATURE	PR No	DATE
	20050168	05/04/19

CLIENT

SIGNATURE — DATE

DESIGNED	DRAWN	CHECKED
WHK	SCS	WMS

FOR TENDER

CONSULTANT

iX engineers
Infrastructure Excellence
31 Allen Drive | Loevenstein | Cape Town | 7530
Tel: +27 (0) 21 912 3000 | Fax: +27 (0) 21 912 322
www.ixengineers.co.za

CLIENT

LANGEBERG
MUNISIPALITEIT MUNICIPALITY MASIPALA

PROJECT

ROBERTSON MAIN SUBSTATION
REPLACEMENT OF 15MVA 66/11kV TRANSFORMER

DRAWING DESCRIPTION

NEW TRANSFORMER LOCATION

DATE	SCALE	ORIGINAL SIZE
MARCH 2019	1: 100	A0

DRAWING NUMBER	REV
301268-EL-DAL-0002-001	0

GOUDMYN SUBSTATION

LE CHASSEUR SUBSTATION

PROPOSED EXTENTION FOR THIRD 66/11kV TRANSFORMER & SWITCHGEAR

ESKOM INFEED

66kV

TRFR 3 Dyn 11

TRFR 2 Imp 11,11% Dyn 11

TRFR 1 Imp 11,37% Dyn 11

ROBERTSON MAIN 66/11kV SUBSTATION

11kV

CAPACITOR 4 3200 kvar

CAPACITOR 3 3200 kvar

CAPACITOR 2 1600 kvar

CAPACITOR 1 800 kvar

SPAAR

ROBERTSON KELDER

ERF 3

UITBREIDING 9

TRFR 3

BUSSECTION 2

KONINGSRIVIER

NOREE

GOEDEMOED

LE CHASSEUR

WATERWERKE

LASBEHEER RMU

WHITESTR 2

TRFR 2

BUSSECTION 1

TRFR 1

SPAAR

NESTLE

KWV LINE

WHITESTR 1

AUXILLIARY TRF

ASHTON

MCGREGOR

LANGVLEI

SCALE FOR REDUCED PLAN

0 5 10 20 30 40 50

50mm ON ORIGINAL A3 PLAN

FOR TENDER

REVISION SCHEDULE

No	DATE	DESCRIPTION

CONSULTING ENGINEER

SIGNATURE | 20050166 PR No | 05/04/19 DATE

CLIENT

SIGNATURE | DATE

CLIENT: LANGEBERG

CONSULTANT: iX engineers Infrastructure Excellence

31 Allen Drive | Loevenstein | Cape Town | 7530
Tel: +27 (0) 21 912 3000 | Fax: +27 (0) 21 912 322
www.ixengineers.co.za

PROJECT: ROBERTSON MAIN SUBSTATION REPLACEMENT OF 15MVA 66/11kV TRANSFORMER

DRAWING DESCRIPTION: SINGLE LINE DIAGRAM OF EXISTING SUBSTATION

DESIGNED	DRAWN	CHECKED
WHK	SCS	WMS

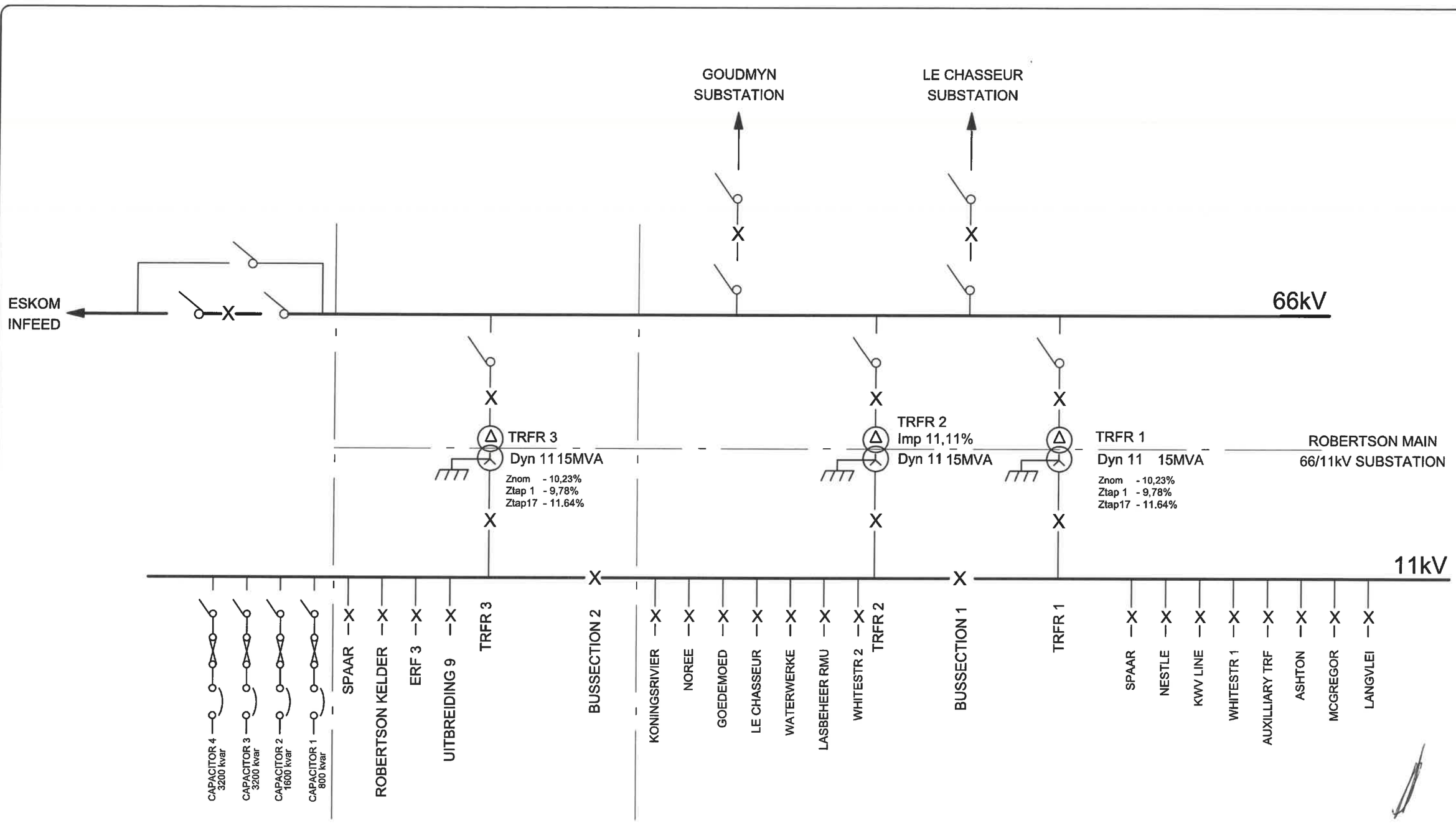
DATE	SCALE
MARCH 2019	NTS

DRAWING NUMBER: 301268-EL-DSL-0001-001

REV: 0

P:\iX Projects\301268 - Robertson Replacement of 15MVA Transformer\08.Drawings\01 Active\301268-EL-DSL-0001 Rev 0 SLD OF Existing Substation.dwg

24/05/2019 3:42:32 Printed By: Cecilia Sterrenberg (Cape Town)



SCALE FOR REDUCED PLAN

0 5 10 20 30 40 50

50mm ON ORIGINAL A3 PLAN

FOR TENDER

REVISION SCHEDULE

No	DATE	DESCRIPTION

CONSULTING ENGINEER

SIGNATURE — 20050166 PR No — 05/04/19 DATE

CLIENT

SIGNATURE — DATE

CLIENT: LANGEBERG

CONSULTANT

iX engineers Infrastructure Excellence
31 Allen Drive | Loevenstein | Cape Town | 7530
Tel: +27 (0) 21 912 3000 | Fax: +27 (0) 21 912 322
www.ixengineers.co.za

PROJECT

ROBERTSON MAIN SUBSTATION
REPLACEMENT OF 15MVA
66/11kV TRANSFORMER

DRAWING DESCRIPTION

SINGLE LINE DIAGRAM OF
NEW TRANSFORMER

DESIGNED	DRAWN	CHECKED
WHK	SCS	WMS

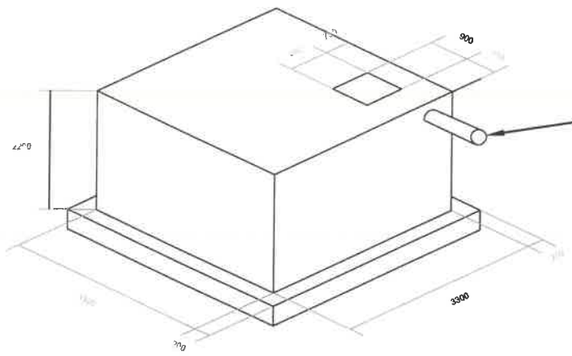
DATE	SCALE
MARCH 2019	NTS

DRAWING NUMBER: 301268-EL-DSL-0002-001

REV: 0

P:\iX Projects\301268 - Robertson Replacement of 15MVA Transformer\08.Drawings\01.Active\301268-EL-DSL-0002 Rev 0 SLD OF New Substation.dwg

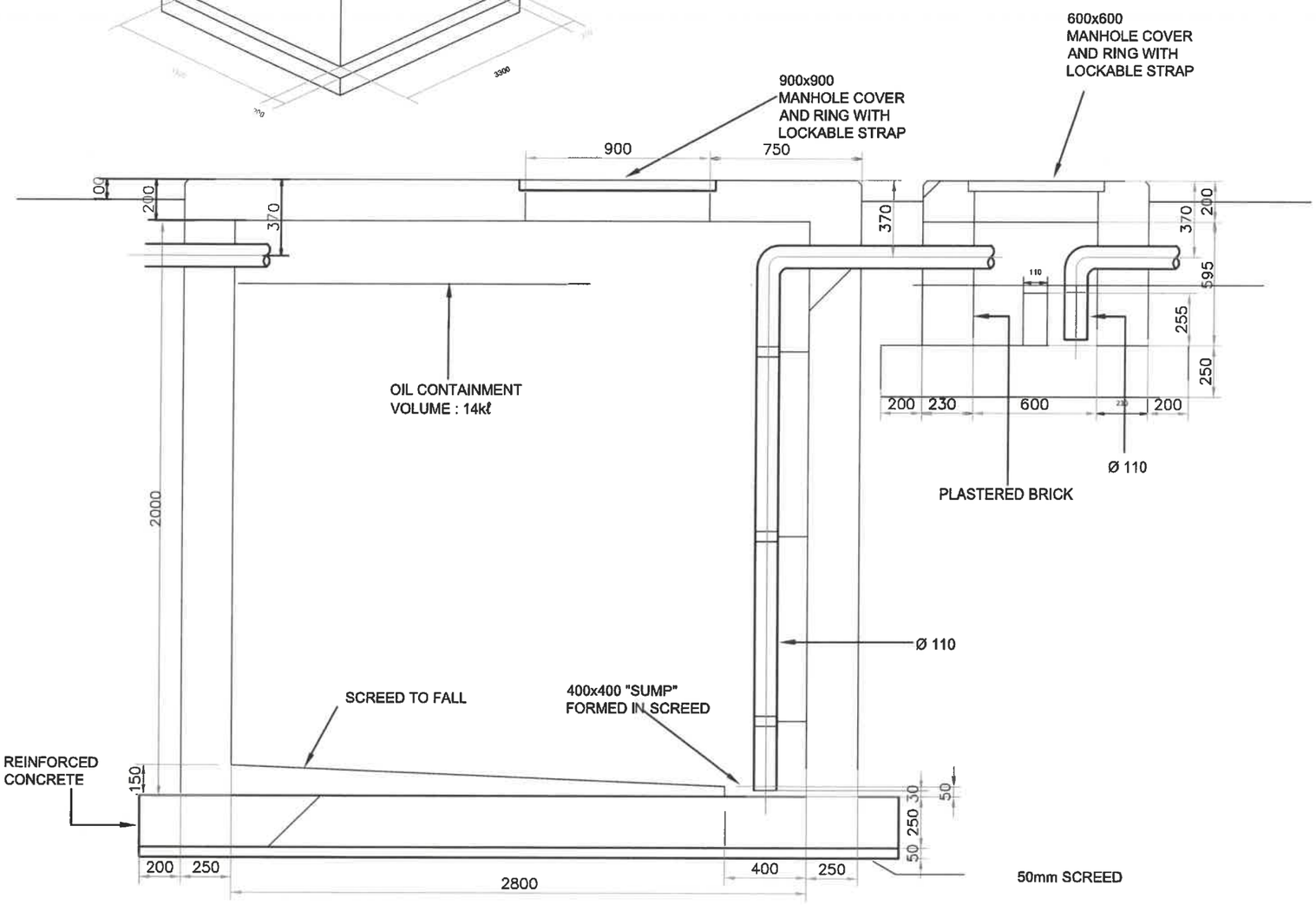
24/05/2019 3:44:51 Printed By: Cecilia Sterrenberg (Cape Town)



WATER RELEASE TO
STORMWATER CATCHMENT

STRUCTURAL NOTES:

1. CONCRETE: 30MPa/19mm
2. REBAR: ALLOW 120kg/m
3. MASONRY: 14MPa
4. MORTAR: CLASS II



SCALE FOR REDUCED PLAN

0 5 10 20 30 40 50

50mm ON ORIGINAL A3 PLAN

FOR DISCUSSION

REVISION SCHEDULE

No	DATE	DESCRIPTION

CONSULTING ENGINEER

SIGNATURE | 20050166 PR No | 05/04/19 DATE

CLIENT

SIGNATURE | DATE

CLIENT: LANGEBERG

CONSULTANT

iX engineers
Infrastructure Excellence
31 Allen Drive | Loevenstein | Cape Town | 7530
Tel: +27 (0) 21 912 3000 | Fax: +27 (0) 21 912 322
www.ixengineers.co.za

PROJECT

ROBERTSON MAIN SUBSTATION
REPLACEMENT OF 15MVA
66/11kV TRANSFORMER

DRAWING DESCRIPTION

OIL DAM DETAILS

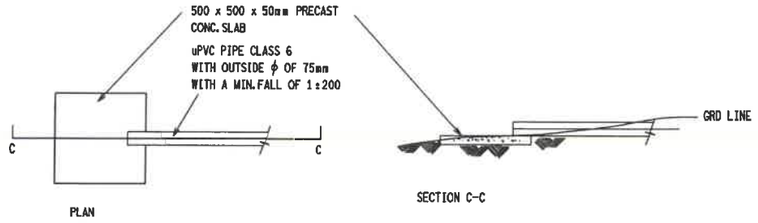
DESIGNED	DRAWN	CHECKED
WHK	SCS	WMS

DATE	SCALE
MARCH 2019	NTS

DRAWING NUMBER	REV
301268-EL-DRD-0001-001	0

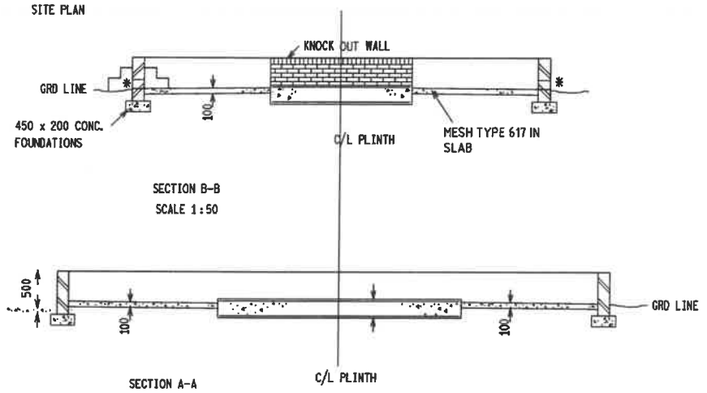
P:\iX Projects\301268 - Robertson Replacement of 15MVA Transformer\08.Drawings\01.Active\301268-EL-DRD-0001 Rev 0 Oil Dam Details.dwg

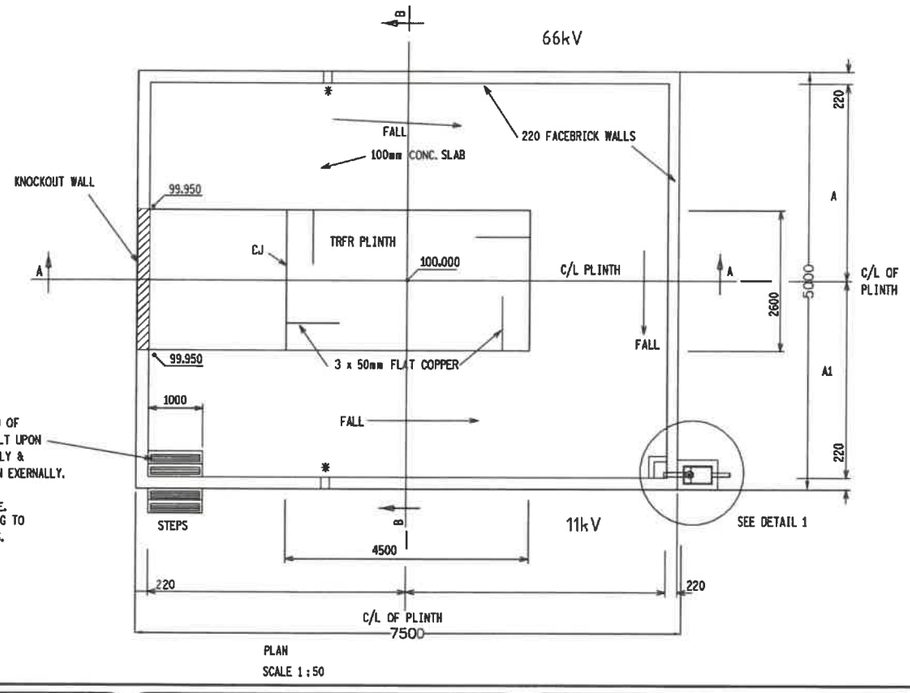
24/05/2019 3:44:07 Printed By: Cecilia Sterrenberg (Cape Town)

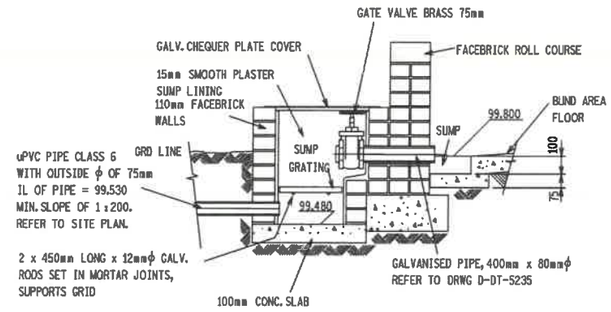


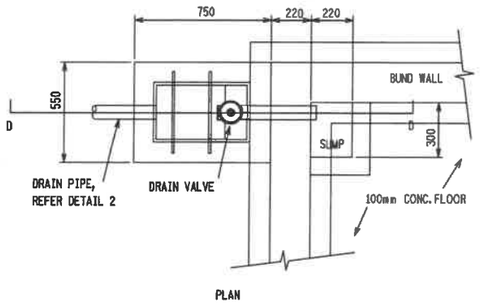
DETAIL 2
SCALE 1:15

FOR FINAL POSITION REFER SITE PLAN









DETAIL 1
SCALE 1:15

NOTES

ALL CONCRETE WORK SHALL COMPLY WITH SANS 1200 GA.
MINIMUM 28 DAYS COMPRESSION STRENGTH SHALL BE 20MPa.
NOMINAL AGGREGATE SIZE SHALL BE 19mm.

THE REINFORCING MESH SHALL BE PLACED IN THE TOP AND BOTTOM OF THE PLINTH AND RUNWAY SLABS WITH A COVER OF 40mm.
WHERE THE GROUND CONDITIONS ARE POOR, A 50mm THICK MASS CONCRETE BLINDING LAYER SHALL BE CAST PRIOR TO THE MESH BEING PLACED.

ALL REINFORCING OVERLAPS SHALL HAVE A LAP OF 350mm.
THE SUBGRADE MATERIAL UNDER THE TRFR PLINTH AND SLIPWAY SHALL BE COMPACTED TO 90% OF MOD AASHTO MAXIMUM DENSITY.

ALL CONSTRUCTION (CJ)/ EXPANSION JOINTS AND CABLE ENTRY POINTS SHALL BE SEALED USING EXPANDABLE INSERTS OR COMPOUND SYSTEMS. THESE SEALING SHALL HAVE A MINIMUM 2 HOUR FIRE RATING IN ACCORDANCE WITH SANS 10177.
RECOMMENDED SYSTEMS ARE CSD SEALING SYSTEMS FROM MERIDIAN TECHNOLOGIES AND INTUMEX FROM P & H PROTECTIVE PLASTER SYSTEMS.

BUND WALLS TO BE CONSTRUCTED FROM FACE BRICKS COMPLYING WITH SANS 227 AND APPROVED BY ENGINEER. ALL JOINTS SHALL CONSTRUCTED WITH 10mm THICK MORTAR (1:4) CEMENT : SAND, RAKED FINISH. ALL JOINTS TO BE IN STRAIGHT HORIZONTAL AND VERTICAL LINES. WALLS TO BE CAPPED WITH A ROLL COURSE.
PLASTER TO BE 1:4 (CEMENT : SAND), MIN. 15mm THICK, SMOOTH FINISH, INCLUDING BENCHING.

STAIR TREADS TO BE RIBBED FOR GRIP.

SUMP COVER TO BE 650 x 450 x 3mm GALVANISED CHEQUER PLATE WITH 25mm DIA. LIFTING HOLE AT THE CENTRE.

LEVEL OF TOP OF THE PLINTH TO RELATE TO THE CENTRE OF ADJACENT ROAD LEVEL FOR EACH SITE.

|| 160mmϕ PVC SLEEVE FOR CABLES. SLEEVE TO BE CORKED AFTER
* CABLES ARE LAID. FINAL POSITIONS TO BE DETERMINED ON SITE.

GRATING IN SUMP TO BE 370 x 290 GALV. B60 30mm x 4.5mm GRIPWELD OR SIMILAR APPROVED.
NB. TRFR MASS TO BE CHECKED FOR EACH INSTALATION AS EXCEPTIONS TO THE ABOVE MAY OCCUR.

BUND WALL DIMENSIONS:
BUND WALL DIMENSIONS A, A1, B AND B1 ARE TO SUIT.
OUTLINE DRWG AND SHALL BE AS FOLLOWS:
DIMENSION TO INSIDE LINE OF BUND WALL TO ANY PART OF THE TRANSFORMER CONTAINING OIL SHALL BE 1500mm.

SLIPWAY DIMENSIONS:
SLIPWAY DIMENSION E TO BE DETERMINED BY THE SITE LAYOUT, REFER TO SUBSTATION LAYOUT DRAWINGS.

OIL ABSORBANT CUSHIONS:
LINE SUMP, ABOVE GRATING, WITH NO. 2 x 300 x 300 x 50mm NATURAL FIBRE OIL ABSORBANT CUSHIONS AS SUPPLIED BY DRIZIT WESTERN CAPE (021) 531-5335 OR SIMILAR APPROVED CUSHIONS.
ENSURE THAT THE CUSHIONS FIT TIGHT AGAINST THE PERIMETER WALLS.

SCALE FOR REDUCED PLAN
0 5 10 20 30 40 50
50mm ON ORIGINAL A3 PLAN

FOR DISCUSSION

All dimensions must be verified on site before the works commence. Refer any discrepancies to the Engineer.

REVISION SCHEDULE

No	DATE	DESCRIPTION

CONSULTING ENGINEER

SIGNATURE | 20050166 PR No | 05/04/19 DATE

CLIENT

SIGNATURE | DATE

CLIENT: LANGEBERG

CONSULTANT: iX engineers Infrastructure Excellence
31 Allen Drive | Loevenstein | Cape Town | 7530
Tel: +27 (0) 21 912 3000 | Fax: +27 (0) 21 912 322
www.ixengineers.co.za

PROJECT
ROBERTSON MAIN SUBSTATION
REPLACEMENT OF 15MVA
66/11kV TRANSFORMER

DRAWING DESCRIPTION
GENERAL TRANSFORMER
PLINTH ARRANGEMENT

DESIGNED	DRAWN	CHECKED
WHK	SCS	WMS

DATE	SCALE
MARCH 2019	NTS

DRAWING NUMBER	REV
301268-EL-DRD-0002-001	0

P:\iX Projects\301268 - Robertson Replacement of 15MVA Transformer\08.Drawings\01 Active\301268-EL-DRD-0002 Rev 0 General Transformer Plinth arrangement.dwg

24/05/2019 3:43:22 Printed By: Cecilia Sterrenberg (Cape Town)